

## Climate change adaptation and livelihoods in three arid regions of Mauritania

### Part I: Project Information

**GEF ID**  
10103

**Project Type**  
FSP

**Type of Trust Fund**  
LDCF

**Project Title**  
Climate change adaptation and livelihoods in three arid regions of Mauritania

**Countries**  
Mauritania,

**Agency(ies)**  
UNEP,

**Other Executing Partner(s):**  
**Executing Partner Type**  
Government

**GEF Focal Area**  
Climate Change

**Taxonomy**

Focal Areas, Climate Change, Climate Change Adaptation, Adaptation Tech Transfer, National Adaptation Programme of Action, Complementarity, Sea-level rise, Livelihoods, Climate resilience, National Adaptation Plan, Small Island Developing States, Disaster risk management, Least Developed Countries, Innovation, Private sector, Ecosystem-based Adaptation, Community-based adaptation, Climate finance, Climate information, Influencing models, Strengthen institutional capacity and decision-making, Stakeholders, Beneficiaries, Local Communities, Gender Equality, Gender Mainstreaming, Sex-disaggregated indicators, Gender-sensitive indicators, Gender results areas, Capacity Development, Access and control over natural resources, Capacity, Knowledge and Research, Knowledge Generation, Workshop, Seminar, Master Classes, Training, Course, Professional Development, Climate Finance (Rio Markers), Climate Change Adaptation 2, Climate Change Mitigation 0, Mainstreaming adaptation, Participation and leadership

**Duration**

48

In Months

**Agency Fee(\$)**

419,540

**Submission Date**

10/4/2018

**A. Indicative Focal/Non-Focal Area Elements**

<b>Programming Directions</b>	<b>Trust Fund</b>	<b>GEF Amount(\$)</b>	<b>Co-Fin Amount(\$)</b>
CCA-1	LDCF	2,816,210	3,250,000
CCA-3	LDCF	1,600,000	13,000,000
<b>Total Project Cost (\$)</b>		<b>4,416,210</b>	<b>16,250,000</b>

## B. Indicative Project description summary

Project Objective

To increase the adaptive capacity of rural communities in the wilayas of Adrar, Inchiri and Trarza.

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Component 1: Institutional capacity development for planning and implementing climate change adaptation in arid ecosystems of Mauritania.	Technical Assistance	<p><u>Outcome 1:</u></p> <p>Increased technical and institutional capacity for climate change adaptation – particularly EbA – in arid ecosystems</p>	<p><i>Output 1.1:</i> Climate change vulnerability assessments undertaken and adaptation options identified for the wilayas of Adrar, Inchiri and Trarza</p> <p><i>Output 1.2:</i> Institutional capacity-building, including training provided for DRE and CNOEZA in each of the target wilayas.</p> <p><i>Output 1.3:</i> Revisions to local development plans to integrate climate change adaptation proposals</p>	LDCF	700,000	3,000,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
			for each of the target <i>wilayas</i> .			
			<i>Output</i> 1.4: Upscaling strategy for EbA in arid ecosystems of Mauritania developed.			
Component 2: Resilience to climate change in the three target <i>wilayas</i> .	Investment	<u>Outcome 2:</u> Increased resilience of local communities and ecosystems in the <i>wilayas</i> of Adrar, Inchiri and Trarza to the effects of climate change, including drought and desertification.	<i>Output</i> 2.1: Community-level climate action plans developed, with a specific focus on gender.  <i>Output</i> 2.2: Local communities and Associations for the Management of Natural Resources (AGL Cs) trained on	LDCF	2,955,915	10,000,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
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the implementation of EbA.

*Output 2.3:* Improved water management interventions implemented to increase resilience to climate change in the three target *wilayas*.

*Output 2.4:* EbA interventions implemented to increase the resilience of vulnerable communities and ecosystems in the three target *wilayas* to the effects of drought,

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
			<p>desertification and dune migration.</p> <p><i>Output 2.5: Additional natural resource-based livelihoods introduced, with a specific focus on the upliftment of local women.</i></p>			
Component 3: Knowledge on climate change and EbA in arid ecosystems.	Technical Assistance	Strengthened knowledge on climate change adaptation – particularly EbA – in arid ecosystems.	<p>Output 3.1: Policy-relevant research findings published based on monitoring of adaptation results generated under Component 2.</p> <p>Output 3.2: EbA handbooks developed and shared with local implementation</p>	LDCF	550,000	2,000,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
			<p>structures across the three target wilayas.</p> <p>Output 3.3: Knowledge-sharing events on climate change adaptation – including EbA implementation and best practices – conducted in non-target communities within the wilayas of Adrar, Inchiri and Trarza.</p>			
			<p>Output 3.4: Climate information centres and demonstration sites established at focal water points – including oases and well points –</p>			

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
			to promote information sharing, particularly for nomadic pastoralists.			
				<b>Sub Total (\$)</b>	<b>4,205,915</b>	<b>15,000,000</b>
		<b>Project Management Cost (PMC)</b>		<b>LDCF</b>	<b>210,295</b>	<b>1,250,000</b>
				<b>Total Project Cost (\$)</b>	<b>4,416,210</b>	<b>16,250,000</b>

For multi-trust fund projects, provide the total amount of PMC in Table B and indicate the list of PMC among the different trust funds here:

### 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(\$)
Government	Government of Mauritania	In-kind		500,000
Government	Government of Mauritania	Grant		500,000
Donor Agency	World Bank	Grant		13,500,000
Private Sector	Mauritanian Copper Mines (MCM)	Grant		500,000
Donor Agency	Japan International Cooperation Agency (JICA)	Grant		1,250,000
<b>Total Project Cost(\$)</b>				<b>16,250,000</b>

Describe how any "Investment Mobilized" was identified

N/A

### 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(\$)
UNEP	LDCF		Climate Change		4,416,210	419,540
<b>Total Project Cost(\$)</b>					<b>4,416,210</b>	<b>419,540</b>

### E. Project Preparation Grant (PPG)

PPG Amount (\$)

150,000

PPG Agency Fee (\$)

14,250

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)
UNEP	LDCF		Climate Change		150,000	14,250
<b>Total Project Costs(\$)</b>					<b>150,000</b>	<b>14,250</b>

## Core Indicators

### 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	2,200			
Male	1,300			
<b>Total</b>	3500	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**

Core Indicator Expected (at PIF) Number of direct beneficiaries M: 1,300 F: 2,200 Total: 3,500 Number of hectares of land under climate-resilient management 1,300 hectares Number of policies, plans and development frameworks that mainstream climate resilience 3 local development plans (1 in each target wilaya); 1 national plan for development of arid regions Number of people with enhanced capacity to identify climate risk and/or engage in adaptation measures M: 180 F: 220 Total: 400

## Part II. Project Justification

### 1a. Project Description

#### Briefly Describe

- a. The global environmental and/or adaptation problems, root causes and barriers that need to be addressed;
- b. The baseline scenario or any associated baseline Programs;
- c. The proposed alternative scenario with a brief description of expected outcomes and components of the Program;
- d. alignment with GEF Focal Area and/or Impact Program Strategies
- e. Incremental/additional cost reasoning and expected contributions from the baseline, the GEF TF, LDCF, SCCF, CBIT and co-financing;
- f. global environmental benefits (GEF TF) and/or adaptation benefits (LDCF/SCCF); and
- g. Innovation, sustainability and potential for scaling up.

#### *A1.1. The project problem, root causes and barriers that need to be addressed*

Mauritania is a least developed country (LDC) with a population of ~4.3 million people<sup>[1]</sup> and a Gross Domestic Product (GDP) of US\$ 4.6 billion<sup>[2]</sup>. Economic growth in the country is dependent on natural resources, with the mining and agricultural sectors accounting for 38% and 20% of the GDP, respectively<sup>[3]</sup>. Recent economic growth – 3.1% in 2016<sup>[4]</sup> – can be attributed primarily to development in the mining sector, which includes copper and gold mines in the *wilaya*<sup>[5]</sup> of Inchiri. Despite this recent economic growth, more than 40% of the population of Mauritania live in poverty, with the majority (~70%) of these people living in rural areas. The communities located in these rural areas rely on rainfall-dependent, natural resource-based livelihoods including agriculture and pastoralism.

The majority of Mauritania (77%) is considered arid or semi-arid. Land suitable for agriculture and pastoralism covers 397,110 km<sup>2</sup> (39%), while irrigated land covers only 2,500 km<sup>2</sup> (<1%) of the country's 1.03 million km<sup>2</sup>.<sup>[6]</sup> The north of the country, including the *wilayas* of Adrar, Inchiri and Trarza, is more arid than the south and is dominated by Sahelian and Saharian desert ecoregions. Because of the particularly arid conditions, farmers and pastoralists living in these three northern *wilayas* – approximately 10% of the national population – are strongly reliant upon ecosystem goods (e.g. fodder) and services (e.g. groundwater recharge) for their livelihoods. Extreme poverty and a rapidly growing population<sup>[7]</sup> (particularly around the urban areas of Trarza) have, however, led to considerable degradation of the local ecosystems, a phenomenon aggravated by drought-induced desertification. These forces leading

to degradation are unlikely to diminish in the future, leading to further degradation of the remaining natural resources in Adrar, Inchiri and Trarza and a consequent reduction of essential ecosystem goods and services to local communities.

Observed climate change has exacerbated the negative effects of ecosystem degradation in Adrar, Inchiri and Trarza. Since 1960, the climate in Mauritania has become progressively drier and the desert region has extended by 150,000 km<sup>2</sup>.<sup>[84-91]</sup> Other climatic changes that have been observed over the past five decades include: i) increases in the frequency of intense rainfall<sup>[90]</sup> events leading to flash floods; ii) declines in low-intensity, long-duration precipitation events leading to extended dry spells; iii) longer and more frequent droughts; and iv) a 0.9°C increase in average annual temperature<sup>[91]</sup>. These climatic changes have had negative impacts on communities in Mauritania, particularly those living in the drier northern regions. For example, drier conditions experienced during the 1970s and 1980s caused rural nomadic herding communities to settle near oases or migrate to urban areas. As a result, there were substantial declines in meat production across the country and considerable losses in income for livestock herders.

The negative impacts of climate change experienced in Mauritania are predicted to worsen in the future. Climate change scenarios predict more frequent and severe droughts with further increases in mean annual temperature and decreases in mean annual precipitation<sup>[92]</sup>. In addition, more flash floods are expected as the frequency of intense rainfall events increases. The predicted intensification of the current climatic trends will lead to *inter alia*: i) reduced productivity of rain-fed crops (e.g. dates, millet, sorghum, rice and corn); ii) reduced overall productivity and a likely change in species composition of rangelands; iii) reduced availability of clean drinking water and irrigation water; and iv) increased soil erosion and dune migration as a result of dry soils, lack of plant cover and high-intensity rainfall events. These climate change impacts, combined with existing environmental degradation, will negatively impact the livelihoods of rural communities and lead to increased food insecurity in the arid regions of Mauritania.

Different ecosystems and socio-economic circumstances in each of the target *wilayas* result in different drivers of ecosystem degradation. In Adrar, low soil fertility combined with dry conditions has led to the overexploitation of oasis ecosystems, particularly through date farming. Inchiri has better quality soils but poor water management and overgrazing has led to the degradation of ecosystems in this *wilaya*. Finally, overgrazing exacerbates the problem of sand encroachment in the erg<sup>[13]</sup> and reg<sup>[14]</sup> desert areas of Traza. Despite differences in the causes of environmental degradation, rural communities in all three *wilayas* rely on functional ecosystems to buffer them against the negative impacts of climate change and there is therefore a need to implement adaptation interventions that target both people and ecosystems.

The **problem** that the proposed LDCF project seeks to address is that rural communities in the arid regions of Mauritania are most vulnerable to the impacts of climate change. The vulnerability of these communities to climate change is exacerbated by the degradation of arid ecosystems and consequent reduction in goods and services.

Currently, there are few initiatives supporting climate change adaptation in the arid regions of Mauritania (previous LDCF projects have been predominantly implemented in the semi-arid and Saharo-Sahelian southern regions) and there is therefore limited knowledge and demonstration of appropriate adaptation interventions. This restricts the adaptive capacity of both the communities and local government in Adrar, Inchiri and Trarza.

The **proposed solution** is to strengthen the adaptive capacity and ultimately climate-resilience of communities and government in the arid Mauritanian *wilayas* of Adrar, Inchiri and Trarza through the introduction of ecosystem-based adaptation (EbA) approaches. The project will focus on improving the management of water and other natural resources in the climate-vulnerable target communities. Climate impacts on these natural resource-dependent communities will be disrupted using a suite of innovative on-the-ground interventions implemented at the plot and community levels.

EbA interventions will include: i) multi-use greenbelts planted around oases in the desert-oasis transition zone to reduce desertification; ii) sustainable fencing of multi-use greenbelts to reduce overgrazing; iii) pasture management to enhance pastoral livelihoods; and iv) dune stabilization with indigenous plant species. Furthermore, improved water management practices and interventions will be introduced, including, *inter alia*: i) drilling new wells fitted with solar pumps; ii) improving water management practices around oases; iii) working with mines to supply water to communities[15]; iv) introducing water-efficient and smart irrigation technologies; v) introducing water-efficient farming techniques; and vi) promoting the use of innovative water-saving technologies. This will address the predicted impacts of climate change described above, namely: i) reduced productivity of crops and rangelands threatening the sustainability of rural livelihoods; ii) reduced availability of good-quality drinking and irrigation water; and iii) increased soil erosion and dune migration.

On-the-ground interventions will be complemented by institutional and technical support to local, regional and national government authorities to increase their capacity to plan and implement appropriate adaptation interventions in arid ecosystems. Furthermore, knowledge on adaptation in arid ecosystems generated through the proposed LDCF project will be captured and shared to facilitate upscaling and replication of the project's interventions. The project is nationally-driven and is aligned with national strategies, policies, plans and investment priorities of Mauritania.

The proposed LDCF project –the first one to address climate change adaptation in the arid regions of Mauritania – incorporates outputs to address **barriers** to climate change adaptation in the three target *wilayas*. These barriers include: i) limited awareness of climate change within local government structures and communities; ii) limited knowledge of government and communities on appropriate adaptation interventions in arid ecosystems; iii) limited institutional and technical capacity of national and local government to plan and implement climate change adaptation (particularly EbA) in arid ecosystems; iv) insufficient investments in

climate change adaptation (particularly EbA); and v) limited capacity of vulnerable local communities to adopt climate-resilient livelihood strategies.

### ***A1.2 The baseline scenario and associated baseline projects***

Rapid population growth, poverty, inadequate management of natural resources, and the expansion of settlements and agriculture are resulting in the severe environmental degradation of arid ecosystems in Mauritania. These challenges are being and will continue to be exacerbated by the negative effects of climate change, including increasing temperatures, erratic rainfall and longer drought periods. As a result, the rural communities which are dependent on the goods and services supplied by arid ecosystems for their livelihoods are becoming increasingly vulnerable. It is therefore necessary to strengthen the climate resilience of these communities and the ecosystems upon which they depend.

In response to the baseline problems, the Government of Mauritania (GoM) is, with the support of external funding and implementation partners, implementing a variety of baseline projects, which are briefly described below.

The Ministry of Environment and Sustainable Development (Ministère de l'Environnement et du Développement Durable, **MEDD**) is the governmental agency responsible for the development and implementation of environmental policies in Mauritania. MEDD is responsible for managing the national response to climate change, including the implementation and monitoring of the NAPA, and is the focal point for the UNFCCC, the GEF, and the IPCC. As such, the MEDD has the responsibility to: i) provide climate change policy oversight; ii) facilitate the integration of climate change into the broader environment and development framework; and iii) facilitate inter-sectoral coordination of climate change considerations through the Coordination on Climate Change National Programme. The MEDD is also the National Designated Authority (NDA) for the Green Climate Fund (GCF) and is currently coordinating the National Adaptation Plan (NAP) process. Extension services are provided by the Regional Environmental Offices (Délégations Régionales pour l'Environnement et le Développement Durable, **DREDD**) in the 15 *wilayas*.

Despite having the mandate to plan and implement environmental and climate change actions, the MEDD (and DREDDs) currently have limited capacity for these tasks. The proposed LDCF project will work with the existing institutional structures within the MEDD to increase their capacity for climate change adaptation – particularly EbA – in arid ecosystems, building on synergies with the public bodies that are addressing arid lands issues. Day-to-day execution of the project will be coordinated by the National Observation Centre for Arid Areas (CNOEZA). Over the proposed project implementation period, US\$500,000 of MEDD operational budget is

included as in-kind co-financing for the proposed LDCF project. In addition, the Government of Mauritania will provide US\$500,000 cash co-financing.

The **Regional Sahel Pastoralism Support Project (PRAPS)**[16] was initiated in October 2015 with an implementation period of six years (terminating 2021). It is a regional project covering the six Sahelian countries<sup>(17)</sup> and is funded by the World Bank and the International Development Association. The total budget for this project is ~US\$250 million, of which US\$45 million is allocated to Mauritania. Within Mauritania, PRAPS is being implemented in ten *wilayas*, including Adrar, Inchiri and Trarza. The Project Development Objective (PDO) is to “improve access to essential productive assets, services and markets for pastoralists and agro-pastoralists in selected trans-border areas and along transhumance axes across six Sahel countries, and strengthen country capacities to respond promptly and effectively to pastoral crises or emergencies”. The five components of the project include: i) animal health improvement; ii) national resource management enhancement; iii) market access facilitation; iv) pastoral crisis management; and v) project management and institutional support.

The proposed LDCF project will build on the sustainable resource management objectives of PRAPS by introducing EbA interventions in the arid ecosystems of Adrar, Inchiri and Trarza. The climate change adaptation interventions promoted by the project will also strengthen the adaptive capacity of pastoralists targeted by PRAPS. The proposed LDCF project will further complement the activities undertaken by PRAPS by *inter alia*: i) improving water management in the target *wilayas* by taking into account potential conflicts of usage between pastoralists and other users (Output 2.3); and ii) disseminating information on adaptation best practices to community members, including pastoralists, through the establishment of climate information centres and demonstration sites at focal water points (Outputs 3.3 and 3.4). Considering that the proposed LDCF project will only work in three of the ten *wilayas* targeted by PRAPS, US\$13.5 million[18] of the total PRAPS budget is considered as co-financing.

Mauritanian Copper Mines (MCM) is a copper and gold company owned by First Quantum Ltd, which exploits the largest gold mine in Mauritania situated in the Inchiri region. As part of their corporate social responsibility, MCM implements small-scale projects in communities surrounding their mining operations. The ongoing **MCM Community Projects** are community-based and focus on agriculture, pastoralism, water mobilisation and capacity building. For example, MCM supplies water for household use and livestock to communities of Bennichab and Akjoujt through 21 taps along a 120 km pipeline. MCM has also rehabilitated and equipped 11 thermal energy-powered water wells and boreholes with new solar energy systems.

To date, the MCM Community Projects have not integrated climate change impacts and adaptation into the planning and implementation of their interventions. The proposed LDCF will complement the ongoing MCM Community Projects through the addition of climate change adaptation interventions, including those ensuring improved water management. These interventions (such as drip irrigation) will allow communities to derive additional livelihood benefits from the water supply infrastructure installed by

MCM Community Projects and thereby increase their resilience to climate change. EbA interventions (such as greenbelt establishment to reduce desertification) will also be introduced into other MCM communities to improve the climate-resilience of existing agricultural and pastoral interventions. The MCM Community Projects will contribute US\$500,000 of baseline co-financing to the proposed LDCF project.

The **Project Agropole Maraicher of Benichab (PAMB)** is a community-level initiative being implemented in Inchiri. The PAMB project is implemented by the Commissioner for Food Security, CSA Japanese Cooperation, the Ministry of Environment and Sustainable Development, and the Rahma Foundation. With a budget of US\$1.25 million, the PAMB is executed through a public-private partnership and benefits ~300 local families. Through the project's interventions, 200 hectares of high-quality agricultural lands have been fenced, divided in plots and equipped with irrigation infrastructure. Upon signature of a partnership agreement, each benefiting family was given a plot for its own use. The PAMB also supplied agricultural equipment to the target families and provides technical advice. Agricultural products supported through the PAMB were chosen by the farmers according to local needs and market conditions in neighbouring cities. The PAMB is expected to be extended to other villages and communities in the *wilaya* of Adrar.

The proposed LDCF project will build on the ongoing activities of the PAMB project in Inchiri. This will include the incorporation of climate-resilient water management measures (such as water saving irrigation techniques). Furthermore, EbA interventions (such as the planting of greenbelts) will be introduced to reduce the impacts of desertification on the farming plots that have been established by PAMB. The proposed LDCF project will utilise lessons learned through the PAMB project to replicate and upscale the improved water management and irrigation technologies. PAMB will contribute US\$1.25 million in co-financing to the proposed LDCF project.

Although not considered as a baseline project, the proposed LDCF project will also build on the **Sustainable Development of Oases (PDDO)** project. This was an International Fund for Agricultural Development (IFAD) project that targeted the broad development of the oasian regions of Mauritania through an integrated approach combining the improvement of water and energy solutions and capacity-building. The focal point of PDDO was date-palm growing, which provides the foundation for oasis-based economies. The initial eight-year PDDO began in November 2004, following two previous Oasis Development Projects that ended in 2003. The fourth phase of the project is currently being implemented after the termination of the third phase in 2014. PDDO therefore inherited a large body of knowledge and experience on which its interventions were based. The project had four specific objectives: i) promote the effective participation of oasis populations, notably women and young people, in the process of community and local development; ii) strengthen the institutional framework at oasis level; iii) promote the sustainable exploitation of the productive potential of oases; and iv) develop a network of privately managed proximity financial services.

PDDO's objectives were pursued by carrying out a set of actions under five components: i) structuring of the oasis communities; ii) sustainable development of oasis production capacities; iii) development of proximity financial services; iv) development of basic

infrastructure; and v) coordination, monitoring and evaluation. The total programme costs, estimated at US\$38.66 million, were financed by an IFAD loan for US\$11.41 million and contributions from the GoM (US\$6.79 million), beneficiaries (US\$1.36 million), GEF (US\$4.1 million) and the Arab Fund for Economic and Social Development (Fonds arabe de développement économique et social, FADES, US\$15 million). The lead agency was the Ministry for Rural Development.

The proposed LDCF project will build on the PDDO activities in Adrar and Inchiri through the addition of water-efficient irrigation techniques to agriculture in and around oases. This will promote sustainability of the PDDO interventions under conditions of climate change. Furthermore, vulnerable oases will be protected from the effects of desertification through the planting of multi-use greenbelts in desert-oasis transition zones, which will increase the long-term sustainability of PDDO interventions. The resulting knowledge and best practices will build on those already generated by PDDO and can thus be used to promote upscaling and replication of its activities in and around other climate-vulnerable oases in arid regions.

During the PPG phase, the opportunity to include *wilaya* governments' budgets as a source of co-financing will be further investigated.

### ***A1.3. The proposed alternative scenario, with a brief description of expected outcomes and components of the project***

The negative effects of climate change are threatening the livelihoods of local communities across the arid regions of Mauritania, including the target *wilayas* of Adrar, Inchiri and Trarza. These effects are predicted to become more frequent and severe in the future. In the alternative scenario, the proposed LDCF project will increase the capacity of local, regional and national institutions, as well as local communities, to plan and implement climate change adaptation interventions in arid ecosystems. These interventions will restore arid ecosystem functioning and reduce the vulnerability of communities to climate change impacts. Capacity-building of both national and regional government institutions will complement on-the-ground implementation of climate change adaptation interventions. This capacity-building will strengthen the ability of the Government of Mauritania to identify, plan and implement climate change adaptation interventions throughout the arid regions of the country. Furthermore, under the alternative scenario, the project will strengthen knowledge on climate change adaptation – particularly EbA – in arid ecosystems. This will promote the sustainability and replication of these approaches throughout Mauritania.

The proposed LDCF project consists of three primary components, focusing on the themes of institutional capacity, climate resilience and knowledge sharing. The details of these components are described below.

#### **Component 1: Institutional capacity development for planning and implementing climate change adaptation in arid ecosystems of Mauritania.**

Outputs under Component 1 will increase the technical and institutional capacity for climate change adaptation – particularly EbA – in arid ecosystems of Mauritania. This strengthened capacity will facilitate the integration of climate change adaptation into existing and future policies, regulations and strategies related to arid zone development. Institutional support will be provided to the newly established National Observation Centre for Arid Areas (CNOEZA) and the National Meteorological Office (ONM).

Indicative outputs within this component are as follows:

- Output 1.1: Climate change vulnerability assessments undertaken and adaptation options identified for the *wilayas* of Adrar, Inchiri and Trarza.
- Output 1.2: Institutional capacity-building, including training, provided for DREDD and CNOEZA in each of the target *wilayas*.
- Output 1.3: Revisions to local development plans to integrate climate change adaptation proposed for each of the target *wilayas*.
- Output 1.4: Upscaling strategy for EbA in arid ecosystems of Mauritania developed.

## **Component 2: Resilience to climate change in the three target *wilayas*.**

Outputs under Component 2 will enhance the resilience of local communities and ecosystems in the *wilayas* of Adrar, Inchiri and Trarza to the effects of climate change, including drought, desertification and dune migration. This will be achieved through the implementation of EbA interventions that combat climate change impacts specific to arid ecosystems. These EbA interventions will improve ecosystem function and thereby buffer communities against the negative effects of climate change. The introduction of additional natural resource-based livelihoods that utilise ecosystem goods generated by the EbA interventions will further reduce the vulnerability of communities to climate change.

Indicative outputs within this component are as follows:

- Output 2.1: Community-level climate action plans developed, with a specific focus on gender.
- Output 2.2: Local communities and Associations for the Management of Natural Resources (AGLCs) trained on the implementation of EbA.
- Output 2.3: Improved water management interventions implemented to increase resilience to climate change in the three target *wilayas*.
- Output 2.4: EbA interventions implemented to increase the resilience of vulnerable communities and ecosystems in the three target *wilayas* to the effects of drought, desertification and dune migration.

- Output 2.5: Additional natural resource-based livelihoods introduced, with a specific focus on the upliftment of local women.

Component 2 will build on the work being carried out by the Regional Sahel Pastoralism Support Project (PRAPS; see Section A1.2). This includes implementing EbA interventions in the arid ecosystems of Adrar, Inchiri and Trarza, which will enhance the sustainable resource management objectives of PRAPS and strengthen the climate resilience of pastoralists targeted by this baseline project. In addition, sustainable resource management in the face of climate change will be built through improved water management in the proposed project's target *wilayas*, which will consider the needs of both pastoralists and other users (Output 2.3).

MCM Community Projects' interventions will also be built on through Component 2. This will include the addition of climate change adaptation approaches to this baseline project's ongoing agriculture, pastoralism and water mobilisation activities. Additional climate change adaptation interventions include improved climate-resilient water management technologies (such as drip irrigation) under Output 2.3, as well as EbA approaches (such as greenbelt establishment to reduce desertification) to climate proof MCM's existing agricultural and pastoral interventions (Output 2.4).

The baseline Project Agropole Maraicher of Benichab's (PAMB) agricultural and irrigation activities will be built on through the incorporation of climate-resilient water management measures (such as water-saving irrigation techniques) under Output 2.3. Furthermore, EbA interventions (such as the planting of greenbelts) will be introduced to reduce the impacts of desertification on the farming plots that have been established by PAMB.

### **Component 3: Knowledge on climate change and EbA in arid ecosystems.**

Outputs under Component 3 will strengthen knowledge on climate change adaptation – particularly EbA – in arid ecosystems. This will promote the sustainability and replication of EbA interventions throughout the arid regions and Mauritania and neighbouring countries.

Indicative outputs within this component are as follows:

- Output 3.1: Policy-relevant research findings published based on monitoring of adaptation results generated under Component 2[19].
- Output 3.2: EbA handbooks developed and shared with local implementation structures across the three target *wilayas*.

- Output 3.3: Knowledge-sharing events on climate change adaptation – including EbA implementation and best practices – conducted in non-target communities within the *wilayas* of Adrar, Inchiri and Trarza.
- Output 3.4: Climate information centres and demonstration sites established at focal water points – including oases and well points – to promote information sharing, particularly for nomadic pastoralists.

The activities under Component 3 will add to the ongoing natural resource management enhancement interventions of the PRAPS baseline project through the dissemination of information on adaptation best practices to pastoralists (Outputs 3.3 and 3.4). Such information will promote the consideration of climate change in the management of natural resources under the PRAPS project.

#### ***A1.4. Alignment with GEF focal area strategy***

The LDCF project is aligned with the GEF Programming Strategy on Climate Change Adaptation for the LDCF and SCCF (2018-2022). The following Objectives and Outcomes are addressed in the project in particular:

*Objective 1 Reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation; Outcome 1.1 Technologies and innovative solutions piloted or deployed to reduce climate-related risks and/or enhance resilience.*

The proposed project plans to pilot improved water management and ecosystem-based adaptation (EbA) interventions to increase the resilience of vulnerable communities in arid regions to the effects of drought, desertification and dune migration (component 2). There have been very limited investments in climate change adaptation in arid ecosystems in the country, and using ecosystem-based adaptation approaches to build the climate resilience of local communities in Sahelian and Saharan ecosystems is highly innovative. The project would explore various innovations that have potential to be effective in the restoration of arid ecosystems. The project will also learn from the experiences of adaptation interventions in arid areas in other countries, and introduce and pilot these approaches in the project regions and ecosystems. The project will also introduce new natural resource-based livelihoods, with a specific focus on the upliftment of women. This will involve private sector actors, including support to local entrepreneurs and community producers.

*Programming Strategy Objective 3: Foster enabling conditions for effective and integrated climate change adaptation; Outcome 3.2: Institutional and human capacities strengthened to identify and implement adaptation measures.*

The project has a strong focus on setting in place an enabling environment for enhanced adaptation to climate impacts in arid ecosystems. Component 1 of the project, specifically, aims to increase the capacity of local, regional and national institutions, as well as local communities, to plan and implement adaptation interventions. This will be done through assessment of climate change vulnerabilities, identification of adaptation options, institutional training, and support to the integration of climate impacts in

development processes (in particular local development plans). Community-level adaptation action plans will be developed and local communities trained on the implementation of EbA interventions (component 2). Furthermore, component 3 of the project will contribute to the knowledge base on adaptation through the monitoring of the adaptation results generated, and the publication of policy-relevant findings. Capacity for long-term research on climate change impacts and adaptation will also be built through this process.

### ***A1.5. Additional cost reasoning***

The proposed LDCF project will strengthen the capacity of government and rural communities in the Mauritanian *wilayas* of Adrar, Inchiri and Trarza to adapt to the adverse effects of climate change. A description of the additional cost reasoning for each Component of the project follows below.

## **Component 1: Institutional capacity development for planning and implementing climate change adaptation in arid ecosystems of Mauritania.**

### **Business-as-usual scenario**

Climate change is recognised as a major threat to socio-economic development in Mauritania. For example, addressing climate change effects was noted as a priority in the third action plan of the Strategic Framework against Poverty (CSLP<sup>[20]</sup>) and the new growth strategy agenda *Stratégie de Croissance Accélérée et de Prospérité Partagée 2016-2030* (SCAPP). However, the National Adaptation Plan (NAP) was only initiated in April 2015 with the organisation of a NAP workshop by GIZ and NAP Global Support Programme (GSP), and has not progressed since then. The NAP process will receive further support through the GCCA-M and ACCMR projects, but this support is currently at a nascent stage. Therefore, there is currently no long-term national strategy for adaptation to climate change to ensure the consistency, complementarity and coordination of adaptation projects in Mauritania<sup>[21]</sup>. This has limited the integration climate change adaptation into development planning, resulting in adaptation projects being designed and implemented largely in an *ad hoc* manner. Furthermore, although climate change influences a range of economic sectors, mitigation of the effects of climate change is still considered the sole responsibility of the Ministry of Environment and Sustainable Development (MEDD). The current policies, strategies and plans in the environmental sector – including water, livestock husbandry and agriculture – do not include practices for adaptation to climate change such as EbA. Consequently, in the absence of a multi-sectoral response, climate change will severely impact and may even prevent the achievement of the Sustainable and Millennium Development Goals (SDGs and MDGs) and other national objectives for socio-economic development.

At the local level, the GoM is undergoing a process of decentralisation. In the environmental sector, Regional Delegations for Environment and Sustainable Development (DREDDs<sup>231</sup>) were created in 2006 in each *wilaya*<sup>231</sup> to lead and coordinate the MEDD's interventions at the provincial level. DREDDs are also responsible for ensuring that these interventions are aligned with the existing policies, strategies and plans in the environmental sector. However, the DREDDs do not have the material resources, human capacity or technical knowledge to implement the relevant interventions. In each *wilaya*, other ministries relevant for the implementation of the project also have regional delegations, namely: i) the Ministry of Livestock Husbandry; ii) the Ministry of Agriculture; and iii) the Ministry of Hydraulics and Sanitation.

At the community level, local government institutions do not have adequate technical capacity to efficiently identify, design, budget for and implement socio-economic development interventions. The Forestry Law (2007) promotes the decentralised management of natural resources and transfers responsibility from national to local authorities. Thereafter, local authorities have the right to allocate the management of natural resources to community associations. Past initiatives have demonstrated several approaches to community governance in Mauritania. This includes the establishment of Local Collective Management Associations for Natural Resources (AGLCs) to support the sustainable management of natural resources. However, natural resource management continues to be inadequate, and food insecurity and poverty continue to increase. This contributes to the depletion of natural resources, including vegetation, water and topsoils<sup>241</sup>.

Furthermore, the majority of development and climate change adaptation projects implemented in Mauritania to date have been restricted to the southern and eastern parts of the country. As a result, there have been limited investments to enhance institutional capacity for climate change adaptation planning and implementation in the northern and central parts of Mauritania, particularly the arid areas of Adrar, Inchiri and Trarza. Comprehensive climate change adaptation strategies for the arid regions have yet to be developed. The project for Enhancing Resilience of Communities to the Adverse Effects of Climate Change on Food Security in Mauritania (PARSACC), is one of few initiatives implemented in *wilayas* outside of the south of Mauritania that includes the enhancement of local institutional capacity. However, out of the three target *wilayas*, Trarza was the only beneficiary and the initiative placed limited emphasis on EbA as an approach to climate change adaptation.

Under the business-as-usual scenario, the capacity of national and local government to facilitate the planning and implementation of climate change adaptation interventions (particularly EbA) in the arid regions of Mauritania will remain low. This will result in the increased vulnerability of rural communities in these regions to current and expected climate change impacts, as outlined in Section A1.1.

## **Adaptation scenario**

Additional funding (GEF/LDCF: US\$700,000) is required to increase the institutional and technical capacity of local, regional and national government to implement climate change adaptation interventions in arid ecosystems of Mauritania. The proposed LDCF project will complement previous LDCF projects in Mauritania, focusing on the arid central and northern regions of the country which have received limited attention in previous projects.

The proposed LDCF project will, firstly, assess the vulnerability of communities to climate change across the arid *wilayas* of Adrar, Inchiri and Trarza, to identify climate change impacts and the appropriate climate change adaptation strategies for each community. This will build on the ACCMR project which conducted vulnerability assessments for the *wilayas* of Assaba and Brakna in 2016, expanding the geographic scope to include arid regions of Mauritania (see Section A.5 for additional details on this project). By identifying the most vulnerable communities upfront, the proposed project will ensure that the appropriate adaptation interventions are being implemented where they will have the greatest impact. Secondly, government staff in the three target *wilayas*, including those from DREDD and CNOEZA, will be trained to conduct the vulnerability assessments, building their capacity to conduct assessments beyond the scope of the proposed project. This will allow for the vulnerability of communities to be assessed on an ongoing basis, ensuring that interventions are having a positive effect on the vulnerability of beneficiary communities. Ongoing assessments will also allow for increases in the vulnerability of individual communities to be identified and the appropriate adaptation interventions be implemented to build the resilience of these communities. Thirdly, additional gaps in the technical capacity of government staff at regional and local level to plan and implement adaptation interventions will be identified. Staff will then be trained in the relevant adaptation technologies to build their technical capacity and bridge these gaps, focusing on EbA as an adaptation strategy. Government staff will then have the technical capacity to plan, implement and then replicate climate change adaptation interventions across the arid regions of Mauritania.

The proposed LDCF project will address the gaps in climate change planning by developing a long-term upscaling strategy for the arid ecosystems of Mauritania. This strategy will build on the long-term upscaling strategy to be developed under the currently ongoing LDCF project, adding a focus on EbA for arid ecosystems. This strategy will then be integrated into the primary strategy of the recently established CNOEZA, which will benefit from the lessons learned from interventions implemented under Component 2 of the project.

## **Component 2: Resilience to climate change in the three target *wilayas*.**

### **Business-as-usual scenario**

Rural communities living in the arid *wilayas* of Adrar, Inchiri and Trarza rely on rainfall-dependent, natural resource-based livelihoods, including agriculture and pastoralism. These livelihoods are dependent on ecosystem goods (e.g. fodder) and services (e.g. maintenance of soil fertility), and are vulnerable to climate change impacts. Currently, environmental degradation and climate change hazards – such as increased temperatures, erratic rainfall and drought – are negatively impacting the livelihoods of these rural communities, as outlined in Section A1.1. The problem is that these rural communities, as well as local/regional government, do not have the capacity to adapt to the climate hazards they are experiencing. Therefore, without any intervention, these communities will remain vulnerable to climate change impacts and will continue to degrade the surrounding arid ecosystems. This will exacerbate other existing social and environmental problems in these arid areas and will negatively affect socio-economic development.

One of the reasons that communities and government have limited capacity to adapt to climate change hazards is that there have been limited investments in, and therefore demonstration of, climate change adaptation in arid ecosystems. This is because previous investments, including previous LDCF projects, have focused on the more productive semi-arid Sahelian acacia savanna ecoregion in southern Mauritania. In arid ecosystems, MCM Community Projects and the PRAPS are two of the few projects that are currently implementing activities to improve rural community livelihoods (see Section A1.2 for additional information on these projects). In addition, Enhancing Resilience of Communities to the Adverse Effects of Climate Change on Food Security in Mauritania (PARSACC) is implementing agricultural adaptation interventions in Trarza<sup>[25]</sup>(see Section A5), PDDO is specifically targeting development around oases (see Section A5) and PAMB provides agricultural support to communities in Inchiri. Overall, limited investment in, and demonstration of, climate change adaptation interventions means that communities in arid ecosystems will remain vulnerable to climate change impacts.

### **Adaptation scenario**

Additional funding (GEF/LDCF: US\$2,955,915) is required to implement adaptation interventions that will build the resilience of communities and ecosystems in the *wilayas* of Adrar, Inchiri and Trarza to the effects of climate change, including drought, desertification and dune migration. Provisionally, Adala-Miftah Elkheir-Moyassaer (Trarza), Benichab (Inchiri), Akjoujt (Inchiri), Oudane (Adrar), and Chingutty (Adrar) have been identified as target communities within the three *wilayas*. These communities have been selected as they are: i) vulnerable to climate change impacts; ii) have relatively large populations; and iii) are easily accessible.

The implementation of adaptation interventions will be structured according to community-level Climate Action Plans (CAPs) which will be developed with a specific focus on gender and on the basis of the climate vulnerability assessments carried out in Component 1. The CAPs will identify specific interventions – with a focus on EbA – appropriate for each target community based on community consultations and the vulnerability assessments undertaken under Component 1. Furthermore, where appropriate, the CAPs will make provision for the establishment of community-level committees that will coordinate with regional government structures to support the implementation of climate change adaptation interventions within each community. Wherever feasible, these community-level committees will build on existing institutional structures such as AGLCs[26]. The institutional capacity development under Component 1 will support the development of these community-level committees and the coordination between the committees, the community and other relevant stakeholders.

Once the CAPs have been developed, the specific climate change adaptation interventions identified for each community will be implemented. These will include: i) multi-use greenbelts planted around oases in the desert-oasis transition zone to reduce desertification; ii) sustainable fencing of multi-use greenbelts to reduce overgrazing; iii) pasture management to enhance pastoral livelihoods; and iv) dune stabilization with indigenous plant species. Furthermore, improved water management practices and interventions will be introduced, including, *inter alia*: i) drilling new wells fitted with solar pumps; ii) improving water management practices around oases; iii) working with mines to supply water to communities[27]; iv) introducing water-efficient irrigation technologies; v) introducing water-efficient farming techniques; and vi) promoting the use of innovative water-saving technologies. A tentative list of the water-efficient farming technologies to be promoted/supported under Component 2 is presented below.

- Drip irrigation;
- Water-smart plant boxes. This innovative technology allows to grow plants in arid environments with limited water and irrigation efforts once the system has been put in place[28];
- Subsurface irrigation by means of perforated plastic sleeves (cheap, small-scale solution), exuders or below-ground perforated drip irrigation pipes;
- Deep pipe irrigation, which uses an open vertical or near vertical pipe to concentrate irrigation water in the deep root zone;
- Buried clay pot irrigation (dependent on availability of clay), which uses a buried unglazed clay pot filled with water to provide a steady supply of water to plants growing nearby;
- Wick irrigation, which can be used in conjunction with clay pot irrigation. Holes are punched in the clay pot and a porous wick made of cotton is inserted in them. The cotton wicks the water from the container into the soil and provides a slow steady course of water to encourage root development and plant growth; and
- Porous hose irrigation, which uses a vertically placed section of porous hose to wet a vertical soil column. The porous hose can be installed before the plant is planted, using a drill to almost any depth desired (depending on soil conditions and

rockiness). The porous hose can also be placed in the soil when the plant is planted. This can be connected to a water bottle or a tank and distributing system.

A tentative breakdown of the number of beneficiary farms is provided in the table below.

<b>Target community</b>	<b>Wilaya</b>	<b>Estimated number of beneficiary farms[29]</b>
Adala-Miftah Elkheir-Moyassaer	Trarza	25
Benichab	Inchiri	15
Akjoujt	Inchiri	12
Ouadane	Adrar	22
Chinguetty	Adrar	20
<b>Total:</b>		<b>94</b>

The relevant equipment and training required for the implementation and management of the aforementioned technologies will be provided to communities and AGLCs. To maximise the benefits from EbA interventions to vulnerable communities, additional natural resource-based livelihoods will be introduced, taking advantage of the additional ecosystem goods and services provided through the implementation of EbA interventions, with a specific focus on the upliftment of women. These livelihoods will include *inter alia*: i) poultry production; ii) cereal banks; iii) jujube processing; and iv) livestock rearing. Market analyses will be conducted for all livelihood interventions to determine their feasibility, considering the potential for access to export markets. Market linkages will also be facilitated to link community producers to external markets. Furthermore, business plans for NTFPs will be produced and shared with community producers, with a focus on export markets. These business plans will analyse supply chains and link local entrepreneurs to export buyers. This will build on the work done in the Inchiri and Trarza by the SCCF-financed EbA South project (see Section A5), targeting businesses dealing with arid ecosystem services.

### **Component 3: Knowledge on climate change and EbA in arid ecosystems.**

#### **Business-as-usual scenario**

At present, national and local government, as well as local communities, have limited knowledge on climate change and the benefits of an EbA approach to improve climate-resilience in the arid ecosystems of Mauritania. A national web-based information-sharing platform exists, which allows local offices to share planning information with national government, but this platform cannot be accessed by non-government stakeholders and is not currently used to share information on EbA and its associated benefits. In addition, there are no communication or outreach strategies providing such information to stakeholders in the three target *wilayas*. The lack of information and awareness is a major barrier to the implementation and integration of EbA into development planning process. As a result, appropriate EbA measures are not integrated into new and existing national policies and strategies, and the benefits are not appreciated by government and local stakeholders.

The implementation of EbA is also hampered by a limited proof-of-concept of the EbA approach in the arid regions of Mauritania. EbA interventions have seldom been implemented in arid ecosystems, restoration interventions are scarce and their effects are not appropriately monitored. As a result, there is limited evidence to demonstrate the benefits of EbA to local communities and policy- and decision-makers. Without this evidence base, planners are less likely to integrate EbA into plans and strategies, and local communities are unlikely to take ownership of, maintain, replicate and upscale the interventions.

Under the business-as-usual scenario, knowledge and awareness of the effects of climate change, as well as EbA and the associated benefits in building climate-resilience of communities and ecosystems in the arid parts of Mauritania will remain low. Consequently, all levels of government and local communities will continue to have limited understanding of the predicted effects of climate change on arid ecosystems and will be unaware of adaptation options. This will restrict the mainstreaming of climate change adaptation into national policies and regional development plans, which will hamper efforts to improve the climate resilience of rural communities in the arid regions of Mauritania.

#### **Adaptation scenario**

Additional funding (GEF/LDCF: US\$550,000) is required to strengthen the knowledge-base for climate change adaptation in arid ecosystems of Mauritania, with a specific focus on EbA. Research and monitoring will be undertaken to gather information on best practices and lessons learned for adaptation in arid ecosystems implemented in Component 2. This will build on the long-term research being conducted through EbA South and the ongoing LDCF project in Mauritania (see Section A.5 for additional details), complementing the work done in the semi-arid ecosystems by focusing specifically on arid ecosystems. Furthermore, the institutional

arrangements between the MEDD, University of Nouakchott and the Ecole Normale Supérieure that were established through the EbA South project (SCCF-funded) will be used as a platform for the research and monitoring. The knowledge gathered through the research and monitoring will be widely disseminated amongst development planners, environmental managers and the scientific community, contributing to the accumulation of knowledge on EbA practices in Mauritania. To further support the dissemination of knowledge on EbA interventions to development planners, an arid ecosystem EbA handbook will be produced, allowing for the upscaling and replication of interventions across the arid regions of Mauritania. This will complement the handbook produced by EbA South which focused more on semi-arid ecosystems. Knowledge-sharing events on climate change adaptation – including EbA implementation and best practices – will also be conducted in non-target communities within the *wilayas* of Adrar, Inchiri and Trarza. These will be tailored to each specific community based on the needs identified during vulnerability assessments. The events will include: i) roadshows; ii) radio and television programs; iii) training workshops; and iv) tours through target communities to observe implemented interventions. Finally, climate information centres and demonstration sites will be established at focal water points – including oases and well points – to promote information sharing, particularly for nomadic pastoralists. This will build on the development of oases through the PDDO project. These form important focal points for nomadic groups in the arid regions of Mauritania, allowing for maximum reach and visibility to these groups.

#### ***A1.6. Adaptation benefits (LDCF/SCCF)***

Climate change in the arid Sahelian and Saharan ecosystems of Mauritania will reduce *inter alia* water availability, agricultural and pastoral productivity, and ecosystem functioning unless adaptation interventions are implemented. The proposed LDCF project will increase the climate-resilience of rural communities in the arid Mauritanian *wilayas* of Adrar, Inchiri and Trarza through the implementation of EbA interventions. By strengthening management of arid ecosystems (such as oases) and natural resources (including water), and protecting them from desertification, the climate-resilience of natural resource-based livelihoods in the three target *wilayas* will also be enhanced. For example, EbA will contribute to securing livelihoods derived from the exploitation of palm dates<sup>[30]</sup> in oases.

The specific adaptation benefits of the proposed LDCF project will include: i) increasing the resilience of arid ecosystems to buffer against climate-induced droughts; ii) reducing soil erosion; iii) improving water supply by promoting groundwater recharge and water conservation; iv) providing NTFPs and alternative livelihoods; and vii) improving food security through the introduction of water-efficient farming techniques.

Further to the above-mentioned tangible adaptation benefits, the project will build local and national institutional capacity to plan for as well as implement climate change adaptation (particularly EbA) in arid ecosystems. Such institutional capacity building will improve the success of climate change adaptation responses and stimulate additional adaptation investments in the arid regions of

Mauritania. In terms of local communities, training, demonstrations and the dissemination of climate change and EbA information in these areas will promote the autonomous uptake and replication of interventions.

The project is also expected to generate global environmental benefits by reducing deforestation and protecting biodiversity. It will also protect environmental services – such as clean water and fuel wood provision – as a basis for continued resilience.

#### ***A.1.7. Innovation, sustainability and potential for scaling up***

**Innovation:** Using EbA to build the climate resilience of local communities in arid Sahelian and Saharan ecosystems is both innovative and cost-effective. EbA provides favourable cost-benefit ratios compared with hard infrastructure approaches<sup>30</sup>. It not only reduces climate change vulnerability, but also provides a range of co-benefits including carbon sequestration, biodiversity conservation, alternative livelihoods and poverty reduction opportunities. Furthermore, EbA improves ecosystem resilience and helps to conserve biodiversity. The use of EbA was recently pioneered in Mauritania by the SCCF-funded EbA South project in the *wilayas* of Inchiri and Trarza, namely in Sahelian and Saharan regions. The EbA South project is currently documenting the ecosystem-based adaptation interventions in the arid region of Benichab, Inchiri. The proposed project will thus benefit from lessons learned, especially from a technical perspective (suitable irrigation techniques, and appropriate species and planting protocol etc.). Other innovations have been proven to be effective in the restoration of arid ecosystems and will be explored under the proposed project. Such innovations include the utilisation of reusable “water boxes” to limit the amount of water and irrigation efforts, which is a major challenge to the survivorship of seedlings in arid conditions[32]. The project will build on lessons learned from this experience and other past EbA interventions in arid areas[33] to introduce similar approaches in new regions (Adrar) and ecosystems (oases and desert). The project will also collaborate with relevant stakeholders – including researchers in charge of documenting EbA interventions under the EbA South project – to optimise knowledge transmission, avoid redundancy and promote complementarity and cost-effectiveness.

**Sustainability:** The sustainability of the proposed LDCF project will be enhanced by: i) developing EbA measures that are tailored to arid conditions and therefore applicable throughout the target *wilayas*; ii) mainstreaming EbA into policies and strategies; iii) building the technical and institutional capacity of national and local government to assist local communities in the continued planning and implementation of EbA; iv) involving local communities in decision making and implementation to ensure buy-in; v) demonstrating the benefits of low-cost EbA interventions to communities; and vi) providing a knowledge base and guidelines for designing and implementing EbA in arid environments. In addition, the research and monitoring of the project interventions undertaken in collaboration with local research institutes and universities under Component 3 will also generate data and lessons learned to inform future adaptation interventions.

## Potential for scaling up:

*At the national scale:* The activities proposed under Component 3 will enhance the knowledge on the most suitable adaptation interventions in arid regions to increase the resilience of vulnerable communities to the effects of climate change. The results of the research and monitoring efforts will be communicated to the relevant stakeholders in Mauritania, which will promote the upscaling of the best adaptation interventions.

*At the global scale:* The proposed LDCF project will provide an example of iterative medium- to long-term adaptation planning as a means of supporting sustainable development while increasing the resilience of vulnerable communities to the negative effects of climate change. Documenting and disseminating Mauritania's experience will benefit other countries with arid ecosystems that face similar, adverse impacts of climate change. Additionally, the information generated through the research and monitoring will benefit the global community as the effectiveness – in terms of reduced vulnerability to the effects of climate change and costs – of adaptation interventions will be further documented. This will facilitate the upscaling of adaptation best practices through future projects.

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[1] Source: <http://data.worldbank.org/indicator/SP.POP.TOTL>. Accessed on 2 August 2017.

[2] Source: <http://data.worldbank.org/country/mauritania>. Accessed on 1 August 2017.

[3] World Bank. 2014. Note de Politique – La Transition vers une Croissance Verte Inclusive en Mauritanie. Nouakchott.

[4] <http://www.africaneconomicoutlook.org/en/country-notes/mauritania>

[5] Mauritania is divided into 15 *wilayas* (or provinces).

[6] See: <http://data.worldbank.org/topic/agriculture-and-rural-development>.

[7] Population growth is 2.29% in Mauritania: <https://www.cia.gov/library/publications/the-world-factbook/geos/mr.html>.

[8] Boko, M., I. Niang, A. Nyong, C. Vogel, A. Githeko, M. Medany, B. Osman-Elasha, R. Tabo and P. Yanda, 2007: Africa. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge UK, 433-467.

[9] OECD2006. The ecologically vulnerable zones of Sahelian Countries. Atlas on regional integration in West Africa. Available from: <http://www.oecd.org/swac/publications/38409502.pdf>.

[10] Boko, M., I. Niang, A. Nyong, C. Vogel, A. Githeko, M. Medany, B. Osman-Elasha, R. Tabo and P. Yanda, 2007: Africa. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge UK, 433-467.

[11] Hulme, M., Doherty, R., Ngara, T., New, M. And Lister, D. 2001. African Climate Change: 1900 – 2100. Climate Research Vol 17: 145-168.

[12] Boko, M., I. Niang, A. Nyong, C. Vogel, A. Githeko, M. Medany, B. Osman-Elasha, R. Tabo and P. Yanda, 2007: Africa. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge UK, 433-467.

[13] An erg is a large sand dune.

<sup>144</sup>A reg is a flat area that is a mixture of sand and gravel.

[15] This will be part of the co-financing plan.

[16] <http://www.praps.mr/>

[17] Namely Burkina Faso, Mali, Mauritania, Niger, Senegal and Chad.

[18] This amount represents 3 tenths of the total PRAPS budget for Mauritania.

[19] This activity will build on the long-term surveillance programme by CNOEZA.

[20] Cadre Stratégique de Lutte contre la Pauvreté.

[21] Mauritania has not started implementing the NAP process yet.

[22] Délégation Régional de l'Environnement et du Développement Durable

[23] Mauritania is divided into 15 *wilayas* (i.e. provinces), 44 moughataas (i.e. departments) and 216 communes (i.e. municipalities).

[24] IMF. 2007. Islamic Republic of Mauritania: poverty reduction strategy paper.

[25] as well as southern *wilayas*

[26] Associations for the Management of Natural Resources

[27] This will be part of the co-financing plan.

[28] Examples of such technology are available at: <https://www.groasis.com/en/products/stop-using-drip-irrigation-and-use-the-waterboxx-to-plant-trees-vegetables-and-bushes-with-less-water>; <http://www.landlifecompany.com/products.html>

[29] The approximate number of farmers per farm is estimated between 30 and 45, giving a tentative total number of beneficiary farmers between 2,820 and 4,230.

[30] In 2012, 45% of date palms in Mauritania were located in Adrar, and the overall date production was 24,736 tonnes. Furthermore, nationwide, the number of livelihoods dependent on date palms (including the harvesting of dates, as well as palm-sheltered cultures and NTFPs) was approximately 187,900.

Source: Ministère du Développement Rural. 2012. Rapport provisoire sur le recensement des palmiers dattiers de Mauritanie.

[31] Jones, H.P., Hole, D.G. & Zavaleta, E.S. 2012. Harnessing nature to help people adapt to climate change. *Nature Climate Change* 2, 504-509.

[32] Such a solution was successfully tested in the Moroccan Sahara, the arid regions of Spain and Iran. See <https://www.groasis.com/en/projects/scientific-results-of-planting-trees-with-groasis-in-difficult-climates-with-less-water>

[33] For example, in the arid Hexi corridor, northwest China. See Zhao, W. et al. 2008. Shielding effect of oasis-protection systems composed of various forms of wind break on sand fixation in an arid region: A case study in the Hexi Corridor, northwest China. Ecological Engineering.

## 1b. Project Map and Coordinates

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

See Annex A.

## 2. Stakeholders

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

**Indigenous Peoples and Local Communities**

**Civil Society Organizations**

**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.**

Key stakeholders of this project will include governmental bodies (e.g. DREDDs), CNOEZA officers, national scientific and academic partners, local authorities and local communities, as well as private sector entities (in particular the mining sector). The project will be implemented using a consultative and participatory approach. Effective stakeholder involvement will be ensured for all activities. The proposed activities will mobilize local communities and promote local capacity. This project will create active partnerships with NGOs and civil society organizations at the local and national levels, and with relevant ongoing initiatives and projects, which will be updated during the PPG phase.

Conventions and MEAs focal points, active networks, youth and local communities will also be involved during the PPG and implementation phases. Moreover, the representation and active participation of women and vulnerable groups will be emphasized during the implementation of all project activities. Relevant governmental stakeholders (e.g. Departments of Agriculture, Livestock, Water, Housing and Finance) will be consulted in order to ensure that project activities are consistent with specific government priorities within the project areas. At the beginning of the PPG phase, an inception workshop will be convened with all major stakeholders.

A full list of institutional stakeholders will be compiled upon the launch of the PPG phase.

### **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).**

In LDCs, women tend to have lower incomes and fewer livelihood opportunities compared with men. Their capacity to adapt to the current and future effects of climate change is therefore constrained<sup>[1]</sup>. Despite their capability to innovate and lead, women have historically been marginalised from national and local decision-making processes in most LDCs, including Mauritania. The GoM has ratified several conventions that promote gender equality. Despite these laws and regulations, gender equality has not yet been achieved. In 2014, Mauritania's Gender Inequality Index (GII) value was 0.610 – ranking it 139 out of 155 countries – and the Human Development Index (HDI) was 0.446 for females and 0.546 for males<sup>[2]</sup>. In addition, participation in secondary school is 22% and 26% for males and females, respectively. Literacy rates in youth (15–24 years) are reduced in females (66.2%) compared with males (71.6%). For adults, male literacy is 100% while female literacy is 79.6%<sup>[3]</sup>. This restriction limits the participation of women in the formal economic sector and reduces their financial resources and technical capacity as compared to men. This compromises women's ability to meet their livelihood requirements. Consequently, women are more vulnerable than men to the current and future effects of climate change.

Considering the points above, the proposed LDCF project will promote gender equality, women's rights and the empowerment of women. For example, training and awareness-raising activities will take place with an appropriate proportion of women that will be determined during the process of consultations with local authorities and communities. In addition, the project will also emphasise the involvement of particularly vulnerable community groups, such as youth and women-headed households. Such community groups will be targeted for inclusion in the project's activities, particularly with respect to the national awareness-raising campaigns and

identification of climate-resilient livelihoods based on NTFPs. The promotion of women's participation under the project is in line with GEF guidance and standards<sup>[1]</sup>. In particular, recommendations from the GEF Gender Equality Action Plan (2014) will be followed and a gender analysis will be conducted during the PPG phase. The participation and number of women involved in the project will be monitored during project implementation. Gender-disaggregated indicators will be developed to during the PPG phase to provide project targets for women's participation.

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[1] Lambrou, Y., & Piana, G. 2006. Gender: the missing component of the response to climate change. Food and Agriculture Organisation, Gender and Population Division.

<sup>[2]</sup> UNDP, 2014. Human Development Reports 2014.

[http://hdr.undp.org/sites/all/themes/hdr\\_theme/country-notes/MRT.pdf](http://hdr.undp.org/sites/all/themes/hdr_theme/country-notes/MRT.pdf)

<sup>[3]</sup> UNICEF, 2012. Adult literacy rate for the period 2008-2012. [http://www.unicef.org/infobycountry/mauritania\\_statistics.html](http://www.unicef.org/infobycountry/mauritania_statistics.html) Accessed 06 March 2015.

<sup>[4]</sup> GEF. 2017. GEF Policy on Gender Equality. Washington, USA.

**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**

**generating socio-economic benefits or services for women.**

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

Yes

## **4. Private sector engagement**

**Will there be private sector engagement in the project?**

Yes

**Please briefly explain the rationale behind your answer.**

Private sector actors will be engaged in the implementation of the project. For example, the introduction of new natural resource-based livelihoods will involve the private sector, including in activities supporting local entrepreneurs. Furthermore, project will engage with the Mauritania Copper Mines (MCM) Community Projects in Inchiri, to support the integration of climate change impacts and adaptation into the planning and implementation of their interventions. The MCM Community Projects will contribute US\$500,000 of baseline co-financing to the proposed project.

## 5. Risks

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)

#	Description	Potential consequence	Countermeasures	Risk category	Probability & impact (1–5)
<b>National-level risks</b>					
1	Unwillingness to work together or share information and disagreement among stakeholders on the allocation of roles in the proposed LDCF project.	Project interventions delayed or duplicated because of uncertain role allocation. Effectiveness of project management is reduced.	An inception workshop will be held for representatives from relevant institutions at the onset of the PPG development phase to discuss and validate the roles, responsibilities and priorities of each participating stakeholder.	Organisational	P = 2 I = 4
2	Limited technical capacity to develop and implement the project.	Project interventions delayed, insufficient capacity to face potential implementation challenges.	The capacity of national and local government will be substantially strengthened to enable the planning and implementation of EbA measures through the capacity building and training activities under project Component 1, as well as through project management training activities to be specified and budgeted for at PPG phase.	Organisational	P=3 I=3
<b>Local level risks</b>					
3	Limited acceptance/adoption of adaptation interventions by local communities.	Local communities may not adopt interventions during or after the proposed LDCF	Local communities will be involved in designing, as well as implementing, adaptation technologies and plans,	Social	P = 1 I = 4

		<p>project, resulting in the continued unsustainable use of resources. Moreover, interventions will not be sustainable after the project finishes.</p>	<p>which will be implemented in a gender-equitable manner. Special attention will be given to engaging with village elders and head of local communities to ensure their support.</p> <p>During the PPG phase, interventions that deliver tangible benefits will be planned in the first year of the project to ensure optimal community buy-in.</p>		
4	Limited funds available to sustain project benefits.	Interventions will not be sustainable after the project finishes.	<p>An upscaling strategy will be developed and institutionalised. This strategy will include planning for future funding of EbA.</p> <p>EbA measures will be mainstreamed into policies and awareness raising will be conducted for decision makers.</p>	Economic	<p>P=3</p> <p>I=4</p>
5	Natural hazards and climate shocks.	<p>Limited access to project sites impeding on implementation, monitoring and achievement of targets.</p> <p>EbA interventions impeded (e.g. damages to restored ecosystems).</p>	<p>Activities will take into account and integrate climate and early warning information.</p> <p>EbA interventions designed to be climate-resilient (e.g. best practices followed in terms of planting operations, choice of species, etc.)</p>	Natural	<p>P=3</p> <p>I=3</p>

## 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.**

The project will be executed by the Ministry of Environment and Sustainable Development (MEDD) (the Executing Agency, EA). A full-time, dedicated Project Manager will be hired by the MEDD to lead a Project Management Unit (PMU) and execute the day-to-day management of the project. UN Environment, as the Implementing Agency (IA) for the project, will oversee the project and provide the technical assistance required to meet the project. UN Environment will be responsible for project supervision to ensure consistency with GEF and UN Environment policies and procedures. The institutional structure of the project will include a Project Steering Committee (PSC), with a mandate to oversee and guide project implementation, and to review annual workplans and project reports. The PSC will include representatives of MEDD, UN Environment and key project stakeholders. Members of relevant implementing NGOs and CBOs as well as community leaders will also be invited to participate to the PSC to ensure local ownership and guidance for the project.

The project will follow UN Environment standard monitoring, reporting and evaluation processes and procedures. An M&E plan consistent with the GEF M&E policy will be developed in the PPG phase. The Project Results Framework to be developed will include SMART indicators for each expected outcome as well as mid-term and end-of-project targets. These indicators will be the main tools for assessing project implementation progress and whether project results are being achieved. Day-to-day project monitoring will be the responsibility of the project management team particularly the Project Manager and an M&E specialist. In addition, other project partners will be responsible to collect specific information to track the indicators.

Numerous national GEF and non-GEF projects that focus on adaptation to climate change have been or are currently being implemented in Mauritania. These projects will provide information on relevant, cost-effective climate change adaptation interventions as well as lessons learned that can guide the adaptation planning process in the arid *wilayas* of Adrar, Inchiri and Trarza. The proposed LDCF project will focus on collating and synthesising the lessons learned from past and ongoing climate change adaptation projects to inform its design and to disseminate these lessons to both government and the public. This approach will maximise synergies and avoid duplication of activities. These initiatives are described below.

The **Sustainable Management of Landscapes Project (PGDP, 2014–2020)** under the Sahel and West Africa Program in Support of the Great Green Wall Initiative (SAWAP) is funded by the GEF (US\$4.81 million) and the GoM (US\$1.35 million) and implemented by World Bank. PGDP's Project Development Objective is to strengthen sustainable landscape management in targeted productive ecosystems in the *wilayas* of Brakna, Gorgol and Trarza. These are degraded ecosystems with high potential for the preservation and regeneration of economically important gum arabic producing acacia species (including *Acacia senegalensis*). The project targets the following ecosystem goods and services: i) gum Arabic; ii) other non-timber forest products (NTFPs); iii) fodder production; iv) water and soil conservation; and v) carbon storage in vegetation and soil. The proposed LDCF project will build on the ongoing activities of the PGDP by expanding similar activities into arid ecosystems (into the *wilayas* of Adrar and Inchiri). The proposed LDCF project will benefit from lessons learned and NTFP markets developed by the PGDP, while generating additional knowledge on ecosystem-based adaptation and appropriate NTFP-producing species (e.g. date palm) for arid environments. This in turn will benefit the implementation of future PGDP interventions.

The **Great Green Wall for the Sahara and the Sahel Initiative (GGWSSI)**, an ongoing project, was endorsed in 2010 by its 11 partner countries (including Mauritania). This was followed by the development of a strategy, guided by the African Union Commission (supported by the EU, FAO and the GM-UNCCD – Global Mechanism of the United Nations Convention to Combat Desertification) in 2011. The initiative is being implemented in 20 countries, with US\$8 billion having been mobilised/promised for its support. The goal of the initiative is to strengthen the resilience of the region's people and natural systems to desertification and drought through the sound management of ecosystems, sustainable development of land resources, protection of rural heritage and improvement of living conditions of the local population. The objectives of the initiative include the restoration of 100 million hectares of degraded land affected by desertification, sequestration of 250 million tonnes of carbon and creation of 350,000 jobs in rural areas by 2030. The proposed LDCF project is aligned to the GGWSSI through its second outcome, which targets the increased resilience of local communities and ecosystems to the effects of climate change, including drought and desertification. Through the implementation of innovation EbA interventions in arid ecosystems of the three target *wilayas*, the proposed project will contribute to the upscaling of the GGWSSI approaches to regions and landscapes of Mauritania where it is not being implemented. Furthermore, the best practices and lessons learned identified during the implementation of EbA interventions in arid environments will allow them to be replicated or be used to inform similar activities being executed under the GGWSSI.

The project for **Improvement of the Investments in the Water Sector to Increase the Resilience of Pastoral and Forest Resources in the Southern Regions of Mauritania (REVUWI<sup>ii</sup>)** is funded by GEF and AfDB for the period 2015–2018. This project is implemented by AfDB and has a total budget of US\$6,350,000. REVUWI focuses on the sustainable management of natural resources within the sectors of forestry and pastoralism to increase the resilience of local communities and their livelihoods to climate change. The project's activities are mainly focused on eight *wilayas* including Hodh El Chargui, Hodh El Gharbi, Assaba, Guidimaka, Gorgol, Brakna, Tagant and Trarza. The project is structured into the following five components: i) strengthening institutional

capacity at the local level for the sustainable management of natural resources; ii) reducing the vulnerability to climate change of infrastructure and water management activities in the rural areas; iii) diversifying and strengthening livelihood opportunities and income-generating activities for agropastoral communities; iv) management and knowledge sharing, monitoring and evaluation; and v) project management. To prevent any overlap between REVUWI and the proposed LDCF project in Trarza, and to maximise cooperation between their interventions, an active and intense collaboration will be maintained between the two management teams throughout the project design phase.

**The Global Alliance on Climate Change in Mauritania (GCCA-M)** is funded by the European Union and the German Development Bank. The United Nations Development Programme (UNDP) and GIZ are implementing this project that was initiated in June 2014. Its second phase was confirmed in August 2017. With a budget of ~US\$9.6 million, the second phase of GCCA-M will contribute to increased climate-resilience of Africa's population, addressing the need for improved climate information in Africa and strengthening the use of such information for decision-making. The two components of GCCA-M are: i) development of the framework to provide climate support/services in the targeted areas; and ii) increase the capacity of local communities to adapt to climate change in the targeted areas. The project interventions of the second phase are still to be confirmed, but they will build on the interventions from the first phase, which included: i) the creation of a national technical network on climate change; ii) education on climate change; iii) training sessions for adaptation to climate change and rural development; and iv) awareness-raising campaigns and knowledge-sharing on climate change.

The proposed LDCF project will build on the capacity strengthening already undertaken through the GCCA-M by providing additional training and institutional support to national and local government responsible for development in arid regions of Mauritania. Furthermore, it will add to the climate change knowledge base and awareness raising campaigns implemented by GCCA-M.

The project **Increase Capacity for Adaptation to Climate Change in Rural Areas (ACCMR)** was initiated in 2014 and will run until 2018. This four-year project has a total budget of US\$3.6 million provided by the German Federal Ministry for Economic Cooperation and Development (BMZ) and the EU. It is executed by GIZ and the MEDD. The interventions of the ACCMR are focussing on the *wilayas* of Brakna and Assaba. ACCMR is divided into three components: i) mainstreaming adaptation to climate change into the development process of national strategies and plans; ii) designing and implementing site specific- adaptation interventions; and iii) increasing capacity to coordinate climate change and rural development.

The first component of ACCMR will contribute to advancing the NAP process and is of relevance to the LDCF project. The ACCMR interventions under Component 1 include: i) training on the NAP process; ii) developing the NAP road map; iii) awareness-raising campaigns on NAP; iv) developing a funding strategy for the NAP process; and v) supporting the integration of adaptation to climate change into policies, strategies, plans and budgets. The documents to be targeted by ACCMR have yet to be defined. Therefore, the ACCMR will be consulted by the proposed LDCF project during the PPG phase to identify the remaining gaps in the mainstreaming of arid zone adaptation to climate change in all sectors. The ACCMR has also completed detailed vulnerability assessments for the target *wilayas* of Brakna and Assaba to identify adaptation options and integrate these into development planning. The proposed LDCF project will build on the work done by the ACCMR by replicating these vulnerability assessments in the arid *wilayas* of Adrar, Inchiri and Trarza.

The project for **Enhancing Resilience of Communities to the Adverse Effects of Climate Change on Food Security in Mauritania (PARSACC<sup>24</sup>)** is funded by the Adaptation Fund and implemented by the WFP and MEDD in the *wilayas* of Assaba, Brakna, Gorgol, Guidimakha, Hohd El Chergui, Hohd El Gharbi and Trarza. A budget of US\$7.8 million is allocated for the period 2014–2018 to enhance environmental governance through: i) ecological monitoring; ii) management and sharing of climate change knowledge; and iii) engagement with and participation of local communities to adapt to climate change, increase climate-resilience of their livelihoods and increase food security. To achieve this objective, PARSACC interventions are grouped into three components: i) strengthening technical capacity of government and local communities to understand the risks and impacts of climate change, and developing plans and adaptation measures; ii) developing and implementing on-the-ground adaptation interventions through the creation of community-based adaptation plans against desertification and degradation of natural resources; and iii) developing and implementing on-the-ground interventions to diversify and improve the livelihoods of local communities that are vulnerable to climate change. A partnership with this project will enable complementarity between the interventions of PARSACC and the proposed LDCF project, particularly with respect to capacity-building on climate change adaptation, government and community-level adaptation planning, sustainable natural resource management and livelihood diversification.

The LDCF-funded project (budget of US\$5 million) entitled “**Development of an improved and innovative management system for climate resilient livelihoods in Mauritania**” is being implemented from 2017 to 2021 in the Mauritanian *wilayas* of Guidimaka, Assaba, Hodh El Gharbi and Hodh El Chargui. The project is implemented by UN Environment and executed by MEDD. Objectives of the project are to increase the institutional and technical capacity of government stakeholders to enable the systematic planning and implementation of adaptation practices including EbA. Interventions based on both scientific and traditional knowledge will address the impacts of climate change through targeted restoration, engineering and sustainable management of beneficial ecosystems. Rural communities will implement the project’s EbA interventions with the support of NGOs, and communal and provincial authorities. This support will include extensive institutional and technical capacity building for community members. The on-the-ground interventions of the project will be implemented in the forest and rangeland ecosystems within the four target *wilayas*. Through the

implementation of EbA interventions in the arid ecosystems, the proposed LDCF project will complement the work completed by the “Development of an improved and innovative management system for climate resilient livelihoods in Mauritania project”, which is being implemented in other ecosystems in the south of the country. Furthermore, the proposed project will benefit from the best practices identified and lessons learned during the implementation of the above-mentioned project.

**Ecosystem-based Adaptation through South-South Cooperation**, commonly known as **EbA South** is a GEF-SCCF project implemented by UN Environment ([www.ebasouth.org](http://www.ebasouth.org)). It is jointly executed by the MEDD and the National Development and Reform Commission (NDRC) of China. The objective of EbA South is to build climate resilience in vulnerable African and Asia-Pacific countries by providing support for planning, financing and implementing EbA in coastal, mountain and arid/semi-arid ecosystems. The project has three components: i) inter-regional coordination and capacity-building for African and Asia-Pacific developing countries to plan and implement EbA; ii) increased availability of synthesized knowledge on EbA best practices; and iii) increased climate resilience of priority coastal, mountain and arid/semi-arid ecosystems in Seychelles, Nepal and Mauritania. The budget allocated to Mauritania is US\$900,000 for 2013–2018. EbA South-Mauritania focuses on providing strategic support for adaptation to climate change to agricultural production systems in the country. This is done by increasing the resilience of plant and animal production systems that are vulnerable to the effects of climate change in Inchiri, Indini and Trarza. The proposed LDCF project will build on the research and monitoring systems and EbA demonstrations established through the EbA South project. In particular, the EbA South project is documenting lessons learned that will inform the EbA interventions implemented under the proposed LDCF project. Furthermore, the long-term research conducted under the EbA South project and the several research publications describing EbA best practices in the Mauritanian context that are under preparation will be highly valuable resources for the proposed project to build upon.

The **Inclusive Value Chain Development Project (PRODEFI)** has a budget of US\$45.2 million (of which US\$21 million is grant funding from IFAD) and is executed by the Ministry of Agriculture. PRODEFI was implemented in the *wilayas* of Brakna, Assaba, Gorgol, Guidimakha, Hodh El Gharbi and Hodh El Chargui in 2016 and will be completed in 2024. The main objective of the project is to strengthen the incomes and food security of poor rural people (particularly women and young people) in the targeted *wilayas*. This is being achieved through the inclusion of these people in profitable and resilient value chains. Components of PRODEFI include the: i) revitalisation of value chains and development of pro-poor public-private-producer partnerships (4Ps); ii) development and promotion of production models; and iii) coordination M&E and knowledge management. Under Component 2, the use of solar energy will be promoted, as well as sustainable management techniques for natural resources such as water, pastures and plant resources. The activities related to the climate-resilient management of natural resources under the proposed LDCF project should be designed and implemented in collaboration with PRODEFI for these products to support local agricultural production channels and value chains.

The **Poverty Reduction Project in Aftout South and Karakoro Phase 2 (PASK2)** was initiated in 2012 and will end in 2020. It is funded by IFAD and has a budget of US\$22.9 million. The objective of PASK2 is to improve income and living conditions for targeted communities. PASK2 will help to increase economic and social security based on sustainable natural resource management by and for poor rural households. The project includes the following four components: i) increased institutional and management capacity; ii) development of infrastructure in rural areas, including road and water infrastructure; iii) promotion of income-generating activities; and iv) coordination, monitoring and evaluation of the project. The interventions of PASK2 will focus on: i) soil restoration; ii) surface water management; iii) crop and livestock management; and iv) local development support. This project is implemented in three *wilayas*, namely Gorgol, Guidimaka and Assaba. The proposed LDCF project will benefit from the lessons learned and knowledge gained during the implementation of PASK2, particularly those related to the management of natural resources in rural areas, institutional capacity building and the promotion of income-generating activities.

The **Programme Spécial de la Protection de la Ville de Chinguitty (Special Programme for the Protection of the City of Chinguitty, PSPVC)** was launched in 2014 with the objective to reduce dune migration and subsequent desert encroachment on the city of Chinguitty, Adrar, and the Route de l'Espoir. Trees were planted on 200 ha of land to stabilise dunes. A nursery was created to supply planting interventions with seedlings. In addition, 500 ha have been stabilized with fences. The proposed LDCF project will benefit from the lessons learned and knowledge gained during the implementation of MEDD-funded PSPVC, particularly with regards to irrigation challenges and potential land tenure conflicts.

**Gestion adaptative et surveillance des systèmes oasiens au Maghreb: Maroc, Mauritanie et Tunisie** is a GEF-funded regional project implemented by the FAO and executed by Réseau Associatif de Développement Durable des Oasis (RADD) and the Centre national de recherche agronomique et de développement agricole (CNARDA) in Mauritania. It aims at enhancing the knowledge on North-African oasis ecosystems. The project will contribute towards the establishment of an environmental monitoring system for oasis ecosystems. This will include a knowledge-sharing platform to store and disseminate statistical data on oasis ecosystems. The project, launched in 2016, is planned to terminate in 2019.

**Building core capacity for the implementation, monitoring and reporting of Multilateral Environmental Agreements (MEAs) in the context of the Sustainable Development Goals (SDGs) in Mauritania** is a GEF-funded project currently under development. The project will have a budget of US\$ 950,000, and will be implemented by UN Environment and executed by MEDD. The three-year project is planned to start implementation in 2018. The objective of the project will be to strengthen national capacity for environmental information and knowledge management for the implementation, monitoring and reporting of MEAs and relevant SDGs. The project will have two components: 1. Development of a coordinated environmental/natural resources knowledge and information management system; and 2. Enhancement of institutional and technical capacities to mainstream, develop, and utilize policies, plans and programmes for effective implementation of the Rio Conventions, other MEAs and relevant SDGs. The proposed

LDCF project will be able to draw on the data and information systems put in place under the project to support the vulnerability assessments and knowledge-sharing events and products. The proposed LDCF project will also coordinate with the capacity-building project on awareness-raising and public education activities.

Other past, ongoing and future initiatives that the proposed LDCF project will build on and coordinate with are briefly described below.

- **Support to the adaptation of agricultural production systems that are vulnerable to climate change** was a GEF LDCF-funded project (US\$ 3,500,000) closed in 2015 and supported by IFAD. Although this project targeted different *wilayas* (Gorgol, Guidimakha and Assaba) from the proposed LDCF project, its third component aimed to “increase the efficiency of the irrigation and water management systems”. Lessons learned from the implementation of such systems will be studied as part of the activities to be conducted under Output 2.3 of the proposed LDCF project.
- **Improving climate resilience of water sector investments with appropriate climate adaptive activities for pastoral and forestry resources in southern Mauritania** is a GEF LDCF-funded project (US\$ 6,350,000) approved for implementation in 2014, and implemented by AfDB. The project initiated the mainstreaming of climate change into sectoral strategies of southern *wilayas*, including Trarza. In addition, awareness-raising and capacity-building activities were conducted to improve the understanding of both local communities and governmental staff on climate change. The proposed LDCF project will thus build on the initial results from this initiative to further advance the capacity of local communities and authorities in Trarza to adapt to climate change.
- Under the GCF Readiness and preparatory programme, Mauritania is implementing the project **Building capacity to advance National Adaptation Plan Process in Mauritania** (US\$ 2,670,364; approved in 2018). Synergies will be generated between the proposed LDCF project and the following activities to be implemented under this GCF project: i) Activity 1.3.4 (“Develop a national plan for climate risks prevention, including the enhancement of early warning systems and capacity of hydro meteorological services to advice on weather-related impacts on infrastructure.enhancement of early-warning systems”); ii) Activity 1.4.2 (“Raise awareness on climate change through the education system by mainstreaming

adaptation to climate change within activities at high school and university levels”); iii) Activity 1.4.3 (“Develop and implement at least one awareness-raising campaign in each *wilaya* for local authorities, CSOs and local communities”); iv) Activity 1.4.4 (“Develop step-by-step procedures or a training manual, as appropriate, for integrating adaptation priorities into local development planning. Disseminate the procedure or manual to local stakeholders including *wilaya* and *moughataa* officers, and CSOs”); and v) activities under Output 3.3 (“Long-term research and study programmes to inform future investments in adaptation across sectors”).

- The **Project to support the transition to a resilient, low-carbon agriculture in Mauritania (P-STRALAM)** is a GCF project currently under development (US\$ 10,000,000) that will (when approved), *inter alia*, disseminate and implement water conservation techniques in West Brakna (Component 1). Some of these techniques may be relevant to the local semi-arid conditions in Trarza, and synergies will thus be generated with Output 2.3 of the proposed LDCF project.
- **Continental wetlands adaptation and resilience to climate change** is a GEF LDCF project currently in PPG phase (US\$ 4,449,542) and supported by the International Union for Conservation of Nature (IUCN). The pre-selected wetlands to be targeted under this project are not in the vicinity of the target sites of the proposed LDCF project. However, there will be synergies between the two initiatives in terms of training (e.g. DREDD staff to be trained on wetland management under Outcome 1 of the IUCN-supported project), improvement of irrigation techniques and strengthening of monitoring practices.

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[1] Projet d'amélioration des investissements du secteur de l'eau destinés à la résilience des ressources pastorales et forestières des régions méridionales de Mauritanie.

[2] Projet d'Amélioration de la Résilience des communautés et de leur Sécurité Alimentaire face au Changement Climatique.

## 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**

- National Action Plan for Adaptation (NAPA) under LDCF/UNFCCC
- National Action Program (NAP) under UNCCD
- ASGM NAP (Artisanal and Small-scale Gold Mining) under Mercury
- Minamata Initial Assessment (MIA) under Minamata Convention
- National Biodiversity Strategies and Action Plan (NBSAP) under UNCBD
- National Communications (NC) under UNFCCC
- Technology Needs Assessment (TNA) under UNFCCC
- National Capacity Self-Assessment (NCSA) under UNCBD, UNFCCC, UNCCD
- National Implementation Plan (NIP) under POPs
- Poverty Reduction Strategy Paper (PRSP)
- National Portfolio Formulation Exercise (NPFE) under GEFSEC
- Biennial Update Report (BUR) under UNFCCC
- Others

The climate change policy framework in Mauritania is described in the country's Intended Nationally Determined Contribution (INDC), which was submitted to the United Nations Framework Convention on Climate Change (UNFCCC) in 2015. The national priority identified in this document is the implementation of an adaptation strategy to combat the adverse effects of climate change. This strategy aligns with national guidelines contained in the Stratégie Nationale de Développement Durable (National Sustainable Development Strategy, SNDD) and the Plan d'Action National pour l'Environnement (National Environment Action Plan, PANE), both further detailed below.

The SNDD is focused on synergistic relationships between effective environmental policy, economic growth, good governance and poverty reduction. The priority themes identified in the SNDD include:

- managing and promoting sustainable development and environmental protection in line with international commitments, agreements and conventions;
- strengthening institutional capacity and creating an enabling policy environment to effectively manage the environment and natural resources;
- promoting the sustainable development of basic services as a strategy to reduce poverty;
- raising awareness of the multi-sectoral and multi-scale challenges (at both local and national levels) associated with sustainable development;
- promoting integrated and participatory management for the sustainable use of natural resources for multiple sectors and levels; and
- developing funding mechanisms for the PANE.

The PANE is an overall strategic framework for guiding sectoral policies on natural resources and environmental management. The primary objectives of PANE 1 and PANE 2 are, respectively, to: i) highlight the importance of natural resources for the economy and ecology of Mauritania, particularly in the rural environment; and ii) integrate environmental considerations into economic and social development, with an emphasis on sustainable economic growth, social equity and ecological viability. The PANE also emphasises threats to natural capital linked to: i) the widespread dependence on wood fuel; ii) desertification and other effects of drought; iii) the unsustainable use of water on agricultural and pastoral land; v) biodiversity declines; and vi) physicochemical degradation of soils.

The proposed LDCF project aligns with the SNDD and the PANE by contributing to the achievement of the following strategic goals: i) promoting sustainable development and environmental protection in line with international commitments, agreements and conventions; ii) strengthening the institutional capacity of government staff at the national and local level to effectively manage the environment and the natural resources; iii) promoting the development of service delivery as a strategy to reduce poverty; iv) promoting integrated and participatory management for sustainable use of natural resources; and v) raising awareness of the risks associated with climate change, and the benefits of EbA as a means to increase climate resilience.

The Stratégie de Développement du Secteur Rural Horizon 2025 (Rural Sector Development Strategy for 2025, SDRS, 2016) focuses on: i) improving agro-silvo-pastoral productivity; ii) providing fair access to development resources – water, land and pastoral resources – for the most vulnerable local communities as well as their sustainable use; and iii) strengthening institutional capacities to improve the participatory aspect of rural development policies. Assessments of previous SDSR programmes have noted that insufficient emphasis had been placed on natural resource management as opposed to environmental protection and conservation. The

ongoing SDRS has been designed to address this concern, by including a focus on sectoral growth to benefit the rural poor. The proposed project is thus fully aligned with the priorities highlighted in the SDRS.

In addition to the SNDD, the PANE and the SDRS, the proposed LDCF project is consistent with the following national policies/plans/strategies: i) Master Plan for Combatting Desertification (1987); ii) National Biodiversity Strategy (1998); iii) Rural Sector Development Strategy (1998 and 2001); iv) Forestry Code (1997); v) Strategic Investment Framework for Sustainable Land Management (2009); vi) Environmental Code (2000); vii) National Gender Strategy (2006); viii) National Social Protection Strategy (2011); and ix) Poverty Reduction Strategy Paper 2011-2015 (PRSP).

The proposed LDCF project addresses seven of the 28 NAPA (2004) priorities, as described below.

- Priority 3: Promotion of water-saving techniques in oasis zones and Priority 5: Dissemination of the drip technique in the valley and oasis zones. This will be achieved through the promotion of innovative water management techniques under Component 2.
- Priority 11: Participatory reforestation for energy and agroforestry in agricultural zones. This will be achieved through the reforestation EbA interventions under Component 2.
- Priority 20: Development of fodder crops. This will be achieved through the planting of useful tree and fodder species under Component 2.
- Priority 25: Improved knowledge on forest resources and their sustainable management. This will be achieved through the training of AGLC and local communities under Component 2.
- Priority 26: Fixation of drifting dunes threatening the country's socio-economic infrastructure. This will be achieved in Inchiri with EbA interventions under Component 2.
- Priority 28: Institutional reinforcement of the body responsible for nature conservation. This will be achieved through the institutional and technical capacity strengthening of MEDD under Component 1.

## 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.**

The proposed LDCF project will address knowledge management under Components 1, 2 and 3. Firstly, evidence-based knowledge<sup>iii</sup> will be generated from the vulnerability assessments implemented in the three target *wilayas* under Component 1. Secondly, the benefits generated by the adaptation interventions implemented under Component 2 will be monitored, and lessons learned compiled and shared to inform policy development processes. Thirdly, further knowledge on climate change impacts in arid regions and adaptation options will be generated through the research and monitoring undertaken under Component 3. Under Component 3, information will be collated from interventions of past and current aligned initiatives as well as from the proposed interventions of the project. Therefore, this project will generate – and facilitate access to – critical knowledge on: i) degradation processes and climate change impacts in arid Sahelian and Saharan ecosystems; and ii) the implementation of EbA interventions in arid ecosystems. This will create an enabling environment for policy makers and technical staff in the ministries to access such knowledge and for upscaling project interventions to other areas of the country.

Evidence-based knowledge will be disseminated and made easily accessible to the public and government, including through: i) awareness-raising campaigns based on a diversity of media (e.g. social media, documentaries); and ii) relevant dissemination platforms (e.g. Africa Adaptation Knowledge Network – AAKNet, Réseau Associatif de Développement Durable des Oasis – RADD0). Furthermore, the collated evidence-based knowledge will be disseminated to: i) policy- and decision-makers; and ii) relevant researchers, in Mauritania and other countries.

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<sup>iii</sup> Including supporting data and maps.

### **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).**

<b>Name</b>	<b>Position</b>	<b>Ministry</b>	<b>Date</b>
Mohamed Yahya Lafdal, Ph.D	Chargé de Mission GEF Operational Focal Point	MINISTERE DE L'ENVIRONNEMENT ET DU DEVELOPPEMENT DURABLE	9/17/2018

## ANNEX A: Project Map and Geographic Coordinates

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



## **ANNEX B: GEF 7 Core Indicator Worksheet**

Use this Worksheet to compute those indicator values as required in Part I, Table F to the extent applicable to your proposed project. Progress in programming against these targets for the program will be aggregated and reported at any time during the replenishment period. There is no need to complete this table for climate adaptation projects financed solely through LDCF and SCCF.

N/A

## **ANNEX C: Project Taxonomy Worksheet**

Use this Worksheet to list down the taxonomic information required under Part1 by ticking the most relevant keywords/topics//themes that best describes the project

Refer to the attachment