

Strengthening human and natural systems resilience to climate change through mangrove ecosystems conservation and sustainable use in southern Benin

Part I: Project Information

GEF ID

10166

Project Type

FSP

Type of Trust Fund

MTF

CBIT/NGI

CBIT

NGI

Project Title

Strengthening human and natural systems resilience to climate change through mangrove ecosystems conservation and sustainable use in southern Benin

Countries

Benin

Agency(ies)

FAO

Other Executing Partner(s)

Ministry of Living Environment and Sustainable Development (MCVDD)

Executing Partner Type

Government

GEF Focal Area

Multi Focal Area

Taxonomy

Biodiversity, Focal Areas, Biomes, Mangroves, Mainstreaming, Forestry - Including HCVF and REDD+, Agriculture and agrobiodiversity, Productive Landscapes, Protected Areas and Landscapes, Climate Change Adaptation, Climate Change, Innovation, Livelihoods, Least Developed Countries, Influencing models, Transform policy and regulatory environments, Deploy innovative financial instruments, Demonstrate innovative approaches, Strengthen institutional capacity and decision-making, Stakeholders, Private Sector, SMEs, Individuals/Entrepreneurs, Civil Society, Community Based Organization, Non-Governmental Organization, Communications, Awareness Raising, Behavior change, Beneficiaries, Type of Engagement, Participation, Partnership, Local Communities, Gender Equality, Gender results areas, Access to benefits and services, Participation and leadership, Gender Mainstreaming, Gender-sensitive indicators, Capacity, Knowledge and Research, Capacity Development

Rio Markers**Climate Change Mitigation**

Climate Change Mitigation 0

Climate Change Adaptation

Climate Change Adaptation 2

Duration

60 In Months

Agency Fee(\$)

679,814.00

Submission Date

4/4/2019

A. Indicative Focal/Non-Focal Area Elements

Programming Directions	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
CCA-1	LDCF	2,977,473.00	17,000,000.00
CCA-2	LDCF	1,488,737.00	8,750,000.00
BD-1-1	GET	2,689,726.00	9,250,000.00
	Total Project Cost (\$)	7,155,936.00	35,000,000.00

B. Indicative Project description summary

Project Objective

Project Objective: : Increased resilience of mangrove ecosystems and their dependent agricultural, forestry and fishery communities in southern Benin Indicators: Number of direct beneficiaries with reduced vulnerability and increased resilience through improved management of mangrove ecosystems and livelihoods (target: 125,000 women and 125,000 men) Area of mangrove ecosystem under climate-resilient and sustainable management to benefit biodiversity (target: 120,000 ha), including selected areas in Ramsar sites and surrounding production land

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Component 1: Increased adaptive capacity of the natural systems	Investment	<p>1. Mangrove ecosystems and their ecosystem services and goods are sustainably managed to benefit the local agricultural, forestry and fishery communities and biodiversity in demonstration sites</p> <p>Indicators and targets:</p> <p>120,000 ha of vulnerable and degraded mangrove ecosystems under climate-resilient and sustainable management to benefit biodiversity</p>	<p>1.1 A comprehensive assessment of the economic, social, cultural and environmental value of mangrove ecosystems performed in order to inform decision making on ecosystem restoration and conservation interventions</p> <p>1.2 Local awareness-raising platforms in demonstration sites established and made operational contributing to the mobilisation and engagement of local stakeholder groups in mangrove ecosystem management planning, implementation and monitoring</p> <p>1.3 Mangrove ecosystem management plans are developed in X communes involving local stakeholders, including from agriculture, forestry and fishery sectors</p> <p>1.4 Mangrove ecosystem management plans implemented in X communes, promoting innovative and integrated technologies and approaches in the</p>	GET	1,861,644.00	1,750,000.00

X communes adopt and implement mangrove ecosystem management plans, benefitting directly the climate resilience of at least 250,000 women and men

agriculture, forestry and fisheries sectors that contribute to ecosystem restoration, resiliency and sustainability (e.g. innovations in seedling production and handling for restoration purposes, innovative Integrated Food and Energy Systems, improved crop-rotation schemes, small-scale irrigation systems, and more to lift pressure from production land on mangroves)

(TBC during PPG)

1.5 Capacity-building, advocacy, monitoring and technical training activities for local stakeholders undertaken

Component 1: Increased adaptive capacity of the natural systems	Investment	1. Mangrove ecosystems and their ecosystem services and goods are sustainably managed to benefit the local agricultural, forestry and fishery communities and biodiversity in demonstration sites	1.1 A comprehensive assessment of the economic, social, cultural and environmental value of mangrove ecosystems performed in order to inform decision making on ecosystem restoration and conservation interventions	LDC F	1,815,177.00	18,000,000.00
		Indicators and targets:	1.2 Local awareness-raising platforms in demonstration sites established and made operational contributing to the mobilisation and engagement of local stakeholder groups in mangrove ecosystem management planning, implementation and monitoring			
		120,000 ha of vulnerable and degraded mangrove ecosystems under climate-resilient and	1.3 Mangrove ecosystem management plans are developed in X communes involving local stakeholders, including from agriculture, forestry and fishery sectors			

sustainable management to benefit biodiversity

X communes adopt and implement mangrove ecosystem management plans, benefitting directly the climate resilience of at least 250,000 women and men

(TBC during PPG)

1.4 Mangrove ecosystem management plans implemented in X communes, promoting innovative and integrated technologies and approaches in the agriculture, forestry and fisheries sectors that contribute to ecosystem restoration, resiliency and sustainability (e.g. innovations in seedling production and handling for restoration purposes, innovative Integrated Food and Energy Systems, improved crop-rotation schemes, small-scale irrigation systems, and more to lift pressure from production land on mangroves)

1.5 Capacity-building, advocacy, monitoring and technical training activities for local stakeholders undertaken

<p>Component 2: Increased adaptive capacity of the human systems thanks to livelihood diversification and development</p>	<p>Investment</p>	<p>2. Agricultural, forestry and fishery communities dependent on mangrove ecosystems adopt gender-empowering, biodiversity-friendly and sustainable alternative livelihoods that increase their resilience to climate change.</p> <p>Indicators: 42,000 women and 42,000 men benefit from increased incomes thanks to climate resilient alternative livelihoods (including 34,000 fishermen and 50,000 agricultural producers)</p>	<p>2.1 Alternative nature-based livelihoods in mangrove ecosystems identified using the FAO guiding framework to developing gender-sensitive value chains</p> <p>2.2 At least two local public-private partnerships created and operationalized to catalyze investments for alternative nature-based livelihoods and value chains in target communities</p> <p>2.3 Complementing output 2.2 and focusing on the most vulnerable and poorest, local community resilience funds set up to support nature-based livelihoods</p> <p>2.4 Capacity-building and training provided to local stakeholders in order to ensure the sustainability of the selected livelihoods (e.g. innovative Thiaroye Processing Technique, use of invasive species for handicrafts, improved cookstoves, improved salt processing units, and more)</p>	<p>GET</p>	<p>500,000.00</p>	<p>5,000,000.00</p>
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Component 2: Increased adaptive capacity of the human systems thanks to livelihood diversification and development	Investment	<p>2. Agricultural, forestry and fishery communities dependent on mangrove ecosystems adopt gender-empowering, biodiversity-friendly and sustainable alternative livelihoods that increase their resilience to climate change.</p> <p>Indicators: 42,000 women and 42,000 men benefit from increased incomes thanks to climate resilient alternative livelihoods (including 34,000 fishermen and 50,000 agricultural producers)</p>	<p>2.1 Alternative nature-based livelihoods in mangrove ecosystems identified using the FAO guiding framework to developing gender-sensitive value chains</p> <p>2.2 At least two local public-private partnerships created and operationalized to catalyze investments for alternative nature-based livelihoods and value chains in target communities</p> <p>2.3 Complementing output 2.2 and focusing on the most vulnerable and poorest, local community resilience funds set up to support nature-based livelihoods</p> <p>2.4 Capacity-building and training provided to local stakeholders in order to ensure the sustainability of the selected livelihoods (e.g. innovative Thiaroye Processing Technique, use of invasive species for handicrafts, improved cookstoves, improved salt processing units, and more)</p>	LDC F	1,638,356.00	7,000,000.00
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Component 3: Enabling environment for sustainable management of mangrove ecosystems in a context of climate change	Technical Assistance	<p>3. National institutional and policy frameworks strengthened to sustainably manage mangrove ecosystems in a context of climate change and knowledge on climate-resilient mangrove ecosystem management improved, captured and disseminated.</p> <p>Indicators: Number of legal instruments and institutional arrangements addressing national legal and capacity gaps for sustainable and climate resilient mangrove management</p> <p>Number of institutional coordination mechanisms for integrated planning expanded</p>	<p>3.1. Institutional environment pertaining to mangrove ecosystems management strengthened</p> <p>3.2. Legal instruments related to mangrove ecosystems management strengthened</p> <p>3.3 Capacity needs assessment of relevant institutions working on mangroves performed, and capacity development plan prepared and implemented</p> <p>3.4 Local and tailored governance planning tools for bottom-up and participatory resilient coastal ecosystem management disseminated</p> <p>3.5 Decision-making, knowledge and awareness on climate-resilient mangrove ecosystems conservation and sustainable use strengthened</p> <p>3.6 Project progress, results, lessons and best practices documented and disseminated</p>	GET	200,000.00	2,000,000.00
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Component 3: Enabling environment for sustainable management of mangrove ecosystems in a context of climate change	Technical Assistance	<p>3. National institutional and policy frameworks strengthened to sustainably manage mangrove ecosystems in a context of climate change and knowledge on climate-resilient mangrove ecosystem management improved, captured and disseminated.</p> <p>Indicators: Number of legal instruments and institutional arrangements addressing national legal and capacity gaps for sustainable and climate resilient mangrove management</p> <p>Number of institutional coordination mechanisms for integrated planning expanded</p>	<p>3.1. Institutional environment pertaining to mangrove ecosystems management strengthened</p> <p>3.2. Legal instruments related to mangrove ecosystems management strengthened</p> <p>3.3 Capacity needs assessment of relevant institutions working on mangroves performed, and capacity development plan prepared and implemented</p> <p>3.4 Local and tailored governance planning tools for bottom-up and participatory resilient coastal ecosystem management disseminated</p> <p>3.5 Decision-making, knowledge and awareness on climate-resilient mangrove ecosystems conservation and sustainable use strengthened</p> <p>3.6 Project progress, results, lessons and best practices documented and disseminated</p>	LDC F	800,000.00	250,000.00
Sub Total (\$)					6,815,177.00	34,000,000.00

Project Management Cost (PMC)

	LDCF	212,677.00	500,000.00
	GET	128,082.00	500,000.00
	Sub Total(\$)	340,759.00	1,000,000.00
	Total Project Cost(\$)	7,155,936.00	35,000,000.00

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(\$)
Donor Agency	GCF	Grant	Investment mobilized	30,000,000.00
Recipient Country Government	MCVDD	In-kind	Recurrent expenditures	500,000.00
GEF Agency	FAO	Grant	Recurrent expenditures	4,000,000.00
GEF Agency	FAO	In-kind	Recurrent expenditures	500,000.00
			Total Project Cost(\$)	35,000,000.00

Describe how any "Investment Mobilized" was identified

The Ouémé Climate Resilience Initiative (OCRI) is a GCF project under review. It is new and additional financing in support of the project objective. The projects have been designed in order to be complementary in scope, while they are operating in the same geography. Therefore, the financing has been considered investment mobilised. Other ongoing projects of relevance to the achievement of the project objective, operating in the same geography, have been identified as Investment mobilized as well, as long as they are not general operating costs of project partners.

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	LDCF	Benin	Climate Change	NA	4,466,210	424,290	4,890,500.00
FAO	GET	Benin	Biodiversity	BD STAR Allocation	2,689,726	255,524	2,945,250.00
Total GEF Resources(\$)					7,155,936.00	679,814.00	7,835,750.00

E. Project Preparation Grant (PPG)

PPG Required



PPG Amount (\$)

150,000

PPG Agency Fee (\$)

14,250

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
FAO	LDCF	Benin	Climate Change	NA	100,000	9,500	109,500.00
FAO	GET	Benin	Biodiversity	BD STAR Allocation	50,000	4,750	54,750.00
Total Project Costs(\$)					150,000.00	14,250.00	164,250.00

Core Indicators

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)
120000.00	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)
120,000.00			

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

Title	Submitted
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CCA core indicators and meta data	
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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	125,000			
Male	125,000			
Total	250000	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

Please, consider the LDCF CI and Metadata Worksheet in the Roadmap section. C.I. 4.1 reports the 120,000ha of mangrove ecosystems that will directly benefit from the GEFTF investment. An additional 95,000ha of land will benefit from the OCRI investments (this figure needs to be confirmed) introducing climate-resilient technologies. In the core indicator at PIF stage, the direct benefits from the GEF investment are reported. During the PPG, the CI 4.1 figure will be confirmed based on confirmed baseline investment targets, and exact extent of selected sites of the LDCF-GEFTF project (using precise satellite images).

Part II. Project Justification

1a. Project Description

Benin, a politically stable country with high economic potential but a growing rate of poverty

1. The Republic of Benin is a sub-Saharan African country of 114,763 km². It has a 121 kilometers coastline on the Gulf of Guinea, and is bordered by Togo to the West, Nigeria to the East, and Burkina Faso and Niger to the North. Its population is estimated at 11.2 million inhabitants, largely concentrated in the southern coastal zone. The country is relatively flat, with four main geomorphologic features^[1]: a sandy coastal plain in the South characterized by wetlands, lakes and lagoons, sedimentary plateaus in the lower part of the country, a crystalline peneplain in the central part of the country, and the Atacora chain in the North. Benin's climate is characterized by the annual succession of a dry season and a rainy season. The average annual rainfall ranges from 700 mm in the North to 1,500 mm in the South.

2. The country is characterized by a democratic government and **political stability**. The latest presidential elections in 2016 were won by Patrice Talon whose government adopted in December 2016 a Government Action Programme (PAG) structured around flagship projects aimed at improving productivity and living conditions.

3. Despite a moderate GDP growth of 4% to 5% a year over the past two decades, Benin is a Least Developed Country and poverty remains widespread due to limited growth in GDP per capita. National headcount poverty rates increased from 35.2% in 2009 to 40.1% in 2015 and Benin's HDI (0.515) ranks 163th worldwide. Female-headed households experience lower levels of poverty (28% compared to 38% for male-headed) but generally, women suffer from a lack of economic opportunity and are under-represented in high-level decision-making positions.

4. Benin's economy relies on agriculture (35% of its GDP) and on its informal re-export and transit trade with Nigeria, which makes up roughly 20% of its GDP. GDP growth accelerated from 4.0% in 2016 to 5.6% in 2017 (2.7% per capita), driven by a vibrant agricultural sector buoyed by record cotton production, an increase in public investment (particularly infrastructure), and the strong performance of the service sector due to economic recovery in Nigeria.

5. Benin has one of the highest **demographic growth** rates in the sub-region (2.8% in 2017). It is a predominantly rural society with more than 70% of its population depending on employment in the agricultural sector^[2]. Maize, beans, rice, peanuts, cashews, pineapples, cassava, yams are grown for local subsistence and for export to neighboring countries through informal cross-border trading activities. Top commodities produced by quantity are cassava, yams, maize, pineapples, tomatoes, rice, cottonseed, cashew nuts, fresh fruit, and groundnuts^[3]. Cotton is the principal cash crop and accounts for 70% of export earnings.

6. Benin is **vulnerable to exogenous shocks** such as adverse weather conditions, terms of trade (especially for cotton and oil prices), and developments in Nigeria.

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Mangroves provide critical ecosystem services to Benin's coastal area

7. Benin is part of the Guinea Current Large Marine Ecosystem (GCLME), one of the world's most productive marine and coastal ecosystems, that extends from northern Guinea Bissau to southern Gabon. The GCLME hosts valuable wetlands and mangroves that host major coastal ecosystems. FAO^[4] describes "mangroves" as characteristic littoral plant formations of tropical and subtropical sheltered coastlines. It further adds that, generally speaking, mangroves are trees and shrubs growing below the high-water level of spring tides, and that forest community and its habitats constitute an ecosystem.^[5]

8. In Benin's inland water bodies (coastal wetlands, swamps, lagoons, lakes and rivers), **fishery** has a relatively high productivity. With an average productivity of 1 ton/ha/year, yields are significantly higher than other west African lagoon systems (200 to 300 kg/ha/year). Country-wide, inland water bodies provide 33,000 tons of fish, shrimps, and crabs every year, whereas ocean fishing represent 7,000 tons. Fishery is not only the main economic activity for local communities living near inland water bodies, but it also represents an important nutrition, food security and economic asset for the country. The coastal zones provide also other key agricultural products for subsistence (cowpeas, maize, cassava, market gardening) and export (pineapples, banana, coconuts, palm oil). A large number of local **foodstuffs** (fisheries products, salt), and **non-food products** (timber, firewood) that are collected from wetlands and other permanent and seasonal water bodies play important roles in consumption and income generation for rural households.

9. Mangroves provide **critical ecosystem services** to Benin's coastal areas. Among them are i) coastal protection against wave and wind erosion; ii) mitigation of coastal storms and cyclones impacts; iii) shelter and habitat for wildlife; iv) nutrient sink effect and reduction in excessive amounts of pollutants; and v) entrapment of upland runoff sediments thus protecting nearshore reefs and reducing water turbidity (FAO, 1994)^[6]. They contribute to the improvement of rural communities' livelihoods and are essential for biodiversity.

10. Two areas have been designated as Wetlands of International Importance (RAMSAR sites) along Benin's coastline^[7]:

- the Lower valley of the Couffo, Chenel Aho, coastal lagoon and Lake Ahémé (**RAMSAR site #1017**) that extends on 47,500 hectares. This site is made of mangroves (*Avicennia spp.* and *Rhizophora racemosa*), swamps of *Andropogon gayanus*, flooded grasslands of *Paspalum vaginatum* with scattered *Phoenix reclinata* (false date palm) and man-made wetlands with coconut groves and *Acacia auriculiformis*. There are 71 recorded species of fish of which the most important are *Sarotherodon melanotheron* and *Tilapia guineensis*. Among the non-bird fauna are the cane rat (*Trynomis swinderianus*), the green monkey (*Chlorocebus aethiops*), the royal python (*Python regius*), the Nile monitor (*Varanus niloticus*) and the hippopotamus (*Hippopotamus amphibus*). Among birds that populate this wetland (both indigenous and migrating species), 70% nest in coastal lagoon habitats, in Chenel Aho and in the lower valley of the Mono river. Herons, storks, waders, birds of prey and ducks represents the largest share of bird population. The production of fish, crabs and shrimp from this ecosystem is about 5,000 tons per year and employs about 10,000 professional fishermen. In recent months, this RAMSAR site has been extended from its original 47,500 ha to cover over 524,000 ha, including the valleys of the Couffo, Mono and Sazué rivers.

- the Lower Valley of the Ouémé, Porto Novo lagoon and Lac Nokoué (**RAMSAR site #1018**) that extends on 91,600 hectares. This site has flooded forests of *Mitragyna inermis* and *Raphia hookeri*, seasonally flooded forests of *Berlinia grandiflora* and *Dalium guineense*, seasonally flooded grasslands of *Paspalum vaginatum* and *Typha australis*, floating vegetation dominated by *Eichornia crassipes* and *Pistia stratiotes* and a mangrove area of *Rhizophora racemosa*. There are 78 species of fish recorded of which the most important are *Sarotherodon melanotheron* and *Tilapia guineensis*. Mammals are primarily sitatunga (*Tragelaphus spekii*), horned bushbuck (*Tragelaphus scriptus*), mongoose, Potamochoerus, speckle-throated otter, African python, ball python, red-bellied guenon, land tortoises and marine turtles. Among the 168 species of birds that have been identified in Benin in 1996, 72% come from the lower valley of the Ouémé. 21,000 tons of fish, crabs and shrimp are produced from this ecosystem every year, employing about 24,000 fishermen and 13,000 seasonal workers. In recent months, this RAMSAR site has been extended from its original 91,600 ha to cover 652,760 ha. In addition to the lower stretch of the Ouémé valley, the Site now covers a marine area, a lagoon complex, the swamp of Adjarra, and the middle Ouémé valley.

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Mangrove ecosystems are critically receding

11. Despite their critical importance, mangroves and coastal ecosystems of RAMSAR sites 1017 and 1018 are **severely impacted** by various factors. Nationwide, no less than 25% of mangrove area was lost between 1980 and 2003 (FAO, 2003). Over the 1995-2015 period, the area covered by mangroves (13,306 to 9,452 ha), lagoons and lakes (29,700 to 13,121 ha), gallery forests (15,515 to 1,006 ha) and wetlands (141,506 to 84,102 ha) have drastically decreased on site 1017 (FAO, 2018). In parallel, urbanized areas (7,628 to 12,146 ha), farm lands and fallows (136,229 to 230,312 ha) and coconut plantations (11,247 to 56,021 ha) have significantly increased. FAO (2018) predicts a strong increase in farmlands and fallows at the expenses of natural habitats and ecosystems without appropriate measures. In such scenario, it is expected that Beninese mangrove ecosystems would decrease by yet another 12% by 2025.

12. In sites 1017 and 1018, around 20% of flora species are endangered and 27.4% are vulnerable (FAO, 2018). Nine fish species are currently in the process of being included in the IUCN red list. Moreover, green turtles (*Chelonia mydas*, endangered), olive ridley (*Lepidochelys olivacea*, vulnerable), hawksbill turtles (*Eretmochelys imbricata*, critically endangered), leatherback (*Dermochelys coriacea*, vulnerable), the Ukami reed frog (*Hyperolius torrentis*, endangered), hippopotamus (*Hippopotamus amphibious*, regionally extinct), the African Manatee (*Trichechus senegalensis*, vulnerable), the slender-snouted crocodile (*Mecistops cataphractus*, critically endangered) are some of the species of global significance still living in the mangrove ecosystems which are critically receding.

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Stressors are multi-dimensional

13. Drivers of mangroves depletion are multidimensional and both natural and anthropic. Natural drivers include **wave and wind erosion**. Longshore currents generate erosive action on soils, particularly in the region of Grand-Popo (Akakpo 2002). Local and regional winds erode coastal banks. Finally, rainfall convey large quantities of sediments across the watersheds, further accelerating coastal erosion.

14. Mangrove ecosystems are severely affected by **anthropic pressures**. Urbanization is a major driver of deforestation of mangroves. Collection of firewood and timber from mangroves cause mangrove ecosystems deforestation. Overfishing (UNEP, 2007) is another major cause of mangroves depletion in the target sites, fueled by a growing demographic pressure. Population in Ramsar site 1017 increased from 1,347,618 in 1992 to 3,319,812 ha in 2013. Both sites 1017 and 1018 host more than 29% of the country's population. Constructions of large infrastructures such as harbors in Lomé (Togo) and Cotonou, along with dams in the Volta basin and Nagbéto on the Mono river have also significantly affected mangrove ecosystems. Sand quarries located east of Cotonou add further pressure on coastal ecosystems, as well as dikes that were constructed to protect Cotonou's harbor.

15. Local communities rely on natural resources produced by mangroves ecosystems. Salt production in mangrove ecosystems is widespread. Because the relatively short dry season does not allow the production of sun-dried salt, communities cut down mangrove trees, remove around 10 cm of soil to facilitate evaporation, mix the upper crusts with saline solutions and boil such solute to obtain crystallized salt, using mangroves firewood (Blasco, 1985). Hachimou (1993) estimated that 100 kg of salt require 1m³ of mangrove firewood. Such process induces ecological conditions unsuitable for the recolonization of mangroves. Coconut oil production, intensive livestock rearing and slash and burn practices induce similar negative impacts on coastal ecosystems. As highlighted by the numbers provided above, mangroves are being removed by communities at the expense of farmlands, further contributing to coastal ecosystems decline.

16. More than 80% of national industries are located on Benin's shoreline ^[8]. Disposal of their waste adds pressures to lagoons and marine ecosystems in the surroundings. The growing use of pesticides and other agricultural inputs generate widespread pollution in Benin's lagoons and coastal ecosystems. Invasive species such as water hyacinth (*Eichhornia crassipes*) further threaten some mangrove ecosystems.

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Challenges are further exacerbated by the impacts of climate change

Current climate

17. At latitudes of 6-13°N, the climate of Benin is tropical, and strongly influenced by the West African Monsoon. The rainfall seasons are controlled by the movement of the tropical rain belt which creates winds both from the Ocean as well as winds from the Sahara region, that are dustier and warmer^[9]. These two opposing wind directions cause the annual West African Monsoon – resulting in a wet season in the North of Benin from May to November, and two wet seasons from March to July and from September to November in the southern regions of Benin^[10]. In general, most of the country experiences transitional tropical conditions, with less rainfall than in other areas at the same latitude – a climate known as the Benin variant^[11].

18. The seasonal rainfall in this region varies considerably on inter-annual and inter-decadal timescales, due in part to variations in the movements and intensity of the Intertropical Convergence Zone, and variations in timing and intensity of the West African Monsoon. The most well documented cause of these variations is the El Niño Southern Oscillation (ENSO). El Niño events are associated with drier conditions in West Africa.

19. Seasonal variations in temperature in Benin are greatest in the North. In the South, temperatures reach up to 27-32°C in the warmest season and 22-25°C at their lowest in JAS. Nationwide, the annual mean temperature is 27°C, whereas the annual total precipitation is 1150 mm^[12].

Current trends

20. The mean average temperature has increased since 1960 by 1.1°C and the average number of “hot” days^[13] per year in Benin increased by 39 between 1960 and 2003, and hot nights by 73 in the same period^[14]. In contrast, the frequency of “cold” days and nights, annually, has decreased significantly since 1960. Since the end of the 1960s the climate perturbations have increased in Benin which has manifested in reduced annual amplitude of rains by 180 mm^[15]. In addition droughts have intensified during the same period, especially in the 1970s and 1980s, and rains have intensified by 100 mm/h enhancing soil erosion and floods^[16]. Moreover, the annual count of wet days as well as the annual maximum 30-day total rainfall showed a substantial decrease over the 1960-2000 period^[17].

General impacts of climate change

21. Diffenbaugh and Giorgi (2012) identify the Sahel and tropical West Africa as hotspots of climate change for both RCP4.5 and RCP 8.5 pathways, and unprecedented climates are projected to occur earliest (late 2030s to early 2040s) in these regions (Mora et al., 2013)^[18]. It adds that the Western Africa shoreline is critically vulnerable to climate change, especially with respect to floods, droughts, erosion, agricultural yield loss, salinization, wetlands destruction, ocean acidification and propagation of invasive species. All these consequences of climate change weaken mangrove and coastal ecosystems, making them even more vulnerable to present and future stressors.

22. The expected impact of climate change in Benin, especially the projected rise in temperature and rainfall, is likely to compound the challenges already faced by the agriculture and forestry sectors, while the coastal areas, which host half of the country's population, will experience a sharp rise in sea level.

23. The agricultural production capacity in the intensively cultivated South is endangered by nutrient mining, most likely to worsen due to climate change, with more frequent occurrence of torrential rains and floods in the south. The most notable climate risks are droughts, late and intensive rains, and floods, in addition to extreme winds^[19].

24. Climate models project an increase in the normal annual maximum temperature for the whole country, ranging from slight (1–1.5°C) to substantial (2.5–3.0°C)^[20]. The mean annual temperature is projected to increase by 1.0 to 3.0 °C by 2060, and by 1.5 to 5.1 °C by 2090. The range of projections by the 2090s under any emissions scenario is around 2.0-2.5 °C.

25. The negative consequences of intense and successive periods of drought and floods could affect food security: they may reduce the production of food by 6% by 2025 if no adaptive measures are taken^[21]. As for water resources, the consequences of climate change (decline of precipitation) could result in 40% to 60% reduction in the availability of water resources, further influencing Benin's food production^[22].

26. **Sea level rise** will threaten communities living along the country's coastline where both income and population density is higher (between 250 to 1000 persons/km²) than in other regions of Benin. Both biophysical and socio-economic vulnerability is high due to limited adaptive capacity. Since agriculture is of greatest importance for the Beninese economy, the agricultural sector will need to adopt adaptive measures in order to respond to the consequences of climate change that threaten food security^[23]. ND-Gain measured Benin's exposure, sensibility and ability to adapt to the negative impacts of climate change at 163 out of 181 countries. Benin ranks 147th in terms of ability to leverage investments and convert them into adaptation actions^[24].

Impacts of climate change on coastal/mangroves ecosystems

27. As outlined in the AR5 report of the IPCC, moderate warmings such as the ones expected in southern Benin are likely to destabilize plankton dynamics and thereby affect food resources for higher trophic levels of many planktivorous fish, which will in turn lead to extinction of freshwater fishes, among others.

28. With the current rate of wetlands destruction, the **coastal wetland in Benin is projected to decrease by 40%** by 2080^[25]. **Sea level rise** due to climate change is estimated between 15 to 63 cm (scenario B1) to 20 to 81 cm (scenario A1B) by the end of the century in coastal Benin^[26]. This is likely to exacerbate coastal catastrophes such as **coastal erosion, floods, and storm waves**^[27]. A direct consequence will be the **salinization** of coastal soils, which will in turn lead to the degradation of wetlands and farmlands and, *in fine*, to the salinization and pollution of groundwater tables and in turn, affecting communities' health. Many flora species established on the shoreline and embankments will be negatively affected by an increasing salinization of soils, hence further disturbing the coastal ecosystems. **Internal migration and urbanization** of the country's coast is also likely to increase numbers of people vulnerable to coastal climate change impacts (Seto, 2011)^[28].

29. Moreover, according to the Global Climate Change Alliance (GCCA) the consequences of the degradation and destruction of gallery forests in the Ouémé river basin – caused by charcoal unsustainable timber extraction and extensive fallow-based agricultural practices – is being exacerbated by climate change^[29]. This is not only a significant problem for forest-dependent communities, but also for downstream regions, which increasingly suffer from devastating floods during the rainy season.

Barriers to resilient and sustainable mangrove management

30. A complex web of interacting barriers exists for resilient and sustainable management of mangrove ecosystems in Benin. Such barriers constrain appropriate responses to the threats highlighted above, and are of different nature: institutional, political, social, cultural, biophysical, behavioral and gender-related. Previous projects, such as FAO (TCP/BEN/3502) have generated a wealth of lessons learned concerning obstacles to climate change adaptation and sustainable mangrove ecosystem management.

31. **1/ Limited institutional and technical capacity, insufficient knowledge availability, and policy gaps for the sustainable management of mangrove ecosystems.** Within the Ministry of Living Environment and Sustainable Development (MCVDD), the General Directorate for Water, Forestry and hunting (DGEFC) is the main institution responsible for mangrove forest management. MCVDD's Environment and Climate General Directorate is in charge of coordinating national ministries and institutions to mainstream climate change into national policies and planning. Still, inter-institutional cooperation with other relevant agencies and institutions such as the Ministry of Agriculture, Breeding and Fisheries, the Ministry of Development and Planning, the Beninese Agency for the Environment (ABE, hosted by the MCVDD) and the National Fund for the Environment and Climate (FNEC) is lacking. Insufficient collaboration between relevant entities and lack of coordination among different ministries are hindering an efficient approach to tackle coastal and mangrove ecosystems threats. The MCVDD needs to strengthen its institutional capacity to set objectives, outcomes and investment plans and implement initiatives on the ground in a participatory and integrated manner for sustainable and resilient mangrove ecosystem management. In addition, there are currently no legal instruments nor directions that aim specifically at the protection of mangrove ecosystems. There are indeed no national laws on mangrove ecosystem management, Benin's national forestry code has no reference to such mangroves, and there is no appropriate land-use planning process for coastal ecosystems. Finally, there is a lack of local and global knowledge about the causes, patterns and consequences of climate change impacts on mangrove ecosystems and on climate resilient mangrove ecosystems management, as well as of appropriate decision-making tools for sustainable mangrove ecosystem management. As a result, there is a strong need (i) to revising the national organization and institutional structures for mangrove ecosystem management, (ii) to strengthen institutions' capacity to implement climate resilient mangrove ecosystem management, (iii) to promote climate resilient alternative activities to mitigate the climate and anthropic stressors of mangrove ecosystems and (iv) to design decision-making tools for policy makers. Providing dedicated legal instruments pertaining to mangrove ecosystems management and raising awareness for mangrove ecosystems management are equally needed. **Component 3** will aim at filling such institutional, knowledge and technical capacity gaps.

32. **2/ Lack of and limited access to successful models and examples of sustainable mangrove ecosystem management.** Local communities living in Ramsar sites 1017 and 1018 have traditionally used firewood and timber from mangroves, practiced fisheries and shellfish collection and various traditional activities (such as salt production) for centuries. Due to demographic pressure, urbanization and migration from other regions of Benin to the coastline, current pressures are increasingly degrading mangrove ecosystems. In order to address this unsustainable mangrove ecosystem management, climate-resilient, biodiversity-friendly and economically-viable alternative livelihood activities are required to prevent further biodiversity loss and mangrove ecosystem depletion while building resilience of local communities to current and future climate change impacts. Such alternative activities would increase ecosystems and livelihoods resilience to climate change and support biodiversity conservation, while providing economic incentives that trigger behavioral and attitudinal change of local communities. Communities need to be offered access to climate resilient low-risk and cost-effective alternative activities that are adapted to the socio-economic local environment. Non-timber forest products may represent such opportunities and contribute to diversified revenues and production systems. Burgeoning alternative activities and value chains (honey, salt, palm fruit, mushrooms, snails, handicrafts, eco-tourism among others) remain scattered and not sufficiently structured nor consolidated to attract private investors and address unsustainable practices in mangrove ecosystems. Similarly, access to credits and markets remain challenging for local communities. Incentives for ecosystem services may bring additional support to implementation of alternative activities. The project will look to empower women through the identification, selection and implementation of alternative activities. **Component 2** will work to lift such barriers.

33. **3/ Lack of informed, integrated and comprehensive investment and management plans for mangrove ecosystems to maximize their adaptive capacity.** Mangrove ecosystems are endangered by threats of various nature and are critically declining. Despite the implementation of various initiatives, mangrove restoration and conservation management planning processes insufficiently engage local stakeholders. Without appropriate awareness of the vital importance of mangrove ecosystems in a context of climate change, resilience is likely not to be achieved and further conservation and restoration efforts are likely not to be supported by local stakeholders. In addition, initiatives have focused thus far on very specific reforestation or mangrove protection investments, and have lacked a comprehensive landscape approach. As a result, mangrove ecosystems need to be urgently managed at a landscape level in

an informed and comprehensive manner to increase resilience of communities and natural habitats. Moreover, current endeavors in mangrove ecosystems management are rather scattered and uncoordinated. An integrated landscape planning and coordination process appears necessary for sustained restoration and conservation efforts. Also, despite the implementation of several local initiatives, no biomonitoring system exists to assess the effectiveness of such interventions (successes/failures, restored ecosystem services, and conserved threatened taxa, etc.). Such system could support decision-making, planning and integrated management of mangrove ecosystems. **Component 1** will seek to address such challenges.

34. **4/ Lack of incentives for the private sector to invest in economic activities that support the sustainable management of mangrove ecosystems**

Due to the public goods nature of climate resilient and biodiversity conservation investments and the low level of revenue, the private sector (including also microfinance institutes, banks, ...) is not engaged in supporting these investments and smallholder farmers do not have access to credit to finance on farm investments. Barriers to access credit include low level of assets, poor understanding of climate risks in the financial sector and underdeveloped rural finance services. **Component 2** will analyse the current situation and complement the *Ouébé Climate Resilience Initiative* in order to lift this barrier.

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Baseline scenario and projects

35. The government of the Republic of Benin has developed key national development institutional frameworks, policies and strategies that help manage mangroves and coastal ecosystems. These include: i) a series of legislations (n° 90-32 of 11 December 1990 article 27, law 93-009 dated 02 July 1993 and revised law on forests policy lastly revised in 2012) providing a framework for forest management in Benin; ii) law 97-029, 15 January 1999 lead the path for decentralization in Benin and provided local communes with legal personality and financial autonomy and grant them with responsibilities in natural resource management (2003); iii) fauna (2006) and land-tenure (2007) laws complemented such efforts; iv) an inter-ministerial decree (2012) provided an institutional framework for the management of sacred forests including mangroves (021/MEHU/MDGLAT/DC/SGM/DGFRN/SA) and prohibited fishing and wood collection in specific areas; v) a coastlines act n° 2018-010 that aims at protecting the entire coastline of the country as well as various Ministerial council decisions in 2016 and 2017 against deforestation.

36. In Benin, the management of mangrove ecosystems falls under the responsibility of the Directorate General for Water, Forests and Hunting ("DGEFC" in French) and the Directorate General for the Environment and the Beninese Agency for Environment ("ABE"). All are hosted by the Ministry of Living Environment and Sustainable Development ("MCVDD" in French). The Ministry of Agriculture, Breeding and Fisheries and its General Directorate for Fisheries has also a key role to play in mangrove ecosystems management. The DGEFC coordinates the design and implementation of national policies pertaining to sustainable forests and resource management. Its mandate is to ensure the development and sustainable management of forests and naturel resources, notably through the National Program for Sustainable Natural Resources Management (PNGDRN). The ABE has the mandate to implement environmental policies as defined in the national general framework for development and to ensure that environmental considerations are integrated into key sectoral policies.

37. Several projects were developed and implemented to support the sustainable management of forests and coastal ecosystems, and increase resilience to climate change in southern Benin. From 2014 to 2017, FAO supported the restoration of mangrove ecosystems in Ramsar site 1017. The proposed project will build upon lessons learned from this project to scale-up some of its best practices. In addition, baseline projects, thematically and geographically connected to the proposed project, include the following:

Project name	Financing, partners, implementation period, co-financing	Objectives	Barriers overcome and link to objective of FAO-GEF project
Restoration of mangroves ecosystems at RAMSAR site 1017 in Benin	USD 369,000 FAO 2014-2017 Co-financing: USD 0	The objective of this 3 years Technical Cooperation Project (TCP) was to address challenges faced by mangrove ecosystems, through strengthening institutions, implementing biodiversity protection pilot activities and strengthening knowledge on mangrove ecosystems.	The proposed project will build upon lessons learned from this project in scaling-up successful biodiversity protection activities while climate-proofing such successful interventions. It will seek to sustain knowledge generated through this project and will build-upon key outputs such as an inventory of flora and fauna species in the Ramsar site, a draft national mangroves management strategy and a report on non-timber forests products.
West Africa Coastal Areas (WACA) Resilience Investment Project	USD 206,072,607 MCVDD supported by World Bank /Nordic Development Fund / French Facility for the Global Environment / GEF 2018-2022 Co-financing: USD 0	<p>The objective of the WACA project is to improve management of shared natural and man-made risks, including climate change, affecting targeted coastal communities and areas in the West Africa region (Senegal, Benin, Togo and Sao Tome and Principe).</p> <p>In Benin, the WACA project delivers emergency interventions and designs and builds long-term coastal protection infrastructure. In the Mono River basin lagoon maintenance, river bank stabilization, revetment and revegetation of the shores is foreseen. Erosion risks in Avlo will be reduced thanks to the regular opening of the Bouche du Roy. In the Canal de Gbaga ecosystem, coastal erosion will be managed through community biodiversity con</p>	<p>The WACA programme in Benin has a strong focus on infrastructure along the coastline to protect human and natural areas from erosion processes caused by an increasing sea level rise. The LDCF-GEF project benefits from these investments made by WACA, even though they are made in a different geography, i.e. more downstream in the watershed as compared to the project intervention area of the LDCF-GEF project. There is therefore a geographical complementarity, as well as a technical complementarity: where WACA focuses on protection of infrastructure from erosion intensified by climate change, LDCF-GEF focuses on vulnerability to increasing floods, storm waves, soil salinisation and unsustainable charcoal and timber extraction resulting from climate change.</p>

		High community biodiversity conservation areas.	
Sustainable Forest Management and Conservation Project in Central and South Benin	<p>USD 18,657,226 (co-financing included)</p> <p>MCVDD</p> <p>supported by African Development Bank / GEF</p> <p>2017-2021</p> <p>Co-financing: USD 0</p>	The objective of the project is to promote socially and environmentally sustainable forest management in central and south Benin by improving forest and land management to preserve forest cover, prevent biodiversity loss, and monitor carbon stocks and emissions.	<p>The project will enhance the conservation of forest ecosystems and wildlife in classified forests and improve the sustainability and functioning of forest ecosystems, therefore addressing barriers 2 and 3.</p> <p>The proposed project will complement work delivered by such project by climate-proofing sustainable mangrove management in southern Benin.</p>
Small Grant Programme	<p>MCVDD</p> <p>supported by United Nations Development Programme / GEF</p> <p>Continuous</p> <p>Co-financing: USD 0</p>	Various small grants programme have been provided across southern areas of Benin.	The proposed project will build upon lessons learned from some projects that addressed the barriers listed above (e.g. improved fireplaces provision as a mean to reduce pressure on forest ecosystems, alternative salt production techniques and sacralization of local forests).
Strengthening the Resilience of Rural Livelihoods and Sub-national Government System to Climate Risks and Variability in Benin	<p>USD 34,550,000 (co-financing included)</p> <p>Ministry of Planning and Development supported by United Nations Development Programme / GEF</p> <p>2017-2021</p>	The objective of the project is to strengthen the resilience of rural livelihoods and sub-national government system to climate risks and variability in Benin.	The proposed project will consider the resilient livelihoods investments tested as part as this project and will seek to scale up the successful ones where never relevant and appropriate to the context of the target sites.

	Co-financing: USD 0		
Transboundary Biosphere Reserve in the Mono Delta	<p>EUR 7,500,000</p> <p>MCVDD supported by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH</p> <p>2014-2019</p> <p>Co-financing: USD 0</p>	<p>The project aimed to protect natural resources, particularly biodiversity, and promote natural resources use in a sustainable manner across the Mono Delta, shared between Benin and Togo.</p> <p>The project identified particularly valuable areas in the delta and ways to protect them as core zones. It also proposes sustainable management practices to be introduced in the buffer zones (forests, rivers and fields) of these core zones.</p> <p>The project had an important capacity development component, providing training to conserve resources and set up management structures of the natural resource base.</p>	<p>The GEF project will capitalize on the recognition of the Mono Delta as a UNESCO Man and the Biosphere area to promote, among others, ecotourism and mangrove conservation and restoration activities. The GEF project will work with co-management structures already put in place by the Biosphere project, and it will further bring to bear a number of tools and approaches developed by and implemented in the Biosphere project in order to promote mangrove restoration and other land management practices. The added value of the GEF project is found in part in a more comprehensive integration of climate change (including future scenarios) into the project intervention strategy.</p>

Baseline projects valued as co-financing

Project name	Financing, partners, implementation period, co-financing	Objectives	Barriers overcome and link to objective of FAO-GEF project
Promoting Decent Rural Youth Employment and Entrepreneurship in Agriculture and Agribusiness	<p>USD 4,000,000</p> <p>FAO, NEPAD supported by African Solidarity Fund</p>	<p>The FAO executed project objective is to offer better opportunities to rural young women and men in Benin, Cameroon, Malawi and Niger for entrepreneurship and enterprise development and</p>	<p>The project will deliver 3 main outputs in Benin, namely national action plans for youth employment and skills development in rural economic value chains, support to design and implementation of Youth Capacity Development</p>

	<p>2015-2021</p> <p>Co-financing: USD 2,000,000</p>	<p>access to decent farm and non-farm employment.</p>	<p>Projects, and policy dialogues on a coordinated approach to decent youth employment and entrepreneurship. It therefore delivers solid grounds for component 2 work on livelihood resilience and diversification of income, particularly for young women and men.</p> <p>The GEF project's intervention strategy includes diversification of livelihood options in order to create more climate change resilient communities. Though the GEF project is going to benefit from the capacity and skills development initiatives of the NEPAD investment, the GEF project is also allowing for a broader approach that does consider a basket of agricultural products from the mangrove ecosystems, in addition to the leading value chains that are being developed by the NEPAD project. It will bring to bear the infrastructure put in place for these leading value chains, the access to local and regional markets, and other provisions that facilitate decent employment creation in rural Benin. Note that this basket of products approach will not only contribute to more resilient (diversification) livelihoods, but it will also benefit nutritious diets and gender equality. All these elements are to be considered to be the incrementality of the GEF project.</p>
<p>Ouémé Climate Resilience Initiative (OCRI)</p>	<p>USD 30,000,000</p> <p>Ministry of Agriculture, Livestock and Fish</p>	<p>The project objectives are: (1) reduce greenhouse gas (GHG) emissions due to deforestation and degradation of forests and natur</p>	<p>In response to climate change threats, OCRI supports activities to promote the adoption of soil and water conservation and land restoration practices.</p>

	<p>Ministry of Agriculture, Livestock and Fisheries, Benin, MCVDD, FAO supported by Green Climate Fund</p> <p>2020-2024</p> <p>Co-financing: USD 30,000,000</p>	<p>regeneration of forests and natural rangelands and increase the absorption of GHGs through sustainable management and restoration of forest landscapes, agricultural, fishing and breeding activities of the Oueme Valley; (2) increase the resilience of smallholder farmers, their livelihoods and enhance food security and water availability; and (3) strengthen the resilience of ecosystems and related services through Climate Smart Agriculture (CSA).</p>	<p>as well as investments in small-scale rural water infrastructure to develop productive and climate resilient agro-ecosystems.</p> <p>Contributing to components 1 and 2 of the GEF project, OCRI will help lift a number of barriers described above, including: (i) improve access to technical know-how, climate-resilient seed varieties and extension services; (ii) facilitate access to private investments; and (iii) strengthen extension services by improved coordination between national and local governments, enhanced professionalization of extension agents and strengthened decentralized services.</p>
<p>Global Transformation of Forests for People and Climate: a focus on West Africa</p>	<p>USD 8,400,000</p> <p>FAO supported by Sweden</p> <p>2019-2023</p> <p>Co-financing: USD 2,000,000</p>	<p>Focusing on ECOWAS countries, the project aims to strengthen decision-making on forests and land management. In particular, the project will focus on 3 areas of work, including: knowledge of the state of forest ecosystem dynamics; forest and land related laws, policies and strategies at the subregional level; and demonstration and dissemination of sustainable forest and land use practices.</p>	<p>The project investments will support outputs under component 3 and in particular respond to capacity needs in terms of landscape management and support the set up of a conducive institutional environment for sustainable and resilient mangrove ecosystem management. It will further integrate the mangrove ecosystems with forest ecosystems further upstream. The baseline project provide this infrastructure to build upon, the GEF investment is incremental as it adds biodiversity conservation and management</p>

38. In addition to this list of baseline projects, a number of projects have informed the design of the proposed project. Among them are the Food Security Support Program (PSSA-Benin, FAO), the Participatory development of traditional fishing Programme (PADPPA, AfDB), Flood Control and Climate Resilience of Agriculture Infrastructures in Oueme Valley (AfDB, LDCF), the NAP Readiness Project financed by the Green Climate Fund (UNDP), the Environmental Management Project (PGE, World Bank), the National Programme for Environmental Management (PNGE), the project of integrating sacred forests in the protected areas system (PIFSAP, UNDP), the project strengthening the preservation and development of forested galleries and production of numeric cartography (PAPDFGC, UNDP) and the project aiming at creating a touristic area on the fishery road. During PPG, exchanges with these development partners will be furthered in order to fully integrate lessons learnt into the project intervention logic and management arrangements at the various levels of intervention, and in order to ensure complementarity.

39. These various international and national projects have generated various lessons learned that informed the proposed project. Among them are the creation of an internationally recognized biosphere reserve, sacralization of forested areas through local voodoo divinities, community reforestation of mangroves, village mangrove management plans, introduction of improved fireplaces, sustainable salt processing units, honey production, eco-tourism, among others. Nevertheless, no mangrove-specific initiatives have been implemented so far to take up the challenge to maximize mangrove ecosystems adaptive capacity in an integrated and comprehensive manner while providing market-based alternatives to livelihoods that cause mangrove ecosystems degradation.

The GEF alternative

40. **Objective statement:** The project will aim at increasing the adaptive capacity of human and natural systems to climate change through mangrove ecosystem restoration and sustainable use in southern Benin. The project will focus on the agricultural, forestry and fishery communities located in and around two 2001 assigned Ramsar sites.

41. Through its three complementary and interlinked components, the project offers an opportunity for local communities in Ramsar sites 1017 and 1018 to acquire the technical capacities, financial means, knowledge and institutional support to plan and adapt to the impacts of climate change and to sustainably manage mangrove ecosystems in order for them to deliver the full potential of their ecosystem services. This latter includes a diversity of livelihoods for local rural communities and habitat for a vast and rich flora and fauna. As mentioned in para 7, “mangrove ecosystems” are characterized by the mangroves and by their environment (communities and habitats). The change process already established by the baseline and highlighted by the lessons learned described above will be catalyzed and accelerated by the proposed project interventions in order to achieve global environment benefits, either directly (120,000 ha of mangrove ecosystems under sustainable and climate resilient management to benefit biodiversity) or indirectly (changes in people’s behavior and mindsets, improved planning processes and institutional frameworks). The project interventions will target mangrove areas under climate and anthropic pressures that hold the potential to be sustained and managed in a cost-effective way. The global environment benefits will be sustained in the medium to long term thanks to the development benefits obtained by the local communities, i.e. the 250,000 direct beneficiaries of the proposed project.

42. The project will contribute to a wide array of Sustainable Development Goals (SDGs) as it is based upon the following principles:

- **Build the resilience of rural communities** to withstand shocks, crises, and disasters (SDGs 1, 2, 10, 16);
- **Sustainably manage and restore forests** and promote an ecosystem approach (SDGs 2, 6, 13, 14, 15);
- **Develop pro-poor growth strategies** in rural areas, focusing on women, small-scale farmers and the people left furthest behind (SDGs 1, 2, 8,9, 10);
- Adopt **holistic approaches**, such as agro-ecology, agroforestry, and conservation agriculture and forest and landscape restoration (SDG 2, 7, 13, 15, 17)

Integrating considerations from the COVID-19 crisis into the project design

Benin reported 2,340 coronavirus cases on 30 September 2020, including 40 deaths. To contain the propagation of the SARS-CoV-2, the Government of Benin put in place 13 containment measures. Together with containment measures taken in other countries, the impacts on the agriculture sectors have been multiple, including: limited access to extension services, limited access to laborers (seasonal workers oftentimes from Burkina Faso and Togo), limited access to mostly international markets (e.g. 37% decrease of the pineapple exportations in February-March alone), negative repercussions on animal production and health, among others. These impacts have sadly translated into increased poverty and food and nutrition insecurity in the country. As a response, Benin has identified medium-long term objectives to build back better the agriculture sectors, including:

- Improve production and productivity along food value chains;
- Facilitate commercialization of agricultural and agro-food products; and
- Improve the living conditions of vulnerable agricultural households.

These longer-term objectives can be met by immediate priority actions:

- Facilitation of access to production factors and markets;
- Promotion of digital solutions in the agriculture sectors; and
- Improvement of social security networks to combat COVID-19 and M&E of interventions.

The LDCF-GEFTF project is well equipped to support some of these priority actions identified by the Government of Benin, while it complements them by addressing environmental degradation, which is believed to help mitigate future pandemics. Indeed, the Covid-19 pandemic dramatically exposed the impact of ecosystem degradation on and the vulnerabilities of our societies. The planning and management component of the project offers an opportunity to carefully consider the human-wildlife interactions and how to limit these along efforts to strengthen ecosystem's health and limit fragmentation. The project may help identify high-risk areas and consider appropriate mitigation measures.

Short-term responses can be delivered thanks to some of the adopted approaches in the project, including the Farmer Field Schools. These have continued to operate during the pandemic (and therefore delivered important extension services), and have successfully integrated modules on hygiene and social distancing measures to contain propagation of viruses. The project will also address market access issues,

and can integrate lessons from the recent past into its activities. During the PPG phase, opportunities to build back better will be explored and integrated into the project design.

Despite the downward trend of daily infections in Benin, and the gradual lifting of containment measures, negative impacts on project development and implementation are to be accounted for. Several risks are explored and mitigation measures identified. These are included in the risk section of the PIF.

43. The project has been structured around the following components and the project's theory of change is depicted in a separate annex :

Component 1: Increased adaptive capacity of the natural systems

44. Addressing barrier 3, component 1 will build upon past initiatives and complement on-going investments in southern Benin from the World Bank and the African Development Bank, among others. It will scale-up lessons learned from FAO's TCP project 3502 by identifying and implementing landscapes restoration, conservation and sustainable use interventions in target areas, while climate-proofing such ecosystems to the impacts of climate change and ensuring that the habitat is being restored to protect and conserve the critical biodiversity it harbors. The project will be implemented across sites located in Ramsar sites 1017 and 1018. Based on the outcomes of an in-depth assessment of the multiple services and products delivered by the mangrove ecosystems (see output 1.1), the project will work closely with local land users, communities, communes and relevant stakeholders (e.g. CSOs, including local environmental NGOs, local authorities, researchers) to identify landscapes that i) are the most vulnerable to climate change and ii) have the highest biodiversity restoration and conservation potential. It will adopt an inclusive and participatory landscape approach to mangrove ecosystem management by identifying, designing and implementing climate resilient and biodiversity conservation and sustainable use management plans and build an enabling environment for such planning and monitoring process.

45. A comprehensive assessment of economic, social, cultural, resilience and environmental values will be performed early during project implementation (output 1.1). This assessment will answer the question of what ecosystem services and goods provided by mangroves could and should be restored and conserved in order to contribute to improved system resilience. Such assessment will consider what products and services mangrove ecosystems provide and how they can be used best without damaging and depleting them. It will provide information related to the benefits and values of mangrove ecosystems assets and will allow better decisions regarding land-use.

46. Previous initiatives have outlined the importance of raising awareness of local communities and stakeholders (e.g. CSOs, local authorities, agricultural extension and advisory services) on both the impacts of climate change, adaptation strategies (with a particular focus on ecosystem-based adaptation strategies), the ecosystem services provided by the mangroves, and the current threats faced by mangrove ecosystems, and the existing legal instruments related to mangrove ecosystems management. For local communities and stakeholders to be fully engaged in planning, monitoring and implementation of mangrove ecosystem conservation and sustainable use activities, there is a need to strengthen and complement their understanding of i) the ecosystem services provided by mangroves to human and natural systems, notably with respect to climate change adaptation and biodiversity conservation; ii) the nature and extent of threats currently faced by mangroves landscapes; and iii) the costs and potential benefits from climate resilient and sustainably managed mangrove ecosystems. The project will thus initiate local platforms on target sites for mangrove ecosystem awareness-raising (output 1.2). Such platforms will, among others, raise awareness on the respective roles that men and women can play in restoring, conserving and sustainably managing mangrove ecosystems. They will be in charge of undertaking awareness-raising activities (e.g. knowledge exchange visits between villages and

communities, broadcast from local radios), trainings for communal staffs, local communities, NGOs and local decision makers to raise awareness on the importance of climate-proofing mangrove ecosystems and restoring and conserving biodiversity. The information, knowledge and lessons shared through these platforms will be provided by assessments and studies carried out by the project itself, such as the above-mentioned assessment, in-depth vulnerability studies and market analyses, as well as from baseline investments and past efforts in the region in support of sustainable mangrove ecosystem management.

47. Building upon these efforts to mobilize local communities, participatory climate resilient landscape restoration and conservation management planning processes will take place (output 1.3). These processes will convey local stakeholders and will consist of: i) performing climate change vulnerability assessments building upon previous analyses undertaken (notably a flora and fauna inventories and assessment of mangrove ecosystems' dynamics); ii) preparing comprehensive land use and land use change maps and identifying potentials for interventions for each land use category which contribute to ecosystem restoration and sustainable management; iii) identifying intervention sites based on their vulnerability to climate change impacts and on their restoration and conservation potential; iv) designing climate-resilient mangrove ecosystem conservation and sustainable management plans, based on the outcomes of points i), ii) and iii). It is important to clarify that the management plans will cover various land uses, and not only the mangroves. Instead, the main land use categories (i.e. mangroves, lagoons and lakes, wetlands, gallery forests, farmland and plantations) will be mapped, assessed and included in restoration and conservation activities. Furthermore, the management plans are to be articulated with existing land use and management plans. Indeed, the project partly overlaps with areas, such as the Mono Delta Biosphere, for which a participatory landscape management plan has been designed, anchored in the local development plans and initiatives. In such a case, the LDCF-GEFTF project will not redesign a plan, but rather work with the existing co-management structures (such as the local management committees supported) in order to assess potential gaps, particularly when it comes to climate change adaptation, and address these gaps. With changing climate patterns and increasing variability (and the cascading redistribution and decreasing resource availability and increasing competition and demands on natural resources), the existing institutions and regulations governing land use planning are challenged. In other project areas (in particular in the 1018 Ramsar site), participatory landscape management plans have not yet been developed. The planning and monitoring activities in these areas will learn from the insights and successes of the previous investments in neighbouring landscapes, while building upon and valuing the existing land use plans, mainstreaming biodiversity conservation/sustainable use and climate change resilience, and introducing the participatory, integrated and landscape dimensions that are believed to secure engagement and sustainability.

48. The project will then support the implementation of such climate resilient mangrove ecosystems management plans (output 1.4). Interventions may include community participatory reforestation campaigns in priority landscapes identified by the assessments. Moreover, based on FAO's experience and because of the lack of public land available in some target areas (because of land appropriation by local land-users for agriculture and fisheries or settlement construction), the proposed project may base such restoration efforts on direct collaboration with land-users (free provision of mangrove seedlings to land-users for instance, as successfully experienced during the implementation of the TCP 3502 project). Based on the outcomes of the climate vulnerability assessments, a community forestry approach will be promoted. Natural regeneration areas will be identified and subsequently protected in order to increasing adaptive capacity of mangrove ecosystems and to restore and preserve biodiversity. Similarly, community-owned forests will be planted and managed by relevant stakeholders in the target areas. Such forests will provide alternative sources of firewood and timber, hence acting as buffer zones between communities and mangroves. Collaboration between communes will be promoted through this approach to ensure an integrated landscape approach.

49. Local communities will be trained to proceed with restoration and conservation activities through Farmer Field Schools. Previous projects in the intervention areas or neighbouring areas and countries have demonstrated a great number of innovative technologies, packages of innovative practices and tools. The project will learn from these, scale-up a selection of relevant innovations based on the resilient conservation and sustainable use management

plans and consultations with local communities. Examples of such technical innovations include: (i) improved seedling production and handling processes for forest restoration purposes; (ii) introduction of crop-rotation schemes for sustainable production intensification; (iii) introduction of Integrated Food and Energy Systems (optimizing land use efficiency and optimizing biomass use); and (iv) development of small-scale irrigation systems.

50. The project will also support the emergence of community-based citizens' mangroves monitoring bodies, based on successful interventions from previous projects, and deploying innovative planning, mapping and monitoring tools, such as Collect Mobile (a mobile phone application that allows for fast and flexible field-based data collection, part of the OpenForis toolbox of free open-source tools for environmental monitoring).

51. In addition to the necessary initial awareness-raising efforts, the project will undertake a series of capacity-building, advocacy, monitoring and technical training activities (output 1.5). Indeed, in order to sustain the participatory processes designed under output 1.2 and implemented under output 1.3, the project will advocate for and facilitate the process of inclusion of climate resilient mangrove ecosystems conservation and sustainable use plans into municipalities' territorial planning. In addition, the project will implement a dynamic biomonitoring system aiming at capturing lessons from restoration and conservation activities, in order to increase the effectiveness of such interventions and support scaling-up on the interventions. Similarly, it will establish technical capacities in municipal governance to integrate mangrove ecosystems management and promote concerted action for climate change adaptation. In addition, the project will build capacity of local organizations to articulate adaptation and conservation actions and learn from the experience drawn from the design and implementation of the climate-resilient mangrove ecosystem restoration and conservation plans. Another crucial aspect the project will address is to build the capacity of local stakeholders to mobilize further financial streams for climate proofing of mangrove ecosystems. Equally important would be the trainings of citizens' mangroves monitoring bodies and the strengthening of law enforcement stakeholders' capacity.

52. **Expected outcome:** Mangrove ecosystems and their ecosystem services and goods are sustainably managed to benefit the local agricultural, forestry and fishery communities and biodiversity in demonstration sites.

53. **Indicators of success:** 120,000 ha of vulnerable and degraded mangrove ecosystems under climate-resilient and sustainable management to benefit biodiversity; X communes adopt and implement climate resilient mangrove ecosystems conservation and sustainable management plans, benefitting directly at least 250,000 women and men (TBC during PPG)

Component 2: Increased adaptive capacity of the human systems thanks to livelihood diversification and development

54. The integrated landscape approach planned under component 1 will materialize mangrove ecosystems restoration and conservation efforts and support increased resilience of such natural systems to climate change. Tackling barrier 2, component 2 will build upon such interventions and those of other investments to induce long-term changes needed to sustain the restoration results obtained as a result of component 1 and other restoration and conservation initiatives. Component 2 will indeed strengthen the resilience of local communities to the impacts of climate change while reducing the anthropic pressures on mangrove ecosystems through the introduction of alternative nature-based livelihoods. The supported livelihoods will be nature-based and geared towards delivering biodiversity conservation and sustainable use and resilience benefits (potential trade-offs and the assumptions underbuilding the causal link between livelihood creation and BD conservation benefits will be unpacked and studied in detail during the PPG, and evidence from literature provided), and be economically viable to constitute a strong incentive for behavior changes. They will also be gender-sensitive, as women are key agents of both mangrove ecosystems economic livelihoods and depletion. Building upon lessons learned from previous initiatives and relevant assessments and studies (including the assessment planned under output 1.1), this component will engage local communities and land-users/producers, financial institutions and private investors to support access to markets and value chains strengthening, hence seeking to sustain alternative livelihoods over time.

55. The FAO guiding framework to developing gender-sensitive value chains (<http://www.fao.org/3/a-i6462e.pdf>) will be applied for the selection of alternative livelihoods that contribute both to biodiversity conservation and sustainable use as well as to gender equality. This includes:

- a. Assess relevant territorial food systems specifically identifying gender-based constraints, i.e. i) describing key elements of territorial food systems (production, processing, distribution and consumption); ii) defining the quantity and quality of employment in the value chain; iii) defining main tasks carried out by women and men; iv) defining the main gender-based constraints hindering women to fully benefit from their participation in food systems activities;
- b. Identify potential strategies to make food systems more inclusive for vulnerable producers and processors;
- c. Analyse the benefits and limitations of each identified strategy taking into account certain parameters (feasibility, reliability, reproducibility, sustainability, cost-effectiveness, etc.).

56. Based on the assessment (output 1.1) and FAO's experience in promoting alternative activities in degraded ecosystems, this latter will analyze possible alternative livelihoods that would be viable and sustainable, considering the outcomes of the socio-economic context and based on lessons learned from similar experiences worldwide. Such study will consider the feasibility of initiating certification for sustainable mangrove ecosystem products (e.g. for non-timber forests products from mangroves and adjacent buffer zones). The study will also take into account local communities' expertise and knowledge of mangrove ecosystems' livelihoods. It will take into account relevant outcomes from FAO draft national strategy for non-timber forests products in mangrove ecosystems. The project will also consider the possible role of incentives for ecosystem services in such alternative livelihoods. The objective of such market study will be, *in fine*, to identify a list of most adequate, women empowering, economically viable, biodiversity-friendly and sustainable alternative livelihoods tailored to the local socio-economic context and the national economic environment and opportunities. GEF investments in alternative livelihood options will also complement the many investments made by the baseline projects (OCRI and Transboundary BR projects *in primis*). Examples of such alternative livelihoods include (though this list is illustrative and neither exhaustive nor prescriptive, as it will emanate from the assessment mentioned above) opportunities created from non-timber forest products, sustainably intensified production on farmland and aquaculture, but also opportunities created along the value chains of a basket of food and agriculture products found in the landscape (primarily subsistence, as most vulnerable people are targeted by the project). This involves the development of small industries (honey, snails, mushrooms, doum palm tree and other non-timber mangroves products), and eco-tourism. Alternative livelihoods may also include the promotion of alternatives to the use of mangroves for woodfuel (greening the woodfuel value chain introducing for instance more efficient wood-to-charcoal conversion technologies), the development of cooperatives and handicrafts activities and the valorization of invasive species (e.g. the use of water jacinth (*Eichhornia crassipes*) for handicrafts (wickerwork) or for decontamination (e.g. collaboration with the Beninese Greenkeeper Africa company), or introducing more efficient fish smoking techniques (for example the Thiaroye Processing technique^[30]) and cook stoves.

57. Once alternative livelihoods are identified, the project will seek to catalyze investments in the target livelihoods' value chains through public-private partnerships (output 2.2). Based on the outcomes of the studies conducted in output 2.1, the project will facilitate the creation of public-private partnerships for value chain development. Facilitated by a local actor which has the authority, the long-term vision and ability to engage multiple stakeholders and local communities (e.g. local government, NGO, ...), the partnership will engage voluntary private investors, producers/land owners, local financial institutions, and community representatives. The role of the local actor will be to ensure that i) partners' disparate interests and visions are aligned and consensus reached, ii) the role of each partner is clearly defined and their unique skills and expertise brought to bear, iii) risks are fairly shared by the PPP partners and risk mitigation plans are in place, iv) lessons are captured and shared to feed back into institutional and regulatory frameworks to facilitate PPP creation and sustainability. The PPP will be tasked with: i) selecting alternative livelihoods from the shortlist emanating from output 2.1, ii) facilitating access to finance, iii) piloting the implementation of alternative livelihoods, iv) facilitating access to markets, and iv) scaling-up alternative livelihoods initiatives. Alternative livelihoods initiatives will be identified based on criteria that include potential for climate resilience, cost-benefit, market opportunities, potential for scaling-up, sustainability, potential for gender empowerment.

58. In order to facilitate communities' access to the initial investments, the project will create a win-win situation through which alternative livelihoods will be financed through shared investments between the project (that will provide seed investments) and the communities (private owners). Local community resilience funds will be created under output 2.3. Output 2.3 is complementing output 2.2, as it is common knowledge that PPPs can sensibly promote the inclusion of smallholders and SMAEs, but they are unlikely to have an impact on the poorest of the poor.

59. Adapted capacity-building and trainings will be provided to local stakeholders' in alternative livelihoods in order to ensure the sustainability of the selected livelihoods (output 2.4).

60. **Expected outcome:** Agricultural, forestry and fishery communities dependent on mangrove ecosystems adopt gender-empowering, biodiversity-friendly and sustainable alternative livelihoods that increase their resilience to climate change.

61. **Indicators of success:** 42,000 women and 42,000 men benefit from increased incomes thanks to climate resilient alternative livelihoods (including 34,000 fishermen and 50,000 agricultural producers)

Component 3: Enabling environment for the sustainable management of mangrove ecosystems in a context of climate change

62. This component will address the weak inter-institutional coordination pertaining to mangrove ecosystems management in Benin, and the lack of effective legal instruments, knowledge and capacity to sustainably manage mangrove ecosystems in a context of climate change (barrier 1). This component will actively engage with stakeholders such as relevant ministries, national and regional governmental and research institutions.

63. A first aspect will be to strengthen the national institutional and legal environment pertaining to mangroves management (outputs 3.1 and 3.2) to tackle the lack of institution and legal considerations with respect to mangroves. To achieve this, the project will perform a gap analysis of relevant national **legal instruments and institutional arrangements** pertaining to mangrove ecosystems management and implement the needed actions to address these gaps. Examples of such actions include i) develop new draft legislations for sustainable and resilient mangrove ecosystems management, ii) update the current institutional arrangements related to mangrove ecosystems management in a context of climate change, iii) strengthen the legal capacities of institutions related to mangroves management, iv) propose the integration of mangrove ecosystems in the national protected area systems, v) integration of mangroves ecosystem services in planning efforts. The project will build upon the national strategy and action plan for sustainable mangroves management and the national strategy and action plan for non-timber forest products that FAO produced as outcomes of the project TCP 3502. Furthermore, the natural capital assessment proposed in output 1.1 (which is an exercise similar to the Natural Capital Assessment and Accounting (NCAA) for a number of priority accounts, even though the extent of the NCAA and the accounts will be confirmed during PPG) of mangrove ecosystems in Benin and will inform decision makers and stakeholders at the national level in revising existing legal instruments and institutional arrangements.

64. In parallel, the three dimensional **capacity** needs assessment approach of FAO will identify gaps and weaknesses of key national and regional stakeholder groups (primarily MCVDD' Environment and Climate General Directorate -DGEC- and MCVDD's General Directorate for Water, Forestry and Hunting-DGEFC). Relevant to mangrove ecosystems management in a context of climate change (output 3.3). A capacity development plan will be prepared and implemented accordingly. As a result, and based on the capacity needs assessment, study visits, research exchange programmes, trainings and other technical capacity development activities will be considered and implemented.

65. The project will identify and integrate local and tailored **governance planning tools** for bottom-up and participatory resilient coastal ecosystem management (output 3.4). It will seek to scale-up participatory climate-resilient mangrove ecosystems restoration and conservation planning processes experimented under component 1. The expected result of this activity will be a comprehensive analysis of such local planning tools. Similarly, the creation of a national coastal vulnerability index will be considered.

66. The project will strengthen **knowledge availability, awareness and decision-making support** on climate-resilient mangrove ecosystems restoration and conservation at the national and global levels (output 3.5). The purpose of this output will be to: i) increase the knowledge available on the role and functioning of mangrove ecosystems, and economic opportunities from sustainable management; ii) raising national and global awareness; and iii) develop decision-making tools to support sustainable mangrove management and conservation. To this end, the project will design and implement a tailored knowledge management strategy aiming at promoting the benefits provided by mangroves in adapting to climate change and alternative livelihoods. This will encompass capturing and sharing lessons learned from the project and other relevant initiatives, organizing national awareness-raising campaigns, undertaking knowledge sharing activities with countries in the sub-region on good practices in terms of resilient mangroves management and alternative resilient livelihoods, introducing decision-support tools, organizing communication activities in mangroves areas.

67. The project progress, results, lessons and best practices will be monitored and documented as per GEF and FAO reporting requirements, and disseminated in order to sensibly contribute to capacity building efforts enlisted above.

68. **Expected outcome:** National institutional and policy frameworks strengthened to sustainably management mangrove ecosystems in a context of climate change and knowledge on climate-resilient mangrove ecosystems management is improved, captured and disseminated.

69. **Indicators of success:** Number of legal instruments and institutional arrangements addressing national legal and capacity gaps for sustainable and climate resilient mangrove management; and Number of institutional coordination mechanisms for integrated planning expanded.

Alignment with GEF focal area and/or Impact Program strategies

70. *Climate Change Adaptation:* by designing and implementing participatory climate resilient mangrove ecosystems conservation and sustainable management plans in climate vulnerable sites on one hand (outputs 1.2 and 1.3) and by catalyzing climate resilient and biodiversity-friendly alternative livelihoods (output 2.2) the project will contribute to reducing the vulnerability of human and natural systems to the adverse effects of climate change (CCA-1). In addition, the project will contribute through outputs 3.1 and 3.2 to strengthen institutional and technical capacities for effective adaptation (CCA-2).

71. *Biodiversity:* by implementing community-led mangroves restoration and conservation activities in the most climate vulnerable and biodiversity sensitive sites on one hand and by catalyzing alternatives activities that further avoid loss and degradation of mangroves, the project will contribute to mainstream biodiversity across sectors as well as landscapes and seascapes through biodiversity mainstreaming in priority sectors (BD-1-1).

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

72. Despite the baseline investments, which contribute to more thriving mangrove ecosystems and communities but in a piecemeal and scattered fashion, climate change stressors in the short and medium-long term will remain a threat to the local forestry, fishery and agriculture communities in the mangroves of southern Benin, potentially increasing rural poverty, food insecurity and malnutrition. These communities do not have the access to successful models, the knowledge and the finance to adapt their practices and approaches, while incentives for private sector engagement and comprehensive, integrated and informed investment and management plans for mangrove ecosystems that embed climate change adaptation are lacking. The LDCF investment ensures that – through its landscape, multi-sector and participatory approaches – the fragile mangrove ecosystem and its dependent communities become more resilient to current and future climate stressors, including floods, storm waves and soil salinisation.

73. Biodiversity conservation and sustainable use in a densely populated area is challenging and mainstreaming of BD into productive sectors and land use planning and management is proposed. Conservation efforts are being undermined by limited institutional and technical capacity, policy gaps and limited awareness and knowledge of local communities on the importance (and the 'how to') of BD conservation and sustainable use. The GEF investment will

put BD conservation and sustainable use at the core of investment and management plans of selected landscapes, and will mainstream BD conservation and sustainable use considerations into key land users' strategies (i.e. fisheries, forestry and agriculture). It will address identified barriers at the local and national level to sustainably manage the land in order to benefit biodiversity and secure its long term benefits through participatory approaches and livelihood opportunities for the local communities.

74. The following table shows the co-financing of the identified baseline projects for each of the project components, further developed in the text below.

		TOTALS	COMPONENT 1	COMPONENT 2	COMPONENT 3	PMC
FAO Decent Work	Grant	\$ 2,000,000		\$ 2,000,000		
FAO SFM ECOWAS	Grant	\$ 2,000,000			\$ 2,000,000	
FAO	In-kind	\$ 500,000				\$ 500,000
MCVDD	In-kind	\$ 500,000				\$ 500,000
OCRI (GCF)	Grant	\$ 30,000,000	\$ 19,750,000	\$ 10,000,000	\$ 250,000	
	TOTALS	\$ 35,000,000	\$ 19,750,000	\$ 12,000,000	\$ 2,250,000	\$ 1,000,000

Component 1

75. The GEF project will leverage the investments from the OCRI project (co-financing to component 1 is USD 19.75 M). The OCRI project has a strong focus on the agriculture sector, and the dissemination and uptake of climate resilient agriculture techniques and practices, particularly for water management (managing both the scarcity and the excess of this resource). It contributes to the development of a resilient and sustainable soil, food and water management system in the Oueme. For the development of resilient ecosystems, the project will strengthen disaster-risk management capacities, introducing early warning systems and timely information to small-scale farmers. It will invest in local waterworks (small dams and dykes, cisterns or superficial boreholes, ...) and other small-scale infrastructure, and accompany extension services to support small-scale farmers with the adoption of updated or new (or traditional but abandoned) farming practices and techniques. The GEF project will benefit from these investments made, which have a strong emphasis on restoration and sustainable land and water management, adding an explicit biodiversity conservation and sustainable use dimension. For instance, it will easily be able to recycle Master trainers and facilitators to animate Farmer Field Schools and ensure that curricula embed climate change, water management, and biodiversity conservation and management comprehensively.

76. Benefiting from basic investments into extension services and infrastructure, the GEF project can extend interventions to the forestry and fishery sectors, in addition to agriculture, and address the interactions, the trade-offs, the mutual dependencies between these sectors at the level of the mangrove ecosystem.

77. Moreover, the GEF project invests in mangrove restoration and management cost-benefit assessments, giving a value to the ecosystem the local communities depend upon. This is fundamental for informed decision-making on the use and management of the ecosystem services provided, and is therefore an important increment of the GEF project to the baseline context.

Component 2

78. The OCRI project (USD 10 M) is an important investment for the achievement of component 2 related outcomes, as it will invest in Farmer Business Schools (in order to address business and marketing problems and opportunities with small-scale farmers, women in particular), in training of local organizations on business incubation and economic modelling for climate resilient agriculture, in business incubators, in private-sector support from at least 3 companies identified for investment in farmers as suppliers of agricultural products or as clients (certification, financial literacy, inputs, microcredit), and more. These investments are directly relevant to component 2 of the GEF project. The GEF project will complement these investments and expand their scope (or alternatively replicate successes in other geographies) in order to successfully address gaps and barriers along selected food value chains.

79. The GEF project will benefit from the investments made by the Promoting Decent Rural Youth Employment and Entrepreneurship in Agriculture and Agribusiness project (NEPAD, USD 2 M) capacity and skills development initiatives. Catalyzing this investment, the GEF project proposes a broader mixed-value chain approach (basket of agri-food products), in addition to the leading value chains that are being developed by the NEPAD project. It will bring to bear the infrastructure put in place for these leading value chains, the access to local and regional markets, and other provisions that facilitate decent employment creation in rural Benin. Note that this basket of products approach will not only contribute to more resilient (diversification) livelihoods, but it will also benefit nutritious diets and gender equality. All these elements are to be considered to be the additionality of the GEF project.

Component 3

80. The *Global Transformation of Forests for People and Climate: a focus on West Africa* project provides considerable inputs to the GEF project. This project aims at harmonizing national, institutional, legislative and regulatory frameworks for the protection of forests in ECOWAS countries, delivering a West Africa knowledge portal on forest resources (enhancing knowledge of forest status and dynamics), assessments of forest and land-related laws, policies and strategies in support of the development of effective decentralized governance instruments, and demonstration of community-based sustainable forest and land-use. The GEF project will benefit from these investments in order to further inform and strengthen the institutional and regulatory environment for mangrove management. It will benefit from the lessons in neighbouring countries, and complement the exchange also internationally with targeted learning events (including study visits to neighbouring Togo, joint workshops, and more).

Global Environmental Benefits and adaptation benefits (LDCF/SCCF).

81. The project will generate various adaptation benefits. By funding the additional costs of interventions necessary to integrate the expected impacts of climate change on conservation and restoration of mangrove ecosystems, the project will contribute to ensure that the risks related to climate change, including variability, are integrated into biodiversity restoration and conservation management plans in mangrove areas. The expected area of land under climate-resilient management (LDCF core indicator) will be 120,000 ha, including 70,000 ha within the Ramsar sites (2001 designated area) and 50,000 ha of surrounding smallholder production land. The project will further generate adaptation benefits by facilitating the integration of climate risk into existing legal instruments and institutional arrangements related to mangroves management, hence contributing to some key aspects of Benin NAPA. The project will mainstream climate resilience into a number of policies, plans or development frameworks (LDCF core indicator – number TBC during PPG). Under component 2, the project will invest into the identification, development and strengthening of alternative livelihoods that diversify livelihood opportunities for local communities in the agriculture, forestry and fishery sectors. It is believed that diversification is a successful adaptation strategy, contributing positively to the adaptive capacity of human systems to respond to the impacts of climate change. Throughout components 2 and 3, both coastal communities and

ecosystems' capacity to cope with climate change will be reinforced. The number of people with enhanced capacity to identify climate risk and/or engage in adaptation measures is expected to reach 84,000 (50% men, 50% women – LDCF core indicator). In total, 250,000 people will directly benefit from the project (50% men, 50% women – LDCF core indicator).

82. The project will also directly contribute to Aichi target 7 of the CBD, whereby areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity. This is captured in core indicator 4.1, i.e. 120,000 ha of mangrove ecosystems under improved management to benefit biodiversity. BD investments will also directly benefit 250,000 women and men (50% men, 50% women).

83. The following table illustrates to which Aichi targets the project primarily contributes (from Benin's updated 2016 NBSAP).

National Aichi Targets	SMART Indicators	How the Project contributes
1: By 2020, decision makers, civil society organizations and communities become aware of the value and fragility of natural ecosystems and get involved in their conservation (Aichi target 1).	Existence of a data collection and sharing framework.	Through its components 1 and 3, the project will contribute to increase and raise awareness of communities, CSOs and decision-makers about mangrove ecosystems' value and fragility. Through its component 1, the project will involve stakeholders in mangrove conservation.
3: Community management plans are designed, adopted and monitored in an effective manner. By 2020, at least 60% of the forests reserves and other important massifs are managed through community participatory management processes (Aichi targets 7, 11, 14).	Percentage of national ecosystems management through participatory planning.	The project will support the design and implementation of participatory climate-resilient mangrove ecosystems conservation and restoration management plans.
4: By 2020, the pace of deforestation in forest areas and buffer zones decrease by 20% (Aichi target 5).	Deforestation rate in forests areas and buffer zones.	Through its components 1 and 2, the project will support efforts to reduce pace of mangroves deforestation through sustainable land planning and reduction of anthropic pressures on mangroves through alternative livelihoods.
9: By 2015, the on-going mangroves recovery programs are strengthened (Aichi targets 5, 11).	Percentage of mangroves recovered.	The proposed project is fully dedicated to climate proofing mangroves while restoring and conser

		ving their ecosystems.
9: By 2016, the stakeholders involved in vulnerable marine ecosystems are provided with alternative solutions reducing pressures on such ecosystems (Aichi targets 4, 5, 10).	Number of stakeholders who implement marine ecosystem alternative solutions.	Component 2 of the project will identify and catalyze climate-resilient alternative livelihoods that aim at lowering anthropic pressure on mangrove ecosystems.
16: By 2014, information on ecosystem services provided to communities are gathered, updated and analyzed.	Updated document on stocktaking exercise about ecosystem services provided.	As part of component 3, a natural capital assessments and accounting of mangrove ecosystems in Benin will be conducted.

84. This project will contribute to the Sustainable Development Goals (SDGs), in particular to Goals no 13 (“Take urgent action to combat climate change and its impacts”) and no 15 (“Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss”). Indirectly, the Project will also contribute to the following SDGs:

- Goal 1: End poverty in all its forms everywhere - the project focuses in areas where poverty is increasing. The project will focus on the poor and marginal in these communities, developing their capacities to implement climate-resilient sustainable and economically viable alternative livelihoods, hence helping to bring a number of people out of poverty;
- Goal 12: Ensure sustainable consumption and production patterns. The project will help build awareness of communities living in mangrove ecosystems about sustainable development and management of natural resources; and
- Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development. Both components 1 and 2 focus on sustainably manage and restore mangroves, which provide essential services to oceans, seas and marine resources.

Innovation, sustainability, and potential for scaling up

85. The project innovations lie in the design and implementation of participatory climate-resilient mangrove ecosystem conservation and sustainable management plans that have not been implemented in Benin to date. Such approach will be informed by international best practices in terms of participatory approach and conservation practices in mangrove ecosystem. Similarly, component 2 will seek the identification of innovative alternative livelihoods activities in mangroves area. Such approach will also be informed by international and sub-regional best practices in shifting communities’ behaviors towards climate-resilient livelihoods that are sufficiently viable to induce behaviors changes and sustainable use of natural resources in mangroves ecosystems. The public-private partnership local platforms that will aim at catalyzing such alternative livelihoods through private investments and value chains strengthening will also be an innovative feature of the project.

86. The description of project components above illustrates a number of innovative technologies and approaches that the project intends to deploy and scale-up (both for ecosystem resilience and sustainable use as well as for livelihood diversification purposes). These technologies have been piloted by previous projects (including BEN/3502 – Restoration of the Mangrove Ecosystem of the RAMSAR 1017 site in Benin) and management plans will identify the most appropriate technologies from longlists of best practices, in a participatory fashion. Participatory planning will ensure social acceptance of new technologies, a better integration with traditional practices and eventually a greater uptake. Selected innovative technologies will also need to be (i) simple for

easy reproduction by the local populations, and (ii) cheap in use and maintenance to be accessible and widely adopted. Also innovative approaches are being introduced, including (i) community landscape planning, management and monitoring potentially through mobile applications such as Collect Mobile and (ii) innovative financial instruments in support of biodiversity conservation and climate change adaptation.

87. The project will carry out activities that will enhance adaptive capacities of human and natural systems in Benin mangrove ecosystems, while generating global environmental benefits. This process includes a wide variety of activities such as establishing sustainable and climate resilient mangrove ecosystems management plans and restoring degraded mangroves.

88. Furthermore, the project will do a real effort to integrate risks related to climate change and biodiversity conservation. To this end, the project will support communities in their integrated and participatory planning and monitoring endeavors, and identification and implementation of alternative livelihoods that will build adaptive capacity of human systems and will divert current livelihoods from unsustainable use of resources.

89. The sustainability of the project will be guaranteed by a multi-level capacity development approach whereby not only the system-level but also organizational and individual capacities are developed. Project results can therefore be adopted at scale, and results can be maintained beyond the life of the project. Direct involvement of national and local authorities, non-governmental organizations and private investors in addition to the local communities will facilitate the development of a system, which is environmentally sound and economically viable. Training elements will be integrated in the key institutions of the MCVDD to provide potential for scaling up. The involvement of the private sector in the local public-private partnerships will aim at engaging private investments in the development and commercialization of alternative livelihoods outputs, hence helping in sustaining the project interventions.

90. Moreover, social and economic sustainability will be promoted through maximizing participation of local beneficiaries in the project design and implementation of interventions in the target sites. The project will demonstrate the ecosystem services of mangrove ecosystem and the economic potential of alternative livelihoods. With the local communities becoming the basis upon which conservation and restoration efforts are being built in a participatory manner, and thanks to their involvements in public-private partnership for alternative livelihoods development, communities will become the main stakeholders deciding on mangrove ecosystems development pathways, balancing optimal and efficient use of natural resources in a context of increasing climate change vulnerability.

91. Institutional sustainability will be ensured through strengthening the capacities of MCVDD. The communication, trainings and knowledge sharing methods undertake will utilize pragmatic and cost-effective tools.

92. The project will, through its awareness raising and knowledge strategy identify potential opportunities for scaling-up demonstrated practices and approaches. The sustainability strategy is twofold: i) ensuring ownership and commitment of local and national stakeholders, and ii) catalyzing investments from the private sector to direct financial flows towards the development of sustainable and climate-resilient alternative livelihoods in mangrove ecosystems.

[1] http://www.undp.org/content/dam/benin/docs/environnement/PANA_BENIN.pdf

[2] https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Agricultural%20Situation_Lagos_Benin_3-20-2014.pdf

[3] <http://www.fao.org/faostat/en/#country/53>

[4] FAO, 1994, Mangrove forest management guidelines

[5] The term “mangrove ecosystems” used in this document characterizes the mangroves and its environment (communities and habitats).

- [6] <http://www.fao.org/3/ap428e/ap428e00.pdf>
- [7] <https://rsis.ramsar.org/ris/1017> and <https://rsis.ramsar.org/ris/1018>
- [8] https://wedocs.unep.org/bitstream/handle/20.500.11822/10418/Rapport_PNUE_Draft_FINAL.pdf?sequence=1&isAllowed=y
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- [11] Jalloh, A.; Nelson, G.C.; Thomas, T.S.; Zougmore R.; Roy-Macauley H., (2013): West African Agriculture and Climate Change, A Comprehensive Analysis, IFPRI <http://www.ifpri.org/sites/default/files/publications/rr178.pdf>
- [12] Climate Service Center (2013): Climate fact sheet Benin, Ghana, Togo <http://www.climate-service-center.de/>
- [13] 'Hot' day or 'hot' night is defined by the temperature exceeded on 10% of days or nights in current climate of that region and season. 'Cold' days or 'cold' nights are defined as the temperature below which 10% of days or nights are recorded in current climate of that region or season.
- [14] McSweeney et al. (2010)
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- [24] <https://gain.nd.edu/our-work/country-index/rankings/>
- [25] http://www.undp.org/content/dam/benin/docs/environnement/PANA_BENIN.pdf

[26] <https://unfccc.int/resource/docs/natc/bennc2f.pdf>

[27] UNDP; Beninese Ministry of Environment and Nature Protection (2008)

[28] Niang, I., O.C. Ruppel, M.A. Abdrabo, A. Essel, C. Lennard, J. Padgham, and P. Urquhart, 2014: Africa. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Barros, V.R., C.B. Field, D.J. Dokken, M.D. Mastrandrea, K.J. Mach, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1199-1265.

[29] Global Climate Change Alliance (GCCA) (2013): From Integrated Climate Strategies to Climate Finance

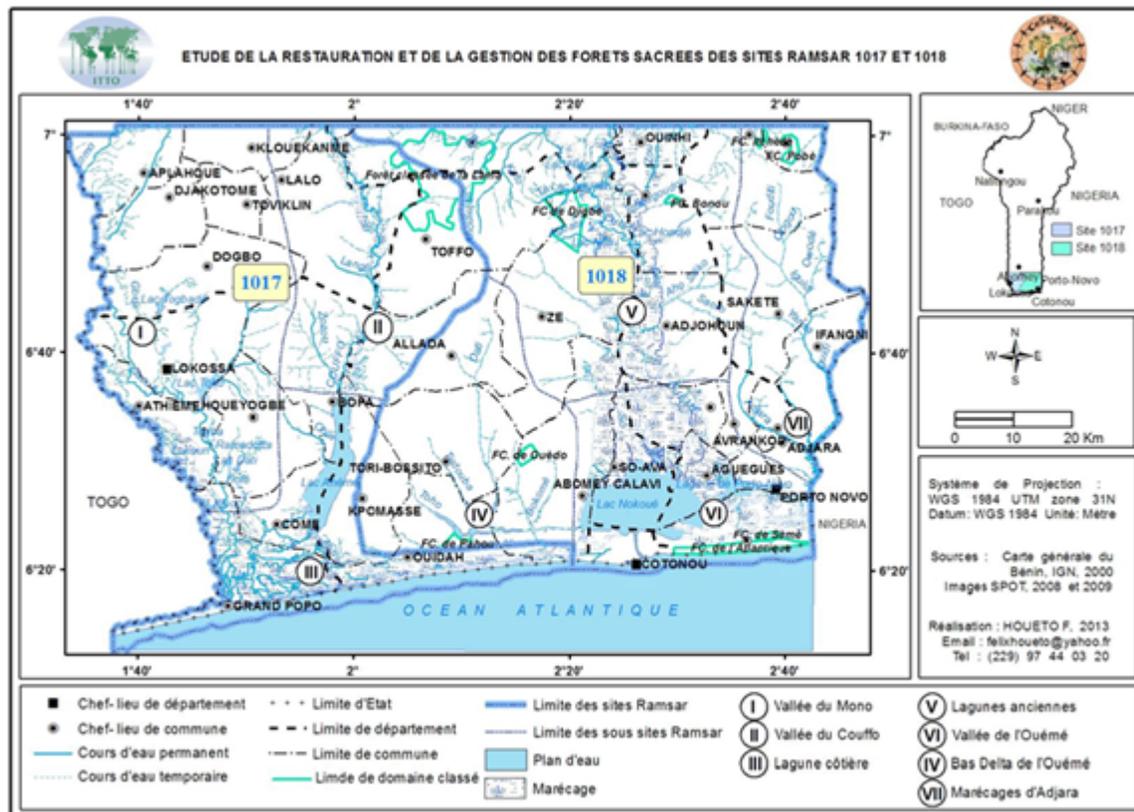
Effectiveness – Experiences from the GCCA. <http://www.gcca.eu/sites/default/files/soraya.khosravi/gcca2013-eng-pdf.pdf>

[30]. This technology addresses the deficiencies in smoking techniques by adding new components to the existing or improved kilns (Altona, Banda, Chorkor or any traditional kilns). One of the main advantages of the FTT-Thiaroye system is its improved energy efficiency by encapsulating heat and smoke, as well as other potential environmental protection features. The new kiln reduces charcoal consumption and optimizes the use of agricultural residues such as coconut husks, sugar-cane bagasse or manure throughout the process. In most African countries, agro-wastes are easily available. They are not only an affordable alternative fuel, but because they are available within a reasonable distance, their use reduces the labour spent by fish processors – mostly women – in obtaining wood or charcoal for fuel. This also reduces the intensity of mangrove wood harvesting which will benefit the mangrove ecosystems and biodiversity through reduced deforestation and degradation of mangroves. The FTT-Thiaroye has progressively gained the confidence of African small-scale fishing communities, and the technology is now in use in a dozen of countries on the continent.

1b. Project Map and Coordinates

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

- The project will take place in two Ramsar sites (full description of both sites in para 8):
 - the Lower valley of the Couffo, Chenel Aho, coastal lagoon and Lake Ahémé (RAMSAR site #1017), in Bopa (6.5874, 1.96539), Grand Popo (6.28036, 1.82251), Togbin (Abomey-Calavi) (6.34555, 2.20338)
 - the Lower Valley of the Ouémé, Porto Novo lagoon and Lac Nokoué (RAMSAR site #1018), in Sémé-kpodji (6.39468, 2.58172)



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

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.

1. Key stakeholders for this project include governmental institutions and local communities living in and depending on mangrove ecosystems. The latter will be strongly involved in identifying, designing, implementing, monitoring, evaluating and coordinating the project interventions in the target sites, and therefore act as agents of change to achieve resilient and sustainable mangrove ecosystems management. MCVDD will lead project implementation and will be responsible for the day-to-day management and monitoring of the project. MCVDD will also be responsible for the technical implementation of the project in close cooperation with FAO.

2. Stakeholder consultations were conducted in 2019 in Benin (in Cotonou, Grand Popo, Sémé, Togbin, and Bopa) through a series of meetings, presentations, and interviews. The following table provides a preliminary description of key stakeholders and their envisaged roles. It will be updated during the project preparation phase.

Stakeholder	Relevant Roles
Ministry of Living Environment and Sustainable Development ("MCVDD")	The MCVDD will act as the executing agency for the project. MCVDD provides Benin with directions in terms of natural resource management and the environment. Its General Directorate for Water, Forestry and Hunting (DGEFC) is the national structure that coordinates the design and implementation of states policies related to sustainable forests and natural resource management, notably through the National Programme for Sustainable Resources Management ("PNGDRN" in French). MCVDD hosts the Beninese Environmental Agency ("ABE" in French) whose mission is to implement the environmental policy as defined by the government in its general development plan. MCVDD's Environment and Climate General Directorate ("DGEC") is in charge of coordinating national ministries and institutions to mainstream climate change into national policies and planning.
Ministry of Agriculture, Breeding and Fisheries ("MAEP")	MAEP is responsible for creating an enabling environment to agricultural production improvement and increasing agricultural incomes and rural livelihoods. Synergies will be sought in the field of fishery and alternative livelihoods, whenever relevant.
Local authorities in	Municipalities are organized in local committees to implement municipalities develop

target sites	<p>ment programmes. Municipalities play a key role in raising awareness on the importance of mangrove ecosystems and participate to restoration, conservation efforts, monitoring and protection of coastal ecosystems.</p>
Local communities in target sites	<p>Main beneficiaries and key partners to design and implement climate-resilient mangrove ecosystems restoration and conservation plans and to identify and implement climate resilient alternatives livelihoods.</p>
Civil Society Organizations (CSOs)	<p>CSOs include community based organizations that represent the main beneficiaries and key partners and will contribute to the design and implementation of the project interventions, in close collaboration with local communities. Among them is the women organization operating in the lagoon (AFEL). Non-governmental Organizations (NGOs) will play a key role in supporting the design and implementation of local interventions. Local NGOs have accumulated valuable experiences in conservation and restoration of mangroves, such as Eco-Bénin, Action Plus, Eco-Ecolo, Cidev, Cesaren.</p>
Private sector	<p>Private entities will play a pivotal role in the proposed project by helping to identify alternative livelihoods and promising value chains in mangrove ecosystems, to help restructuring value chains through financial investments and technical expertise, to ease access to markets and scale-up livelihoods initiatives.</p>
Research institutions	<p>Research institutions include universities namely the University of Abomey-Calavi where a research group is working on mangroves ecosystems, in particular on mangrove restoration and fast-growing firewood plantation establishment for reducing pressure on mangrove forests. In addition, the DGEFC-hosted “Centre d’Etudes et de Recherche Forestières” contributes to research on firewood in Benin. Both will play a pivotal role in the biomonitoring system of mangroves restored and under conservation and firewood community forests initiative.</p>

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).

1. Women are key stakeholders in the traditional economic and social life in the target sites. They contribute to a large share of daily tasks such as firewood collection, fish processing and marketing, agricultural work, cooking, salt processing, in addition to a variety of households-related tasks. Because of their strong reliance on natural ecosystems (including mangroves) for such tasks, women represent a significant part of the local population that experiences the negative outcomes associated with climate change and environmental degradation, and that is the most preoccupied about mangrove ecosystems vulnerability to climate change and mangroves depletion.

2. As a result, women will be the main beneficiaries of the proposed project. All project activities will be designed to empower women. Throughout component 2, the project will work towards promoting women access to alternative climate resilient, economically viable and sustainable livelihoods, building upon their current roles and knowledge about agriculture as well as non-agricultural products (handcraft, processing and commercialization of non-timber forests products, eco-tourism etc.). Further, it will increase women capacity to implement and sustain such activities, and will encourage the advent of women entrepreneurs through the public-private partnerships platforms. Similarly, component 1 will work with women as main agent of change to raise awareness on mangrove ecosystems, and to design, implement and sustain climate-resilient mangrove ecosystem conservation and restoration plans.

3. Early in the project implementation, a gender responsive rapid assessment will be conducted. The project will ensure that its findings are reflected in the nature and ways project activities will be implemented. The project will ensure that women's specific needs are met, that women enjoy equal access to project activities from the design to the implementation stage and that all potential benefits are equitably accessed through project implementation. The project will monitor its interventions using disaggregated indicators to assess project results and effects on men and women. Gender sensitive indicators will be developed during PPG at the output level in order to assure a gender-equal participation and access to benefits from the project interventions. Active participation of women during the consultation and decision-making processes will be promoted to ensure equitable participation between men and women, so that both benefit from the outcomes of the project, following FAO's policy on gender equality.

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;

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.

The private sector targeted for participation in this project are mainly MSMEs in the agriculture, forestry and fisheries sectors, as well as private landowners and therefore individual investors. Particularly in the site #1017, a number of these MSMEs have received training on sustainable use of the natural resource base they depend upon. These trainings have been provided by local NGOs (African Mobile Nature (AMN), JVE Benin and Eco-Benin) in the context of the IUCN global programme *Shared Resources Joint Solutions*. Still, as described above, the involvement of the private sector is hampered by a number of barriers, one of which is access to finance to adopt innovative technologies and approaches, and low value added of investments in biodiversity conservation and climate change adaptation. The project will help lift these barriers, and therefore provide for a more conducive environment for private sector engagement in conservation and sustainable use of mangrove ecosystems.

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)

A major assumption in this project is that local communities and key stakeholders will comply with national legislation and local government authorities. At the national level, one of the assumptions is that the government, local communities, private sector, NGOs and other relevant stakeholders will collaborate effectively within a joint framework with the aim to fulfill commitments under this project.

The table below lists the main risks, their categories, level of impact, and the proposed risks mitigation measures

Risk/External Factor	Risk Category	Level of Impact	Risk Mitigation Measures
Insufficient inter-institutional cooperation	Institutional	M	Through component 3, the project will seek to improve legal instruments and inter-institutional coordination pertaining to mangrove ecosystems management. The project will ensure that a close collaboration between the relevant stakeholders is fostered.
Climate change impacts may constitute a threat to conservation and restoration efforts	Climate change	M	The conservation and restoration planning processes in (component 1) will take into account climate change projections in order to mitigate risks associated with such activities. All project activities will aim at strengthening the resilience of human and natural systems to the impacts of climate change.
Limited interest or involvement by target communities in restoration/conservation activities and implementation of alternative livelihoods	Social	L	The project will seek permanent participatory approach from communities and local stakeholders for the implementation of both components 1 and 2. Based on the government and FAO's successful experiences in mangroves conservation and restoration, direct involvement of land users in such efforts will mitigate such risk. In addition, the involvement and subsequent investments by the private sector in the local public-private partnerships platform will help maintaining involvements of stakeholders in alternative livelihoods through stimulation of entrepreneurship.
Chronic illegal mangrove harvesting	Social	M	As part of component 1, the project will build capacity of local communities and stakeholders to monitor and report illegal activities.

<p>oves deforestation may jeopardize the project conservation efforts</p>			<p>cal stakeholders to set up monitoring and surveillance communities-led committees in target sites. In addition, awareness-raising efforts are expected to help changing behaviors toward more sustainable mangroves management.</p>
<p>Lack of political support to enhance inter-institutional strengthening for resilient mangrove ecosystems management</p>	Political	L	<p>Key decision-makers will be involved in the project implementation. The project will maintain close relationships with key authorities and update them about the progress made towards the project milestones.</p>
<p>Benin's vulnerability to exogenous shocks and poverty could hinder the project diversification efforts (alternative livelihoods) and result in continuous degradation</p>	Economic	M	<p>The socioeconomic assessment planned under component 2 will provide a comprehensive overview of local communities' situation from a social and economic standpoint. Taking into consideration local knowledge, it will provide key insights economic vulnerability drivers, hence allowing the market and value chains study to consider communities' socioeconomic situations. Alternative livelihoods will be identified on an economic profitability basis to incentivize economic change and reduce poverty. In addition, public-private partnerships will aim at catalyzing private investments in profitable livelihood, thus contributing to reduce poverty. The project will complement such efforts in facilitating communities' access to initial investments and creating shared investments schemes.</p>
<p>National execution partner(s) are assessed to have moderate or high risks on a selection of operational standards, making the operationalization of the project more costly and complex</p>	Fiduciary	M	<p>Before engaging partners as operational partners in project execution, FAO carries out micro-assessments of the operational capacity of the partner. This is done either at PIF or PPG stage. FAO will engage with the partner only if risks are low or moderate. A detailed risk mitigation plan is developed and is part of the operational partner agreement (OPA) with the national execution partner.</p> <p>It is the intention to work with national execution partners, as the project partnership can help develop operational capacities of the partners. Still, if no suitable national execution partner can be identified during PPG (meaning that the micro-assessment indicates high risk and OPA is not an option), an international partner will be engaged in the project execution.</p>
<p>Local, regional and/c</p>	Health	M	<p>Resilience in the project intervention logic is interpreted in</p>

<p>Local, regional and/or global measures to contain impacts from pandemics (such as Covid-19) and their repercussions on availability of technical expertise, engage stakeholders, and secure financing</p>	<p>Health</p>	<p>IV</p>	<p>resilience in the project intervention logic is interpreted in a rather comprehensive fashion, and therefore includes building less vulnerable communities to pandemics, putting in place the infrastructure to build back better, such as short value chains for local markets, extension services that easily and promptly address health related concerns so they do not become social, economic and environmental crises, etc. The project intervention logic has the potential to address critical issues around human-wildlife interaction (including increased exposure to viruses), and the landscape management plans will explicitly integrate this concern.</p> <p>To overcome concerns in mobilizing the technical expertise to support project design and implementation, the project will work as much as possible with locally rooted (CSOs, NGOs, government institutes, extension services, ...) organizations and realities in order to minimize the impacts of limitations on mobility at the national and international level. Technological alternatives to face-to-face consultations will be deployed, securing proper participation and engagement of all relevant stakeholder groups, including women and youth.</p> <p>As government priorities potentially shift to address crises (health or other), the project will deliver evidence and increase its sensitization and awareness raising and capacity development efforts in order to advocate for continued support to green and resilient recovery.</p>
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Please, refer to the Environmental and Social Risks Level Certificate for potential risks FROM the project (coherent with FAOs Environmental and Social Safeguards policy) in the Roadmap section of the Portal.

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.

1. The Government of the Republic of Benin will implement this project with the support of FAO. The Ministry of Living Environment and Sustainable Development (MCVDD) will be the national partner responsible for ensuring that the project results are achieved, and that resources are allocated and disbursed efficiently and effectively. The implementation of the project will be conducted under the overall guidance of a project steering committee, designed specifically for this purpose. A project manager/coordinator will be in charge of designing and implementing annual work plans and budget and will report directly to the project steering committee. The project coordination unit will be also responsible for the project monitoring, while evaluations are to be conducted by an independent body, the OED (Evaluation Office of the FAO), as per all FAO-GEF projects.

2. The project will coordinate with ongoing initiatives in Benin related to coastal and forests management, and mangroves restoration and conservation. The proposed project will design at early implementation stage coordination framework with these initiatives to ensure enhanced learning and sharing of lessons learned.

3. **GEF-financed initiatives:** The project will build on the work and coordinate and establish linkages with the following projects and initiatives:

- Investments towards resilient management of Guinea Current Large Marine Ecosystem Project: this project is being implemented by the World Bank with a US\$ 20,250,000 funding from the GEF Trust Fund. The project aims at improving management of shared natural and man-made risks, including climate change, affecting targeted coastal communities and areas in the West Africa region. In Benin, the GEF project (IW) focuses on an off-shore area located at the eastern part of the coast, next to the Nigerian border which covers abandoned oil field installations. Regional activities in Togo and Benin (IW, LD, BD) will include the rehabilitation of 20 km of flood banks along the Chenal de Ggaba. The project will identify the biophysical and socio-economic data needed to understand changes in the landscape related to such investments, collect and share information at the national and regional levels. Such data will be considered as inputs to component 2 of the proposed project to help determining alternative livelihoods activities. The lessons learned from the rehabilitation efforts and support in social investments will directly inform the components 1 and 2 of the proposed project.

- Sustainable Forest Management and Conservation Project in Central and South Benin: this project is being implemented by the African Development Bank with a US\$2.627,226 funding from the GEF Trust Fund. This project aims at supporting efforts in creating and upscaling national protected areas in Benin with improved management effectiveness and will support the implementation of sustainable forest management plans. The project will also support the adoption of innovative technologies and management practices for GHG emission reduction and carbon sequestration to promote the conservation and enhancement of carbon stocks in Benin central and south forests. The proposed project is going to build on the experiences gained designing and implementing sustainable forest management plans to implement the climate-resilient mangroves restoration and conservation plans.

- Strengthening the Resilience of Rural Livelihoods and Sub-National Government System to Climate Risks and Variability in Benin: this project is being implemented by the United Nations Development Programme with a US\$ 6,000,000 funding from the Least Developed Country Fund. This project aims at building greater awareness and technical knowledge of climate change impacts at the government level. This will be complemented by the restoration of depleted natural resources through resilient livelihoods and by large-scale investments in climate resilient agricultural infrastructures. The proposed project will complement such activities in areas not covered by this UNDP project. It will complement institutional strengthening efforts by further enhancing inter-

institutional coordination pertaining to mangrove ecosystems management and further building technical capacity of using restoration and conservation of mangroves as an ecosystem-based adaptation strategy. The alternatives livelihoods that the proposed project will identify and implement will be informed by lessons learned from resilient livelihoods implemented by this project.

- Strengthening resilience to climate change of coastal communities in Togo. This LDCF project is currently under development by FAO. This project aims at strengthening collaboration of fisheries, forestry, livestock and agricultural sectors in a context of climate change. Some activities will take place in coastal zones and are particularly relevant to the proposed project (e.g. climate-proofing of natural ecosystems and introduction of diversified livelihoods, among others). Early lessons and feedback from each project will inform the implementation of the other. As proposed in the project knowledge management strategy, a two ways flow of information between the two projects will ensure complementarity of the similar initiatives and will allow building synergies where appropriate.

Non-GEF initiatives:

- The NAP Readiness project, financed by the GCF and implemented with UNDP support, addresses a number of barriers to better plan, manage and monitor climate change adaptation in Benin, through 3 complementary and related components. It helps provide the economic and climate information informing the Government Action Plan (PAG – Plan d’Action Gouvernementale, which integrates climate change), supports the development and use of mechanisms and tools to facilitate CCA mainstreaming into budgeting, and supports government efforts to enhance the mobilisation of local, private and external funding for climate adaptation. The GEF project collaborates closely with the key stakeholders involved in the NAP process, including this NAP Readiness project (i.e. the Ministry of Living Environment and Sustainable Development (MCVDD), the Ministry of Planning and Development (MPD), the Ministry of Economic and Finance (MEF), the Commission of Economic Modelling of the impacts and Integration of Climate Change in the state general Budget (CMEICB), the National Environment and Climate Fund (FNEC)), most of which will be represented in the project Steering Committee, and therefore linkages across the investments are guaranteed. Nevertheless, already during PPG, explicit linkages will be established with this NAP Readiness project, so as to ensure project development, implementation, and eventual results are coordinated with and informed by the NAP process and its various initiatives.

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

1. The proposed project is fully consistent with the relevant national development programmes and sector plans adopted by the Government of the Republic of Benin, as well as with the various programmes and action plans formulated by the Beninese Government under the relevant international Environmental Conventions.

2. With respect to national strategy and development programmes, the proposed project is in direct conformity with the following national programmes and sector plans:

- **Government Action Programme (2016-2021)**. The programme has 3 main pillars and underlying strategic axis and actions. One of the axis focuses on balanced and sustainable development of the national territory and include an action aiming at “improving well-being and conserve the environment”.
- **The National Development Plan (2018-2025)** include as a strategic objective (3.6.3) to ensure a sustainable development and quality of life, a sustainable environment and the emergence of regional hubs. Components 1 and 2 of the proposed project will contribute directly to such objectives. The NDP includes specific references and guidance in terms of “natural capital valorization” and “strengthening of climate change resilience”, to which the project will directly contribute.
- **The low carbon and climate resilient development strategy (2016-2025)** includes as main directions to strengthen the resilience of local communities’ agricultural production systems (pillar 1) and to reduce climate risks in order to reduce communities’ vulnerability to natural disasters and climate-borne diseases (pillar 3). The proposed project will fully contribute towards the achievements of these two pillars.
- Benin’s **first Technology Needs Assessment (TNA)** was prepared in 2003. It included as adaptation strategies the promotion of alternative activities, reforestation of river banks, improvement of lagoon production and dissemination of improved fireplaces. The project will directly contribute to promotion of alternative activities, reforestation of river banks and improvement of lagoon production.
- Benin’s **National Capacity Self-Assessment (NCSA)** was prepared in 2008. It warned about the strong depletion of mangroves and identified agriculture and biodiversity as among the most vulnerable sectors to the impacts of climate change.
- Benin’s **National Adaptation Plan of Actions (NAPA)** has been submitted in 2008. It identified coastal erosion as a main environmental issue in the country and lists coastal areas, forestry and agriculture as sectors that will be the most affected by the impacts of climate change. It prioritizes actions on coastal zones (5th position) that have as a general objective to address the overall sediments imbalance, beach erosion, the restoration of mangroves and promoting improved salt extraction technologies with wind and solar energies.
- Benin’s **Intended Nationally Determined Contributions (INDC)** has been submitted in 2015. Its global objective in terms of adaptation is to increase efforts aiming at reducing the vulnerability of human systems to climate change and increase the resilience of ecosystems in a context of climate change. It identifies the protection of coastal zones as a priority in light of sea level rise and coastal erosion. To this respect, the restoration of mangrove ecosystems is listed a key objective.

- Benin's *first nationally determined contribution (NDC) under the Paris Agreement, 2017*. It includes as a key adaptive target to develop mangrove ecosystems by 2030. Similarly, it plans to build adaptive capacity to climate change in all socio-economic sectors, to ensure diversification and promotion of high value-added agricultural value chains, to reduce the vulnerability of natural and human systems to water stresses, floods and degradation of water quality, to promote intensive afforestation throughout the country using incentive measures; to promote sustainable management of public and community forests areas; to adapt the forest sector's legislative and regulatory framework to climate change context, to ensure the protection of the shoreline against the risk of sea-level rise which can exacerbate the phenomenon of coastal erosion; and to ensure continuously the protection of marine and lagoon ecosystems. The three components of the proposed project are all fully aligned with these different objectives.
- *Benin's National Biodiversity Strategy and Action Plan (NBSAP), 2016*. This revised version of the NBSAP highlights the importance of "restoring and conserving mangroves ecosystems" and materialize this under its 9th goal: "Reduce anthropic pressures on vulnerable marine ecosystems that are subject to climate change and oceans acidification" and 4th goal: "Reversing natural habitats degradation and depletion, including forests", both of which will be key aspects of the project.
- Benin has ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1994, ratified the Kyoto Protocol in 2002 and the Paris Agreement in 2016. Its First National Communication to the United Nations Framework Convention on Climate Change was published in 2001, and the Second National Communication to the UNFCCC was submitted in 2011. Benin ratified the Convention on Biological Diversity in 1994.
- Benin is part of the African Forest landscape Restoration Initiative, a country-driven initiative coordinated by NEPAD with support and many technical and financial partners including FAO. The country pledged to restore 0.5 million ha of degraded land. (see: <https://afr100.org/content/benin>)

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.

1. The project will generate knowledge across its three components. Such knowledge will be disseminated within and beyond the project intervention areas through existing information sharing networks and forums. In addition, the project will identify and participate, as relevant and appropriate, in scientific, policy-based, and/or any other networks, which may be of benefit to project implementation through lessons learned.
2. The project will generate and share lessons learned that might be beneficial in replicating the project outcomes in other mangroves area in the Gulf of Guinea and beyond. A focus will be on the knowledge generated from local communities on both the climate-resilient mangrove ecosystem restoration and conservation processes and outcomes and on the climate-resilient alternative activities. Furthermore, the project will create the needed linkages with projects of a similar focus inside and outside the country, and adapt a two-way flow of information (sharing and gaining knowledge). The project will particularly consider building bridges with the WACA resilience investment project that is designed to become a convening platform for coastal countries and partners to share knowledge and expertise on coastal management, including mangrove ecosystem management. Similarly, knowledge exchanges are foreseen with FAO's LDCF "Strengthening resilience to climate change of coastal communities in Togo" project currently under development, particularly in the areas of climate change adaptation mainstreaming, capacity-building for climate change adaptation, community planning and management of ecosystems, and development of non-timber forests products, among others.
3. The project will design a knowledge management strategy aiming at promoting the lessons learned from the project and benefits provided by mangroves in adapting to climate change and in climate-resilient livelihoods. This will encompass organizing awareness-raising campaigns, undertaking south-south knowledge sharing activities with countries in the sub-region and organizing national and local communication activities in Benin's mangrove ecosystem areas.

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

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.

Please, consider the attached document.

Supporting Documents

Upload available ESS supporting documents.

Title

Submitted

Updated ESR screening

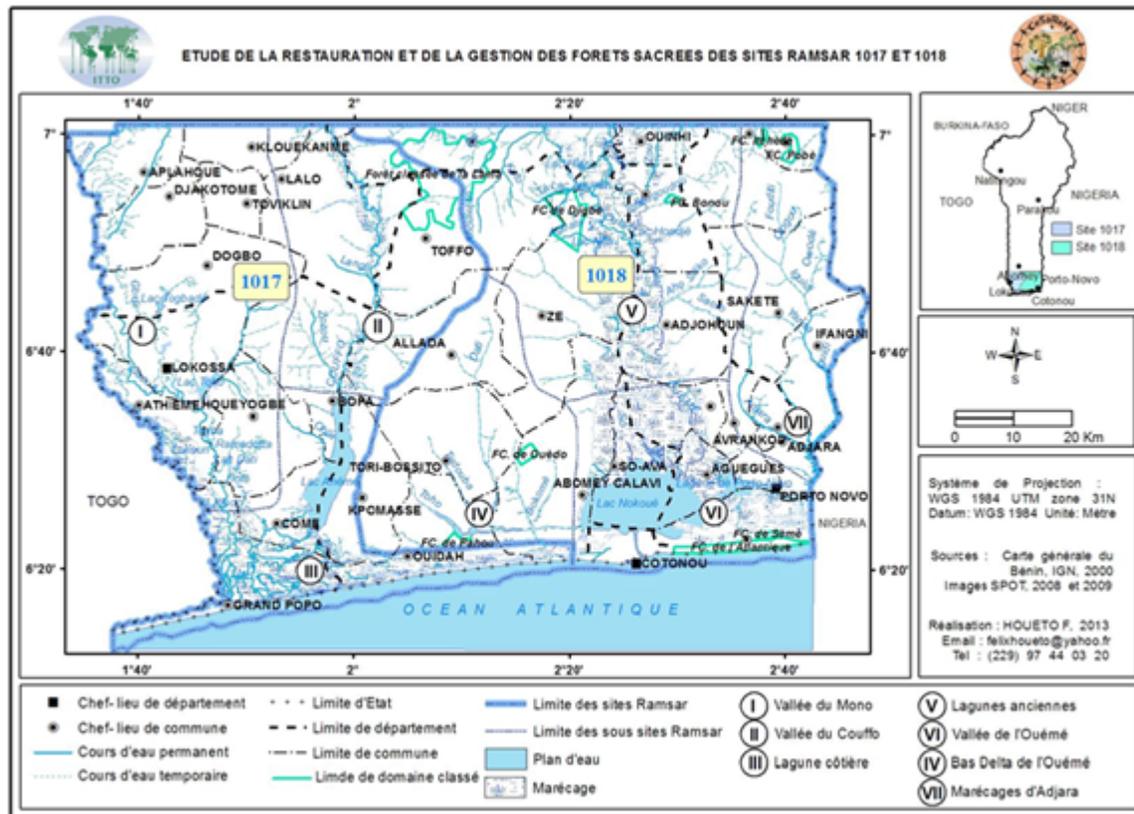
Part III: Approval/Endorsement By GEF Operational Focal Point(S) And Gef Agency(ies)

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
Delfin AIDJI	GEF Operational Focal Point	Ministère du Cadre de Vie et du Développement Durable	9/30/2020

ANNEX A: Project Map and Geographic Coordinates

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



The project will take place in two Ramsar sites (full description of both sites in para 8):

- the Lower valley of the Couffo, Chenel Aho, coastal lagoon and Lake Ahémé (RAMSAR site #1017), in Bopa (6.5874, 1.96539), Grand Popo (6.28036, 1.82251), Togbin (Abomey-Calavi) (6.34555, 2.20338)
- the Lower Valley of the Ouémé, Porto Novo lagoon and Lac Nokoué (RAMSAR site #1018), in Sémé-kpodji (6.39468, 2.58172)

