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

CBIT/NGI
- ☐ CBIT
- ☐ NGI

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

Countries
Mauritania

Agency(ies)
UNEP

Other Executing Partner(s):
Ministry of Environment and Sustainable Development (MEDD)

Executing Partner Type
Government

GEF Focal Area
Climate Change

Taxonomy
Focal Areas, Climate Change Adaptation, Climate Change, Community-based adaptation, Innovation, Least Developed Countries, Ecosystem-based Adaptation, Small Island Developing States, Livelihoods, Mainstreaming adaptation, Adaptation Tech Transfer, Climate resilience, Influencing models, Strengthen institutional capacity and decision-making, Transform policy and regulatory environments, Demonstrate innovative approache, Stakeholders, Local Communities, Private Sector, Individuals/Entrepreneurs, Beneficiaries, Type of Engagement, Partnership, Information Dissemination, Participation, Consultation, Communications, Awareness Raising, Public Campaigns, Behavior change, Civil Society, Community Based Organization, Non-Governmental Organization, Academia, Gender Equality, Gender Mainstreaming, Sex-disaggregated indicators, Gender-sensitive indicators, Women groups, Gender results areas, Access to benefits and services, Knowledge Generation and Exchange, Participation and leadership, Capacity Development, Capacity, Knowledge and Research, Knowledge Generation, Training, Workshop, Learning, Theory of change, Indicators to measure change, Knowledge Exchange, Field Visit, Peer-to-Peer, Targeted Research

Rio Markers
Climate Change Mitigation
Climate Change Mitigation 0

Climate Change Adaptation
Climate Change Adaptation 2

Submission Date
10/4/2018

Expected Implementation Start
1/1/2021

Expected Completion Date
12/31/2024

Duration
48In Months

Agency Fee($)

419,540.00

A. FOCAL/NON-FOCAL AREA ELEMENTS

Objectives/Programs	Focal Area Outcomes	Trust Fund	GEF Amount($)	Co-Fin Amount($)
CCA-1	Outcome 1.1	LDCF	3,299,758.00	10,251,757.00
CCA-2	Outcome 2.1	LDCF	198,059.00	615,334.00
CCA-2	Outcome 2.3	LDCF	918,393.00	2,853,283.00
			Total Project Cost($) 4,416,210.00	**13,720,374.00**

B. Project description summary

Project Objective

To strengthen the adaptive capacity and climate resilience of rural communities in the Mauritanian wilayas of Adrar, Inchiri and Trarza, in the arid ecoregion

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
Component 1: Institutional and technical capacity development for the planning and implementation of climate change adaptation in arid ecosystems	Technical Assistance	Outcome 1: Stakeholders demonstrate increased technical and institutional capacity for climate change adaptation – particularly EbA – in arid ecosystems	Output 1.1: Climate change impact and vulnerability assessments undertaken, and adaptation options identified and validated by stakeholders in each of the 3 target wilayas and 8 project sites Output 1.2: 575 representatives of regional governments, private sector, civil society organizations and community-based organizations (e.g. cooperatives, AGPOs) across the 3 target wilayas trained on adaptation approaches (including EbA) Output 1.3:	LDCF	538,215.00	3,771,866.00

			3 Regional Development Plans (PDRs) and 8 Local Development Plans (PDLs), integrating adaptation to climate change and gender, revised or developed and shared with stakeholders Output 1.4: An upscaling strategy and action plan for climate change adaptation in arid ecosystems of Mauritania developed in collaboration with national stakeholders, focusing on EbA approaches			
Component 2: Sustainable access to and efficient use of water	Investment	Outcome 2: Enhanced sustainable access to and efficient use of water for increased drought-resilience of local communities and ecosystems in the wilayas of Adrar, Inchiri and Trarza	Output 2.1: 16 new efficient water provisioning systems (e.g. new wells, boreholes, solar pumps, desalination units) and 4 water collection and storage systems installed in the 8 project sites Output 2.2: Small-scale infrastructures implemented on 4	LDCF	1,274,800.00	2,214,000.00

			water courses to increase infiltration and to reduce erosion and flooding			
			Output 2.3: 8 efficient irrigation water distribution systems established (one in each project site)			
			Output 2.4: 8 community associations (e.g. cooperatives, AGPOs) trained on sustainable and efficient water management and distribution (one in each project site)			
Component 3: Protection, productivity and diversification of local livelihoods	Investment	Outcome 3: Protection, productivity and diversification of livelihoods enhanced to increase climate-resilience in the wilayas of Adrar, Inchiri and Trarza	Output 3.1: Regional community nurseries specialized in plant production for arid ecoregions established and operational, and training for their sustainable management provided to local communities or cooperatives in 3 wilayas	LDCF	1,835,100.00	4,951,500.00
			Output 3.2:			

EbA interventions implemented on 400 hectares of dunes to protect vulnerable communities, livelihoods and ecosystems from dune-migration

Output 3.3:

EbA interventions implemented on 150 hectares to shelter vulnerable communities from dune migration, wind and heat and to provide forage for livestock and non-timber forest products

Output 3.4:

Additional natural resource-based livelihoods introduced for local populations

Component 4: Knowledge for action on climate change and EbA in arid ecosystems	Technical Assistance	Outcome 4: Stakeholders demonstrate strengthened knowledge and action-oriented attitudes on climate change and adaptation approaches (particularly EbA)	Output 4.1: 5 publications on policy-relevant research findings published based on monitoring of adaptation results generated under Components 2 and 3, and disseminated to at least 45 decision makers Output 4.2: A series of 4 EbA handbooks detailing best practices for arid ecosystems developed and shared with at least 550 members of local implementation structures across the 3 target wilayas Output 4.3: At least 750 local stakeholders informed of climate change adaptation and good EbA practices in the three target wilayas	LDCF	342,500.00	2,102,008.00
Monitoring and Evaluation (M&E)	Technical Assistance			LDCF	215,300.00	120,000.00

	Sub Total ($)	**4,205,915.00**	**13,159,374.00**
Project Management Cost (PMC)			
	LDCF	210,295.00	561,000.00
	Sub Total($)	**210,295.00**	**561,000.00**
	Total Project Cost($)	**4,416,210.00**	**13,720,374.00**

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

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
Recipient Country Government	Ministry of Environment and Sustainable Development (MEDD) / PRCPNA	In-kind	Recurrent expenditures	7,200,000.00
Recipient Country Government	Ministry of Environment and Sustainable Development (MEDD)	In-kind	Recurrent expenditures	500,000.00
Recipient Country Government	National Meteorological Office (ONM)	In-kind	Recurrent expenditures	300,000.00
Private Sector	Mauritanian Copper Mines (MCM)	In-kind	Recurrent expenditures	1,000,000.00
Donor Agency	IFAD / PDDO project	In-kind	Recurrent expenditures	110,000.00
Recipient Country Government	Government of Mauritania / PAMB project	In-kind	Recurrent expenditures	1,940,000.00
Donor Agency	GCF / MEDD (NAP)	In-kind	Recurrent expenditures	2,670,374.00
			Total Co-Financing($)	13,720,374.00

Describe how any "Investment Mobilized" was identified

Not applicable.

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

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount($)	Fee($)
UNEP	LDCF	Mauritania	Climate Change	NA	4,416,210	419,540
				Total Grant Resources($)	**4,416,210.00**	**419,540.00**

E. Non Grant Instrument

NON-GRANT INSTRUMENT at CEO Endorsement

Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

F. Project Preparation Grant (PPG)

PPG Required ☐

PPG Amount ($)

150,000

PPG Agency Fee ($)

14,250

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

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			
Total	3500	0	0	0

Part II. Project Justification

1a. Project Description

While some significant restructuring of the project outcomes and outputs has been done during the PPG phase, the new outcomes and outputs all continue to contribute to the overall objective of the project, in a more effective fashion than initially presented. In particular, the water and land management aspects of the project were both included under Outcome 2 in the PIF, and have now been separated into two outcomes (2 and 3) to give more prominence to water management. Seedling production has been added as an output (3.1) to ensure that restoration activities can successfully go forward and access the necessary inputs locally. The following summarizes the changes made as a result of the consultations organised during the PPG phase, in terms of the project's outcomes/outputs and co-financing activities:

Output as written in the PIF	Output revised or added during PPG
Output 1.1: Climate change vulnerability assessment undertaken and adaptation options identified for the wilayas of Adrar, Inchiri and Trarza AND Output 2.1: Community-level climate action plans developed, with a specific focus on gender.	Output 1.1: Climate change impact and vulnerability assessments undertaken, and adaptation options identified and validated by stakeholders in each of the 3 target wilayas and 8 project sites
Output 1.2: Institutional capacity-building, including training, provided for DREDD and CNOEZA in each of the target wilayas AND Output 2.2: Local communities and Associations for the Management of Natural Resources (AGLCs) trained on the implementation of EbA.	Output 1.2: 575 representatives of regional governments, private sector, civil society organizations and community-based organizations (e.g. cooperatives, AGPOs) across the 3 target wilayas trained on adaptation approaches (including EbA)
Output 1.3: Revisions to local development plans to integrate climate change adaptation proposed for each of the target wilayas	Output 1.3: 3 Regional Development Plans (PDRs) and 8 Local Development Plans (PDLs), integrating adaptation to climate change and gender, revised or developed and shared with stakeholders
Output 1.4: Upscaling strategy for EbA in arid ecosystems of Mauritania developed.	Output 1.4: An upscaling strategy and action plan for climate change adaptation in arid ecosystems of Mauritania developed in collaboration with national stakeholders, focusing on EbA approaches
Output 2.3: Improved water management interventions im	Output 2.1: 16 new efficient water provisioning systems (e

Output 2.3: Improved water management interventions implemented to increase resilience to climate change in the three target wilayas.	Output 2.1: 16 new efficient water provisioning systems (e.g. new wells, boreholes, solar pumps, desalination units) and 4 water collection and storage systems installed in the 8 project sites
	Output 2.3: 8 efficient irrigation water distribution systems established (one in each project site)
	Output 2.4: 8 community associations (e.g. cooperatives, AGPOs) trained on sustainable and efficient water management and distribution (one in each project site)
Output not present in PIF	Output 2.2: Small-scale infrastructures implemented on 4 water courses to increase infiltration and to reduce erosion and flooding
Output 2.2: Local communities and Associations for the Management of Natural Resources (AGLCs) trained on the implementation of EbA.	Integrated to Output 1.2 as well as at the activities level of Outcome 3: Protection, productivity and diversification of livelihoods enhanced through EbA and small-scale infrastructure interventions to increase climate-resilience in the wilayas of Adrar, Inchiri and Trarza
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 3.2: EbA interventions implemented on 400 hectares of dunes to protect vulnerable communities, livelihoods and ecosystems from dune-migration AND Output 3.3: EbA interventions implemented on 150 hectares to shelter and reforest vulnerable communities, livelihoods and ecosystems and to provide agroforestry and non-timber forest products
Output 2.5: Additional natural resource-based livelihoods introduced, with a specific focus on the upliftment of local women.	Output 3.4: Additional natural resource-based livelihoods introduced for local populations
Output not present in PIF	Output 3.1: Regional community nurseries specialized in plant production for arid ecoregions established and operational, and training for their sustainable management provided to local communities or cooperatives in 3 wilayas
Output 3.1: Policy-relevant research findings published based on monitoring of adaptation results generated under Component 2.	Output 4.1: 5 publications on policy-relevant research findings published based on monitoring of adaptation results generated under Components 2 and 3, and disseminated to decision makers
Output 3.2: EbA handbooks developed and shared with local implementation structures across the three target wilay	Output 4.2: A series of 4 EbA handbooks detailing best practices for arid ecosystems developed and shared with loca

as.	l implementation structures across the 3 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 merged into Output 4.3 (see below)
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.	Output 4.3: At least 750 local stakeholders informed of climate change adaptation and good EbA practices in the three target wilayas

The changes in the Output plan have also resulted in changes to the amount of budget allocated to the project's three Outcomes. These are displayed in the table below.

Outcome	Amount budgeted in PIF	Amount budgeted in PPG phase
Outcome 1	700,000	527,700
Outcome 2	2,955,915	1,274,800
Outcome 3 –New: split from Outcome 2	0	1,835,100
Outcome 4 – Knowledge management (old Outcome 3)	550,000	342,500

In terms of co-financing, since the project was initially prepared at PIF stage significant changes have taken place (i.e. projects have ended while others have begun). Amongst those, the National Adaptation Plan (NAP) process has been launched in Mauritania, and forms an important co-financing opportunity, as does the Awleigatt National Park Capacity Support Project (PRCPNA). The original and new co-financing amounts are displayed in the table below:

Co-financing source	Amount budgeted in PIF	Amount budgeted in PPG phase
PRAPS	13,500,000	0
PRCPNA (Parc National d'Awleigatt)	0	7,200,000
MEDD	1,000,000	500,000
MCM	500,000	1,000,000
ONM	0	300,000
PDDO	0	110,000
PAMB	1,250,000	1,940,000
GCF-NAP	0	2,670,374
TOTAL	**16,250,000**	**13,720,374**

Project summary

The rural and peri-urban Mauritanian populations of Inchiri, Adrar and northern Trarza are highly dependent on natural and agro-pastoral ecosystems for their subsistence. The landscape of these arid and hyper-arid areas is composed of few shrub relics and pastures, often very scattered, which constitute the only pastoral resources, small amounts of fuelwood for cooking, and a rudiment of pharmacopoeias. Agriculture forms a larger part of the economic activity in the wilayas of Adrar and Trarza than in Inchiri, which relies primarily on the extractive sector. The Inchiri region's livelihoods are mainly based on mining and pastoralism, while those in its capital Akjoujt are a mixed of mining, pastoralism, and dates production and horticulture in oases and wadis. The main livelihoods in the two project sites in the Adrar region are mixed pastoral, dates production and horticulture in oases and wadis. The Trarza region is transhumant pastoralist in its southern part and rainfed cropping in its northern part.

Dune encroachment, water scarcity, and extreme climate are already major challenges to the main production systems and local economy. The combined effects of rapid population growth, accelerated sedentarization on the last parcels of productive land, and the increasing dependence of populations on ecosystem goods and services, have established extensive overexploitation of natural resources and stimulated their large scale degradation.

In addition, the country faces unprecedented climate change, with projections under RCP8.5 by the 2050s showing an expected increase in the frequency and intensity of weather-related droughts and heat waves in Mauritania. A significant change in rainfall seasonality is expected, suggesting that precipitation may become more variable between the months of the year in most parts of the country, and an increase in heavy rains. Some of the project's intervention sites are expected to see a change in the timing of the rainy season, such as in Akjoujt and Boutilimit, where rains could begin later and intensify towards the end of the season. Climate change will therefore have an impact on the productivity of ecosystems, due to a reduction of deep and surface water resources, the increase in water and wind erosion especially and bush fires in pastoral areas and thus ultimately on the adaptive capacities of local populations who depend mainly on agriculture and livestock for their livelihoods.

In this context, no institutional structure currently has the assets or capacity to reverse the cycle of increasing vulnerability of populations facing climate change, whether be it national, regional, or local. There are two major constraints to institutional capacities at all levels, namely: the shortage of qualified personnel to deal, in an operational manner, with resilience to climate change, and the lack of coordination and sharing of knowledge including good experiences at the level of all institutions (in particular in arid areas). This jeopardizes any effective national response for adaptation to climate change.

This Least Developed Countries Fund (LDCF) project will seek to increase the local and regional adaptive capacity of the populations of the arid wilayas of Mauritania (Adrar, Inchiri and Trarza) by strengthening local and regional institutional capacities and improving access to innovation, technical know-how and knowledge. This will enable the introduction of ecosystem-based adaptation (EbA) approaches to strengthen the ecosystem functions of desert, oasis and wadi ecosystems, so that they can better contribute to the resilience of local populations to the impacts of climate change. In order to achieve this, the project will be implementing a series of complementary interventions, focused on: i) strengthening the institutional capacities of the government to guide adaptation planning and promote the EbA approach; ii) strengthening of adaptation planning capacities using the EbA strategy at sub-national level, in particular by training regional delegations and other key actors, and establishing development plans that integrate climate change considerations at municipal level; iii) implementing EbA interventions, including on water management, and promoting climate resilient livelihoods; iv) raising awareness of climate change and adaptation options, including EbA; and v) increasing the availability of evidence-based best adaptation practices such as EbA in Mauritania and its arid regions in particular.

UN Environment Programme (UNEP) has been a leading partner in Mauritania on climate change adaptation issues. UNEP was the Implementing Agency for the SCCF-funded “EbA South” project, upon which this LDCF project will be building and integrating lessons learnt, and it is also currently supporting the NAP Readiness project in Mauritania, through the GCF (Adaptation Planning support for Mauritania through UNEP). The project is well aligned with past and ongoing initiatives such as those mentioned above. Given its climate change adaptation and EbA focus, the proposed project is also strongly aligned with UNEP’s Medium-Term Strategy (2018–2021). The proposed project will enhance partnerships between national institutions and international donors, address Mauritania’s immediate adaptation needs, and provide a platform for the success of future adaptation investments.

Environmental and adaptation problems, root causes and barriers that need to be addressed

This proposal seeks funding from the Least Developed Countries Fund (LDCF) to implement the Full-Sized Project (FSP) “Climate change adaptation and livelihoods in three arid regions of Mauritania” (AMSTRA, for its acronym in French). Hereafter, this FSP will be referred to as “the proposed project” or “the project”.

Problem statement

In Mauritania, the dynamics of climate change already observed are projected to intensify (see below). In addition to increasing average temperatures, climate change is expected to increase the frequency and intensity of weather-related droughts and heat waves in Mauritania. A significant change in rainfall seasonality is expected, suggesting that precipitation may become more variable between the months of the year in most parts of the country, and there may be an increase in heavy rains. Some of the project's intervention sites are expected to see a change in the timing of the rainy season, such as in Akjoujt and Boutilimit, where rains could begin later and intensify towards the end of the season.

Populations in the areas targeted by the project (approximately ten per cent of the national population) depend mainly on agricultural and pastoral activities, namely the production of dates, horticulture and the breeding of goats, sheep and camels (see section on socio-economic context). These productive activities are already affected by the observed impacts of climate change, including the alteration of rainfall patterns and an increase in temperatures, which are projected to intesify in the future. Producers in both the agricultural and pastoral sectors are also highly dependent on ecosystem goods (e.g. fodder for camels and small ruminants) and services (e.g. groundwater recharge) for their livelihoods. The production of these ecosystems goods and services is compromised by climate change, which will therefore ultimately affect the livelihoods of the local populations.

Due to a range of factors, the unsustainable use of natural resources is prevalent. The degradation of ecosystems and the natural resource base further exacerbate the vulnerability of populations to the impacts of climate change. The combined effects of climate change and unsustainable use of natural resources include: (i) increased desertification and movement of sand dunes; (ii) decreased availability of surface and groundwater; (iii) a reduction in vegetation; and (iv) increased severity of soil erosion. This will lead to negative impacts on agricultural activities by reducing crop productivity. Similarly, pastoralism will be affected by the decreased availability of forage and reduced number and output of watering point. The resulting socio-economic effects will include: (i) higher meat prices; (ii) reducing the incomes of livestock producers; (iii) decreased crop yields; (iv) food insecurity and (v) adverse health impacts. As a result, the impacts of climate change in Mauritania are expected to increase both poverty and food insecurity for the country's growing population. Without this intervention, this will lead in further pressure being put on already degraded ecosystems, further exacerbating vulnerability to climate change.

The continued degradation of the remaining natural resources in Adrar, Inchiri and Trarza and the consequent reduction in the essential supply of ecosystem goods and services to local communities will exacerbate their vulnerability to impacts climate change. To address this, the proposed LDCF project aims to increase the adaptive capacity of rural communities in the wilayas of Adrar, Inchiri and Trarza through the introduction of ecosystem-based adaptation (EbA) approaches . The project will focus on improving the management and sustainable use of water and other natural resources in the target communities to reduce their vulnerability to climate change. Climate change impacts on these resource-dependent communities will be mitigated through a suite of innovative on-the-ground interventions implemented at the plot and community levels.

Climate change in Mauritania

Climate change observations

According to Mauritania's Fourth National Communication to the UNFCCC, three key factors have characterized recently-observed climatic change in the country: (i) an increase in the frequency and intensity of droughts, associated with both a decrease in total precipitation and a longer duration of the dry season; (ii) an increased frequency of heat waves and a decrease in the frequency of cold waves; and (iii) an increase in the frequency and intensity of floods, especially in the north and north-east of the country, associated with an increase in the intensity of daily rainfall and a slight increase in the frequency of extreme rainfall events. The more frequent, long and severe droughts are contributing to an intense process of desertification, putting severe pressure on the extremely fragile oases of the Sahara and moving the desert conditions further south, even threatening the country’s very fragile and most fertile lands in the Sahelian region and the Senegal River.

Drought dynamics: Evolution of total rainfall in the project intervention zone

This indicator is based on the rainfall trend observed at a given weather station. As highlighted in the report of the climate change analysis conducted during the PPG, attached in Appendix 13 of the Project Document, rainfall data in synoptic stations show a general trend of gradual decrease in precipitation in the project area, with a very high level of statistical significance in all stations of the area, with the exception of Akjoujt.

Data from the Atar station in Adrar indicate a decrease in annual rainfall accumulation of about 40 mm during the observation period (1945-2010), meaning a 38% decrease. This decrease is less significant in the western part of the wilaya. The spatial analysis of this indicator shows that the rate of rainfall decrease is less than 0.5 mm/year on average in Inchiri and the center of Trarza (overall decrease of about 33 mm over the 65-year period) and exceeds 0.5 mm/year on average in other parts of the project area. It is around 0.8 mm/year on average around Chinguetti in Adrar (overall decrease of about 52 mm over the 65-year period) and 1 mm/year on average in southern Trarza (overall decrease of about 65 mm over the 65-year period).

Drought dynamics: Length of the dry period

This indicator is based on the number of consecutive days without rain, or the length of the water shortage season. All of Mauritania's weather stations, including those in the wilayas targeted by the project, show a trend of increased length of the dry period with a very high statistical significance (see figures in Appendix 13 of the Project Document).

During the observation period (1945-2010), the increase in the length of the dry period was around 80 days in Akjoujt (Inchiri) (hyper-arid zone), 60 days in Atar (Adrar) (arid zone), and 50 days in Boutilimit (Trarza) (northern Sahel). The length of the dry period increased on average by less than one day per year over the 1945-2010 period in the eastern and southern part of Trarza, and by 1 to 2 days in Adrar and northern and western Trarza. As for Inchiri, the dry period increased by 1 to 3 days per year, going from southeast to northwest. In conclusion, meteorological data from the stations in the three wilayas targeted by the project indicate that the area has experienced an overall drying since the beginning of the observation period, and especially from the late 1960s onward. That said, it is important to note the significant interannual variability of this indicator.

Warming climate: Heat waves

The climatic series highlight an increase in the frequency of heat waves in the wilayas concerned by the project, with the exception of the Boutilimit station where the trend is statistically insignificant (see figures in Appendix 13 of the Project Document).

The greatest increase in heat waves is observed in Rosso (capital of Trarza), in the south of the project intervention zone, with a tripling of the annual number of heat waves during the 1945-2010 observation period. At the Atar station (Adrar), the number of heat waves has increased over the 1945-2010 period from 4 waves per year on average to more than 9 waves per year.

Overall, mean temperatures in Mauritania have increased by about 0.9°C since the 1960s, with rates of increase higher during the dry and hot season. Moreover, there has been an increase in warm days and nights observed, with a decrease in the number of cold nights. These trends are expected to continue in the near future .

Flood dynamics: Changing precipitation patterns

Significant mean seasonal (May-September) increases in precipitation have been observed in Mauritania (1983-2010), in particular in the south of the country . That region, bound to the south by the Senegal River, is already facing recurrent flooding events of differing intensity (e.g. flood event of September 2007) due to geophysical characteristics (floodplain) and anthropogenic activities, and these changes are exacerbating that risk. While farmers rely on the seasonal flooding for agricultural production on the floodplain, extreme events can have catastrophic consequences on productivity .

Projected climate change

Drought dynamics

For the emissions scenario RCP8.5 (the high emissions “baseline” scenario), the average monthly rainfall is expected to remain largely unchanged across Mauritania over the period 2040-2059, though more significant decreases are projected in the south of the country (Figure 1). However, there is still a lot of uncertainty around precipitation projections in West Africa.

Projected Change in Monthly Precipitation of Mauritania for 2040-2059 (Compared to 1986-2005)

MONTHLY PRECIPITATION (MM)

-40 -30 -20 -10 -6 -2 0 2 6 10 20 30 40

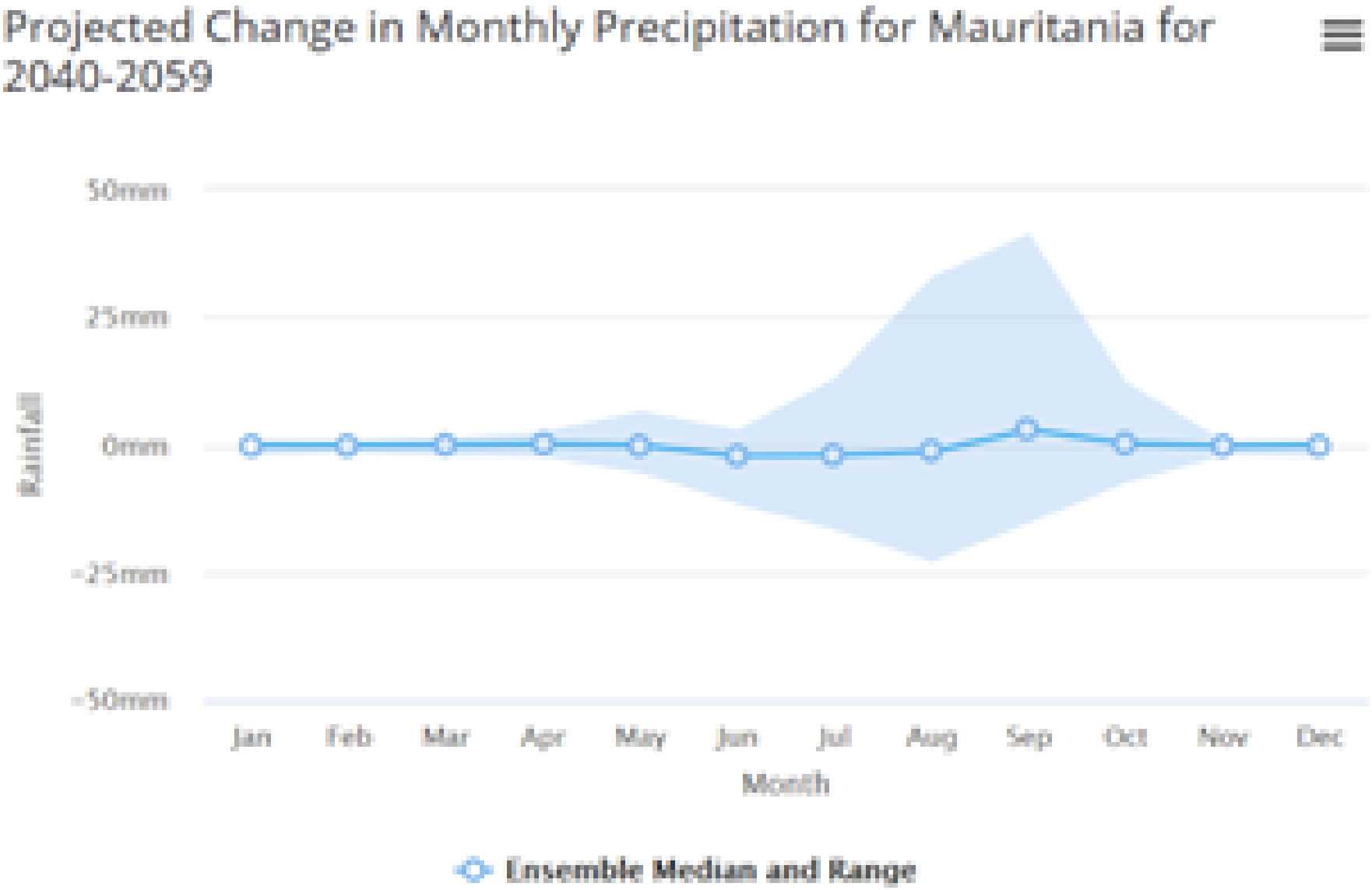
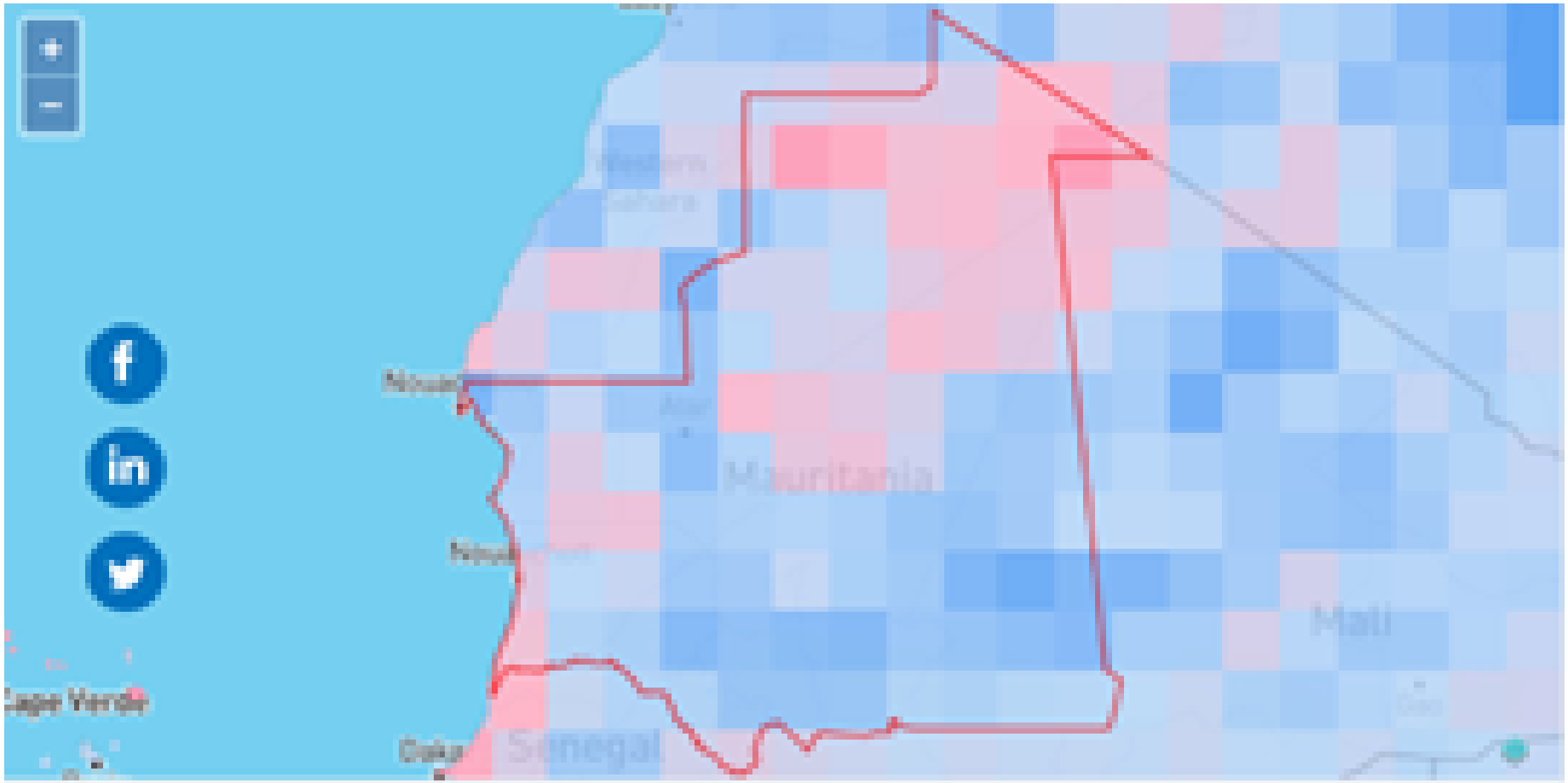


FIGURE 1 PROJECTED CHANGES IN MONTHLY PRECIPITATION FOR THE 2050S (COMPARED TO THE 1990S) MULTI-MODEL MEAN FOR RCP8.5

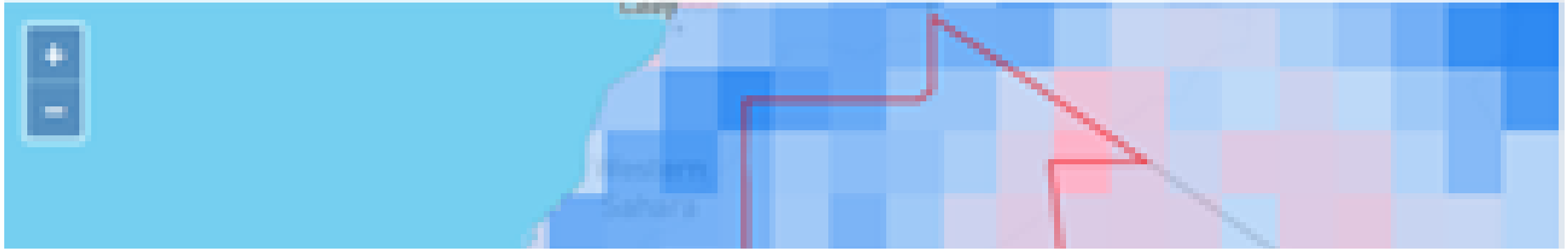
While there are uncertainties regarding rainfall averages, the frequency and intensity of droughts are expected to increase by the middle of the 21st century. As shown in Figure 2, an increase in rainfall seasonality is expected in the project area, suggesting greater variability in precipitation, particularly for the emissions scenario RCP 8.5. This is confirmed by data (RCP 8.5) from the University of Cape Town for the towns of Akjoujt (Inchiri) and Boutilimit (Trarza) (Figure 3) which show a trend (for all models)

of late start of rainy season, strong intra-annual variability and a likely reduction in the number of rainy months. This may increase the risk of drought as shown in Figure 4. Moreover, there is the potential for longer dry seasons (RCP8.5), in particular in the areas of intervention of the project (see Figure 5).



RAINFALL SEASONALITY (MM)

-0.7 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.7



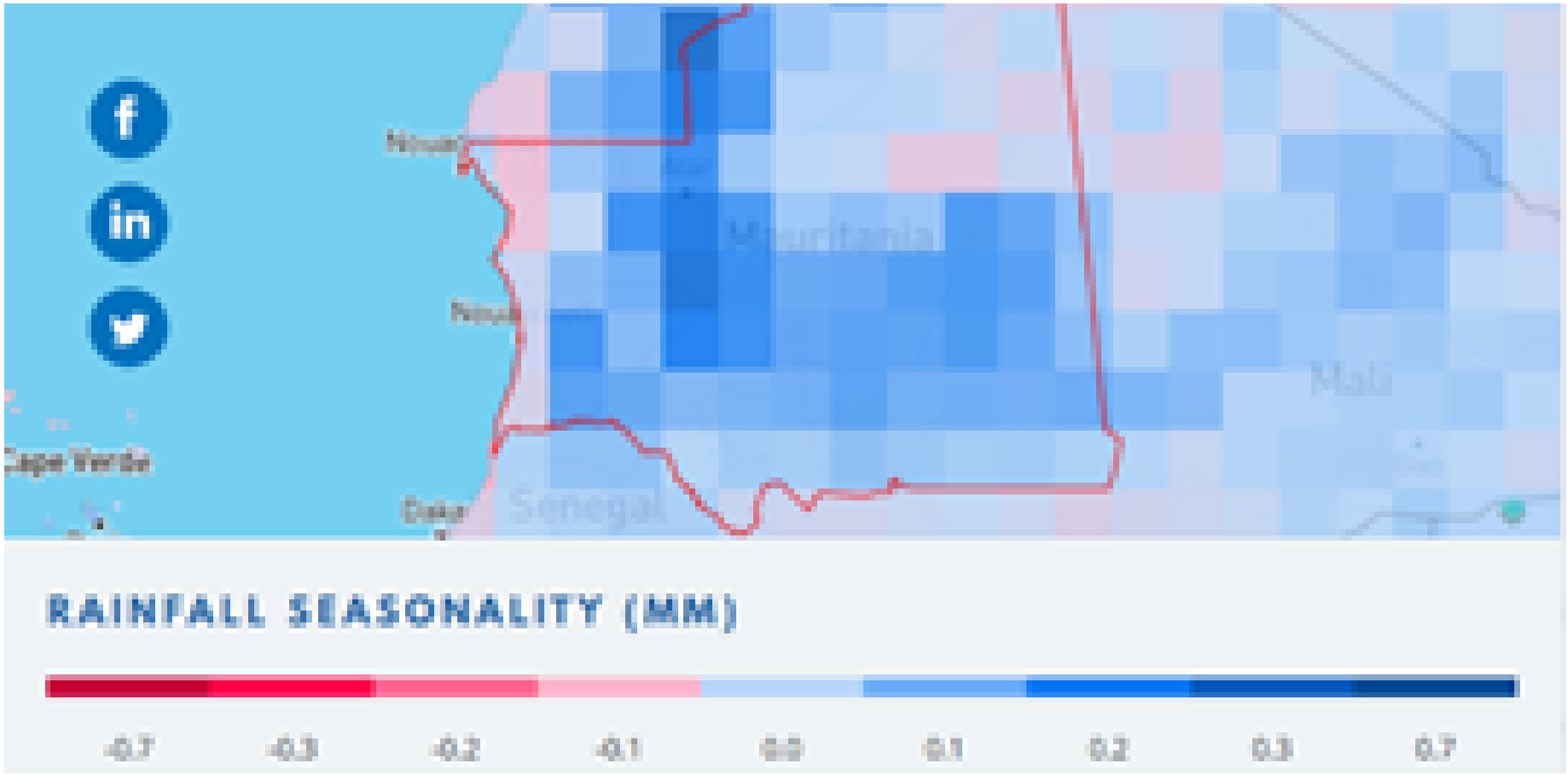
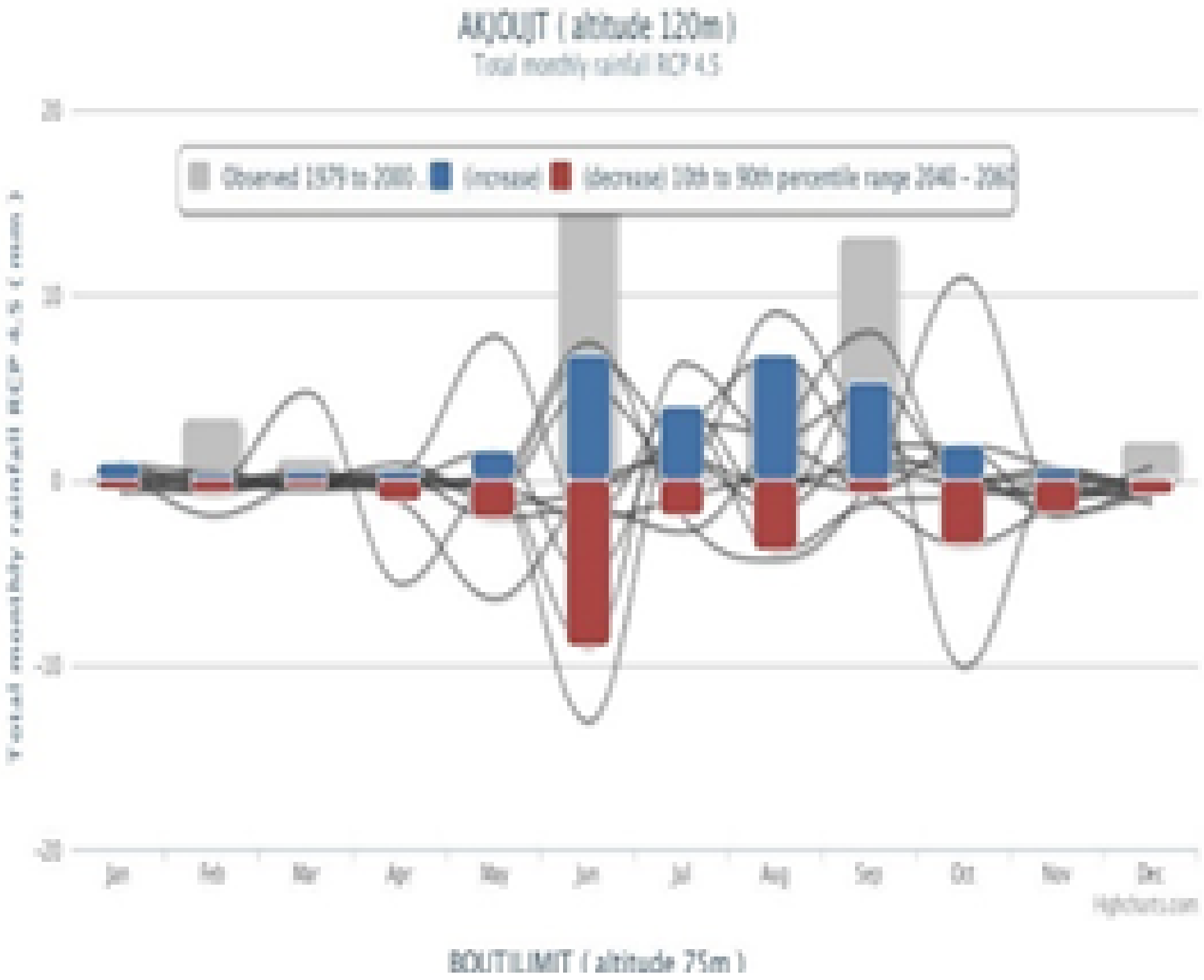
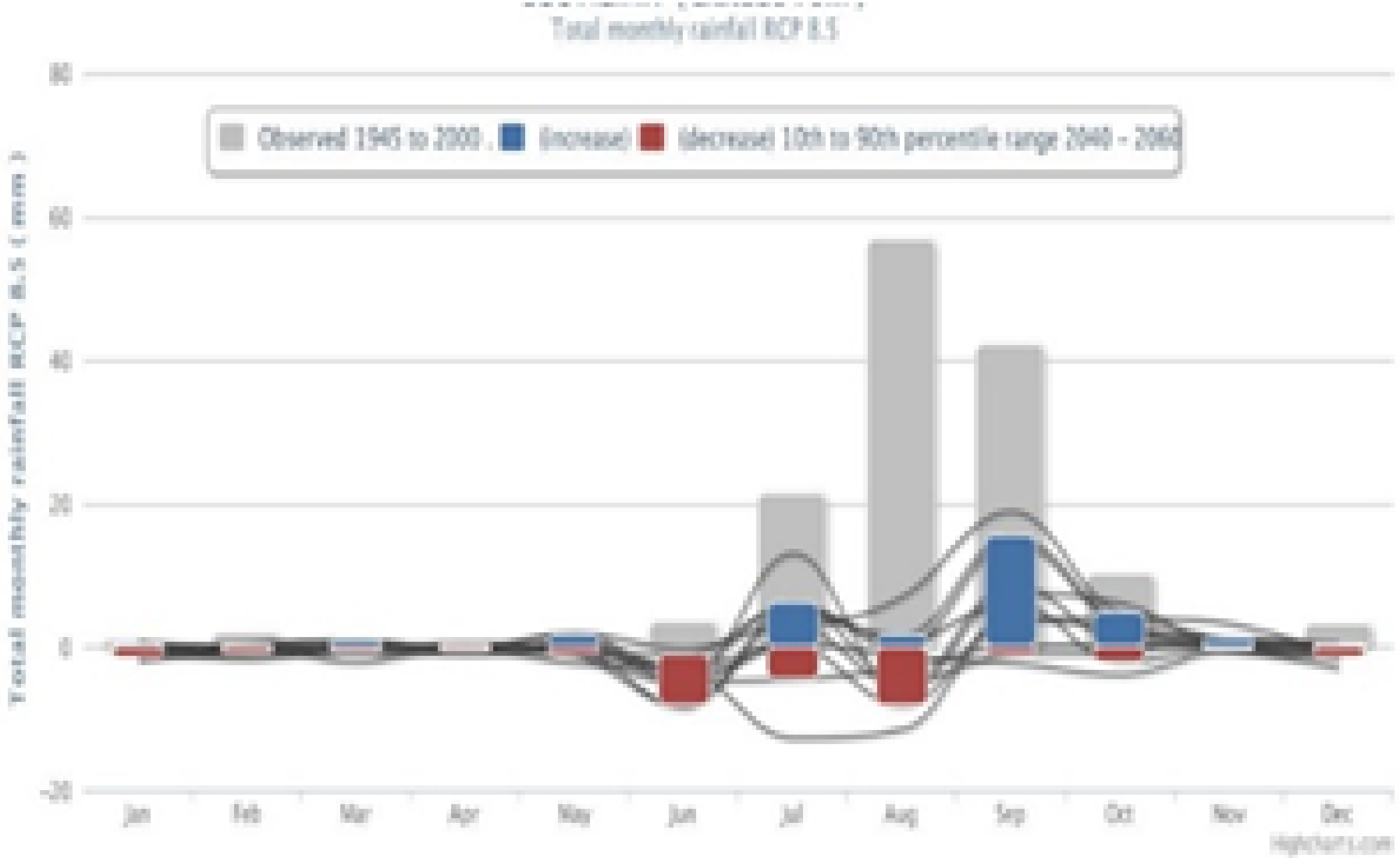
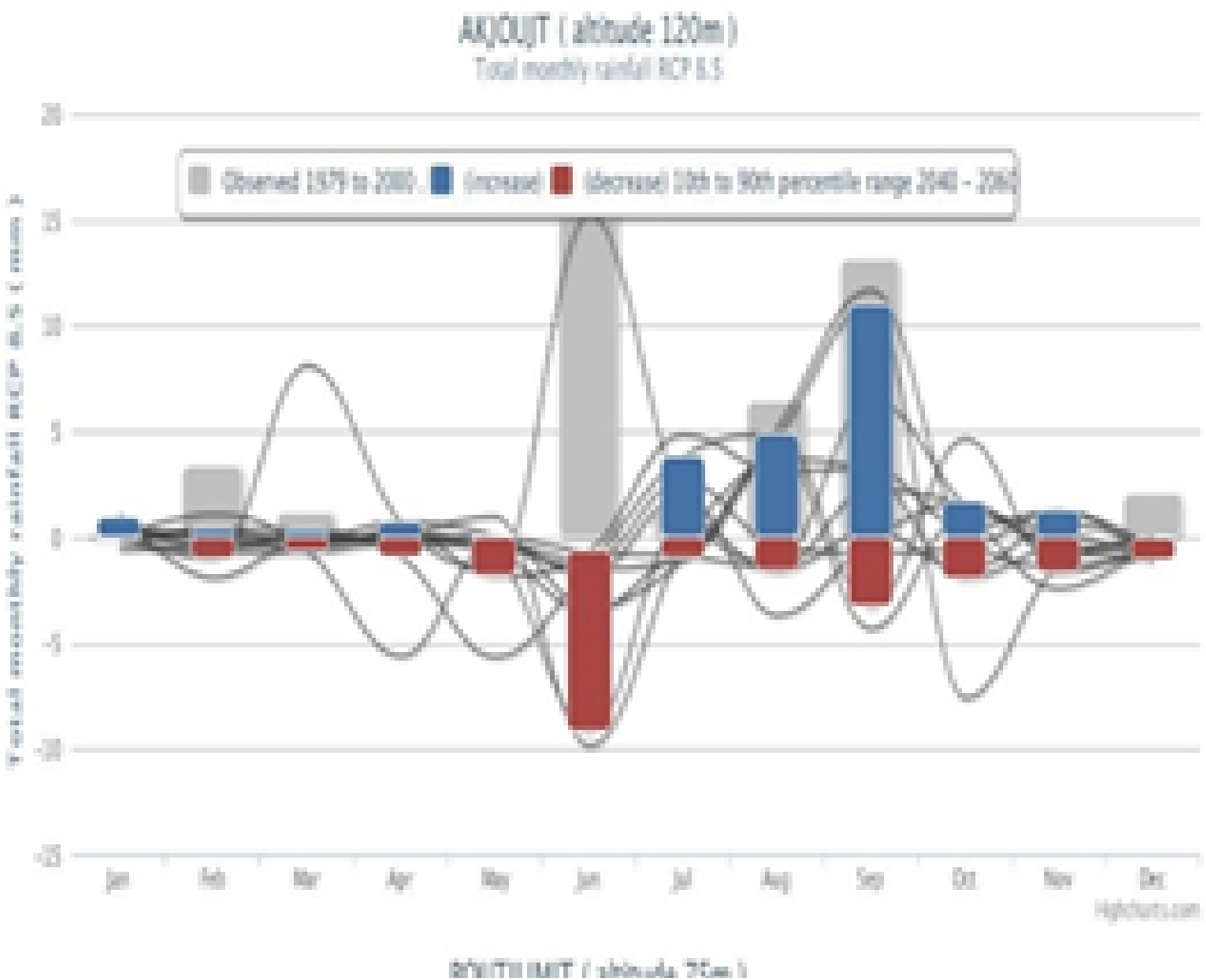


FIGURE 2 PROJECTED CHANGE IN RAINFALL SEASONALITY IN MAURITANIA FOR THE 2050S (COMPARED TO THE 1990S), MULTI-MODEL AVERAGE FOR RCP4.5 (LEFT) AND RCP8.5 (RIGHT) .


AKJOUJT (altitude 120m)
Total monthly rainfall RCP 4.5
Observed 1979 to 2005
(increase)
(decrease) 10th to 90th percentile range 2040 - 2065
Total monthly rainfall RCP 4.5 (mm)
20
10
0
-10
-20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Highcharts.com
BOUTILIMIT (altitude 75m)


Total monthly rainfall RCP 8.5
Observed 1945 to 2000
(increase)
(decrease) 10th to 90th percentile range 2040 - 2060
Total monthly rainfall RCP 8.5 (mm)
80
60
40
20
0
-20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Highcharts.com


AKJOUJT (altitude 120m)
Total monthly rainfall RCP 8.5
Observed 1979 to 2005
(increase)
(decrease) 10th to 90th percentile range 2040 - 2065
Total monthly rainfall RCP 8.5 (mm)
20
15
10
5
0
-5
-10
-15
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Highcharts.com

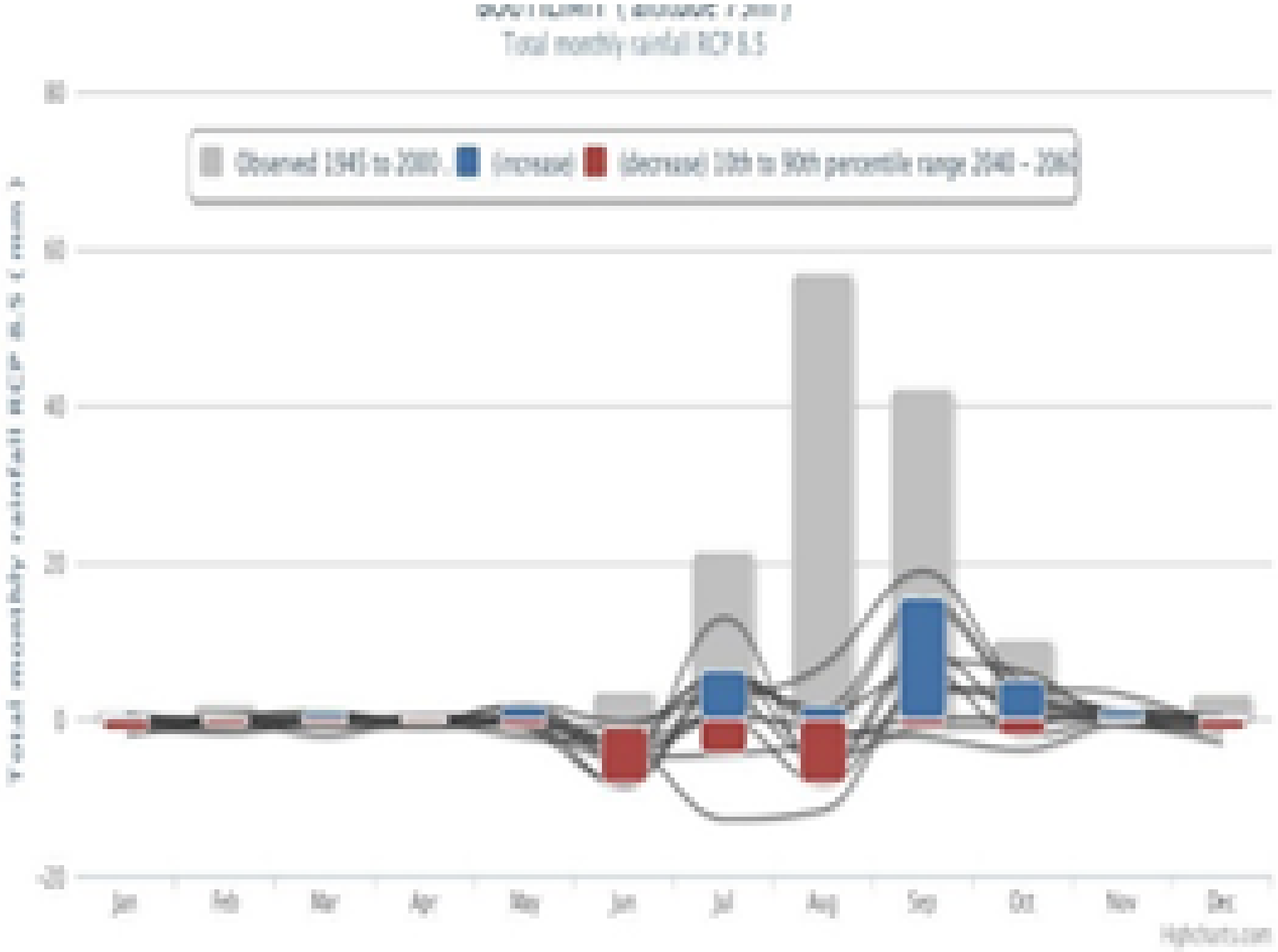
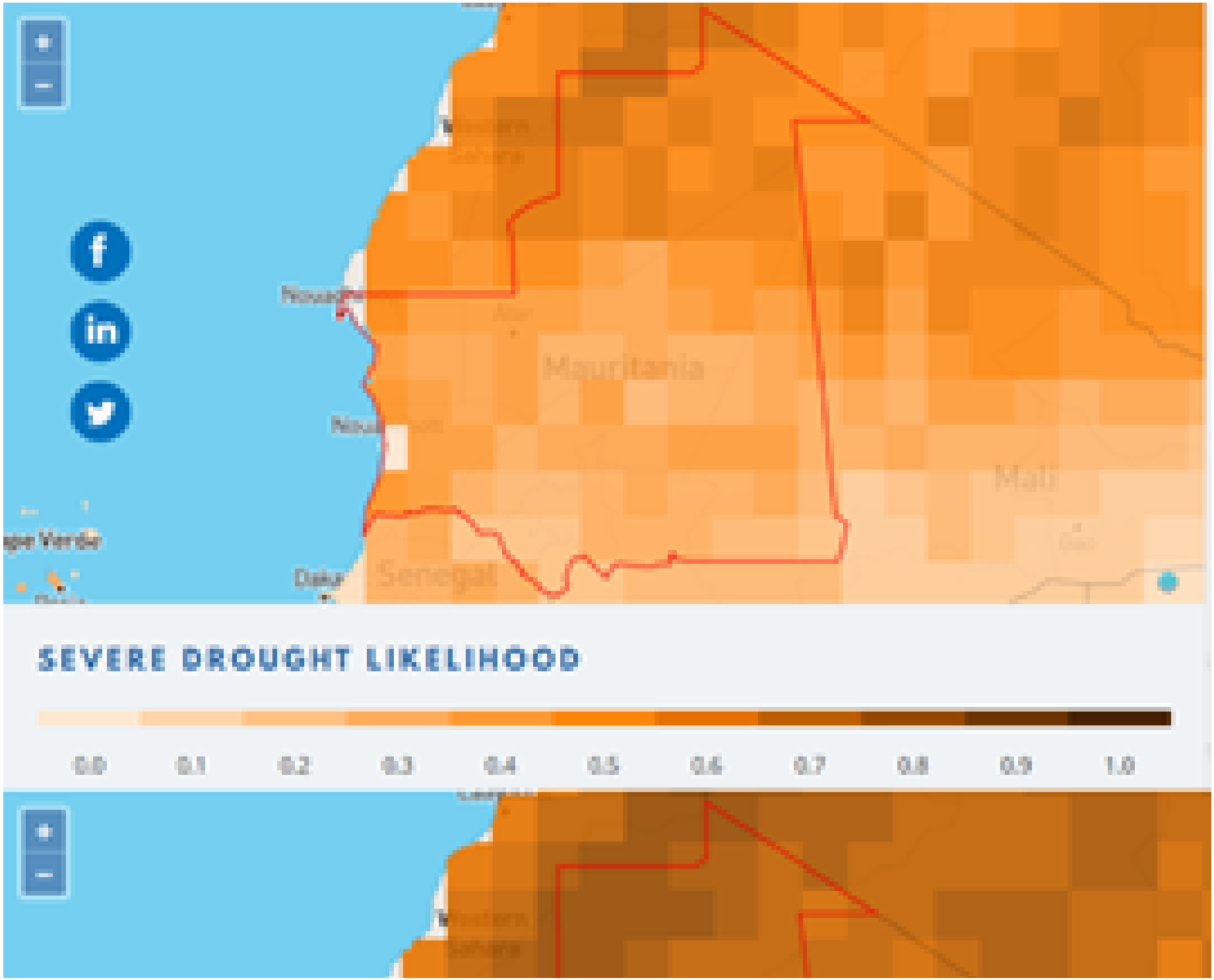


FIGURE 3 PROJECTED CHANGE IN TOTAL MONTHLY PRECIPITATION FOR AKJOUJT (INCHIRI) AND BOUTILIMIT (TRARZA) FOR THE 2050S COMPARED TO THE PERIOD 1979-2000, MULTI-MODEL AVERAGE FOR RCP4.5 (TOP) AND RCP8.5 (BOTTOM)


Mauritania
Mali
Senegal
Dakar
SEVERE DROUGHT LIKELIHOOD
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

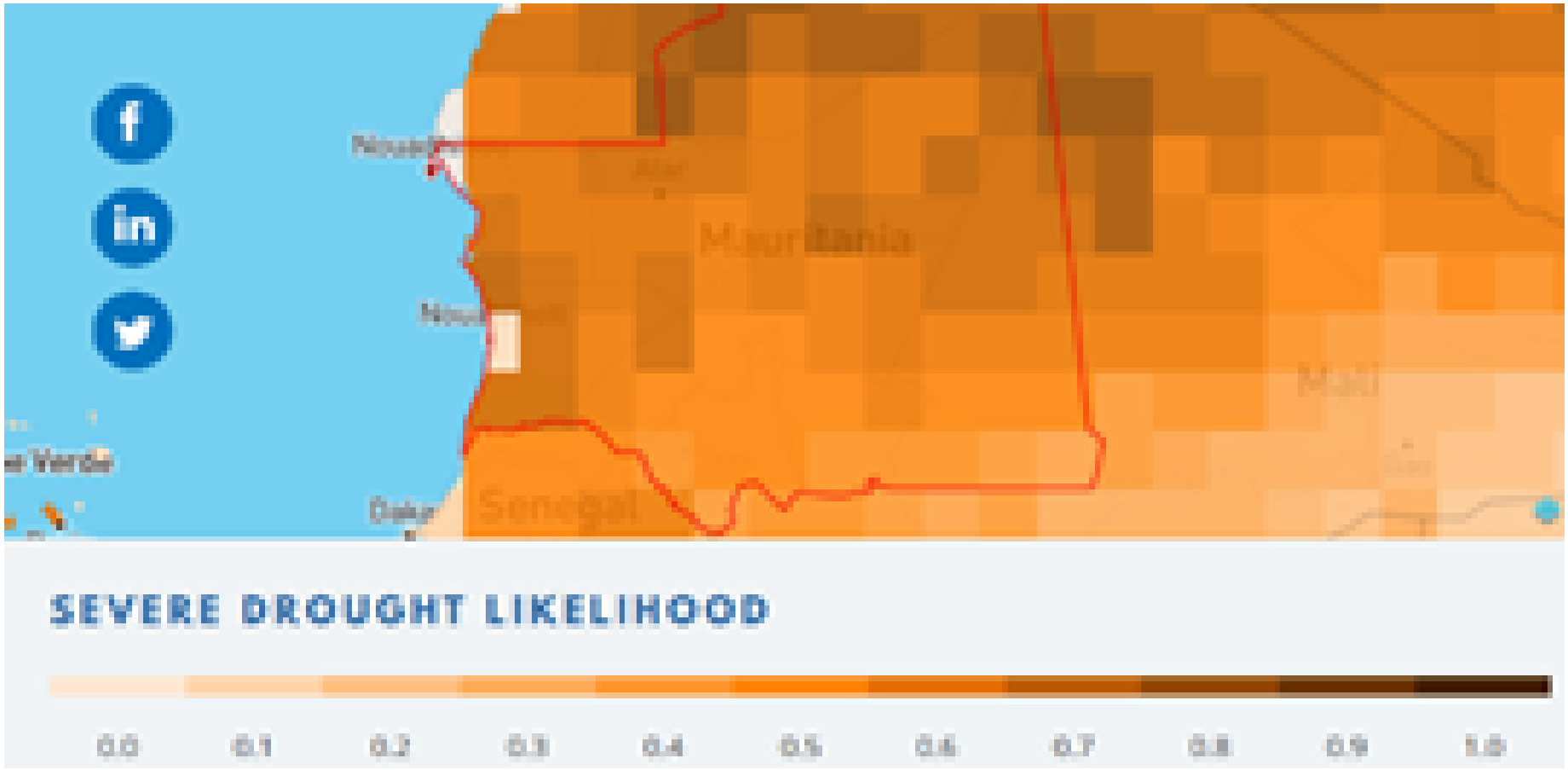
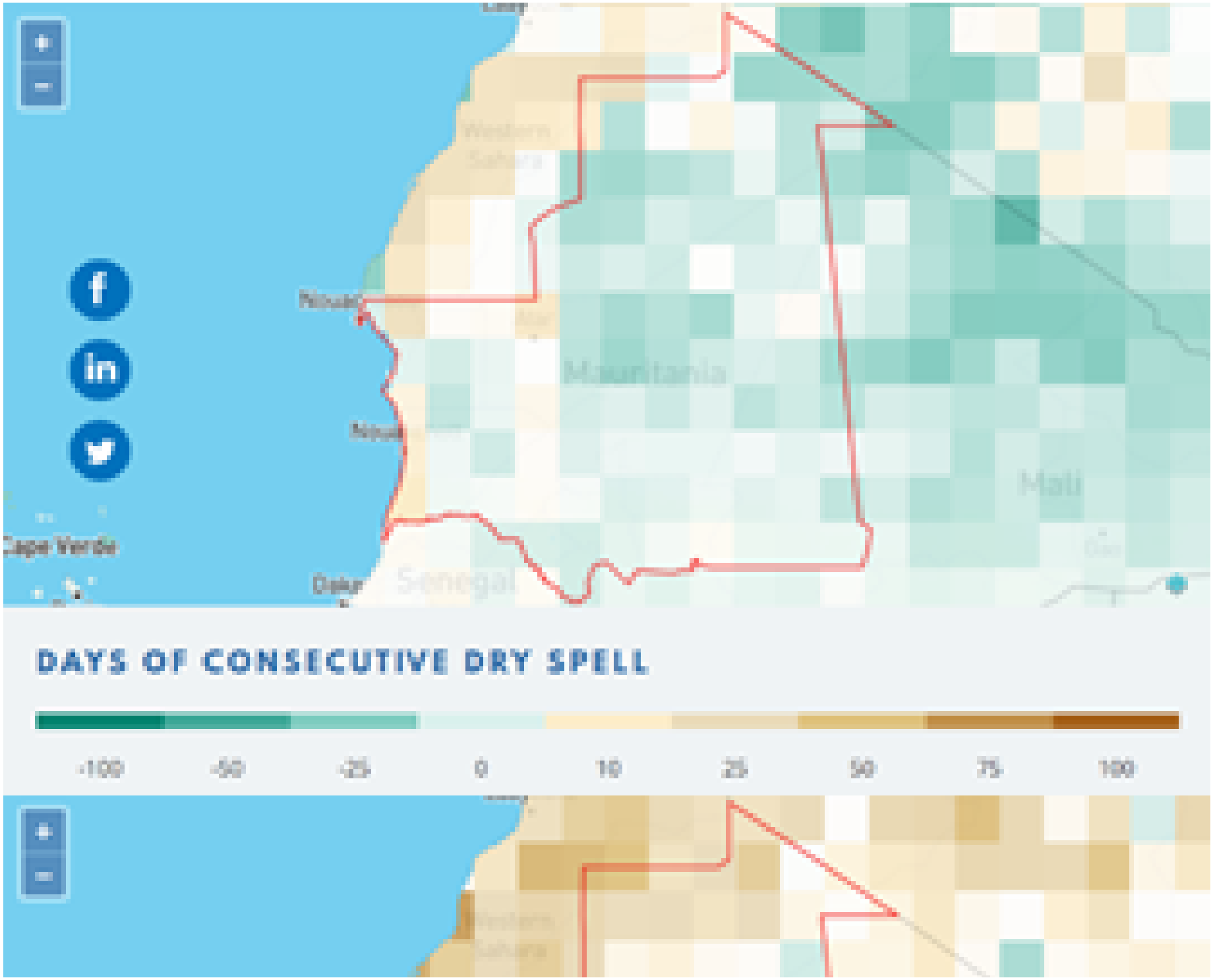


FIGURE 4 PROJECTED CHANGE IN THE PROBABILITY OF SEVERE DROUGHT IN MAURITANIA FOR THE 2050S (COMPARED TO THE 1990S), MULTI-MODEL AVERAGE FOR RCP4.5 (LEFT) AND RCP8.5 (RIGHT)


Western Sahara
Mauritania
Mali
Senegal
Dakar
Cape Verde
DAYS OF CONSECUTIVE DRY SPELL
-100
-50
-25
0
10
25
50
75
100

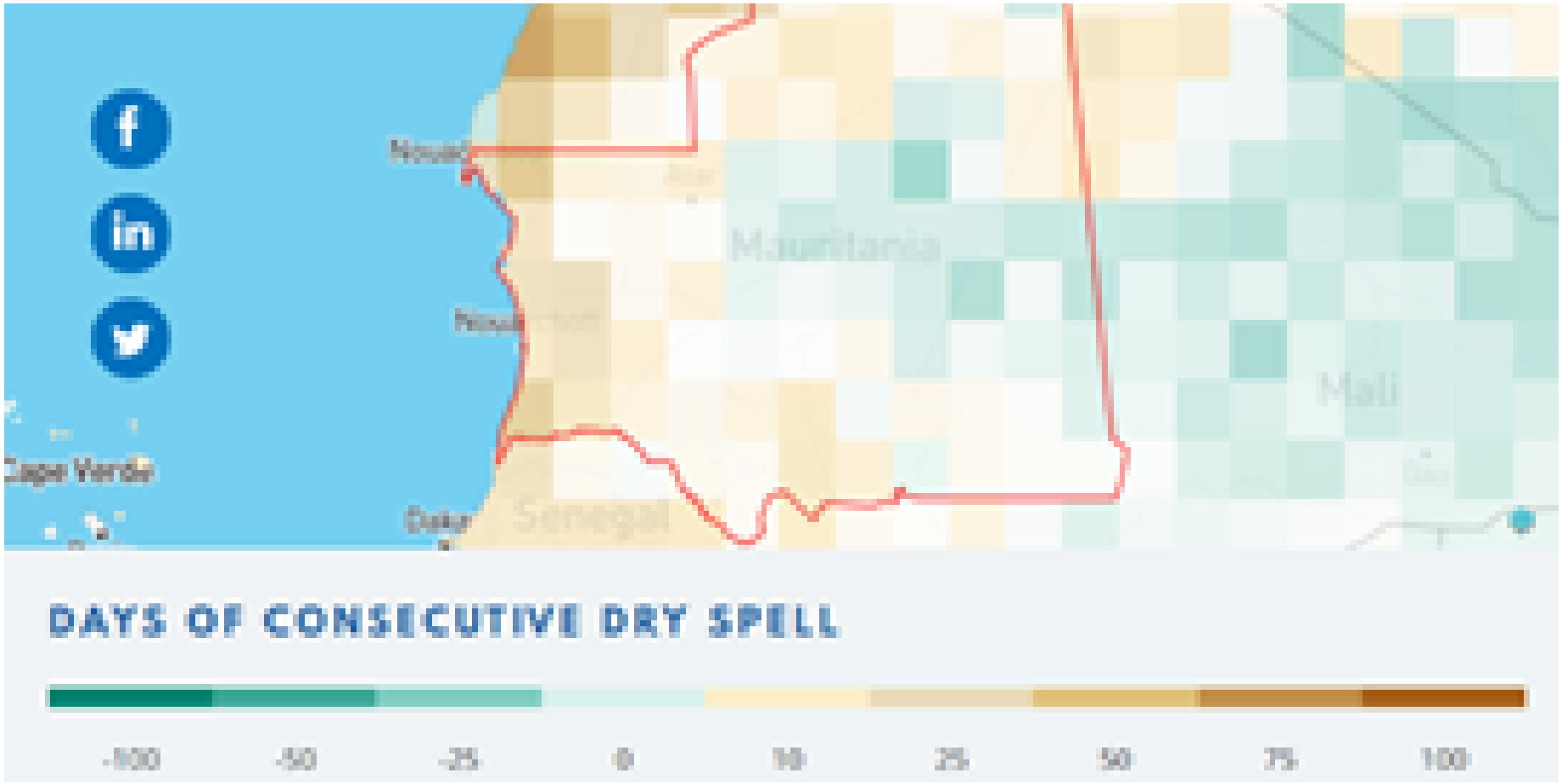
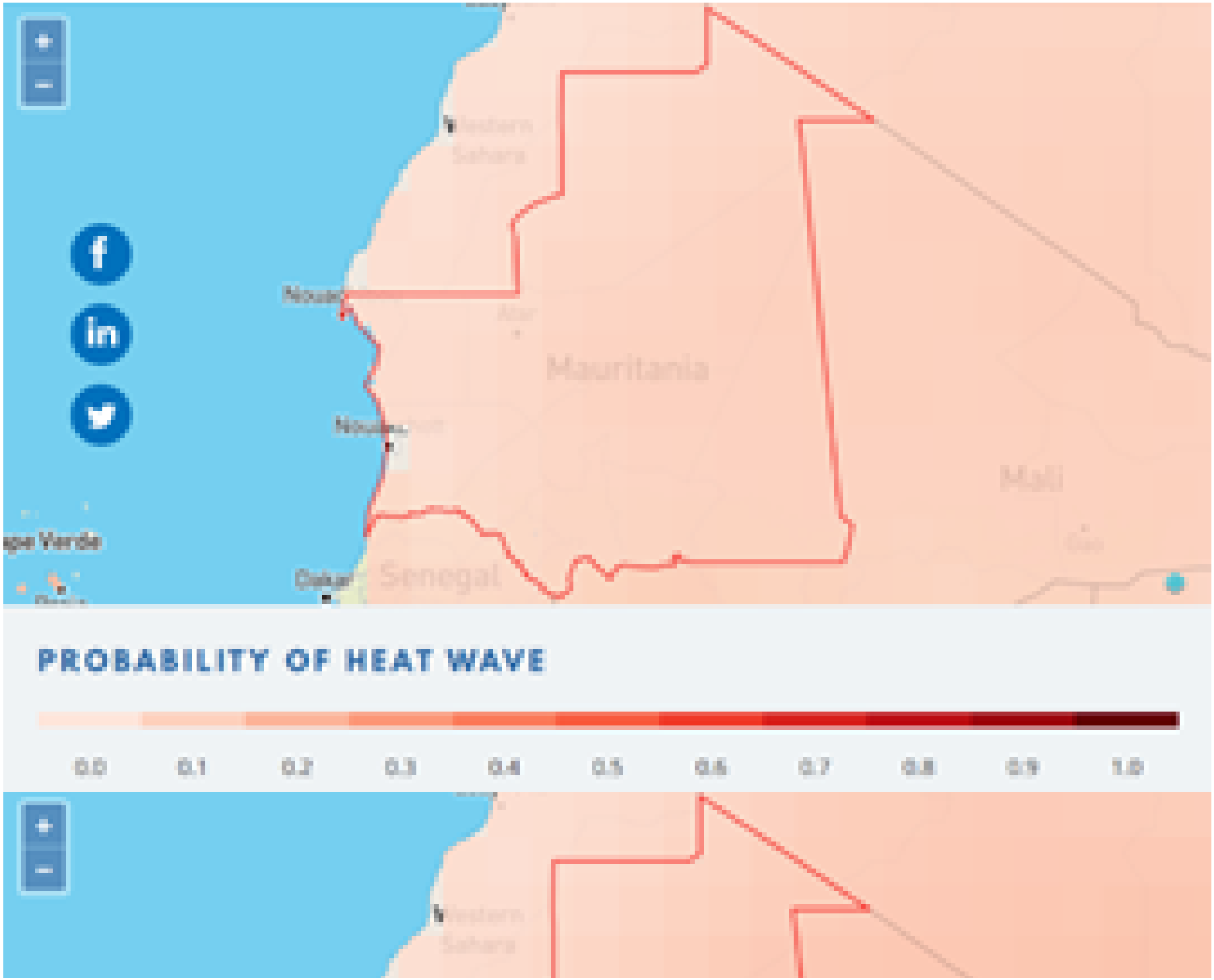


FIGURE 5 PROJECTED CHANGE IN THE MAXIMUM NUMBER OF CONSECUTIVE DAYS WITHOUT PRECIPITATION (DRY SEASON DURATION) IN MAURITANIA FOR THE 2050S (COMPARED TO THE 1990S), MULTI-MODEL AVERAGE FOR RCP4.5 (LEFT) AND RCP8.5 (RIGHT)

Rising temperatures

As with droughts, the intensity and frequency of heat waves are expected to increase (see Figure 6) while the frequency of cold spells is expected to decrease. Heat waves can be particularly detrimental to human health and cause extreme heat stress for crops and livestock.


Western Sahara
Mauritania
Mali
Senegal
Dakar
PROBABILITY OF HEAT WAVE
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

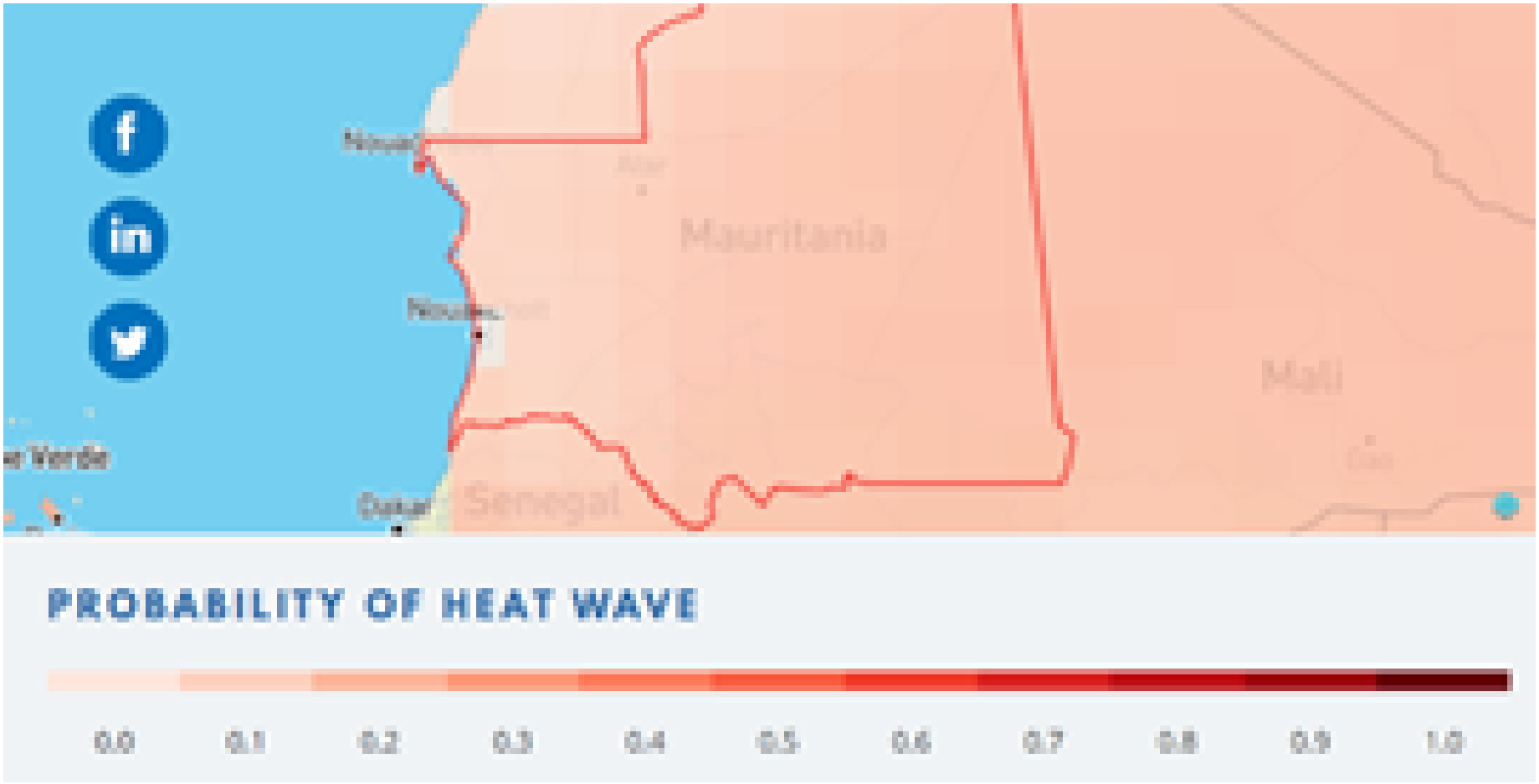
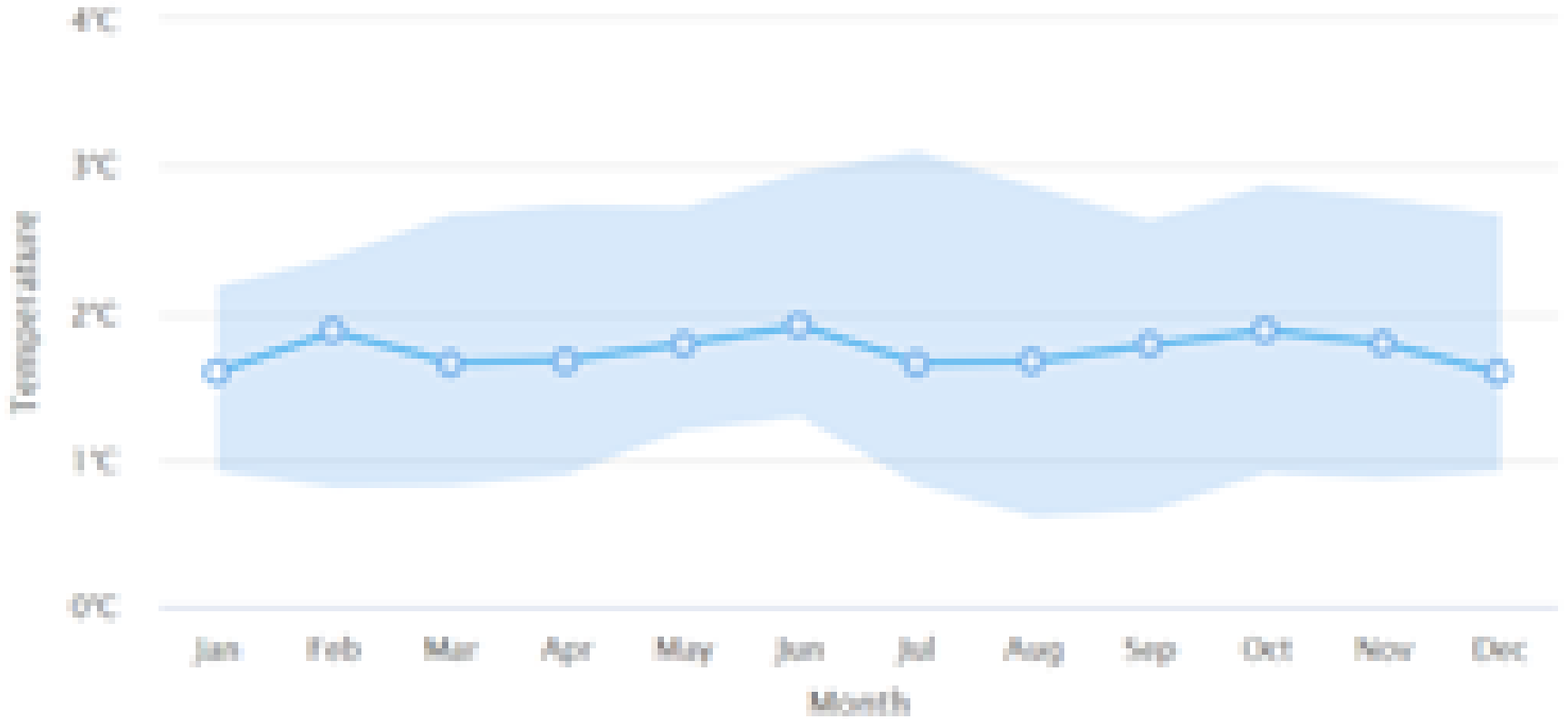
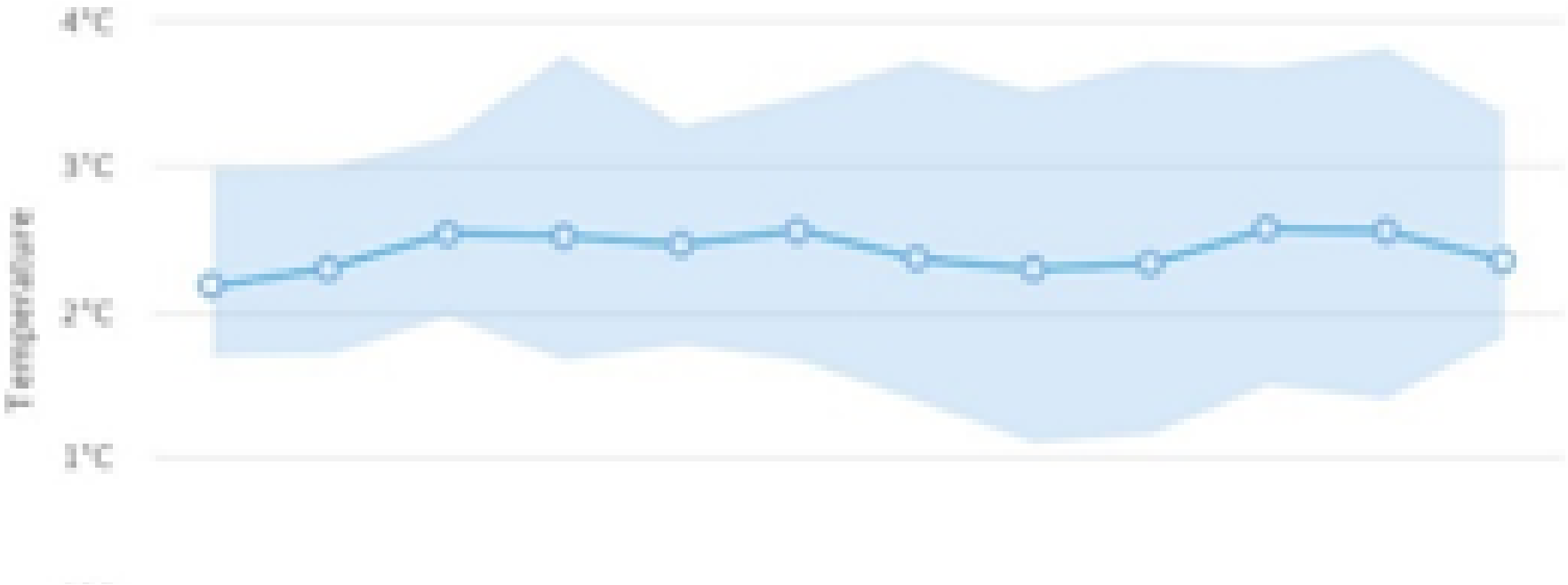


FIGURE 6 PROJECTED CHANGE IN THE DAILY PROBABILITY OF A HEAT WAVE IN MAURITANIA FOR THE 2050S (COMPARED TO THE 1990S), MULTI-MODEL AVERAGE FOR (LEFT) RCP4.5 AND (RIGHT) RCP8.5

Overall, the average monthly temperature for the country is expected to increase by about 2.5oC by the 2050s under RCP8.5 (see Figure 7), with smaller increases on the Atlantic coast (slightly below 2oC on average), and larger increases in the east of the country. Increased temperatures are associated with an increase in potential evapotranspiration, which can contribute to water stress experienced by crops.


4°C
3°C
2°C
1°C
0°C
Temperature
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Month


4°C
3°C
2°C
1°C
Temperature

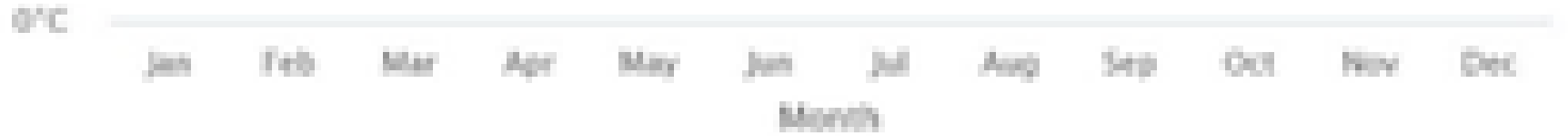
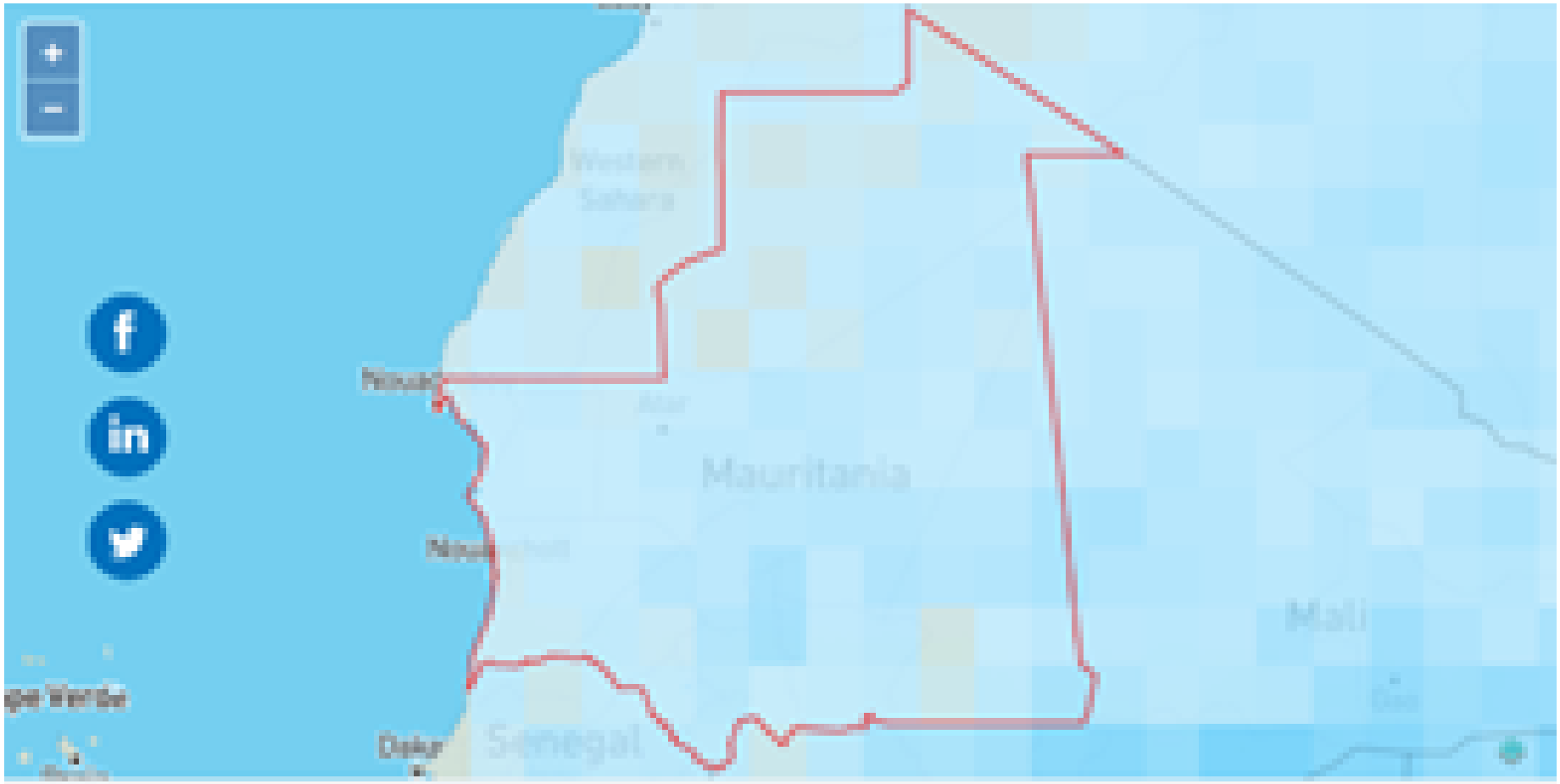


FIGURE 7 PROJECTED MEDIAN CHANGE IN THE AVERAGE MONTHLY TEMPERATURE IN MAURITANIA FOR THE 2050S (COMPARED TO THE 1990S), AND THE 10-90TH PERCENTILES (SHADED AREA) OF DIFFERENT CLIMATE MODELS FOR RCP4.5 (LEFT) AND RCP8.5 (RIGHT)

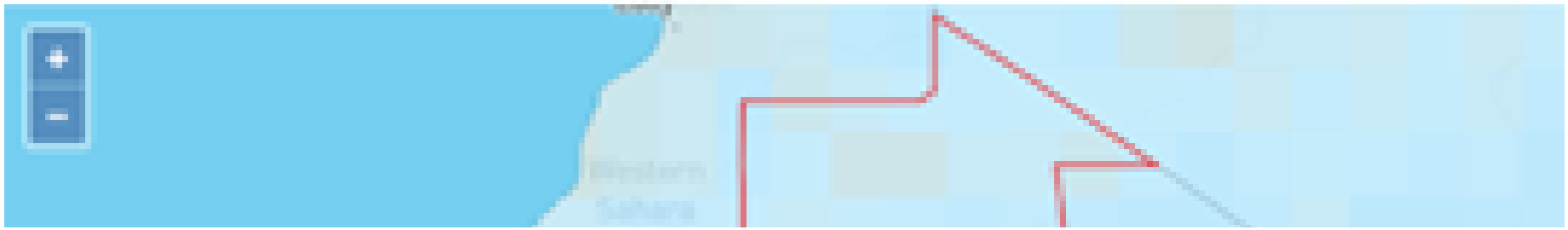
Flood dynamics

The intensity of the rains can be used as a proxy for the potential for flooding. In general, the different regions are expected to experience a difference between -5mm and 5mm of rainfall on the day of the year with the maximum total rainfall (Figure 8). For Akjoujt and Boutilimit (the two stations where data is available in the area of intervention), the intensity of rainfall (maximum daily rainfall) is expected to increase towards the end of the rainy season and decrease at the beginning (Figure 9). Changes in flood risks associated with climate change are therefore unclear.



MAXIMUM DAILY RAINFALL (MM)

-20 -10 -5 0 5 10 20 30 40 50 60 70



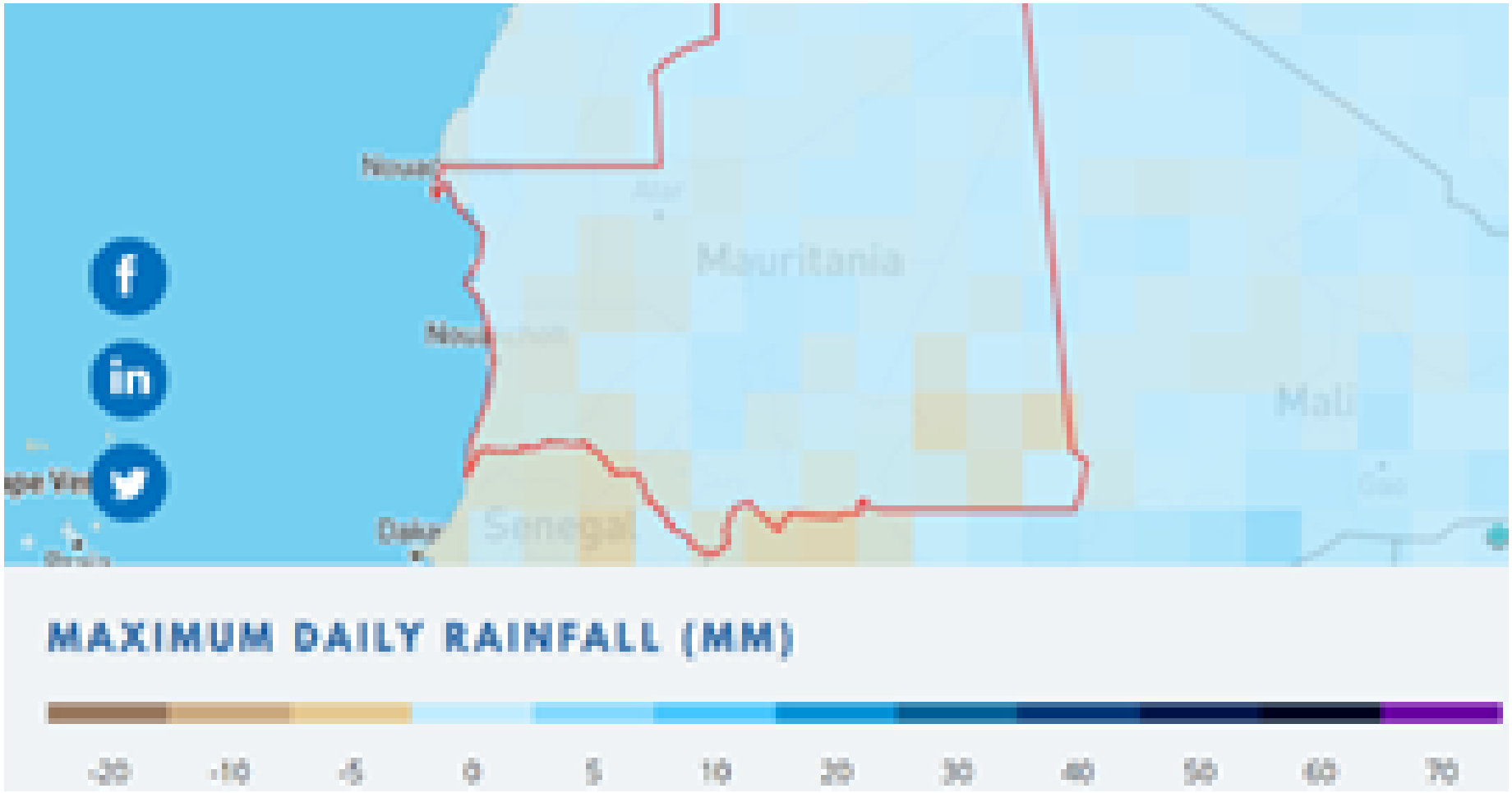
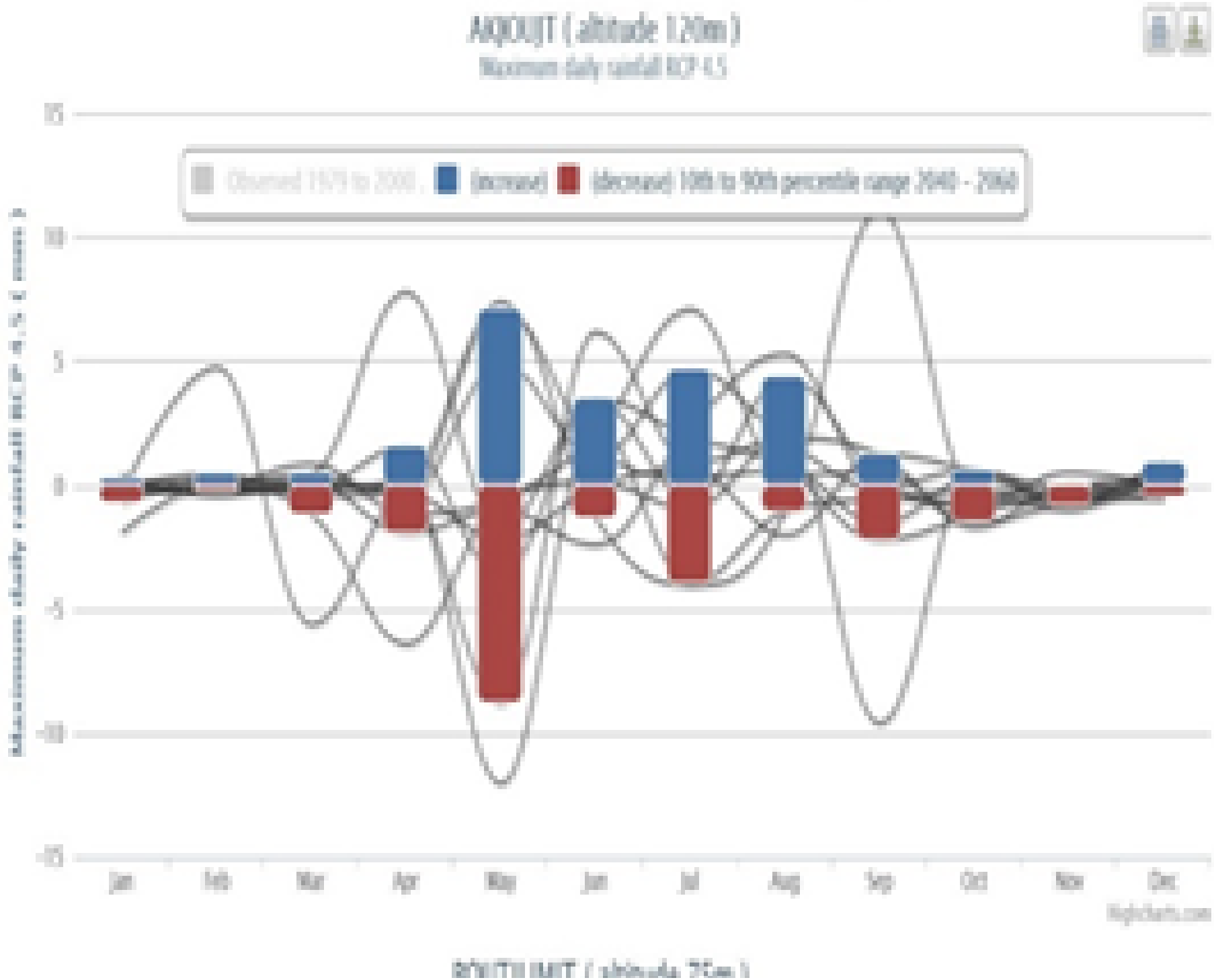
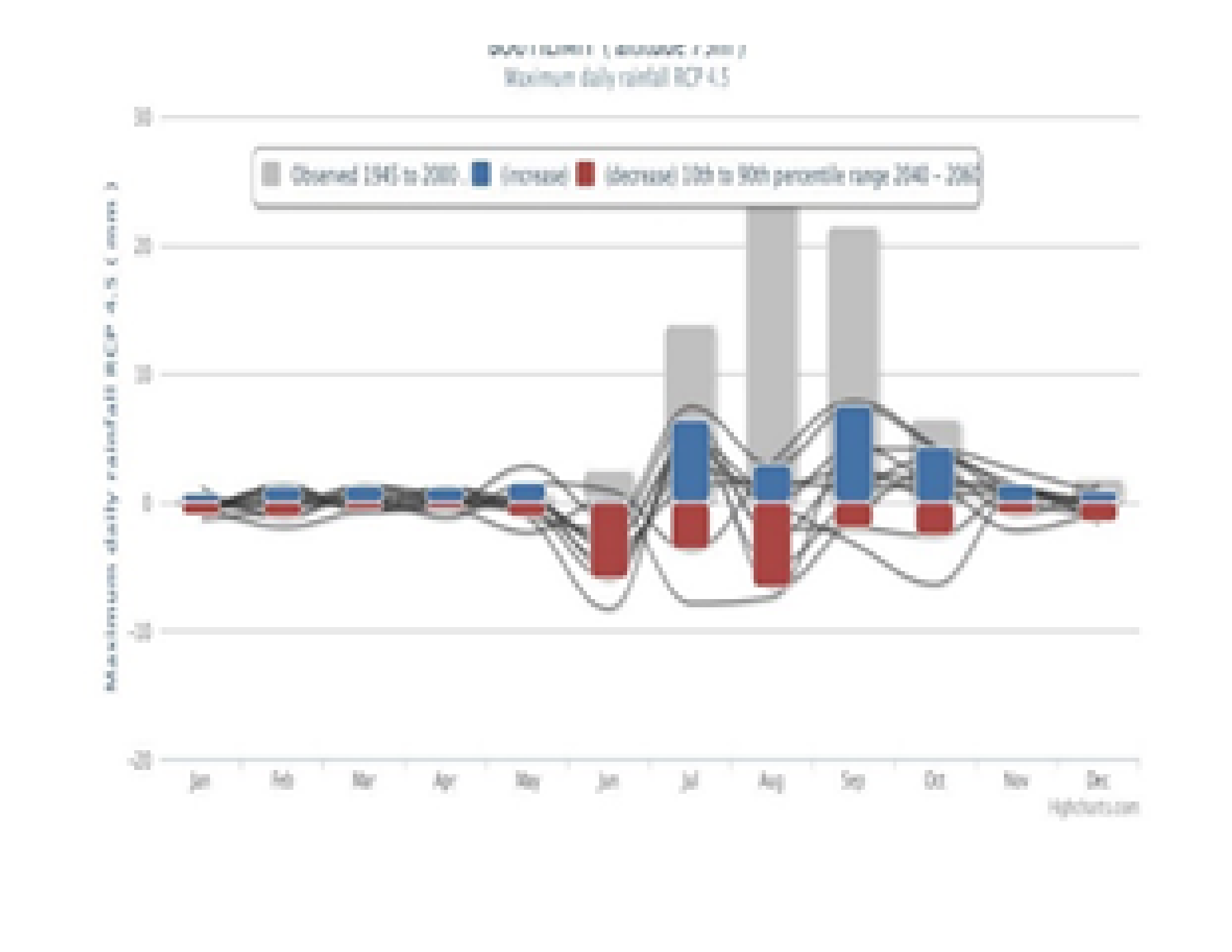
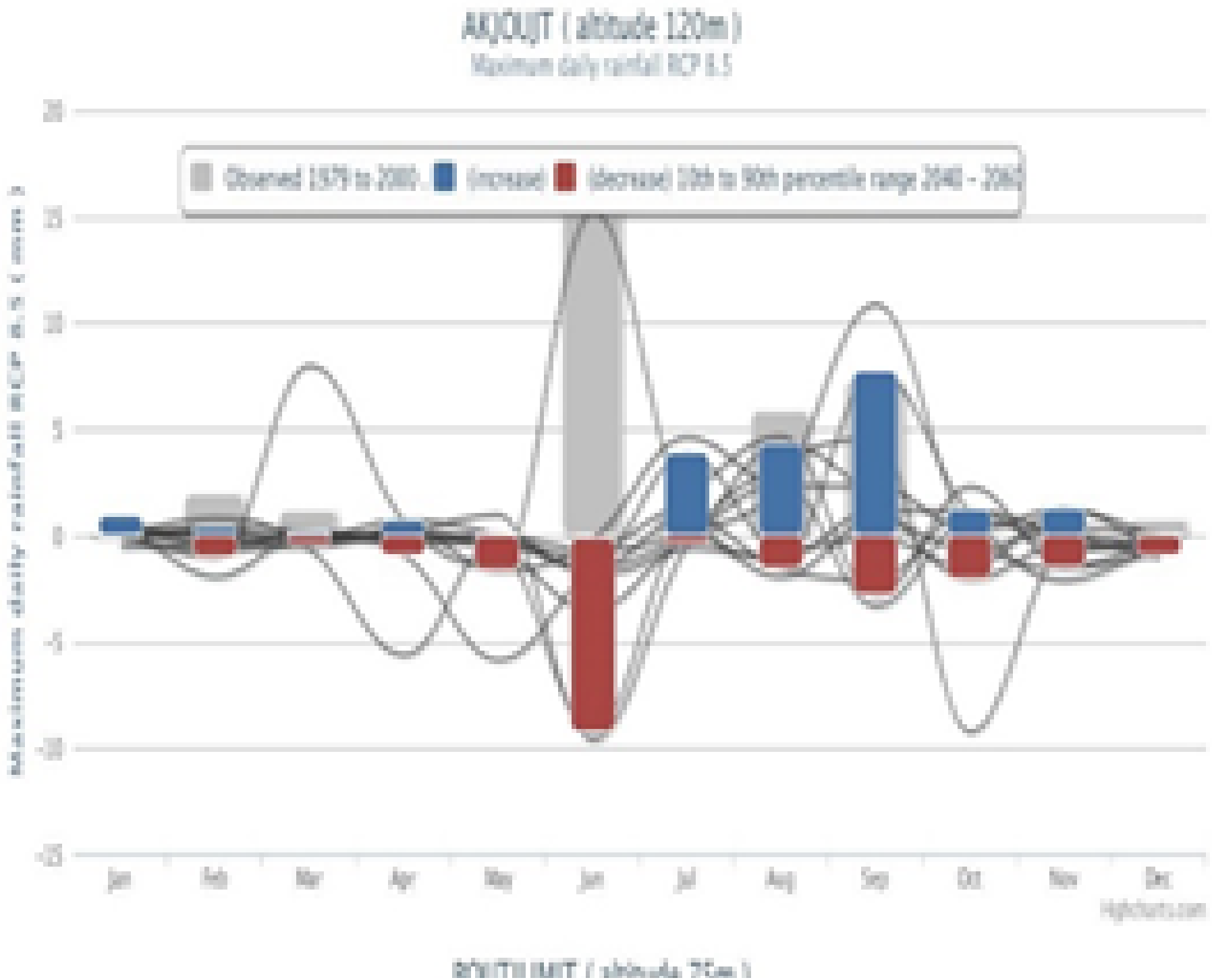


FIGURE 8 PROJECTED CHANGE IN MAXIMUM DAILY PRECIPITATION FOR MAURITANIA FOR THE 2050S (COMPARED TO THE 1990S), MULTI-MODEL AVERAGE FOR RCP4.5 (LEFT) AND RCP8.5 (RIGHT) .


Observed 1970 to 2000
(increase)
(decrease) 10th to 90th percentile range 2040 - 2060
15
10
5
0
-5
-10
-15
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Maximum daily rainfall RCP 4.5
Observed 1945 to 2005
Increase
Decrease
10th to 90th percentile range 2040 - 2065
Maximum daily rainfall RCP 4.5 v mm
30
20
10
0
-10
-20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Highcharts.com


Maximum daily rainfall RCP 8.5 (mm)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

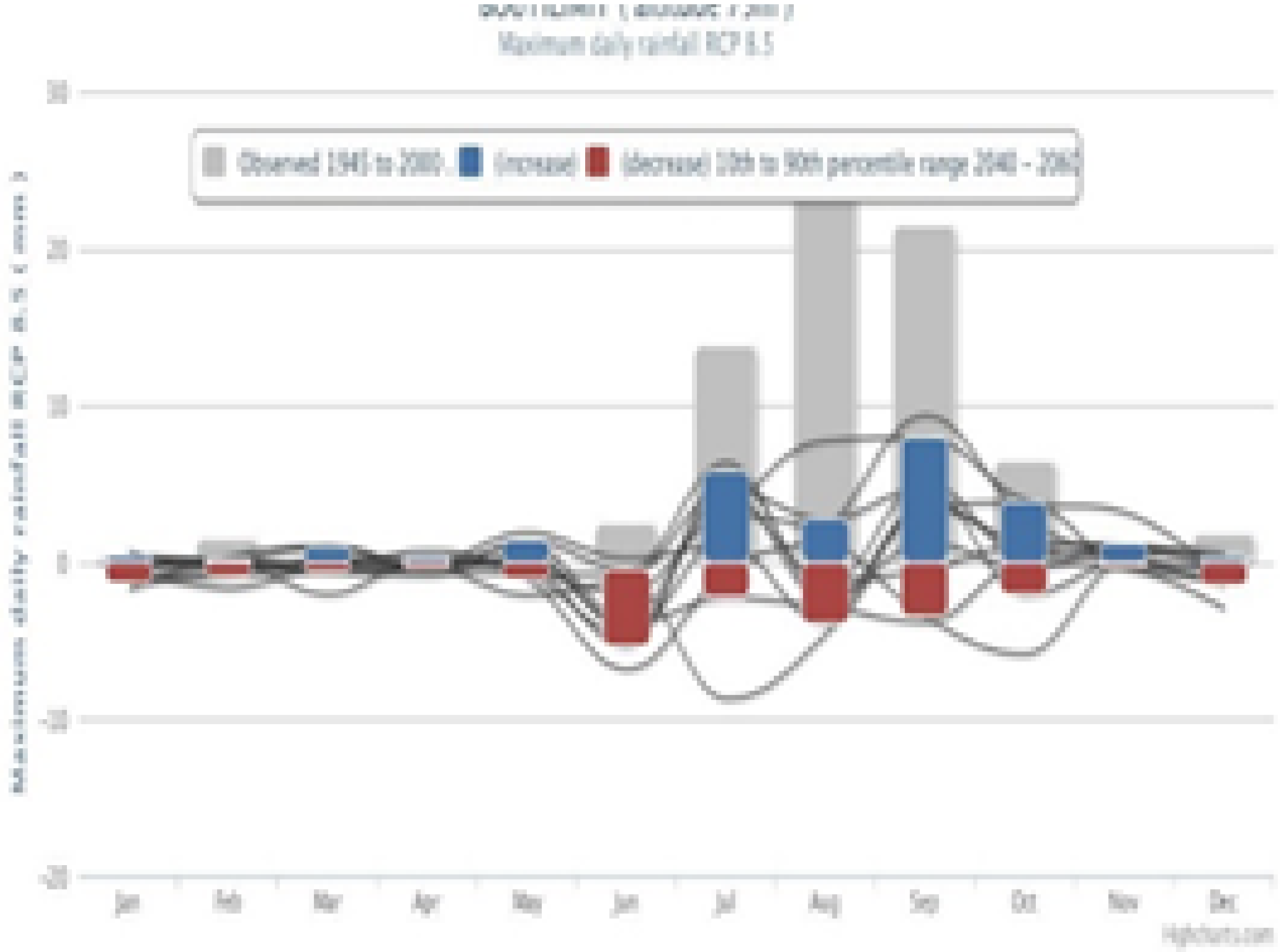


FIGURE 9 PROJECTED CHANGE IN MAXIMUM DAILY PRECIPITATION FOR AKJOUJT AND BOUTILIMIT FOR THE 2050S COMPARED TO THE 1979-2000 PERIOD, OVERALL RANGE FOR RCP4.5 (TOP) AND RCP8.5 (BOTTOM) .

Other projected changes in climate

Decreases in extreme wind speeds are expected in the intervention wilayas under RCP8.5, ranging from 0 to 10% by the end of the 21st century .

Finally, according to the 5th IPCC report, median values for global mean sea-level rise would be in the range of 24 to 30 cm, depending on the different emissions scenarios (range from RCP2.6 to RCP8.5) for the 2050s relative to the period from 1986-2005. By 2100, the median increase would be even more worrying and would range from 44 cm and 74 cm.

Climate change impacts on ecosystems and livelihoods

Dune mobility and encroachment

The intrusion of sand dunes into built infrastructure and oases is a phenomenon observed in all three targeted wilayas, with regional differences in the scale and severity of the problem. While some areas (such as the towns of Benichab, Aoujeft and Chinguetti) face direct and immediate threats of dune invasion of urban infrastructure (roads, houses, public buildings) and of stands of palm trees (oases), others face a more latent threat. Direct observations and consultations with local governments during the PPG process resulted in the inventory of at least 650 hectares of dunes invading oases and infrastructure in and around the 8 targeted project sites.

In addition to the impacts of more frequent and intense droughts, the mobility of the dunes is also exacerbated by overgrazing and unsustainable exploitation of groundwater (for irrigation purposes in oasis production systems in particular), which lead to a reduction in vegetation cover in some areas .

When sand dunes invade an oasis, they cause significant damage to palm stands, water wells and irrigation infrastructure, sometimes resulting in partial or complete abandonment of the date production site. This was observed during the field missions in Chinguetti, Tawaz, Aoujeft, Ajouer and Boutilimit. Dune encroachment reduces the availability of forage when sand invades pastoral areas. In urban and suburban areas, entire neighbourhoods are sometimes relocated, as is observed in Chinguetti, Benichab and Atar. According to the mayor of Aoujeft, local governments in dune regions spend a large part of their budget on clearing sand from roads and protecting residential areas.

Decrease in water availability

Increased frequency and duration of droughts will result in a decrease in the availability of water resources. The sites of Benichab, Aoujeft and Chinguetti all sit on top of large groundwater tables which, according to local stakeholders, seem to provide sufficient reserves to support future urban expansion, even under the projected conditions of reduced rainfall. In general, however, the overexploitation of groundwater reserves by the population, without measures to assist recharge, will lead to a decrease in groundwater, and increase vulnerability to climate change.

In date production in Adrar, water potential in some oases is already overexploited with the frequent use of motor pumps (see above). In some oases, date farmers are forced to deepen their wells every 3-4 years. The decrease in the availability of water will lead to the abandonment of some oases, partly or completely, after the date palms dry out. Detailed hydrological and technical studies (output 2.1) are needed to inform the current availability of water and project trends according to current and future needs for water taking into account population growth (migration) and climate change.

Overall reduction in vegetation

Mauritania faced over the last 40 years an intense vegetation cover reduction and desertification process (see Project Document for further details). Uncontrolled grazing in unprotected (unfenced) palm groves, horticultural plots and tree plantations in the two most arid wilayas (Adrar and Inchiri), contribute to the reduction of vegetation.

In addition to dune encroachment, the loss of vegetation and soil cover also contributes to soil degradation and exposes the soil to different types of erosion: wind erosion, rain erosion (impact of raindrops affecting soil structure) and run-off (riverbank) erosion .

Soil degradation and erosion

Extreme events such as heavy rainfall cause soil degradation by increasing the rate of erosion, especially in areas with low vegetation cover. As a result, heavy rains on degraded land lead to further reductions in agricultural yields and productivity in traditional agricultural sectors: livestock and date production. Soil degradation is further exacerbated by overgrazing.

In summary, these impacts have resulted in increased water and food insecurity, increased poverty and reduced income security, as well as heightened social conflicts over the use of natural resources, resulting in turn in increased human pressure on already degraded natural resources, in a vicious circle. Climate change projections suggest that these impacts may worsen in the near future.

Root causes

Poverty

In 2015, Mauritania's Human Development Index (HDI) score was 0.51, ranking it 157th out of 187 countries. While poverty has declined significantly since 2008, in 2014, 31% of the population still lived below the national poverty line and 5.6% of the population lived below the international absolute poverty line of US$ 1.90 (in purchasing power parity).

Overall poverty, and particularly that of women and the landless (ex-slaves), is still high in the arid wilayas targeted by the proposed project. Adrar is one of the poorest wilayas in the country, with a poverty rate of 36.9% as of 2014. In Inchiri, the poverty rate has fallen from 31.7% in 2008, and reached 23.7% in 2014. Finally, in Trarza, the average poverty rate was 32.2% in 2014 compared to 37.1% in 2008. There are however major disparities between urban and rural areas, with rates of 16.7% in cities versus 44.4% in rural areas. In these targeted wilayas, a large majority of the population depends on the primary sector for its livelihood. Based on partial data from the Institute of Statistics, formal and informal employment in the agricultural sector (including processing) account for between 65% and 85% of the total labour force .

Population growth

According to the World Bank, Mauritania's population was estimated at 4.4 million in 2018, with annual population growth of about 2.8%. The population is expected to double every 28 years. This demographic shift is driven by a high birth rate (32.31% in 2013) and a mortality rate of 10.90%.

Sedentarisation

Nomadism was once a central aspect to life in Mauritania, but since its independence in 1960, the country has experienced a rapid sedentarisation of its nomadic population. Nomads accounted for 75% of the total population in 1965, but only 6% in 2000 . Sedentarisation has been taking place in response to varying climatic conditions, including the severe droughts of the 1970s, but also as a result of the transformation of the country's political economy over time. Sedentarisation is one of the main adaptation strategies of the populations in the arid regions of Mauritania, resulting in more people exploiting the same ecosystems for services and goods, especially

in the poorer neighbourhoods in the regional towns. As a result, sedentarisation is leading to environmental degradation and conflict in the peri-urban, urban and green oases where nomads are settling. The overexploitation of natural resources in oases and suburban areas (see below) is also exacerbated by the increasing influx of families abandoning their nomadic lifestyles.

Direct non-climate drivers

Unsustainable use of natural resources

The overexploitation of ecosystems is a direct result of the over-reliance of the poor and landless on these systems and the ecosystem services they generate (water, food, soil fertility, etc.) , but also of the limited knowledge of how ecosystems function and how humans can strengthen and restore ecosystem and the delivery of their services. As discussions during the PPG-phase field missions demonstrate, people reliant on natural resources in these wilayas tend to exploit existing natural resources to a maximum before modifying their livelihood strategies.

In terms of water use, continuous pumping at solar-powered wells and boreholes creates large water losses, as was noted by several agricultural producers and public servants during the PPG phase consultations. As users are no longer impacted by the direct cost of energy needed for pumping, these facilities are often left in continuous operation (between sunrise and sunset), resulting in the overexploitation of underground water supplies for inefficient water use.

There is limited infrastructure in place for harvesting rainfall during regular and heavy rains, and for storing and distributing it during periods of drought to cope with decreased and increasingly variable rainfall. There has also been little investment in water speed deceleration infrastructures that increase infiltration, as well as in check dams, reservoirs and other types of water collection and storage infrastructure. Large volumes of water flowing cause considerable soil erosion and a high risk of flash flooding .

Water resources are not well managed in many oasis and peri-urban areas, as was observed during the PPG phase, and overexploitation of water resources is a direct consequence. Women's cooperatives have access to water infrastructure, but rely mainly on gravity-fed irrigation (only a few cases of drip irrigation were observed in the three wilayas) and discussions with producers revealed challenges due to water scarcity, but also due to water distribution and governance issues.

Limited livelihood options

In the target wilayas, income-generating activities tend to focus on a few activities, mainly date production and camel herding, which are typically male-dominated activities. Alternative activities, such as horticulture, small animal farming (chicken, goat), development of gum arabic and other non-timber forest product (NTFP) value chains, are beginning to gain prominence, but still lack the technical and commercial support needed to become viable and competitive sectors. In addition, income-generating activities tend to be very basic, with little value addition. Moreover, these rural activities rarely exploit the economic opportunities offered by the proximity of urban areas. Women are also turning to activities that are less dependent on ecosystem services, such as baking bread (from imported flour) and textile dyeing.

This limited diversification of livelihoods increases vulnerability. If climate change affects a particular income-generating activity (e.g., dates, camels), communities in the northeastern wilayas, like those in other parts of the country, are extremely affected due to the lack of alternative sources of livelihoods and income.

More information regarding non-climate drivers and climate-related challenges specific to each intervention site is presented in the Project Document.

Preferred solution

Very few interventions on adaptation to climate change have taken place in the project areas to date. The preferred strategy therefore aims at creating broad and sustainable adaptive capacity to identify, plan and implement adaptation measures, with an emphasis on ecosystem-based adaptation (EbA) approaches. The project takes an essentially regional and local approach (as opposed to interventions at the national level) in order to optimize and concentrate project resources, and to best complement other recent and ongoing initiatives. The project aims to strengthen a wide range of aspects that contribute to adaptive capacity (institutions, knowledge, innovation, access to information and assets).

The preferred solution is to increase the local and regional adaptive capacity of the populations of the arid wilayas of Mauritania (Adrar, Inchiri and Trarza) by strengthening local and regional institutional capacities and improving access to innovation, technical know-how and knowledge. This will enable the introduction of ecosystem-based adaptation (EbA) approaches to reinforce the ecosystem functions of desert, oasis and wadi ecosystems, so that they can better contribute to the resilience of local populations to the impacts of climate change.

This approach will be implemented under four complementary outcomes:

(i) Increased technical and institutional capacity for climate change adaptation - in particular EbA - in arid ecosystems.

This component will contribute in the first place to more comprehensive and granulated knowledge of climate change vulnerabilities at the local and regional level in the three wilayas as well as the eight project sites. Secondly, the public sector's capacities will be strengthened in order to understand and integrate climate change and adaptation considerations into regional and local development planning. Private and civil society stakeholders as well as local associations will also be trained in technical and ecosystem-based adaptation solutions to climate change.

(ii) Enhanced sustainable access to and efficient use of water for increased drought-resilience of local communities and ecosystems.

This component will focus on planning and implementing sustainable adaptation solutions in terms of access to water, water-use efficiency and improved collective water management. Current water distribution and application technology will be combined with improved local hydrological knowledge and increased technical and water management capacities among water users.

(iii) Improved protection, productivity and diversification of livelihoods for increased resilience of local communities and ecosystems to droughts, desertification, heavy rainfall and floods.

The third component's approach is based on the strengthening of resilience and the protection of existing livelihoods against desertification, wind, droughts, floods and erosion, as well as on the introduction of new livelihood options in terms of income-generating resilient activities. Combined solutions creating protection and food production (NTFPs, agroforestry, small ruminants) will be prioritized. In order to produce the plant material that will allow to pursue these goals, regional nurseries will be created, operated by local women cooperatives.

(iv) Strengthened knowledge on climate change and adaptation - particularly EbA - in arid ecosystems.

Finally, through the fourth component, the LDCF project will generate and disseminate climate change knowledge and insights for the arid regions of Mauritania relevant for policy-makers (publications) and practitioners (handbooks). Regional information and training centers will be established in each of the three wilayas to provide information on climate change and adaptation options to local populations, raise awareness and build local capacity.

Barriers

The preferred solution includes components (specifically under outcomes 1 and 4), for addressing several technical, institutional and financial obstacles to climate change adaptation in the three targeted wilayas:

- Limited institutional capacity to plan and implement EbA strategies and initiatives;
- Limited integration of EbA strategies into development and land-use planning;
- Limited knowledge and management capacity for efficient and equitable water management at association level; and
- Limited access to evidence-based knowledge on EbA practices and strategies and to technical and financial support to implement EbA measures.

Limited institutional capacity to plan and implement EbA strategies and initiatives

To start with, the existing information, planning and institutional environments in the three wilayas are not conducive to climate change resilience. There are crucial information and planning gaps, at both regional and local levels. There is limited awareness and knowledge on the impacts of and vulnerability to climate change. An informed common vision on these aspects in the form of a clear assessment of impacts and vulnerabilities has not yet been built in these wilayas. Information on loss and damage is not available, nor are granulated vulnerability assessments for these wilayas and communities. The project entitled "Enhancing Resilience of Communities to the Adverse Effects of Climate Change on Food Security in Mauritania" (PARSACC) financed by the Adaptation Fund conducted detailed and participatory climate change vulnerability assessments in remote villages, but not in the project target areas.

Due to limited experience in the design and implementation of climate change projects, particularly those focused on promoting EbA approaches and managing droughts and water scarcity, policy-makers, regional delegates, mayors and local councils are unable to effectively plan for sustainable development at the national and local levels. This is particularly true for cross-sectoral issues, such as sustainable management of natural resources and adaptation to climate change. For example, government staff have not received training in the design and implementation of EbA interventions. This was observed during consultations and workshops with stakeholders during the PPG phase of the proposed project, with a large majority of government stakeholders not understanding the approach. As a result, government staff do not have the capacity to implement EbA interventions to reduce vulnerability to climate change in Mauritania.

Local delegations (DREDD) of the MEDD are active and appreciated partners by regional authorities and regional representations of other ministries. However, their action radius is restricted due to a lack of infrastructure (office, cold storage for plants, irrigation water) and operational budget (for public transportation of the delegates, for example). The mayors' offices and Walis visited during the first data collection mission as part of the PPG phase were in agreement on desertification and problems related to water availability in their growing urban hubs. Despite increased human pressure due to natural population growth and rural-urban migration, including the sedentarisation of nomads , strategies for the sustainable use of natural resources have not been widely designed and implemented to conserve the extremely fragile ecosystems of the three target wilayas, in particular considering the additional stress caused by climate change. Water management plans are rare, whereas pasture and forest management plans to factor in climate change do not exist in the targeted cities and oases, except for the Oasis of Thengarada in Tawaz municipality. Resource-use conflicts between livestock and agriculture, and between tribes have not been managed through participatory small-scale resource management plans. Studies have not been conducted to assess the economic value of ecosystem services and natural resources.

There is also a lack of ecological codes of conduct to incentivize sustainable use of natural resources. Complementary strategies to protect forests have not received great attention in the target areas. In the absence of general climate change assessments and planning, environmental impact assessments that would factor in climate change are not conducted for infrastructure projects in the target area.

Limited integration of EbA strategies into development and land-use planning

Urban (or watershed) plans have been recently developed at almost all the project sites, but while they include some risk reduction activities, adaptation to climate change has not been included in these plans. There is no urban plan in Aoujeft. In this context, planning decisions are often made without incorporating information on climate change risks. For example in Aoujeft, houses are built in low-lying areas because they are cooler, regardless of the fact that these areas are highly prone to flooding. In addition, existing local development plans (PDL) do not take into account the links between urban and rural areas which, as explained above, are important from a climate change adaptation perspective. Existing plans have not involved robust participatory processes, engaging all relevant stakeholders including municipalities, associations for participatory oasis management (AGPO) and populations, which have limited awareness. In this context, there is little coordination between those working in climate change-related activities in each of the eight target areas.

Limited knowledge and management capacity for efficient and equitable water management at association level

At the local level, associations, cooperatives and other grassroot organisations are mainly focused on value chain strengthening: production, storage and marketing of agrifood products, and little on fair and efficient water management. Water distribution is managed on a “first come, first served” approach, which leads to farmers closer to the water provision or storage infrastructure (those with more influence) obtaining larger flows of water, and having access to better technology to cover larger areas of land. Water distribution is arranged organically, which often leaves the most vulnerable with reduced water flows: young farmers, farmers with leases (landless farmers), women, and recently sedentarised farmers.

Since there is no objective accounting to monitor and manage collective and individual needs and water availability (current and projected), agreements between users are informal, short-lived and a potential source of conflict. Indeed, during the PPG phase, discussions with association staff and leaders revealed that the organic nature of water management in these regions leads to conflicts between users and groups of users. The absence of collective water management based on inclusive governance, quantitative parameters, internal regulation and healthy financial management, is therefore a major barrier to the successful and sustainable implementation of water provision, storage and distribution infrastructure.

Limited access to evidence-based knowledge on EbA practices and to technical and financial support to implement them

Knowledge on cost-effective ecosystem-based adaptation measures is often limited, including on integrated land rehabilitation and dune stabilization techniques, integrated water resource management and water technologies, resilient crop and tree species, and possible non-traditional sources of income. Economic assessments of adaptation options have not been carried out in the country or in the three targeted wilayas. For example, there is limited clarity on which strategies could be more efficient in increasing water availability in each project site, given the specific climate projections.

Technical knowledge is sometimes well developed in an oasis or a regional city, but poorly established or absent in others. This is the case for knowledge on species for reforestation (present in Benichab, among others, due to the SCCF-funded EbA South project), dune stabilization (present in Aoujeft) and drip irrigation (practiced by some of the cooperatives visited in Chinguetti). The exchange of technical and commercial knowledge seems to be lacking.

Some of the project sites can rely on local expertise on specific techniques and practices, such as in Benichab (on drought-resistant species and water-efficient planting techniques) and Aoujeft (on cost-effective dune stabilization), but lack the overall strategic and analytical capacity to intervene on a territorial, integrated scale.

Communities facing climate change have a lack of practical experience to handle climate change. Access to the evidence-base for adaptation options is very weak and EbA measures are not implemented. Best EbA practices are rarely transferred from pilot sites and scaled out to larger areas. Moreover, lack of technical and financing support for the implementation of best practices is a key barrier to their uptake, making local communities increasingly vulnerable to the impacts of climate change.

Baseline scenario and associated baseline projects

The baseline scenario, as it relates to each outcome of the proposed project, is described below.

Outcome 1: Stakeholders demonstrate increased technical and institutional capacity for climate change adaptation – particularly EbA – in arid ecosystems

Baseline scenario

There have been few initiatives to supporting adaptation to climate change in the arid regions of Mauritania to date, with past and ongoing LDCF and other projects mainly implemented in the semi-arid and Saharo-Sahelian southern regions of the country. Demonstration and knowledge of appropriate adaptation interventions in the area targeted by the project are therefore limited. Comprehensive climate change impact and vulnerability assessments have not been undertaken in the three wilayas, and there has been no systematic identification of adaptation options. This limits the adaptability of communities and local authorities to climate change in Adrar, Inchiri and Trarza.

The Mauritanian government has recognized the imminent negative effects that climate change will have on the local communities and natural ecosystems of the country and has taken decisive steps to integrate climate change adaptation into the institutional frameworks and national policy. However, the institutional framework is currently in a nascent phase, most climate policies are in the process of developed, and not devolved and/or decentralized yet. For example, the National Adaptation Plan (NAP) process was launched in April 2019 and is currently underway.

At the local level, the DREDDs (Regional delegations for environment and sustainable development) are mandated to lead and coordinate MEDD's interventions in the wilayas. DREDDs are also responsible for ensuring that these interventions are aligned with the existing policies, strategies and plans in the environmental sector. However, although mandated to plan and implement actions in the area of environment and climate change, the DREDDs do not have the material resources, human capacity or technical knowledge to fulfil this role. Similarly, other local authorities such as the regional commissions and delegations (CREDD, CRD and DRHA, DRDR), civil society organisations (NGOs), local cooperatives and producer organisations as well as the private sector (including the extractive industries), which will be involved in the project implementation, lack knowledge on local climate change and vulnerabilities and technical know-how for planning and implementing adequate adaptation measures.

Without the proposed interventions of the project, technical and institutional capacities will remain weak and adaptation to climate change (and in particular EbA approaches) in arid ecosystems will continue to suffer from technical deficiencies. Among other things, the government does not have the technical capacities to undertake vulnerability analyses, and it is therefore impossible to prioritize adequate response measures at the level of the targeted wilayas. Interventions may therefore not be based on a sufficient understanding of local vulnerability.

Without project interventions, good practices and evidence will not be available to demonstrate the benefits of adaptation (including EbA) approaches, and the communes will therefore not consider them in local planning. Similarly, regional institutions will also not be able to integrate adaptation responses in their work or take advantage of EbA approaches. Climate change considerations and proven adaptation (including EbA) measures and guidelines will not be integrated into existing or future regional and local development plans.

Outcome 2: Enhanced sustainable access to and efficient use of water for increased drought- resilience of local communities and ecosystems in the wilayas of Adrar, Inchiri and Trarza

Baseline scenario

Currently, climate change and unsustainable use of water are severely impacting water availability in the areas targeted by the project. Reduced frequency of seasonal rains and droughts are affecting underground water reserves, especially in Adrar, where groundwater reserves are local and smaller than in Benichab and Aoujeft, for example. Uninformed local cooperatives and associations intensify their exploitation of natural resources (digging deeper wells, using more water), without being aware of the possibility of these resources to become depleted. Important water losses are caused by the continuous pumping at solar-powered wells and boreholes. As users are no longer impacted by the direct cost of energy needed for pumping, these facilities are often left in continuous operation (between sunrise and sunset), resulting in the overexploitation of underground water supplies. Water-use efficiency is also low, with most users applying flood irrigation, leading to considerable losses of water through evaporation. New wells are also installed without studies taking water availability and climate change projections into account.

Associations of date and vegetable producers generally have an existing but limited access to water resources, and are organised around productive activities (collective harvesting, marketing). Water distribution is based on proximity to the water source, social influence and wealth (land area per user). This leads to unequitable distribution of water and the persistence of social and economic inequalities, especially with regards to vulnerable groups. Equitable water management and distribution schemes are rare and access to irrigation technology (drip irrigation) limited.

Without the project's interventions, it will not be possible to meet the growing demand for access to clean water, including for humans, animals and crops. This will also result in an additional burden for women in particular. In addition, without appropriate technologies to increase the efficiency of water use, there will be a continued waste of water resources. Water governance, distribution and management systems are deficient, and local communities do not have the knowledge or capacity to implement appropriate adaptation measures.

Mauritanian Copper Mines' (MCM) current community projects in Inchiri focus on agriculture, pastoralism, water mobilization and capacity building, but have so far not integrated climate change impacts and adaptation considerations in the planning and implementation of their interventions. The Sustainable Oasis Development Project (PDDO) is implemented by the International Agricultural Development Fund (IFAD), and aims at the general development of Mauritania's oasis regions through an integrated approach, combining improvements in water and energy solutions and capacity building, with a focus on date palm cultivation. However, the sustainability of this project remains vulnerable to the impacts of climate change, including the effects of intensified desertification.

Outcome 3: Protection, productivity and diversification of livelihoods enhanced through EbA and small-scale infrastructure interventions to increase climate-resilience in the wilayas of Adrar, Inchiri and Trarza

Baseline scenario

The intrusion of sand dunes in infrastructure and oases is a phenomenon observed in all three targeted wilayas, with differences between the regions with regards to the scale and the severity of the problem. Between 1975 and 2013, two of the most widespread natural vegetation cover types and important pasture grounds, steppe and Sahelian short grass savanna, were affected by the largest losses in terms of area. Almost 19,000 km2 of steppe was lost between 1975 and 2000, and over 15,000 km2 between 2000 and 2013. For Sahelian short grass savanna, these figures amount to over 12,000 km2 from 1975 to 2000 and almost 11,000 km2 from 2000 to 2013. Steppe gave way to large swaths of sandy areas. Local observations done during the PPG process allowed to identify at least 650 hectares of dunes invading oases and infrastructure in and around the 8 targeted project sites.

Extreme events such as heavy rainfall cause soil degradation by increasing the rate of erosion, especially in areas with low vegetation cover. As a result, heavy rains on degraded land lead to further reductions in agricultural yields and productivity in traditional agricultural sectors: livestock and date production. These impacts have resulted in increased water and food insecurity, increased poverty and reduced income security, as well as heightened social conflicts over the use of natural resources, resulting in turn in increased human pressure on already degraded natural resources, in a vicious circle. Climate change projections suggest that these impacts may worsen in the near future.

In addition to the impacts of climate change, dune mobility is also exacerbated by the unsustainable exploitation of water tables as well as by overgrazing in some areas, which lead to a reduction in vegetation cover. Where sand dunes invade an oasis, they cause important damage to date palm stands, water wells and irrigation infrastructure, sometimes leading to partial or complete abandonment of the date production site. This has been observed especially in Benichab (where the old city has been displaced because of dune invasion), in Aoujeft, in Chinguetti, and in Akjoujt. Dune encroachment reduces availability of forage when sand invades already degraded pastoral areas. Local governments spend large amounts of their budget on road clearing and protection of residential areas.

Dune stabilisation projects implemented to date have led to the stabilisation of only a fraction of dunes threatening human settlements and livelihoods in the 8 project sites. Local beneficiaries and authorities have confirmed that additional resources are lacking in order to address the urgent threat from dune invasion in all project sites.

Currently, there are no records of established nurseries in the three targeted wilayas. All plantations (dune fixation, greenbelt plantations, agroforestry systems, live fences) are carried out with plant material from Nouakchott, which increases tree mortality rates during transportation. Moreover, Nouakchott nurseries produce little plant material adapted to the arid ecosystems, let alone material adapted to future climate conditions.

Traditional livelihoods are currently under pressure: date production suffers from drying of water wells and groundwater tables whereas camel breeding is affected by loss of pastoral land and forage production. Alternative activities, such as horticulture, small animal breeding (chicken, goat), Arabica gum and other Non-Timber Forest Products (NTFP) valorization, seed production, medicinal plants and fish drying are starting to gain importance, but still lack the technical and commercial support needed for them to become viable and competitive sectors. Furthermore, income-generating activities in the project areas tend to be very basic, with little value addition. These rural activities also rarely exploit the economic opportunities provided by the proximity to urban areas.

Outcome 4: Stakeholders demonstrate strengthened knowledge and action-oriented attitudes on climate change and adaptation approaches (particularly EbA)

Baseline scenario

There is little information available on climate change in Mauritania, and even less on EbA practices in arid areas. At present, regional and local government, as well as local communities, have limited awareness and knowledge on climate change adaptation and the benefits of an EbA approach. EbA interventions have seldom been implemented in arid ecosystems of Mauritania (with the exception of the EbA South project), 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. Moreover, there are no communication or dissemination strategies providing such information to stakeholders in the three target wilayas.

Mauritania is not in a position to make sufficient investments in education, especially at the tertiary level (the share of higher education in public education expenditure is less than 15%, one of the lowest rates in Africa). This has also hindered the development of scientific materials in the country, and the integration of these materials into current decision-making processes is therefore not considered as a priority. Although higher education courses cover issues related to natural resource management, the quality of this education is currently difficult to measure. Therefore, scientific publications on the adaptation in the local context remain rare, particularly with respect to EbA approaches.

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 hamper efforts to improve the climate resilience of rural communities in the arid regions of Mauritania.

Co-financing plan

The proposed project LDCF will benefit from several sources of co-financing, which will increase the impact of the LDCF funds. These sources of co-financing are: the investments planned by the national government under the Awleigatt National Park (PRCPNA) (US$ 7,200,000), contributions from the Ministry of Environment and Sustainable Development (MEDD) (US$500,000), the community projects of the Mauritanian Copper Mines (MCM) (US$ 1,000,000), the National Meteorological Office (ONM, US$ 300,000), and the contribution of the PDDO programme (US$ 110,000). In addition, the Project Agropole Maraicher of Benichab (PAMB) will provide a co-financing of US$ 1,940,000, while the GCF Readiness Program will provide a NAP project co-financing of US$ 2,670,374.

The **Awleigatt National Park ecological capacity building project (PRCPNA)** is funded by the Mauritanian Government (GoM). It was launched in 2018 and with a funding of US$ 7.2 million, entirely from the Mauritanian government budget. The Awleigatt National Park is located less than 100km from the city of Boutilimit, in the wilaya of Trarza. The project aims, inter alia, at raising awareness and promoting environmental education, research on semi-arid and arid ecosystems, as well as at the socio-economic development of communities bordering the Park, promoting ecotourism, and the establishment of a phyto-zoological complex. The proposed LDCF project will first disseminate through its trainings the valuable knowledge the PRCPNA will generate on native plants of the country's arid regions, for ecosystem restoration, protection, and stabilization against desertification and extreme climate events. Furthermore, the Awleigatt National Park management is currently not based on a sound and comprehensive vulnerability assessment and its planning is not fully taking climate change considerations into account. The PNA actions on arid land restoration will also remain within the PNA boundaries and further efforts are needed to cover larger areas. Therefore, the PRCPNA will benefit from the LDCF project interventions relating to the integration, through training and planning support, of climate change considerations and EbA interventions into its strategic planning. Its territory and communities will be taken into account in the vulnerability assessments conducted under Output 1.1. And finally, the LDCF project will implement complementary EbA interventions in areas close to the PNA that will complement its own restoration activities.

Mauritanian Copper Mines (MCM) is a copper and gold company owned by First Quantum Ltd. that operates Mauritania's largest gold mine in the Inchiri region. As part of its corporate social responsibility, MCM implements small-scale projects in the communities surrounding its mining operations on an on-going basis. **MCM's community projects** focus on agriculture, pastoralism, water mobilization and capacity building. For example, MCM supplies water for domestic and livestock use to the communities of Benichab and Akjoujt through 21 taps along a 120 km pipeline. MCM has also rehabilitated and equipped 11 new thermal water wells and wells with new solar energy systems. To date, MCM's community projects have not incorporated the impacts of climate change and adaptation in the planning and implementation of their interventions. The proposed LDCF project will complement ongoing MCM community projects by integrating climate change adaptation approaches and interventions, including those aimed at improving water management and livelihoods (Components 2 and 3). These interventions (such as drip irrigation) will enable communities to acquire additional livelihoods through the water infrastructure installed by MCM community projects and thereby increase their resilience to climate change. EbA interventions (such as the establishment of agroforestry green belts to reduce desertification) will also be introduced in other MCM communities to improve the climate resilience of existing agricultural and pastoral interventions.

Building capacity to advance National Adaptation Plan (NAP) process in Mauritania (US$ 2,670,364; approved in 2018) is funded by the Green Climate Fund (GCF) Readiness Program, and is implemented by UNEP and executed by MEDD. The currently on-going NAP process will contribute in terms of training and awareness-raising on adaptation to climate change for public servants at the national, regional and local levels, which complement the proposed project's trainings on EbA measures. Climate modeling to be undertaken by the NAP project will contribute to the climate change and vulnerability analyses under Output 1.1 of this project. Further complementarities are found with the NAP process's intended climate information system, to which this project can contribute through its Output 1.4. The NAP process also intends to develop local planning integration guidelines, complementing this LDCF project's Output 1.3. The NAP process will contribute to the generation of new knowledge on adaptation, and will enable the curation of adaptation knowledge through an information-sharing and knowledge platform upon which this LDCF project can capitalize.

PDDO is an International Fund for Agricultural Development (IFAD) multi-phase programme, one of which will be implemented during the same period as the LDCF project. This programme aims at the overall development of the oasis regions of Mauritania through an integrated approach combining improved water and energy solutions and capacity building. The focus of PDDO is the cultivation of date palm, which is the foundation of oasis-based economies. The initial eight-year PDDO began in November 2004, following two previous oasis development projects completed in 2003. The fourth phase of the project is currently being implemented after the completion of the third phase in 2014. PDDO has therefore inherited a vast body of knowledge and experience on which its interventions were based. The project has four specific objectives: (i) to promote the effective participation of oasis populations, particularly women and youth, in the community and local development process; (ii) to strengthen the institutional framework at oasis level; (iii) to promote the sustainable exploitation of the productive potential of the oases; and (iv) to develop a network of local financial services managed by the private sector. The objectives of the PDDO are pursued through a series of actions under five components: (i) structuring oasis communities; (ii) sustainable development of oasis production capacities; (iii) development of local financial services; (iv) development of basic infrastructure; and (v) coordination, monitoring and evaluation. The total costs of the programme, estimated at US$ 38.66 million, are financed by an IFAD loan of US$ 11.41 million and by 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 (AFESD, US$ 15 million). The lead agency is the Ministry of Rural Development. Since PDDO is mainly active in the oases, the proposed project will take advantage of the knowledge gained by PDDO to disseminate it to other oases and wilayas where PDDO is not present, notably Inchiri. Conversely, the LDCF project will propose a strengthening of PDDO interventions in terms of integration of climate aspects in its implementation.

The Project Agropole Maraicher of Benichab (PAMB) is a market gardening community-level initiative being implemented in Benichab, Inchiri. It is an ongoing initiative, initiated in 2014, that has no proposed project closure date. The LDCF project will build on the results, conclusions and lessons learned of its interventions and will replicate and upscale the improved water management and irrigation technologies being implemented in market gardening in Benichab (wilaya of Inchiri) in small collective and individual market gardening areas. Although PAMB is disseminating water management and irrigation technologies, it is not tackling climate issues when it comes to water management and horticulture. The proposed project will complement PAMB interventions by providing training on adaptation to climate change and EbA interventions to PAMB's beneficiaries.

The National Meteorological Office (ONM) will provide historic weather observation data for the comprehensive climate change vulnerability analyses that will be conducted at the wilaya and local levels.

BREAKDOWN OF BUDGET BY DONOR

	US$	%
LDCF-GEF	**4,416,000**	**24.3%**
PRCPNA (Parc National d'Awleigatt)	7,200,000	39.7%
MEDD	500,000	2.8%
MCM	1,000,000	5.5%
ONM	300,000	1.7%
PDDO	110,000	0.6%
PAMB	1,940,000	10.7%
GCF-NAP	2,670,374	14.7%
Subtotal co-financing	**13,720,374**	**75.7%**
Total	**18,136,374**	**100%**

Component 1

Co-financing for Outcome 1 amounts to a total of US$ 3,771,866. It is provided by MEDD, which will contribute in staff time, in-kind material and equipment for project training sessions and workshops for a value of US$ 385,000. The LDCF project will build on the results, conclusions and lessons learned from the Project Agropole Maraicher of Benichab (PAMB - a community-level market gardening initiative being implemented in Benichab, Inchiri) interventions over the last few years and will replicate and upscale the improved water management and irrigation technologies being implemented in small collective and individual market gardening areas. Although PAMB is disseminating water management and irrigation technologies, it is not tackling climate issues when it comes to water management and horticulture. The proposed LDCF project will therefore also complement PAMB interventions by providing training on adaptation to climate change and EbA interventions to PAMB's beneficiaries. PAMB co-financing amounts to US$ 40,000 to project component 1. An additional US$ 20,000 will come from the PDDO.

The currently on-going NAP process, funded by Green Climate Fund (GCF) readiness and preparatory support programme, will contribute in terms of training and awareness-creation on adaptation to climate change for public servants at the national, regional and local levels. Training for the latter are planned for during the NAP process and will complement this project's trainings on EbA measures. Climate modeling to be undertaken by the NAP project will contribute to the climate change and vulnerability analyses under Output 1.1 of this project. The NAP process also intends to develop local planning integration guidelines, complementing this LDCF project's Output 1.3. This LDCF project will also align its upscaling strategy (Output 1.4) with the adaptation funding strategy under Output 3.2 of the NAP process. The NAP project's contribution to this component is estimated at US$ 1,607,366 in co-financing.

The PRCPNA (Projet de renforcement des capacités du Parc National d'Awleigatt) is a project aiming at structuring and strengthening this National Park created by decree n° 0178 of 05 October 2016 and located less than 100km from the city of Boutilimit, in the wilaya of Trarza. The project aims, inter alia, at raising awareness and promoting

environmental culture, at strengthening knowledge on semi-arid and arid ecosystems through research, as well as at the socio-economic development of communities bordering the Park. The proposed LDCF project will first disseminate through its trainings the valuable knowledge the PRCPNA will generate on native plants of the country's arid regions, for ecosystem restoration, protection, and stabilization against desertification and extreme climate events. Furthermore, the Awleigatt National Park management is currently not based on a sound and comprehensive vulnerability assessment and its planning is not fully taking climate change considerations into account. Therefore, the PRCPNA will benefit from the LDCF project interventions relating to the integration, through training and planning support, of climate change considerations and EbA interventions into its strategic planning. Its territory and communities will be taken into account in the vulnerability assessments conducted under Output 1.1 of the LDCF project. Knowledge on climate risks and vulnerabilities will enable the Park authorities to make evidence-based management decisions and enhance the sustainability of their own interventions. PRCPNA's co-finance contribution to this component amounts to US$ 1,311,500.

The National Meteorological Office (ONM) will be closely involved in this component in order to provide historic weather observation data for the comprehensive climate change vulnerability analyses that will be conducted at the wilaya and local levels. Its co-financing consists of US$300,000 for this component.

Mauritanian Copper Mines (MCM) is a copper and gold company owned by First Quantum Ltd, which operates Mauritania's largest gold mine located in the Inchiri region. As part of its corporate social responsibility, MCM implements small-scale projects in the communities surrounding their mining operations. The ongoing MCM Community Projects are community-based and focus on agriculture, pastoralism, water mobilisation and capacity building. To date, MCM community projects have not integrated climate change impacts and adaptation into the planning and implementation of their interventions. Complementary for this component lies in the mutual strengthening of training and capacity building efforts. The know-how and knowledge MCM has accumulated over the years on how to effectively conduct capacity-building on community-based agriculture, pastoralism, and water management in the areas of intervention will bring added value to LDCF project's training interventions. The proposed LDCF project will in turn support the integration of climate change considerations into MCM's capacity building efforts. MCM's co-finance contribution for this component consists of US$ 108,000.

Component 2

Co-financing for Outcome 2 amounts to a total of US$ 2,214,000, and is provided by PAMB, PDDO and MCM, respectively for US$ 1,475,000, US$ 40,000 and US$ 699,000. Complementarity between the LDCF project and the PAMB, PDDO, and MCM initiatives lies in the water provision, distribution and storage systems already put into place in the 8 project sites by these initiatives, as well as their integration in the integrated hydrological and technical studies the LDCF project is planning under component 2. Furthermore, these existing infrastructures will be upgraded and improved by the proposed LDCF project, and their current users trained in efficient water consumption practices. The LDCF project will also support the integration of climate change considerations in the planning and implementation of the co-finance projects' interventions. Water management plans to be developed will also include these infrastructures already in place. Finally, experiences and lessons learned from infrastructure and water management strengthening undertaken by these initiatives will inform the LDCF project intervention strategy.

Component 3

Co-financing for Outcome 3 is foreseen to amount to US$ 4,951,500, from PAMB, PRCPNA, PDDO, and MCM, for respectively US$ 425,000, US$ 4,371,500, US$ 30,000and US$ 125,000. Complementarity between the LDCF project and the PAMB, PDDO, and MCM initiatives lies in the livelihood strengthening, dune stabilisation, agroforestry and small-scale riverbed stabilisation activities already undertaken by these initiatives in the 8 project sites. Future interventions to be undertaken by these co-financing projects will be aligned with the findings of the vulnerability assessments, prioritisation of adaptation options and technical studies conducted by the LDCF project, and integrated into PDRs and PDLs. Where these initiatives have successfully strengthened livelihood options in the 8 project sites, these experiences will inform the LDCF project's intervention strategy and scale-up.

The PRCPNA actions on arid land restoration will remain within the PNA boundaries and further efforts are needed to cover larger ares. Therefore, the LDCF project will implement complementary EbA interventions (Outputs 3.1, 3.2) in areas close to the PNA that will complement its own restoration activities. The LDCF project will build on the knowledge generated by PRCPNA for the selection of species most appropriate for restoration activities and the implementation of EbA interventions.

Component 4

Co-financing for Outcome 4 amounts to a total of US$ 2,102,008, and is provided by MEDD (staff time and logistics), the NAP process, PRCPNA, PDDO, and MCM, for respectively US$ 55,000, US$ 1,063,008, US$ 896,000, US$ 20,000, and US$ 68,000. Complementarity between this LDCF project and the co-financing initiatives consists of mutual exchange of lessons learned, research results and methodologies, good practices and expertise (experts, specialists) to strengthen multilaterally knowledge management, databases, scientific publications, handbooks, awareness raising campaigns and knowledge-sharing events. This is particularly well aligned with one of the key missions of the PRCPNA, to enhance the research base and knowledge on local arid ecosystems, and provide a space for the dissemination of this knowledge to take place (e.g. interpretation center). The LDCF project will enhance this mission, by disseminating knowledge on climate change and EbA in particular.

Further complementarities are found with the NAP process, where its awareness raising activities will supplement those of this project under Output 4.3. Moreover, the NAP process intends to adapt a cost-benefit analysis system and use it to review adaptation options, which will complement the LDCF project's Output 4.1. Finally, the NAP process will also support a long-term research programme, which links to this project's Output 4.1, as well as an information-sharing and knowledge platform which will be capitalized on by this LDCF project.

Proposed alternative scenario with a brief description of expected outcomes and components of the project, and additional cost reasoning

The adaptation scenario for each outcome is described below. For more information on the expected outcomes, outputs and activities, see Section 3.3 of the Project Document.

Outcome 1: Stakeholders demonstrate increased technical and institutional capacity for climate change adaptation – particularly EbA – in arid ecosystems

Under Component 1, the project will address gaps in the institutional and technical capacity of governmental and non-governmental institutions in arid and hyper-arid areas of the country to introduce best adaptation practices to reduce vulnerability to climate change. This component will focus in particular on (i) conducting climate change impact and vulnerability assessments for the three wilayas, as well as at the 8 sites, and identifying adaptation options and best practices; (ii) strengthening the institutional and technical capacities of regional governments, the private sector, civil society organizations and community associations; (iii) revising or developing regional development plans (PDRs) and local development plans (PDLs) in each of the three target wilayas and 8 target sites to integrate climate change adaptation options and best practices identified through the vulnerability assessments with a particular focus on gender; and (iv) developing a long-term upscaling strategy for adaptation in the arid ecosystems of Mauritania, with a focus on EbA approaches.

The enhanced understanding of climate change vulnerabilities and the strengthened capacities of policy-makers, planners and government officials will facilitate the effective integration of adaptation (including EbA) approaches into relevant policies and plans. With cities, oases (local level) and wilayas (regional level) integrating climate change analysis and adaptation solutions in their local and regional development plans, local populations would benefit directly from concrete and well-informed actions that build their resilience to climate change, but also promote good practices, such as sustainable wood collection, containment of stray animals, tree and plantation management, etc. The planning, implementation and monitoring of these adaptation interventions will be facilitated by the increased technical and institutional capacity of the key governmental and non-governmental actors. This would allow for the comprehensive and integrated planning and distribution of scarce ecosystem services and goods to support the communities in adapting to the impacts of climate change (protection from dune invasion, provision of water, fertile land, and plant material, and protection of plantations and horticulture against stray animals).

Outcome 2: Enhanced sustainable access to and efficient use of water for increased drought-resilience of local communities and ecosystems in the wilayas of Adrar, Inchiri and Trarza

The adaptation scenario is based on a four-fold approach: (i) creating new and sustainable access points to fresh water, (ii) increasing infiltration rates to restore groundwater reserves through the installation of small-scale water retention infrastructures, (iii) establishing sustainable distribution and irrigation systems adapted to local users, and finally (iv) strengthening capacities among existing associations and cooperatives to collectively and efficiently manage the installed systems.

The project will establish 16 new water provisioning systems (wells, solar-powered pumps and boreholes, desalinisation units for the coastal project site (Mhaijratt) and 4 water towers (elevated water tanks). The construction of desalination units will take into account the management of saline by-products (concentrated brine solutions), by installing for instance evaporation ponds. Water towers will allow for water storage, optimized use (at times of the day with lower evaporation rates) and maintaining pressure in distribution systems, while saving energy and pump life. Before proceeding to the acquisition and installation of this equipment, comprehensive technical and hydrological studies will be conducted in every project site in order to establish the optimal location and technical modalities of every new water source. These studies will allow to accurately establish 1) current access, 2) current and future water needs at the site level as well as at the beneficiary level, 3) current and potential hydrological sources of water, and 4) optimised technical solutions and sustainable systems for the 8 selected sites.

Water-retention and soil conservation and practices are essential for restoring and maintaining (i) groundwater reserves and (ii) soil fertility and structures in wadi beds and riparian areas. Careful planning and execution of these practices (thresholds to slow down flow of water, check dams, bunks and embankments, filtering dikes) will help replenish groundwater by slowing down and promoting the infiltration of strong currents from infrequent but abundant rains. Planting trees (through the use of regional nurseries) and rip raps on the banks of the wadis will reduce soil loss due to these currents.

The project will establish distribution systems that allow for the efficient distribution and reliable extraction of water for beneficiary water users (see total number of water users in Table 7 of the Project Document). These distribution systems and efficient irrigation technologies will be acquired (pipes, pumps, taps, connectors, drip irrigation) and installed in accordance with the findings of the aforementioned studies on every project site, in close consultation with local cooperatives. These associations and cooperatives will become the managers and operators of the distribution systems.

The project will ensure that water users are well trained in efficient water use, use of new irrigation technologies and collective water management. Water use efficiency will be increased by implementing good irrigation practices (watering at cooler moments of the day, adapted irrigation techniques to different crop needs), the use of improved irrigation techniques (drip, sprinkler irrigation or improved flood irrigation) and the adequate use of improved irrigation technology. At the association level, groups of producers will be organised (in water committees, for example) in order to sustainably and fairly manage water-access rotation systems, individual water flows and times, repair and maintenance of the equipment, periodic payments for operational costs, surveillance and general governance. Associations will be trained to quantify water extraction and water-access turns, but also in the financial aspects of water management: establishment of water fees, amortization of equipment individually and collectively, and establishing saving schemes for expansion and renewal of equipment.

Creating collective capacity among associations and cooperatives to manage and ensure the maintenance and renewal of equipment is one of the sustainability strategies for this infrastructure. The comprehensive hydrological studies to be undertaken for the 8 project sites is another and the implication of DREDDs in the long-term monitoring of project interventions a third strategy.

Outcome 3: Protection, productivity and diversification of livelihoods enhanced through EbA interventions to increase climate-resilience in the wilayas of Adrar, Inchiri and Trarza

The focus of this outcome is on the one hand the protection and improved resilience of existing livelihoods and community infrastructure against the effects of desertification and floods and, on the other hand, the creation of new, more resilient livelihood options, especially for women. To this effect, the main impacts of climate change on these livelihoods, dune encroachment and soil (riparian zones) erosion will be tackled. With regards to livelihoods, beneficiaries will benefit from strengthened value chains, value addition and market opportunities for products drawn from resilient livelihoods.

Significant quantities of plant material adapted to arid conditions will be needed to ensure sufficient supply for the planned plantations for dune stabilisation and agroforestry or NTFP systems. In order to ensure this, regional community nurseries (PCR) will be established by the MEDD officials (DREDDs) and transferred on to local associations, after sustainability safeguards are put into place. PCRs will be established in strategic locations selected on the basis of the capacities of the local cooperatives and associations, presence of a sustainable water source, and (road) infrastructure to ensure supply and marketing. Business plans will be developed for each of the three nurseries, and the staff of local associations will be trained in their management. CNOEZA and DREDDs will use the nurseries as testing, domestication and production sites for native plant seeds (e.g. Acacia tortilis, Acacia ehrenbergiana, Balanites aegyptiaca, Stipagrostis pungens) with the potential to be more resilient to climate change. Native plants to be developed and produced will be based on earlier experience and results of the EbA South project. Other species that will be produced by the PCRs are, among others: Rhus tripartita, Calligonum comosum, Azadirachta indica, Delonix regia, Ficus sp., Nerrium oleander, and Bougainvillier sp.

Dune stabilisation interventions will be preceded by detailed and comprehensive studies of the dune migration and intrusion situation for every project site (dune intrusion takes place on all sites, with different degrees of intensity and impacts), and the most appropriate and cost-effective dune stabilisation techniques will be selected and their implementation planned. Mechanical dune stabilisation based on gray infrastructure (brick and cement walls) will only be used where no ecosystem-based dune stabilisation methods may have the desired effect. Dune fixation with dead plant material (“Palissade” technique: woven matted or loose palisades of Euphorbia balsamifera, Leptadenia pyrotechnica or “clayonnage” technique: woven date palm leaves) and vegetative stabilisation will be the most used techniques. A total of 12,800 peoples’ livelihoods, housing and other infrastructure will be protected against dune encroachment by the end of the project.

The use of innovations such as the “waterboxx” and solar condensation-irrigation (developed by Mauritanian researchers under the EbA South program) would reduce dependence on nearby water sources for tree planting and dune stabilization. The waterboxx is a plastic receptacle that consists of a central opening, a wick dripping water into the soil under the box, a water reservoir and a channeled lid that also serves as a condensation capturing surface. Through condensation, the water reservoir is replenished at night and at dawn, and the wick allows for a steady but slow irrigation of the roots under the box. The box also prevents strong evaporation of trickled water. The waterboxx facilitates plantations in places where water availability is low or expensive. The solar-condensation irrigation is a Mauritanian device consisting of two modified plastic bottles (one of a gallon and one of a liter), which allows to release the water in the smaller bottle slowly against the walls of the bigger bottle to create a drip-irrigation effect. This technique is not self-replenishing as the waterboxx, but allows to cut down on labor costs. Both technologies will be used in plantations on the 8 project sites.

Soil conservation and water-retention practices are essential for restoring and maintaining (i) groundwater reserves and (ii) soil fertility and structures in wadi beds and riparian areas. Careful planning and execution of these practices (thresholds to slow down flow of water, check dams, bunks and embankments, filtering dikes) will help replenish groundwater by slowing down and promoting the infiltration of strong currents from infrequent but abundant rains. Planting trees (through the use of regional nurseries) and rip raps on the banks of the wadis will reduce soil loss due to these currents. 3,280 people on the 8 project sites are expected to benefit from these small-scale infrastructure interventions.

The project will conduct an analysis of the value chains for potential income-generating activities on the basis of consistency with EbA principles. The results of the study will be widely shared with all stakeholders (women, communities, public services). Market analyses and technical and financial support (particularly on business administration and accounting skills) will thereafter be offered to women's cooperatives. Since most of these women have started these types of production and processing relatively recently, their technical level and commercial gain are still relatively low. Helping women develop the production and marketing of their products would diversify their incomes, increase their time-use efficiency and, as a result, increase the adaptive capacity of approximately 800 direct beneficiairies.

Outcome 4: Stakeholders demonstrate strengthened knowledge and action-oriented attitudes on climate change and adaptation approaches (particularly EbA)

Additional funding 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 from the adaptation interventions implemented in Components 2 and 3 of the project. This will build on the long-term research initiated through the recently-completed SCCF EbA South project and the ongoing LDCF DIMS project in Mauritania, complementing the work done in the semi-arid ecosystems by focusing specifically on arid ecosystems. Institutional arrangements with academic partners and notably Mauritanian universities will be elaborated and the results of the EbA South project will be used as a basis for 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 practitioners and the local population, 4 arid ecosystem EbA handbooks 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, as well as the GCF NAP project (Components 2 and 3) that has strong linkages to knowledge management and dissemination, including the establishment of a long-term research program.

Knowledge-sharing events on climate change adaptation – including EbA implementation and best practices – will also be conducted in 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. Exchange visits will be organized to successful project sites to demonstrate and promote the replication of best adaptation practices, targeting community-based organizations (cooperatives and associations) as well as civil society organizations and local authorities.

The proposed project's output and activity plan is provided in the table below.

Project output and activity plan

Outcome	Output	Proposed Activities
1. Stakeholders demonstrate increased technical and institutional capacity for climate change adaptation – particularly EbA – in arid ecosystems	Output 1.1: Climate change impact and vulnerability assessments undertaken, and adaptation options identified and validated by stakeholders in each of the 3 target wilayas and 8 project sites A key activity of the project will be the completion of integrated climate change vulnerability analyses in the wilayas of Inchiri, Adrar and Trarza. The results of the analyses should help guide climate change adaptation planning, including the use of EbA, to advance adaptation response measures in arid areas. The vulnerability analysis will be undertaken in two parts. First of all, a vulnerability analysis will be conducted at the regional level (the three wilayas). It will help identify the key factors that make the population of wilayas vulnerable to climate change, through a gender lens, and en	1.1.1. Undertake three integrated vulnerability analyses at the regional level, based on an in-depth analysis of existing climate models and the current and future impacts of climate change on the three targeted wilayas. 1.1.2. Analyze, document and validate with local communities (cooperatives, associations) climate change vulnerability at the level of the 8 selected sites. The vulnerability analyses will be used as a basis for identifying and prioritizing the most appropriate adaptation options through a participatory process, involving both men and women. The findings of the vulnerability analyses and the identified adaptation options will be presented as 8 local adaptation plans. 1.1.3. Develop, validate and disseminate an atlas of climate change vulnerability in the arid areas of Mauritania, covering the three wilayas as well as the local vulnerability and adaptatio

	sure the risks facing both men and women are mapped. The results of the vulnerability analyses at the regional level will be validated at the level of the three wilayas. As a result of the regional vulnerability analyses, a vulnerability atlas covering the three wilayas will be developed. The atlas will build on the approach and methodology of the "Climate change vulnerability analysis atlas and guide for the wilayas of Assaba and Brakna in Mauritania" , developed by the ACCMR project (see Section 6 for additional details on this project), expanding their geographic scope to include the arid regions of Mauritania. In the second stage, vulnerability analyses will be conducted at the local level in the 8 vulnerable communities selected as project sites. Building on the vulnerability analyses, the priority adaptation needs of the local populations and options for adaptation will be identified through a participatory process, and captured in community-level climate action plans, with a specific focus on gender. The prioritized adaptation options will be used to refine the subsequent interventions of this project, but also those of other partners including the PDDO project, the Awleigatt National Park ecological capacity building project (PRCPNA) and PAMB. This activity therefore represents a key way of pulling in co-financing into the project. The local-level vulnerability analyses and the identification of adaptation options will be presented as case studies in the arid regions vulnerability atlas developed by the project.	n options identified for the 8 targeted sites.
	Output 1.2: 575 representatives of regional governments, private sector, civil society organizations and community-based organizations (e.g. cooperatives, AGPOs) across the 3 target wilayas trained on adaptation approaches (including EbA) This output will provide government staff and other relevant stakeholders with the technical capacities to develop, implement and monitor adaptation interventions, with a focus on EbA approaches.	1.2.1. Develop training materials targeting 1) regional and local government institutions, and 2) local community-based organizations, the private sector and civil society organizations. The aim is to develop educational tools adapted to the social and cultural context of the target groups of subsequent training. Modules on gender and climate change will be included. 1.2.2. Provide training for regional and local government institutions (CNOEZA, DREDD, CREDD, CRD and DRHA, DRDR, regional and local governments) on adaptation to climate change in arid and hyper-arid environments.

	Under output 1.2, training will be provided to government staff at the regional and local levels (including DREDDs, CREDDs, CRDs and DRHAs, DRAs, DRDRs, municipal and regional councils), the private sector, civil society organizations and community-based organizations (e.g. cooperatives, associations) in the targeted wilayas. The project will take affirmative action to ensure that women are given access to the requisite skill-building and tools necessary for adaptation planning. Adherence to a gender-equal selection policy will be ensured, to improve both participation and representation, in the key decision-making regarding EbA in the three wilayas. Altering the skewed gender ratio will not only help representation rates, but also create a bona fide cycle of engaging and empowering women through climate change adaptation processes. Technical training under this output will focus on supporting these stakeholders to promote good practices within communities for the implementation of EbA interventions for the sustainable development of local communities under the climate change scenario. The themes covered by the training will include climate change and its impacts, planning, implementation and monitoring of adaptation interventions, the ecological and economic benefits of healthy ecosystems, and training on the restoration of ecosystems that can reduce local communities' vulnerability to climate change and provide them with climate-resilient livelihoods. The participants will also acquire strengthened capacities to analyze their strategies and plans in light of climate change, and to implement revised strategies and plans that integrate adaptation considerations (see output 1.3). Specific training will be provided to the ONM branches under output 1.4 in the collection, interpretation and dissemination of climate information. Output 1.2 training interventions will be supported by the development of training materials that will be distributed to the stakeholders prior to the training sessions. These training materials will (i) facilitate learning	1.2.3. Provide training for regional and local government institutions (CNOEZA, DREDD, CREDD, CRD and DRHA, DRDR) on monitoring and reporting of adaptation interventions, and specifically those implemented under project components 2 and 3. 1.2.4. Provide training for community-based organisations (cooperatives, associations, AGPOs) in the areas covered by the project on adaptation to climate change in arid and hyper-arid environments. This training will also include a component on the application of the forest code by community-based organizations. 1.2.5. Provide training for private sector and civil society representatives in the areas covered by the project on adaptation to climate change in arid and hyper-arid environments.	

during the training workshops; (ii) increase the sustainability of training; and (iii) enable reaching an audience beyond the participants of the training events.	

Output 1.3: 3 Regional Development Plans (PDRs) and 8 Local Development Plans (PDLs), integrating adaptation to climate change and gender, revised or developed and shared with stakeholders The project stakeholders will also acquire strengthened capacities to analyze their strategies and plans in light of climate change, and to implement revised strategies and plans that integrate adaptation considerations. The project will focus on building institutional capacity to integrate adaptation to climate change into development and sectoral planning and budgeting at the regional and local levels. These regional and local development plans will be strengthened or their formulation will be supported, using the vulnerability assessments undertaken at the regional (activity 1.1.1) and local (activity 1.1.2) levels as a major input. Specifically, the institutions of the three wilayas will be supported in integrating climate change considerations - both current observations and future projections, as well as adaptation interventions identified under output 1.1 - in Regional Develoment Plans (PDRs), including their budget allocations. As the current PDRs (called PRLPs: Regional Poverty Reduction Programmes) are largely outdated (they were elaborated in 2014), the project will help mainstream and integrate climate change adaptation aspects into the new regional development plans, in this document referred to as PDRs. Similarly, at the local level, local governments (municipalities, oasis councils and village leaders) will be supported in the development or revision of Local Development Plans (PDLs) using a participatory approach, mainstreaming climate change observations and projections and integrating adaptation considerations and interventions (including EbA approaches) identified under output 1.1 in these plans and associated budget allocations. These experiences will also feed into the NAP process aimed at mainstreaming adaptation in development and sectoral strategies and budget allocations.	1.3.1. Adapt the procedures and tools for the integration of climate change adaptation priorities into local development planning to be developed under the NAP process to the specific needs of the wilayas and sites targeted by the project. 1.3.2. Provide training to DREDDs in the facilitation of planning exercises to develop new regional and local plans or integrate climate change adaptation into PDRs and PDLs. 1.3.3. Contribute to the development of new PDRs or integrate adaptation considerations and measures into existing PDRs of the three wilayas, including their budget allocations, through the DREDDs trained in activity 1.3.2 and the tools developed in activity 1.3.1. 1.3.4. Contribute to the development of new PDLs or integrate adaptation measures into existing PDLs of the 8 selected sites, including their budget allocations, through the DREDDs trained in activity 1.3.2 and the tools developed in activity 1.3.1, and building on the local adaptation plans developed in activity 1.1.2. The integration of adaptation measures into annual communal budgets will be promoted, in order to ensure the sustainability of the planned water and agricultural investments, among others. 1.3.5. Integrate climate change adaptation strategies into sectoral planning and budgeting for agriculture, water resources and rural development through the DREDDs, DRHAs, DRAs, DREs and DRDRs trained under output 1.2.

	Output 1.4: An upscaling strategy and action plan for climate change adaptation in arid ecosystems of Mauritania developed in collaboration with national stakeholders, focusing on EbA approaches A strategy and action plan will be developed to catalyze the scaling up of the best or most promising climate change adaptation interventions in the arid areas of Mauritania, with a focus on EbA approaches. Interventions to be promoted through the up-scaling strategy and action plan will include: (i) practices implemented by this project that have already had some success in the first years of the implementation phase; and (ii) interventions successfully implemented in the past through other initiatives, both in Mauritania as well as in other similar contexts(e.g. those developed by the SCCF-funded EbA South project). Furthermore, the long-term upscaling strategy will encourage the larger-scale adoption of successful adaptation practices identified in the future. The upscaling strategy and action plan for adaptation in arid ecosystems of Mauritania will build directly on the long-term adaptation upscaling strategy to be developed by the ongoing LDCF project, adding a specific focus on arid and hyper-arid areas of the country and on EbA approaches. The upscaling strategy will also be developed in close coordination with the ongoing NAP process in Mauritania to ensure complementarity and avoid any duplication. Moreover, this upscaling strategy will be closely aligned with and build on the SAZAM strategy (*Stratégie d'Adaptation pour les Zones Arides de la Mauritanie*) under development by CNOEZA.	1.4.1. Undertake a stocktaking and an analysis of adaptation measures in arid areas through a national workshop with a diversity of actors, including decision makers, technical experts, associations, youth and women from the intervention areas as well as national and regional institutions. 1.4.2. Based on the results of the stocktaking and analysis of adaptation measures and the national workshop (activity 1.4.1), elaborate a strategy and action plan for the upscaling of climate change adaptation measures in arid environments, with a particular focus on EbA, identifying and analyzing possible public, private, national and international financial sources for its implementation (building on the adaptation funding strategy to be developed under the NAP process).

2. Enhanced sustainable access to and efficient use of water for increased drought- resilience of local communities and ecosystems in the wilayas of Adrar, Inchiri and Trarza	Output 2.1: 16 new efficient water provisioning systems (e.g. new wells, boreholes, solar pumps, desalination units) and 4 water collection and storage systems installed in the 8 project sites This output aims to build or acquire new water sources for the 8 selected sites. The specific types of water provisions systems to be selected depend on the hydrological contexts of the different sites. Precise current availability of water sources per community and per user is at this stage difficult to establish, as are the current and future needs for water, and sustainability of supply, taking into account population growth (migration) and climate change. Therefore, every project site will be subject to a detailed hydrological and technical study, informed by a participatory process including a gender engagement workshop.	2.1.1. Undertake quantitative hydrological studies for each of the 8 project sites to accurately establish: 1) current access to water, 2) current and future water needs at the site level (total extraction needs per site) and at the individual level (extraction needs per beneficiary), 3) current and potential sources of water, and 4) corresponding technical solutions and sustainable water provision systems for the 8 project sites. The studies will also examine and propose solutions to avoid the environmental impact of saline by-products (concentrated brine solutions) from water desalination, by building for instance evaporation ponds. 2.1.2. Acquire 16 new water supply systems (wells, boreholes, solar pumps, desalinization units) and 4 water storage and harvesting systems (water towers, rainwater tanks). 2.1.3. Install 16 water supply systems and 4 water storage and harvesting systems at the 8 targeted sites.
	Output 2.2: Small-scale infrastructures implemented on 4 water courses to increase infiltration and to reduce erosion and flooding Small-scale water deceleration interventions (DRS) will be implemented on 4 water courses (wadis), present in the Akjoujt, Tawaz, Aoujeft and Chinguetti project sites. This output aims to enhance ground water rechargе through increased infiltration of water, and to protect towns, oases, villages and fields from flooding, soil erosion and riverbank erosion. DRS (from the French term "*Défense et Restauration des Sols*", meaning Soil Protection and Restoration) interventions are barriers, filter dikes, gabions, sills, gully corrections, and stone barriers constructed on and around river beds in order to control and make use of seasonal or unexpected water flows due to abundant or torrential rains. Depending on the dimension and the geological characteristics of the wadi, different scales and approaches may be applied. By slowing water speed, these interventions increase retention and infiltration of rainwater into the soil so as to enhance ground water rechargе and increase underground water table levels. Other goals are to divert and store water for use in dry p	2.2.1. Undertake 4 analyses for site selection and prioritization, and for the identification of the types of DRS interventions for the 4 sites with the presence of wadis (Akjoujt, Tawaz, Aoujeft, Chinguetti). The analyses will consider the degree of urgency, financial feasibility and the importance of the areas threatened by flooding and shoreline erosion. The analyses will be used to identify the vulnerable areas and the DRS measures to be implemented. 2.2.2. Implement DRS interventions along 4 wadis using different techniques which are appropriate and adapted to the environment. 2.2.3. Through local authorities trained under activity 1.2.3, undertake technical monitoring of the DRS interventions to ensure the desired levels of increased infiltration and flood and erosion reduction.

	eriods, and to control and reduce river bank erosion. F urthermore, river bank greening and stabilisation will be undertaken with *Acacia ehrenbergiana* and *Acacia tortilis,* after a mechanical stabilisation. The priority areas will depend on the nature of the wa dis, their flow rate in rainy periods and the riparian are as susceptible to erosion. Depending on the site, diffe rent types of DRS interventions will be considered. Th e output will therefore focus first on undertaking 4 an alyses for site selection and prioritization, and for the identification of the types of DRS interventions to be undertaken in each sites. The analyses will consider t he degree of urgency, and the importance of the area s to be protected and the water tables to be recharge d. Local authorities trained under activity 1.2.3 will m onitor the DRS interventions over the long term. 3,280 people on the 8 project sites are expected to benefit f rom this small-scale infrastructure.	

Output 2.3: 8 efficient irrigation water distribution systems established (one in each project site) Once the new water sources are installed (output 2.1), the project will work to build primary and secondary distribution systems to efficiently and fairly transport irrigation water to each identified user. These networks will be adapted to the local context and take into account the production needs of each user (drip, flood irrigation, water outlet displacement), as well as the organizational arrangements developed under project output 2.4. The water distribution systems will be put in place based on the technical parameters established in the hydrological studies developed under output 2.1 and the water distribution and management plans to be developed under this output. They will integrate water supply as well as water-use need parameters, geographical distribution, and infrastructure and equipment protection measures, and will be modulable to allow for future users and new water sources to be connected. The plans will also include an analysis of the current water distribution networks, the identification of efficient irrigation equipment adapted to the beneficiaries' needs, and an accurate estimate of their cost.	2.3.1. Based on the 8 hydrological studies undertaken in activity 2.1.1, develop 8 plans for the distribution and collective management of irrigation water, including newly accessible water sources (as a result of activities under output 2.1). 2.3.2. Acquire and install the irrigation water distribution equipment (pipes, pumps, faucets, drip irrigation, etc.) identified in activity 2.3.1 for each of the 8 selected sites.
Output 2.4: 8 community associations (e.g. cooperatives, AGPOs) trained on sustainable and efficient water management and distribution (one in each project site) Eight associations and/or cooperatives will be selected based on their internal organisational and administrative capacity, outreach, inclusiveness (vulnerable groups) and the degree of access of their members to irrigation water. The selection process will be undertaken by the DREDDs based on a transparent and objective selection matrix. Once an association has been selected for every project site, the eight selected associations will benefit from technical and water management training. In the first instance, the associations will be consulted to validate the hydrological and technical studies developed in output 2.1 through participatory workshops animated by the DREDDs.	2.4.1. Identify and select 8 associations (AGPOs, associations and cooperatives) responsible for the management and equitable distribution of water at the 8 targeted sites . 2.4.2. Validate the 8 plans for the distribution and management of irrigation water (developed in activity 2.3.1) through a participatory process engaging the 8 water management associations. 2.4.3. Strengthen the 8 selected water management associations to build their capacity for the equitable management and distribution of water . 2.4.4. Provide training for the 8 water management associations' members on technologies, techniques and good practices for the sound and sustainable use of irrigation water. 2.4.5. Carry out ongoing organisational and technical monitoring of the implementation of the irrigation water distribution and management plans.

	Subsequently, the aim will be to strengthen the organizational and technical capacity of the associations and water users to ensure the efficient and sustainable use of water resources. Associations will be trained on the collective management of water: participatory development of water rotation schedules, associative operation of the water distribution network, and development of an internal regulatory system including establishment of water management fees, maintenance and reparation modalities, and fines for infractions. Internal regulation systems for water distribution will be established in accordance with the technical findings and recommendations of the hydrological studies (output 2.1), as well as with the water distribution and management plans (output 2.3). On the individual level, users will be trained on the appropriate use of the water provisioning and efficient irrigation technologies provided by the project (under outputs 2.1 and 2.3) and the adoption of water conservation practices (for example irrigated soil management, early and late irrigation to reduce evaporation). An NGO specializing in irrigation water management will be selected through a procurement process and tasked with providing technical and organisational assistance for the implementation of the irrigation water distribution and management plans (output 2.3) throughout the duration of the project. A total of 1,215 people will benefit from fair and efficient water distribution and improved organisational water management.	
3. Protection, productivity and diversification of livelihoods enhanced through EbA and small-scale infrastructure interventions to increase climate-resilience in the wilayas of Adrar, Inchiri and Trarza	<u>Output 3.1: Regional community nurseries specialized in plant production for arid ecoregions established and operational, and training for their sustainable management provided to local communities or cooperatives in 3 wilayas</u> Output 3.1 aims to set up nurseries in each of the 3 wilayas to supply the project with adapted planting material. The establishment of these nurseries must be started at the beginning of the project, in order to ensure sufficient and rapid production of plants to initiate the implementation of Outputs 3.2 and 3.3.	3.1.1. Develop business plans for the establishment of three regional community nurseries (PCRs), one in each wilaya. 3.1.2. Train staff from local associations in nursery techniques, management and administration. 3.1.3. Based on the business plans, set up and operationalize the three PCRs. 3.1.4. Train CNOEZA and DREDD staff in the collection and management of seeds from arid areas, and collect, domesticate and produce indigenous seeds adapted to arid areas (in the three PCRs established in Activity 3.1.3).

Output 3.2: EbA interventions implemented on 400 hectares of dunes to protect vulnerable communities, livelihoods and ecosystems from dune-migration This output aims to reduce the threat of sand encroachment in the towns, oases, villages and fields in the three wilayas through dune stabilization interventions. During the PPG phase, approximately 650 ha of intruding dunes were inventoried, of which about 400 ha required urgent stabilisation. An approximate number of 12,800 beneficiaries will see their homes, plots, palm groves and other assets protected against dune invasion. The areas prioritized for dune stabilization will naturally depend on local perceptions and the value of the crops, infrastructure or real estate threatened. Depending on the site, different types of stabilization approaches will be considered. The output will focus first on undertaking 8 analyses for site selection and prioritization, and for the identification of the most appropriate types of dune stabilization interventions for each of the 8 sites. These analyses will take into consideration the degree of urgency and importance of the areas threatened by sand encroachment. Waterboxx (an innovative water-smart plant box irrigation technology) will be used for plantations with limited access to irrigation water. Local authorities trained under activity 1.2.3 will undertake the long-term technical and ecological monitoring of the dune stabilization interventions.	3.2.1. Undertake 8 analyses for site selection and prioritization, and for the identification of the most appropriate types of dune stabilization interventions for the 8 sites, considering the degree of urgency, the financial feasability and the importance of the areas threatened by sand encroachment. 3.2.2. Based on the analyses undertaken under activity 3.2.1, identify plantations with limited access to irrigation water, and plan and implement the use of waterboxx (an innovative water-smart plant box irrigation technology) for these areas. 3.2.3. Undertake dune stabilization on 400 ha using different biological and mechanical stabilization techniques suitable and adapted to the environment 3.2.4. Through local authorities trained under activity 1.2.3, undertake long-term technical and ecological monitoring of the dune stabilization interventions, to ensure the achievement of the desired level of stabilization.
Output 3.3: EbA interventions implemented on 150 hectares to shelter vulnerable communities, livelihoods and ecosystems from dune migration, wind and heat and to provide forage for livestock and non-timber forest products This output aims at the protection of the towns, oases, villages and fields in the three wilayas from wind, soil erosion and overgrazing by stray animals through the establishment of agroforestry belts, which will also create opportunities for income generation from agroforestry outputs. An approximate number of 2,300 local people will benefit from the protection and additi	3.3.1. Based on the preliminary PPG phase assessment, undertake 8 analyses for site selection and prioritization, and for the identification of the agroforestry interventions (live hedges, reforestation, windbreak hedges, fences) for the 8 sites, given the degree of urgency, financial feasibility and the importance of the areas to be protected and/or reforested. The analyses will enable the identification of the precise areas to be planted (through a participatory process engaging beneficiaries and local authorities), the specific techniques and species to be used, as well as the non-timber forest products that local populations are interested in harvesting and developing in the agroforestry systems.

onal NTFPs that will be generated through these agro forestry systems. The areas prioritized for the establi shment of the agroforestry belts will naturally depend on local perceptions and the value of the crops, infras tructure or real estate protected. Depending on the sit e, different types of agroforestry and different specie s will be considered. The main non-timber forest prod ucts (NTFPs) of Mauritania are food plants (e.g. Adan sonia digitata, Zizyphus mauritiana), Bosia senegalen siis fodder plants (e.g. Acacia spp.), gums (Acacia se negal) and medicinal plants (e.g. Acacia senegal). Le ss socio-economically important NTFPs are dyes (e. g. Acacia seyal, Anogeissus leiocarpus), tannins (Aca cia nilotica), cosmetics, tools and resins (FAO 1998). Other identified species are Lawsonia inermis, Ziziph us lotus, Moringa oleifera, and Pitecellebium dulce. T he output will therefore focus first on undertaking 8 a nalyses for site selection and prioritization, and for th e identification of the most appropriate types of agrof orestry interventions for each of the 8 sites. During th e PPG phase, approximately 150 ha of potential agrof orestry plantations have been inventoried on the 8 pr oject sites. The analyses will consider the degree of u rgency and the importance of the areas to be protect ed or reforested. Waterboxx will be used for plantatio ns with limited access to irrigation water. Local autho rities trained under activity 1.2.2 will undertake the lo ng-term technical and ecological monitoring of the ag roforestry interventions.	3.3.2. Based on the analyses undertaken in activity 3.3.1, iden tify the agroforestry plantations with limited access to irrigati on water, and plan and implement the use of waterboxx for th ese areas. 3.3.3. Establish 150 hectares of agroforestry belt intervention s across the 8 sites, in line with the analyses carried out in act ivity 3.3.1. 3.3.4. Protect agricultural and plantation areas by physical en closures, with the aim of protecting plantation and project inte rventions from grazing by stray animals. 3.3.5. Through local authorities trained under activity 1.2.3, un dertake long-term technical and ecological monitoring of the agroforestry interventions, to ensure the achievement of the d esired level of protection.

	Output 3.4: Additional natural resource-based livelihoods introduced for local populations This output, which will consider both men and women but will pay particular attention to the livelihoods of women and to working with women's associations in the three wilayas, seeks to identify the needs and ambitions of women (in particular) in terms of livelihoods and their diversification, to analyse the feasibility and sustainability of the identified value chains, to train women in the production, processing and marketing of products, and to train associations in business planning and management. Finally, the output also provides for the distribution of equipment to develop the identified value chains, as well as technical and commercial support to ensure their profitability and sustainability. An estimated 800 people will benefit directly from improved and additional resource-based livelihoods	3.4.1. Carry out a rapid analysis of the needs and ambitions of 8 local associations (in particular women's associations) on the sectors and income-generating activities (IGAs) to be developed (including new livelihoods and value chains). 3.4.2. Conduct approximately 8 feasibility studies on the development of the identified value chains, covering both commercial aspects (market studies) and biophysical considerations (the natural-resource dependence of the sectors, their environmental sustainability, and their resilience to climate change). 3.4.3. Organize a workshop with public and private actors from the 8 sites to validate the results of the feasibility studies. 3.4.4. Train the 8 local associations on business management, accounting and the development of business plans. 3.4.5. Provide the 8 local associations with technical support services and equipment, materials and supplies (watering cans, spades, shovels, ovens, chicken coops, fish processing materials, etc.) for the production, processing and value addition for the selected livelihoods and value chains.

4. Stakeholders demonstrate strengthened knowledge and action-oriented attitudes on climate change and adaptation approaches (particularly EbA)	Output 4.1: 5 publications on policy-relevant research findings published based on monitoring of adaptation results generated under Components 2 and 3, and disseminated to at least 45 decision makers Under this output, the project will collaborate with two Mauritanian universities, engaged through a selection process, to produce five policy-relevant publications on the implementation of the EbA approach in arid areas. In first instance, five policy-relevant themes will be selected based on research agendas and priorities established in long-running research programs. Specific attention will be given to salinization of soils in desertic arid (inland and coastal) areas, as well as solutions and policy options. This selection will be guided by a transparent process based on a scientific committee consisting of representatives of Mauritanian universities. After the research subjects have been selected, the project will proceed to a call for proposals directed to all Mauritanian universities, for the five themes. Selection of proposals will be based on criteria such as experience, quality of the methodology, expertise of proposed researchers and price. Finally, contracts will be signed with the selected universities so that research can be completed and research results published. About 45 policy-makers will benefit from these publications. Moreover, the project will be ensuring that the publications and other knowledge products intended for decision-makers contain useful gender information, qualitative and quantitative methodological notes as well as lessons learnt / best practices. Using the information and in-field knowledge generated from the different components, gender actions will be identified. These will create a knowledge base of relevant gender-responsive EbA practices both nationally and regionally.	4.1.1. Select Mauritanian universities based on a call for proposals and select specific research topics inspired by existing long-term research programs and CNOEZA's priorities. 4.1.2. Conduct research to produce five scientific publications to be featured in peer-reviewed journals, specialized journals and international conferences (to be implemented by the selected universities).

	Output 4.2: A series of 4 EbA handbooks detailing best practices for arid ecosystems developed and shared with at least 550 members of local implementation structures across the 3 target wilayas The project will develop a series of four handbooks on EbA practices that can be disseminated to development practitioners and rural population and will include accessible content, relevant to the needs of local communities and stakeholders. Examples of themes that could be covered by these handbooks are stabilisation of dunes, good practices for efficient water use, agroforestry and NTFP production, water-efficient planting technologies (waterboxx, etc.), the use of resilient species for agroforestry, plant reproduction and nursery management, and the protection and fencing of oasis and horticultural gardens. The handbooks will be developed in accordance with the local cultural and linguistic context, and address gender norms. About 550 practitioners will benefit from these manuals.	4.2.1. Organize a workshop with technicians, agronomists, foresters and other resource people to analyse and identify 4 adaptation measures that will be covered by the EbA handbooks, as well as the technical aspects that will be covered for each measure. 4.2.2. Develop the technical content for the 4 handbooks. 4.2.3. Popularize the technical content of the handbooks, rendering the technical aspects understandable to the local populations, including those illiterate. 4.2.4. Translate into local languages, reproduce and disseminate the series of 4 handbooks to local, regional and national actors, and technical and financial partners.
	Output 4.3: At least 750 local stakeholders informed of climate change adaptation and good EbA practices in the three target wilayas Under this output, the project will organize, together with the DREDDs, awareness-raising and information-sharing events on arid ecosystems, climate change and how humans can adapt. Concrete, technical and practical information will be made available to nomadic and sedentary populations, including information on the availability of water resources, weather forecasts, the project interventions, good EbA practices, etc. Exchange visits will be organized to successful project sites to demonstrate and promote the replication of best adaptation practices, targeting community-based organizations (cooperatives and associations) as well as civil society organizations and local authorities. This output has an estimated number of 750 beneficiaries.	4.3.1. Organize 9 events such as fairs, roundtables, and conferences (3 per wilaya), as well as exchange visits to successful project sites, to raise awareness and exchange knowledge on adaptation to climate change and good EbA practices for local non-target populations, local decision makers, actors from other sectors, and other groups of people not targeted by the project. 4.3.2. Implement EbA awareness raising campaigns for policy-makers, civil society and rural communities, as well as municipal staff and association members, to build understanding of climate change adaptation. 4.3.3. Develop content for 9 radio programs (3 in each wilaya) in order to raise awareness among the local population on EbA practices implemented by the project and included in the handbooks (Output 4.2).

Alignment with GEF focal area and/or Impact Program strategies

The proposed LDCF project is aligned with the GEF programming strategy on adaptation to climate change for the LDCF 2018-2022. These include the first two strategic objectives for the LDCF, namely;

• Objective 1: Reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation; and

• Objective 2: Mainstream climate change adaptation and resilience for systemic impact.

Components 2 and 3 of the project will be contributing to CCA-1: Outcome 1.1: "Technologies and innovative solutions piloted or deployed to reduce climate-related risks and/or enhance resilience". The project will focus on implementing a range of cost-effective adaptation technologies in the target wilayas, in particular as they relate to water management and the protection of vulnerable structures and ecosystems. Physical assets will therefore be better protected against threats such as dune encroachment, and water availability for agricultural purposes will be increased, allowing rural communities to better withstand climatic shocks such as droughts. Moreover, the project will work towards enhancing employment opportunities, be it through hiring unskilled labor to implement adaptation technologies, or the activities targeting livelihood diversification.

Components 1 and 4, on the other hand, will be contributing to CCA-2: Outcome 2.3: "Institutional and human capacities strengthened to identify and implement adaptation measures". Indeed, the project will contribute to training government officials, as well as CSOs, CBOs (including AGPOs) and community members, on climate change impacts and appropriate adaptation responses. Under Component 4, EbA handbooks will be produced and shared, allowing local officials to better integrate EbA into planning. More broadly, the project will contribute to raising the awareness of people of climate change impacts and adaptation options, through a range of events. Furthermore, project Output 1.3 which is focused on the integration of climate change adaptation into regional and local development plans will contribute to CCA-2 Outcome 2.1: "Strengthened cross-sectoral mechanisms to mainstream climate adaptation and resilience".

Adaptation benefits

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. This 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.

Overall, it is anticipated that the project will directly increase the adaptive capacity of over 37,000 people in the three wilayas targeted by the project. The specific adaptation benefits of the proposed LDCF project will include: i) increased resilience of arid ecosystems to buffer against climate-induced droughts (550 additional hectares stabilized or protected, including 400 hectares of dunes stabilized and 150 hectares of land protected); ii) reduced soil erosion (3,280 beneficiaries of DRS interventions) and increased carbon sequestration to improve agricultural productivity and ecosystem services; iii) improved water supply (15 552 persons with improved access to water) by promoting groundwater recharge and water conservation, thereby increasing the irrigation potential of agricultural areas and their resilience to climate shocks; iv) provision of NTFPs and alternative livelihoods, reducing the vulnerability of local communities (18 non-traditional IGAs established or strengthened and 800 direct beneficiairies; v) protected infrastructure against dune encroachment (12,800 beneficiairies of protection against dune encroachment); and vi) improved food security through the introduction of water-efficient farming techniques (2,300 beneficiairies of agroforestry).

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, increasing soil carbon sequestration, combatting desertification, and protecting biodiversity by promoting the use of native species in project interventions.

Innovativeness, sustainability and potential for scaling up

Innovativeness

The core innovation of the project is to apply the EbA approach to arid regions of Mauritania, where adaptation interventions remain sparse. The project will be key to demonstrating the effectiveness of such an approach in the country, building capacity to implement EbA for arid ecosystems and oases, and will work towards the strengthening of that knowledge base to inform future adaptation interventions in arid regions. It will, amongst others, produce climate change vulnerability assessments, contributing to the identification and prioritization of adaptation options.

Currently, climate change adaptation is not mainstreamed into development plans across the arid regions of the country. As a result, climate change concerns are not being systematically addressed, and development interventions risk being vulnerable to climate change impacts and unsustainable over the long-term. The LDCF project will therefore introduce planning innovations to the areas of intervention, by working with decentralized government structures and strengthening local level governance. Indeed, it will work closely with regional and local authorities to integrate adaptation into development plans, building on the knowledge on vulnerability being generated through the project.

The project will also be upscaling technical innovations, including efficient water provisioning systems, efficient irrigation technologies, as well as water collection and storage systems. Particularly innovative technologies among those categories include the “waterboxx” and solar condensation-irrigation (developed by Mauritanian researchers under the EbA South project). EbA interventions will benefit from these technical innovations. Indeed, EbA innovations will focus on restoration efforts dependent on access to water, amongst others. These will include further dune stabilization efforts, soil and water conservation practices in wadi beds and riparian areas, reforestation efforts associated with livelihood diversification, agroforestry, and more.

In terms of management innovations, the project will support community management of boreholes, the development of business management capacity for local associations, and community monitoring of technical interventions and ecological state.

Sustainability

The sustainability of the project will be based on a multidimensional approach, including socio-political sustainability; financial sustainability; and institutional sustainability. The socio-political sustainability of the project's investments will be based on (i) the ownership of the project innovations and activities through government structures, local associations and the beneficiary communities of the arid areas ; and (ii) the ownership of project outputs at all institutional levels, including the national level, the regional administrations (Walis and Hakems), the Regional Councils for Environment and Sustainable Development (CREDDs), municipalities, municipal councils and specialized municipal commissions, non-state actors including Community-Based Organizations (CBOs), Civil Society Organizations (CSOs) and the professional organisations of agricultural and agro-pastoral producers, and representatives of bilateral and multilateral donors. In order to build that ownership, it is crucial for the project to take on a participatory approach, and extensive stakeholder engagement/consultations. This process has been launched upfront during project design and the PPG phase (see Appendix 14 of the Project Document - Stakeholder Engagement Plan during the PPG Phase). The project intends to continue to engage with stakeholders through a participatory approach throughout implementation and ensure a socially inclusive process.

In order to increase the adoption of EbA and other strategies promoted by the project, interest has to be sustained in the communities, through awareness-raising and capacity-building/training. As part of the project interventions strategy, Component 1 will include extensive capacity-building for EbA, in particular for community-based organizations such as AGPOs, CSOs, and cooperatives (Output 1.2). Training materials, adapted to the needs of the different stakeholders, will be provided on topics ranging from good practices for SLM, to the ecological and economic benefits of healthy ecosystems, and on the restoration of ecosystems.

In addition, the approach to awareness-raising supported by Components 1 and 4 will focus on: (i) raising awareness of the benefits of EbA, on the basis of a comparative approach between project results and business-as-usual sites; (ii) supporting advocacy and decision support for investment and capitalization of achievements in the field, based on the results of the technical and feasibility studies integrated in the project, as well as the business plans; (iii) using the mobilization potential of CSOs at the local level to engage departments responsible for environmental management in the lobbying of relevant ministries involved in project implementation; and (iv) implementing an approach rigorously built on the long-term collection, analysis, processing and dissemination of data and best practices. Under Component 1, the project will undertake a local participatory process aimed at prioritizing adaptation needs and solutions supported by the results of the vulnerability assessments done at the local level (Output 1.1), subsequently contributing to refining project activities, and thereby building local-level ownership of those interventions. Under Component 4, knowledge on EbA will be generated and disseminated through media such as television and local radio stations. At the local level, the project will follow a pedagogic approach of “learning by doing” which will enable the project's awareness-raising activities beyond the project lifespan. For this purpose, the project Output 4.3 will involve numerous knowledge-sharing and exchange events.

In terms of institutional sustainability, capacity building and training towards strengthening policies and legal frameworks are also recognized as critical, and will be provided to decentralized authorities (Output 1.2). Training interventions will include the development of modules and training sessions based on technical protocols, the design, planning and implementation of EbA interventions, and the monitoring of their long-term effectiveness. An EbA strategy for arid areas will be developed, and training for the integration of EbA in cross-sectoral and sectoral development strategies and plans in the three targeted arid wilayas will be provided at the regional and local levels (i.e. Output 1.3: Development of or revisions to 3 Regional Development Plans (PDRs) and 8 Local Development Plans (PDLs) proposed in the three target wilayas to integrate adaptation to climate change with a particular focus on gender). Focus on gender is also a critical element of long-term sustainability of the project’s interventions in this area, and revisions to the development plans will need to be responsive to the needs and wants of all beneficiaries, including women.

In terms of financial sustainability, the project will undertake a number of technical, hydrological and feasibility studies, to support advocacy and decision-making support for investment and funding of achievements on the ground. Moreover, techniques and technologies adopted to restore ecosystem services and reduce dune encroachment will be carefully selected based on cost-effectiveness, including long-term maintenance costs, and low upfront costs for the local beneficiaries. For instance, biological fixation of dunes proposed in the project can be a cost-effective (see Output 3.2) approach in certain circumstances and bring additional environmental benefits. In addition, the project will focus on approaches which can employ local unskilled labour, supported by minimal training. This focus on low-cost technology and employment of the local workforce will contribute to greater local buy-in of the approaches, and increase their long-term adoption/maintenance.

Furthermore, the financial sustainability of the project will be strengthened through the integration of adaptation considerations in regional and local development plans and sectoral planning processes, and in particular in associated budget allocations. Specifically, the integration of adaptation measures into annual communal budgets in activity 1.3.4 and into sectoral budgets in activity 1.3.5 will strengthen the financial sustainability of the planned project interventions.

The UNEP Safeguard Risk Identification Form (SRIF; Appendix 16 of the Project Document) was completed to assess the safeguards risks associated with the implementation of the project. This tool reviews the project against eight safeguards standards, in line with UNEP’s Environmental and Social Sustainability Framework (ESSF). Moderate risks were identified for Safeguard Standard 1 (Biodiversity, Ecosystems and Sustainable Natural Resource Management), Standard 2 (Climate Change and Disaster Risks) and Standard 8 (Labor and working conditions). Other Safeguard Standards were all ranked low risk. The overall safeguards risk rating for the project is “moderate”.

The table below outlines the most significant risks identified through the SRIF screening process, as well as the measures to be undertaken to further assess, mitigate and monitor these risks. In addition to risks under Safeguard Standards ranked as “moderate”, also risks for those ranked “low” have also been included, where further assessment or mitigation actions are recommended. For further description of the risks, please refer to Appendix 16 of the Project Document.

An E&S Risk Management and Monitoring Plan will be put in place during project inception phase, and will cover all the risks identified as well as possible additional ones identified through the further assessments undertaken. The project Executing Agency (MEDD) will have the overall responsibility for ensuring that the required assessments, mitigation measures and monitoring are undertaken and reported on. This responsibility will be reflected in the legal instrument to be signed between UNEP and MEDD.

E&S risks and actions to be taken

Identified E&S risk or consideration	Action to be taken (assessment, mitigation, monitoring)	Budget reference	Responsibility
Biodiversity, Ecosystems and Sustainable Natural Resource Management **(Safeguard Standard 1):** Possible use of invasive alien species, specifically *Prosopis juliflora*	- Selection of species to be used for dune stabilization and shelter-belt interventions will be undertaken as part of the analyses under activities 3.2.1 and 3.3.1. - Any recommendation for the use of *Prosopis* or any other invasive alien species will be carefully considered, and only agreed to if no other species are viable and urgent intervention is required. - An invasion prevention plan will be designed and its implementation monitored under activities 3.2.4 and 3.3.5 (monitoring of dune stabilization and shelter-belt interventions).	Activities 3.2.1 and 3.3.1 Activities 3.2.4 and 3.3.5	National dune stabilization specialist and national agroforestry and oasis management specialist Local authorities trained by project
Climate Change and Disaster Risks **(Safeguard Standard 2):** Extreme climate events (e.g. droughts, floods or strong winds) or other disasters may result in challenges in accessing the project sites and damages to project infrastructure and equipment	- To mitigate the risk of limited access and damage to infrastructure / equipment, climate and early warning information will be accessed and used for planning timing of interventions, field visits, etc.	N/A	MEDD
Climate Change and Disaster Risks **(Safeguard Standard 2):** Increasingly arid conditions, heavy rains and high winds may compromise the success of EbA interventions	To reduce the vulnerability of EbA interventions to climate change, best practices will be followed in e.g.: - Species selection - Planting operations (e.g. timing, location close to water source, physical protection from heavy rains and strong winds) - Ensuring sufficient watering of seedlings in the arid conditions, through e.g. the waterboxx technology - Regular monitoring of seedling survival and replacement rates - Identification of corrective actions to improve survival rates, e.g. improved access to water or use of different species or planting / watering protocols	Activities under outputs 3.1, 3.2 and 3.3 Activities 3.2.4 and 3.3.5	National dune stabilization specialist + national agroforestry and oasis management specialist Local authorities trained by project
Climate Change and Disaster Risks	- Climate risk assessments of groundwater availability will be undertaken (activities 1.1.1 and 2.1.1)	Activities 1.1.1 and 2.1.1	International consulting firm + national and interna

(Safeguard Standard 2): Water access interventions (new wells and boreholes) could contribute to groundwater over-extraction in particular in the face of reduced rainfall due to climate change	taken (activities 1.1.1 and 2.1.1). - Selection of the final project interventions will be informed by the outcomes of these analyses, as part of the community adaptation plans to be developed (activity 1.1.2). - The sustainable and efficient use of water resources will be strengthened, further mitigating the risk of water over-extraction: water management and distribution plans will be developed (output 2.3), efficient irrigation technologies introduced (output 2.3) and water use associations trained on water conservation and efficient use of water resources (output 2.4).	nd 2.1.1	nal and international hydrologists
Pollution Prevention and Resource Efficiency (Safeguard Standard 3): Possible environmental contamination due to unmanaged disposal of saline by-products (concentrated brine solutions) from water desalination installations, including soil contamination and degradation in deposit sites. Further contamination of underground and above ground water resources may occur.	- To mitigate this issue, the project will foresee technical solutions to manage this waste product in the technical studies included in output 2.1. - Identified technical solutions such as evaporation ponds (instead of discharge into water bodies) will be implemented.	Activities 2.1.1 and 2.1.2	International and national hydrology and water management specialists Two water specialized NGOs
Community Health, Safety and Security **(Safeguard Standard 4):** There may be some community safety risks involved in the construction and installation of the planned water infrastructure	Further assessment to be undertaken at project inception stage, with recommendations to be integrated in the ESMP. Undertake relevant safety and health measures for construction / infrastructure work (e.g. water infrastructure): - Install safety signs, barriers and other communication to local people on the nature, duration and implication of the works	Health, safety and labour safeguards risk study	MEDD with UNEP oversight
Community Health, Safety and Security **(Safeguard Standard 4):** Boreholes and other water sources may be contaminated by upstream sources or e.g. the mining sector, as well as by the brine waste from the desalination plants to be installed by the project (unless appropriately man	- Information on water quality will be reviewed and testing undertaken before installation of new wells and boreholes to be used for drinking-water purposes - After completion of a well or a borehole, water quality will be tested again, before providing community access to the water source	Activity 2.1.1	International and national hydrology and water management specialists

aged)			
Displacement and Involuntary Settlement **(Safeguard Standard 6):** Possible restrictions on land/water use that deny a community the use of resources to which they have traditional or recognizable use rights	- Any possible restrictions on land use (due to e.g. establishment of agroforestry shelter-belts under component 3) or water use (as a result of water management plans developed under component 2), will be identified and agreed upon through the participatory processes of development of community adaptation plans (output 1.1) and water management and distribution plans (output 2.3) - It will be ensured that any restrictions to land or water use will be voluntary, and agreed upon and governed by the communities and resource users themselves	Activities 1.1.2 and 2.3.1	International consulting firm (1.1.2) and national hydrology and water management specialist (2.3.1)
Labour and Working Conditions **(Safeguard Standard 8):** Risk of (i) working conditions that do not meet national labour laws or international commitments; (ii) the use of forced labor and child labor; and (iii) occupational health and safety risks	- Further assessment to be undertaken at project inception stage, with recommendations to be integrated in the ESMP - Compliance with UNEP's ESSF labour and working condition requirements will be ensured - Basic pay and working condition should be respected for all community members engaged in project activities - Potential forced labor will be assessed and addressed - Safety and health-related measures (e.g. helmets, equipment, masks and appropriate distancing procedures in case of significant risk of communicable diseases, operational guidelines for health and safety) will be provided	Health, safety and labour safeguards risk study	MEDD with oversight from UNEP
Grievance mechanism	- A project grievance mechanism will be put in place - Access to the grievance mechanism will be provided through the UNEP project website, government website, as well as information to be made available at the community level - The grievance mechanism will provide access to a relevant Executing Agency official, as well as the UNEP stakeholder response mechanism and project concern form.	N/A	MEDD with oversight from UNEP

Potential for scaling up

In terms of replication potential, the project will first be developing a specific upscaling strategy and action plan for adaptation in arid and hyper-arid ecosystems of

Mauritania, with a particular focus on EbA (Output 1.4). Interventions to be promoted through the up-scaling strategy and action plan will include both practices successfully implemented by this project and best practices successfully implemented in the past through other initiatives, both in Mauritania as well as in other similar contexts (e.g. those developed by the SCCF-funded EbA South project). Increasing local knowledge of these best practices, and clearly demonstrating their potential in the zones, should increase adoption rates at a broader scale.

The project's upscaling strategy will be developed in close coordination with the ongoing National Adaptation Plan (NAP) process in Mauritania to ensure complementarity and avoid any duplication. In support of the NAP process, the project will provide the identification of possible public, private, national and international financial sources, building on the adaptation funding strategy to be developed under the NAP process. The implementation of the upscaling strategy will build on the review of existing national policies, strategies and plans to integrate adaptation considerations undertaken through the NAP process. For example, CNOEZA is currently developing its Adaptation Strategy for Arid Regions (La Stratégie d'Adaptation des Zones Arides de Mauritanie, SAZAM) and will be taken into consideration for the upscaling strategy when finalized and validated. As a result, an increasing number of EbA interventions are likely to be integrated into regional and local development planning processes, beyond those supported in the three Wilayas of intervention of the project.

The scaling-up potential of the project will further be enhanced through two axes of project interventions: (i) supporting the financial feasibility of the interventions, so that they are accessible to the communities, based on affordable costs of investment; and (ii) knowledge production and dissemination, resulting in both the acceptance of the relevance of the measures, as well as in their simple technical and organizational understanding by users.

The potential for the mobilization of financial resources for replication will be built on using locally appropriate technologies and practices, involving small equipment which are accessible at reasonable costs for the implementation of measures that do not require large upstream investments by the poor rural producers, and do not have large maintenance costs associated with complex production infrastructure and technologies. On the contrary, the project will adopt simple actions that mainly require local unskilled labour force inputs, or only require very short and therefore inexpensive training. This initial approach will be supported by action research to simplify techniques and technologies (Outputs 4.1 and 4.2), gradually reducing investment and maintenance costs. This approach will eliminate the risk of committing into implementing approaches involving measures that rely on sophisticated and very expensive equipment and a highly specialized workforce, that is very expensive to buy and maintain, and import. Thus, economic profitability will play an important role in the scale-up, especially since the beneficiaries are poor rural populations that are relatively receptive to highly cost-effective ecosystem measures.

In terms of the second axis of replication potential (knowledge production and dissemination), this will focus on making well-organized and educational information available to government authorities and rural communities in order to support the replication of successful activities and approaches identified by the project, as a result of their tangible benefits in terms of livelihoods and resilience building. The strategy to collect data and support analysis of the benefits of adaptation practices for rural communities (Output 4.1) is expected to raise awareness and understanding among local authorities and communities of the benefits of adopting climate resilient practices in the face of rapid environmental change. The guidelines, protocols and lessons generated by the project will be documented to facilitate the replication and upscaling of activities in other arid and semi-arid areas in the country.

1b. Project Map and Coordinates

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

During the PPG phase, a rigorous site selection process was undertaken to identify sites for the implementation of project interventions. The eight (8) project sites (Figure 10) identified are located in:

- In the wilaya of Inchiri: 1. the city of Akjoujt 19.7461° N, 14.3879° W; 2. the municipality of Benichab 19.4714° N, 15.4288° W; 3. the coastal borough of Mhaijratt 19°01'47.0"N 16°13'56.9"W.

- In the wilaya of Adrar: 4. the municipality of Tawaz 20°40'53.1"N 12°50'33.2"W; 5. the city of Chinguetti 20.4615° N, 12.3664° W; and 6. the city of Aoujeft 20.0266° N, 13.0544° W.

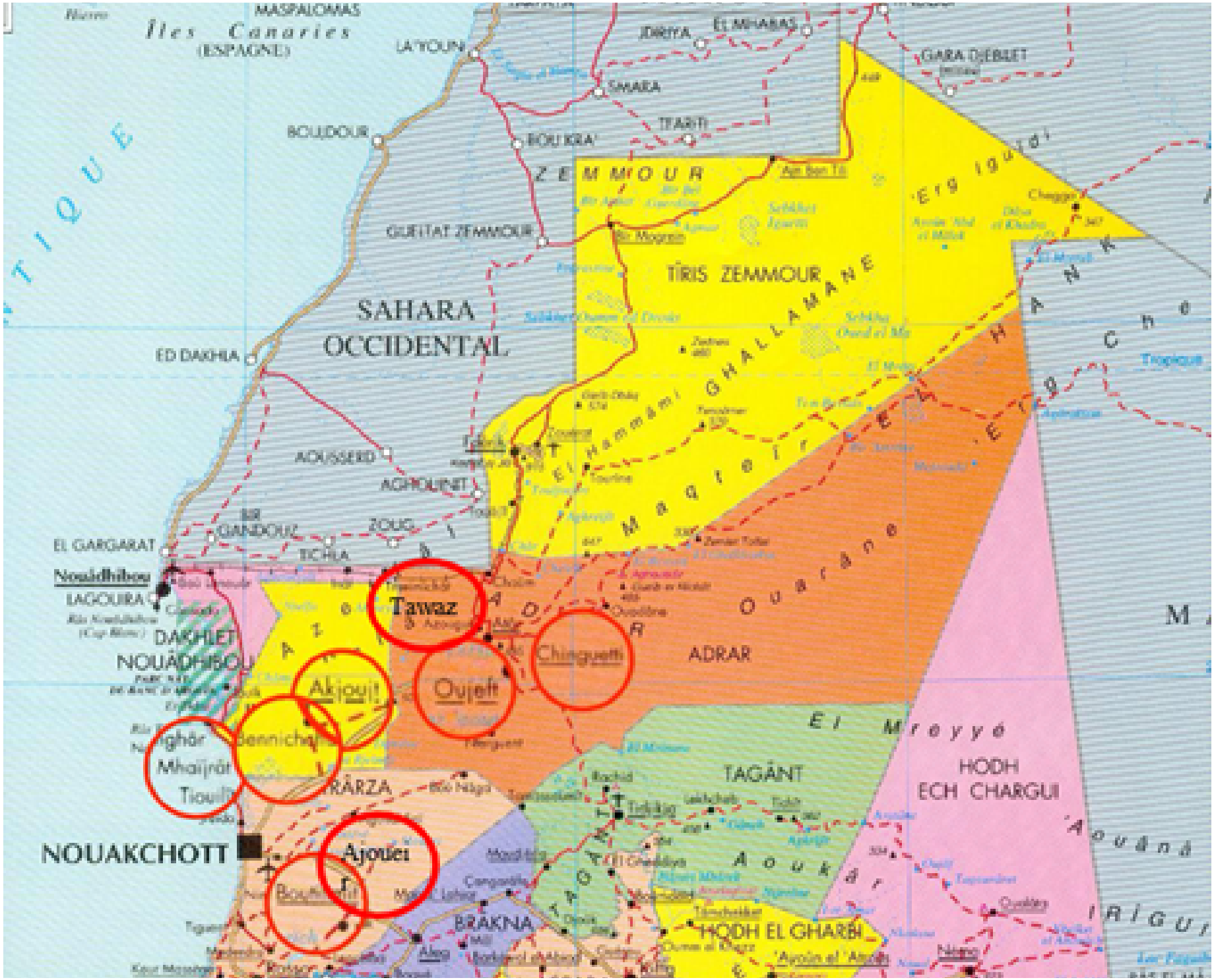
- In the wilaya of Trarza: 7. the city of Boutilimit 17.5489° N, 14.6967° W; and 8. the municipality of Ajoueir 17°12'06"N 14°52'55"W.

Within the 3 wilayas, populations are established in some major oasitic cities such as Chinguetti, and Aoujeft in Adrar, coastal towns (Mhaijratt in Inchiri), Saharan towns (Benichab in Inchiri, Boutilimit and Ajoueir in Trarza) and mining towns (Akjoujt in Inchiri). The population of the sites targeted by the project, as of 2013 (latest census undertaken) is presented in the table below :

POPULATION OF THE PROJECT TARGET SITES

Wilaya	Moughataa	Population (2013)
Inchiri	Akjoujt and Benichab (the latter being established in 2018) (including the coastal borough of Mhaijratt)	19,639
Adrar	Atar (including Tawaz municipality, among 5 municipalities including the capital city)	38,877
	Aoujeft (including Aoujeft municipality, among 5 municipalities in total)	12,997
	Chinguetti (including Chinguetti, among 2 municipalities in total)	6,810
Trarza	Boutilimit (including Boutilimit and Ajoueir municipalities, among 7 municipalities in total)	63,193
	Total	**141,516**

Additional details on project sites are available in the Project Document.


Îles Canaries
(ESPAGNE)
LA'YOUN
SMARA
BOU IDRA'
ZEMMOUR
GUELTAT ZEMMOUR
TIRIS ZEMMOUR
SAHARA OCCIDENTAL
ED DAKHLA
AOUSSERD
AGHOUINIT
EL GARGARAT
Nouâdhibou
LAGOUIRA
DAKHLET NOUÂDHIBOU
Tawaz
Chingueth
Oujeft
Akjouj
ADRAR
TAGÂNT
HODH ECH CHARGUI
NOUAKCHOTT
Ajouer
BRAKNA
HODH EL GHARBI
Mhaijrât
Tiouilit
TRARZA

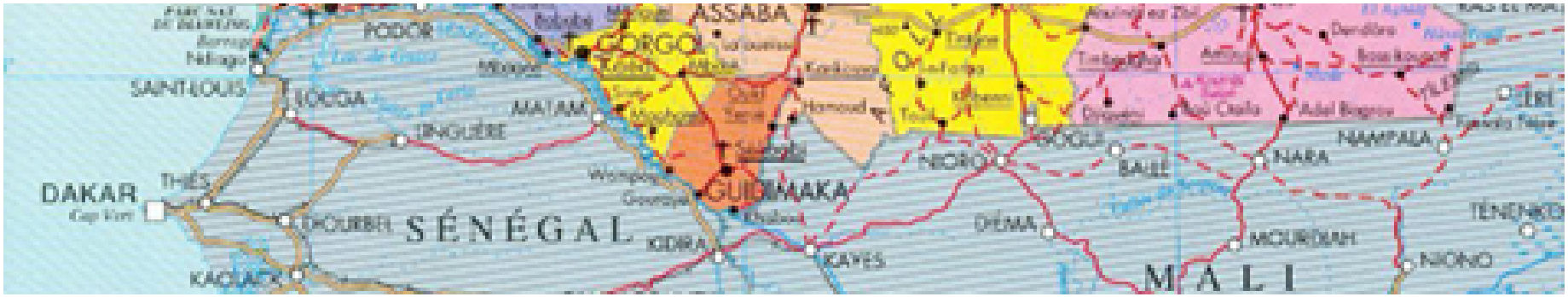


FIGURE 10 LOCATION OF THE PROJECT'S EIGHT INTERVENTION SITES.

Inchiri

The Inchiri region (47,000km2) borders the regions of Adrar to the east and Trarza to the south, and has a short coastline on the Atlantic Ocean. Inchiri is one of the least populated regions of Mauritania. The climate is hot and dry, with maximum temperatures averaging around 35.9°C and minimums of 21.4°C. The very strong large daily temperature amplitude range often causes rocks to burst , which subsequently leads to the formation of sand. Although a desert region, Inchiri is close to the ocean and is therefore influenced by the combined influence of the sea and continental trade winds, as well as the winter monsoon. The region is known for its rich copper deposits and is therefore heavily exploited. The rest of the economic activities in the region are limited to animal husbandry (in particular camels) and agriculture, especially in the capital city Akjoujt (19.7461° N, 14.3879° W), which has many gardens, irrigated with groundwater, ofin which Inchiri is particularly rich.

Adrar

The Adrar region borders Western Sahara and the Mauritanian region of Tiris Zemmour to the north, Mali and the Mauritanian region of Hodh El Chargui to the east, the Mauritanian regions of Trarza and Tagant to the south, and the Mauritanian region of Inchiri to the west. With a surface area of 215,000 km2, it is the second largest wilaya, after Tiris Zemmour. The wilaya of Adrar is dominated by the Majabat El Koubra, an almost impermeable desert that covers 52% of the area with 200 to 350 m in height. The capital city of Adrad is Atar (20.5073° N, 13.0530° W). The climate of Adrar is of desert type - Saharan -, dry and hot, with two strongly contrasted seasons. While the average temperature is close to 28°C for the whole year, it fluctuates around 15-20°C in January-February, with minima that can drop to 5°C during the winter. Summer temperatures are generally between 28 and 38°C, but can reach 46-48°C. During the same day, the range of temperature is often high, usually around 20°C.

Trarza

The Trarza region (67,800 km2) borders the Inchiri and Adrar regions to the north, Brakna region to the east, and Senegal to the south. Its western coastline on the Atlantic Ocean is interrupted only by the Mauritanian capital of Nouakchott, which is located within the region of Trarza. The capital city of Trarza is Rosso (16.5163° N, 15.8026° W). Trarza is entirely subject to a hot desert climate with, however, some nuances: nearly 70% of the territory's surface area has a typical Saharan climate, while the remaining 30% has a Saharan-Sahelian climate, since it is located in the progressive transition zone between the Sahara (desert area) and the Sahel (semi-desert or semi-arid area) where a hot semi-arid climate prevails.

1c. Child Project?

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

2. Stakeholders

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

Civil Society Organizations Yes

Indigenous Peoples and Local Communities Yes

Private Sector Entities Yes

If none of the above,please explain why:

Several stakeholder consultations were conducted during the project identification and preparation phase with representatives of the government, regional stakeholders including the Regional Development Committees (CRDs), the Regional Committees for Environment and Sustainable Development (CREDDs) and the Departmental Committees (CODEP) as well as municipalities, municipal councils and specialized commissions of municipalities, Non-State Actors (NSAs) including Community-Based Organizations (CBOs), Civil Society Organizations (CSOs) and professional organizations of farmers and livestock keepers. A participatory stakeholder mapping was conducted during the PPG phase inception workshop in Nouakchott in April 2019.

The analysis was further refined during the project preparation phase based on consultations with stakeholders. All the stakeholders were consulted during the PPG phase, and their inputs were taken into account while preparing this project document. Consultations were undertaken in particular during several site visits to each of the targeted wilayas, as well as into the capital city. The international and national consultants conducted field missions and consultations with government officials and representatives of local communities in areas adjacent to the intervention sites of the proposed project from April 2019. The purpose of these meetings and missions was to: i) design and refine the project activities; ii) identify and decide on specific intervention sites; and iii) identify the beneficiaries of the project. During these field missions, the consultants also undertook assessments of the current livelihoods of local community members and a rapid appraisal of their access to natural resources. As a result, the activities of the proposed project are well aligned with requirements identified by stakeholders and project beneficiaries.

The consultation approaches included one-on-one meetings, informal interviews and group discussions. One-on-one meetings were mostly used to consult with government representatives and with community leaders. Focus groups were conducted with local communities (women and men) to gain an in-depth understanding of the social, economic and environmental dynamics in the target landscapes. The Stakeholder Engagement Matrix in Appendix 14 includes information on how stakeholders were involved and consulted during the PPG phase.

Women were consulted during site visits conducted under the PPG phase of the project to ensure that their needs are addressed during implementation. On every project site, beneficiaries were consulted first as a general group and subsequently a selection of female beneficiaries were consulted separately in order to obtain their specific views on livelihoods, vulnerabilities, needs and potential project activities. These sessions were complemented with semi-structured household interviews and informal major informant discussions at the project intervention sites to assess first-hand the impacts of climate change and environmental degradation on the lives of women and men living in oasis and desert communities. The resulting gender assessment and action plan are presented in Appendix 17.

Community-Based Organizations (CBOs) and Civil Society Organizations (CSOs) in the target project sites were consulted through interviews with their representatives, and most of them assisted the consultant team during field visits. Representatives of CSOs such as SOS Oasis, MEC ONG, El Emel We Elamel and ONG Arbre were consulted during the missions. As for professional farmers' or livestock keepers' organisations, the target wilayas count on a number of legally recognised cooperatives and a significant number of cooperatives in the target wilayas are based on female constituencies. Female representatives of the Cooperative Insijam, Cooperative Lemdayen ENNASR and Cooperative Dah Mint Deida guided the field visits (visits to oasis, vegetable gardens, small-scale irrigation infrastructure and other livelihood activities) in Akjoujt, Tawaz and Chinguetti, and were extensively consulted on needs and vulnerabilities, as well as the sustainability and feasibility of proposed projected interventions.

These national, regional and local stakeholders will be involved throughout the project implementation phase. The implementation strategy for the proposed project includes extensive stakeholder participation. A stakeholder engagement plan to be used during the implementation phase will be developed at the project inception workshop. The plan will ensure the effective participation of women and vulnerable groups. Stakeholders will be consulted throughout the implementation phase to: i) promote community understanding of the project's outcomes; ii) promote local community ownership of the project through engaging in planning, implementing and monitoring of the interventions; iii) communicate to the public in a consistent, supportive and effective manner; iv) ensure gender equality; and v) maximise complementarity with other ongoing projects.

Please provide the Stakeholder Engagement Plan or equivalent assessment.

The following table summarizes the stakeholder engagement plan per output.

Stakeholder engagement plan

Output	Participants of planning and design of the output	Beneficiaries	Execution	Technical and institutional support
1.1	MEDD MAg MHA MDR MIDEC ONM	Decision-makers Practitioners Beneficiaries	PMU	CNOEZA MEDD ONM
1.2	MEDD MAg MHA MDR	Regional and local governments, the private sector, civil society organizations and community-based organizations (e.g. cooperatives, AGPOs) across the three target wilayas	PMU	CNOEZA MEDD
1.3	MEDD MAg MHA MDR MIDEC ONM	Regional and local governments DREDDs DRHAs DRAs DREs DRDRs	DREDDs	CNOEZA MEDD MDRE
1.4	MEDD MAg MHA	Non-beneficiary arid ecoregion wilayas and communities ONM	PMU	CNOEZA MEDD ONM

	MDR MIDEC ONM			
2.1	DREDDs DRHAs DRAs DREs DRDRs Local associations Local governments of 8 project sites	Local governments of 8 project sites Local associations	PMU	CNOEZA MEDD DRHAs
2.2	DREDDs DRHAs DRAs DREs DRDRs Local associations Local governments of 8 project sites	Local governments of 8 project sites Inhabitants of Local communities	PMU	CNOEZA MEDD DRAs
2.3	Local associations Local governments of 8 project sites	Local governments of 8 project sites Local associations	PMU	CNOEZA MEDD DRHAs
2.4	Local associations Local governments of 8 project sites	Local governments of 8 project sites Local associations	PMU	CNOEZA MEDD DRHAs
3.1	DREDDs DRHAs DRAs DREs	Regional governments of 8 project sites Local associations	PMU	CNOEZA MEDD DRAs

	DRDRs Regional governments of 3 wilayas Local associations			
3.2	DREDDs DRHAs DRAs DREs DRDRs Local associations Local governments of 8 project sites	Local governments of 8 project sites Inhabitants of Local communities	PMU	CNOEZA MEDD DRAs
3.3	DREDDs DRHAs DRAs DREs DRDRs Local associations Local governments of 8 project sites	Local governments of 8 project sites Inhabitants of Local communities	PMU	CNOEZA MEDD DRAs
3.4	Local associations DREs	Local associations	PMU NGOs	CNOEZA MEDD DREs
4.1	CNOEZA MEDD MAg MHA MDR MIDEC ONM	Policy makers	PMU Universities	CNOEZA MEDD
4.2	CNOEZA	Local beneficiaries	PMU	CNOEZA

	EbA Practitioners	EbA practitioners Policy makers		MEDD
4.3	DREDDs DRHAs DRAs DREs DRDRs Regional governments of 3 wilayas Local associations	Local population, governments and associations, nomads	PMU	CNOEZA MEDD
4.4	CNOEZA Local and regional governments	Local population, governments and associations, nomads	PMU, radio stations	CNOEZA MEDD

In addition, provide a summary on how stakeholders will be consulted in project execution, the means and timing of engagement, how information will be disseminated, and an explanation of any resource requirements throughout the project/program cycle to ensure proper and meaningful stakeholder engagement.

During project implementation, stakeholder engagement will be undertaken in three phases. Firstly, the “mobilisation” phase will take place during the first year of the project. This phase will focus mainly on engaging stakeholders and planning their participation in the project. This will include developing a detailed workplan for the activities on a monthly basis according to availability of the required stakeholders and to biophysical parameters for planting interventions (e.g. seasons, growth rates). Secondly, the “consultative implementation” phase will run during the main implementation phase of the project. This phase consists of applying the stakeholder involvement plan to each of the activities defined during the mobilisation phase. Thirdly, the “completion and upscaling” phase will start during the last year of project implementation. This phase will support the sustainability of the project by further transferring responsibility for management of the project’s investments to local stakeholders.

The mechanisms for stakeholder consultations will include: i) initial meetings with national, regional, departmental and communal authorities during the inception workshop; ii) consultations with the coordinators of the baseline and partner projects; iii) consultations with NGOs, local associations and cooperatives; and iv) consultations with other members of local communities that will benefit from the project. It is through the Walis (governors) at the wilaya level that consultations will take place to establish support for the implementation of the project and to stimulate the participation of regional services in the project. Local communities will be involved in the decision making processes and implementation of the project. For example, the selection of adaptation options and the species for producing non-timber forest products in the arid zone will be influenced by the preferences of local communities.

Select what role civil society will play in the project:

Consulted only;

Member of Advisory Body; Contractor;

Co-financier;

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

Executor or co-executor; Yes

Other (Please explain)

3. Gender Equality and Women's Empowerment

Provide the gender analysis or equivalent socio-economic assesment.

Mauritania's kaleidoscope of overlapping social, economic and cultural roles form the critical gender determinants that will inform the intervention strategy and EbA frameworks of this project. The traditional, nomadic and sociocultural norms demarcate household resources, bargaining and decision-making power, as well as domestic duties in a gendered manner. In the Mauritanian context, a majority of women fulfil multiple responsibilities in the household: domestic water and fuel provision, child and elderly care, and other chores – generating gendered 'time poverty'. There is also marginalisation and exclusion, that women face in land ownership and security, decision-making in natural resources management bodies and action plans, and access to adaptation opportunities and options. An informative example of this phenomenon can be found in the World Bank's land governance research, which finds that Mauritanian women only hold 8% of total (official) land deeds, dropping to approximately 5% in the fertile and arable Senegal River Valley. Gender gaps are also typical in economic opportunities. Despite representing 55% of the working-age population (World Bank) , female labour force participation rate is only 27.2%, according to the International Labour Organization (ILO). Labour markets are also characterised by pervasive informality and ad-hoc employment opportunities, increasing the risks determining unemployment, lack of benefits, and steady wages.

The proposed project's commitment to gender equality and women's empowerment are reflected in the Gender Assessment and Gender Action Plan, which can be found at Appendix 17 of the Project Document. The Gender Action Plan is also included below.

Gender Action Plan

CLIMATE CHANGE ADAPTATION AND LIVELIHOODS IN THREE ARID REGIONS OF MAURITANIA			
PROJECT OBJECTIVE:	to increase the adaptive capacity of rural communities in the *wilayas* of Adrar, Inchiri and Trarza		
PROJECT INDICATOR:	number of beneficiaries – with gender disaggregation		
TARGET BENEFICIARIES:	**37,867** beneficiaries, of which 60% are expected to be women		
OUTPUT	ENTRY POINT	ACTION POINT	TARGET
COMPONENT 1:	**Institutional and technical capacity development for the planning and implementation of climate change adaptation in arid ecosystems**		
OUTCOME 1:	Stakeholders demonstrate increased technical and institutional capacity for climate change adaptation – particularly EbA – in arid ecosystems		
1.1 Climate change impact and vulnerability assessments undertake	Climate vulnerability assessments are essential to chart effects on natural resource-dependent sectors, economic losses, as well asset-loss and vulnerabilities of different communi	Analyses targeting communities and social vulnerabilities must employ a 'gender lens' and map out the risks facing men and women in the three wilayas. This will have both an **analytical** and **policy-level impact**.	Gender specialist within PMU · Gender-responsive vulnerability mapp

n, and adaptation options identified and validated by stakeholders in each of the 3 target wilayas and 8 project sites	ties. These are **analytical outputs** that will inform the project context and will be fundamental in understanding the gendered impacts of climate risks and inclusive EbA options in the three wilayas. This will require the assistance of a **GENDER SPECIALIST**.	The **GENDER SPECIALIST** will work with researchers and technical specialists to incorporate gender analyses, especially in community resilience assessments employed in climate vulnerability mapping. The **GENDER SPECIALIST** is expected to undertake mixed methods qualitative as well as quantitative analysis, involving focus group discussions (particularly with women's groups), key informant interviews and consultations with volunteer groups, CSOs, national gender machineries and regional gender forums (such as: the African Union – Women, Gender and Development Directorate and the Commission of the Economic Community of West African States or ECOWAS Gender Development Centre).	ing conducted **REPORT** · Gender Action Plan updated to include inception phase findings and priorities from the three wilayas **WORKPLAN**
1.2 575 representatives of regional governments, private sector, civil society organizations and community-based organizations (e.g. cooperatives, AGPOs) across the 3 target wilayas trained on adaptation approaches (including EbA)	This output focuses on development and implementation of capacity building. Here, gender mainstreaming will take the form of involvement of more women in technical capacities, ensuring greater gender parity (currently favoured towards men). Women do not enjoy equal representation and opportunities in the labour market, see p. 11. This will be a **representation** and **technical** output, where affirmative action policy will ensure women are given access to the requisite skill-building and tools necessary for adaptation planning and EbA.	This will be a **capacity- and technical-level impact**. Quick gender analysis for disaggregation data will be performed for the identified representatives. Adherence to gender-equal selection policy will be ensured, to improve both participation and representation, in the key decision-making regarding EbA in the three wilayas. Altering the skewed gender ratio will not only help representation rates, but also create a bona fide cycle of engaging and empowering women through climate change adaptation processes New training programmes will include modules on gender-climate change adaptation-EbA nexus issues. These modules will also be included in the training exercises for new recruits under activity 1.2.1. The **GENDER** SPECIALIST will be tasked with developing these modules, relevant to the context of the wilayas and made accessible in French, Arabic and vernaculars.	· Training records should show 50 – 50% m/f disaggregation **DATA** · Inclusion of gender-responsive training modules on EbA **REPORT**
1.3	- 1.1 -	- 1.1 -	- 1.1 -

3 Regional Development Plans (PDRs) and 8 Local Development Plans (PDLs), integrating adaptation to climate change and gender, revised or developed and shared with stakeholders			
1.4 An upscaling strategy and action plan for climate change adaptation in arid ecosystems of Mauritania developed in collaboration with national stakeholders, focusing on EbA approaches	- 1.1 -	- 1.1 -	- 1.1 -
COMPONENT 2:	Sustainable access to and efficient use of water		
OUTCOME 2:	Enhanced sustainable access to and efficient use of water for increased drought-resilience of local communities and ecosystems in the wilayas of Adrar, Inchiri and Trarza		
2.1 16 new efficient water provisioning systems (e.g. new wells, boreholes, solar pumps, desalination units) and 4 water collection and storage systems installed in the 8 project sites	Water-short livelihood systems characterize the three wilayas, and Mauritania nationally. Rural and urban water access gap, resulting out power, poverty and inequality, exacerbate the workload and time poverty of women. This is an **infrastructural output.** Consideration of gender perspectives informing water ac	The **GENDER** SPECIALIST will be tasked with organising a gender engagement workshop for the target beneficiaries. Needs and requirements will be identified, such as optimum distance for water collection, time-sharing, and demarcation of responsibilities (and rights) relating to water collection and storage. The workshop will also help in the identification of formal and informal structures, rules and norms mean that inform water use, access, and scarcity. This is because while many water-related tasks and burdens are assigned to women, men of	· Justification of water infrastructure distribution REPORT · Modules and training material developed for the gender workshop WORKSHOP DELIVERABLES

	cess, usage and scarcity will be crucial to increase the effectiveness of the new water infrastructure being proposed by the project.	el related tasks and burdens are assigned to women, men often control water-related powers and rights. These will feed into the overall community usage plan to avoid trade-offs between sustainable water use and social inequities.	· Identification of needs, requirements and agreements regarding community usage that emerge through the workshop **REPORT**
2.2 Small-scale infrastructures implemented on 4 water courses to increase infiltration and to reduce erosion and flooding	- 2.1 -	- 2.1 -	- 2.1 -
2.3 8 efficient irrigation water distribution systems established (one in each project site)	- 2.1 -	- 2.1 -	- 2.1 -
2.4 8 community associations (e.g. cooperatives, AGPOs) trained on sustainable and efficient water management and distribution (one in each project site)	- 2.1 -	- 2.1 -	- 2.1 -
COMPONENT 3:	Protection, productivity and diversification of local livelihoods		
OUTCOME 3:	Protection, productivity and diversification of livelihoods enhanced through EbA and small-scale infrastructure interventions to increase climate-resilience in the wilayas of Adrar, Inchiri and Trarza		

3.1 Regional community nurseries specialized in plant production for arid ecoregions established and operational, and training for their sustainable management provided to local communities or cooperatives in 3 wilayas	Land is a vital productive asset for the majority of Mauritanians and the creation of ecoregions for plant production will require efficient land governance. The Assessment discusses the gendered distribution and access to land in the country. Without consideration to these factors, these plant nurseries will replicate existing gender inequalities and limit access for the most vulnerable interest groups. This will be an **EbA output**.	Building on the research from the first component and the workshop results from the second component, the GENDER SPECIALIST will ensure that gender-responsive perspectives are mainstreamed in the creation of new ecosystem values. Since women lack decision-making power and representation in commonly managed or community entrepreneurial activities, women's cooperatives and interest groups will be identified by the GENDER SPECIALIST to ensure that social and environmental co-benefits of these EbA options are shared.	· Women's cooperatives consulted and included in EbA process REPORT · Inclusion of gender-responsive sharing and management clauses in the community or cooperative legal tools POLICY DOCUMENT
3.2 EbA interventions implemented on 400 hectares of dunes to protect vulnerable communities, livelihoods and ecosystems from dune-migration	- 3.1 -	- 3.1 -	- 3.1 -
3.3 EbA interventions implemented on 150 hectares to shelter vulnerable communities from dune migration, heat and wind and to provide forage for livestock and non-timber forest products	- 3.1 -	- 3.1 -	- 3.1 -

3.4 Additional natural resource-based livelihoods introduced for local populations	- 3.1 -	- 3.1 -	- 3.1 -
COMPONENT 4:	**Knowledge for action on climate change and EbA in arid ecosystems**		
OUTCOME 4:	Stakeholders demonstrate strengthened knowledge and action-oriented attitudes on climate change and adaptation approaches (particularly EbA)		
4.1 5 publications on policy-relevant research findings published based on monitoring of adaptation results generated under Components 2 and 3, and disseminated to at least 45 decision-makers	Impacts of climate risks and loss of ecosystem goods and services on gender relations and dynamics continues to be a lacuna in the existing literature. This is a **knowledge output.** Since the project will engage in a gamut of gender mainstreaming actions through the previous components, there will be useful lessons learnt and best practices generated.	The **GENDER** SPECIALIST will be tasked with ensuring that the publications and other knowledge products intended for decision-makers contain useful gender information, qualitative and quantitative methodological notes as well as lessons learnt / best practices. Using the information and in-field knowledge generated from the different components, the **GENDER SPECIALIST** will put together a portfolio of gender actions, their mileage in the communities, reception and effectiveness, as well as replicability in other contexts. These will be documented by the project through this component to ensure continuity, and create a knowledge base of relevant gender-responsive EbA practices both nationally and regionally.	· Gender sections in the knowledge products REPORT
4.2 A series of 4 EbA handbooks detailing best practices for arid ecosystems developed and shared with at least 550 members of local implementation structures across the 3 t	- 4.1 -	- 4.1 -	- 4.1 -

arget wilayas			
4.3 At least 750 local stak eholders informed of climate change adapt ation and good EbA pr actices in the three ta rget wilayas	- 4.1 -	- 4.1 -	- 4.1 -

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

Yes

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

Improving women's participation and decision making Yes

Generating socio-economic benefits or services or women Yes

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

Yes

4. Private sector engagement

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

The private sector, including extractive industries (e.g. Mauritania Copper Mines) will be directly involved in project implementation/co-financing, but will also benefit from project interventions such as dune stabilization which will protect physical assets, and vulnerability assessments which will enhance decision-making capacity in the face of climate risks. By enhancing awareness of adaptation needs and solutions, the project will also contribute to the development of a demand for adaptation services and technologies (e.g. waterboxx), and could help boost future private sector investments in adaptation. The private sector will also be involved in the value chain strengthening aspects of livelihood diversification efforts undertaken under Outcome 3 of the proposed project, where the project will seek to capitalize on the knowledge of the private sector in supporting the development of sustainable business plans, among others.

5. Risks to Achieving Project Objectives

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

SUMMARY OF RISKS TO THE ACHIEVEMENT OF THE PROJECT OBJECTIVES AND PROPOSED MITIGATION MEASURES.

#	Description of risk	Potential consequences	Mitigation measures	Risk rating	Probability and impact (1–5)
Risks at the national level					
1	High turnover of staff in the project team or on the project steering committee.	Frequent changes in government agencies and key individuals, and the consequent limited institutional memory, result in disruptions and/or delays in project implementation and may compromise the effectiveness and sustainability of the project.	The project will be housed in a new government agency (CNOEZA), specializing in interventions in arid lands, data collection and management, information systems and long-term ecological monitoring. This institution will identify a primary and a secondary focal point in each relevant government institution during project inception phase. This will ensure effective communication, ownership and possible handovers during the project implementation period and beyond. Furthermore, the processes of decision-making, design and implementation under the project will be well documented. Administrative arrangements will also be made to ensure that permanent staff will be hired for the project team.	Low	P = 2 I = 2
2	Possible differences in practices, procedures, mandates and visions between key project partners and non-governmental stakeholders.	Disagreements and differences on the way forward and/or on the best options for project activities cause delays.	The project activities will be supervised and guided by the Project Steering Committee (PSC) and implemented by the Project Management Unit (PMU), on the basis of in-depth dialogue and mutual agreement among all stakeholders. In addition, key stakeholders have already formed a strong network during the PPG phase and government structures have been engaged for maximizing synergies and efficiency.	Low	P = 1 I = 3
3	Unwillingness to collaborate or to share information, and disagre	Project interventions are de	The roles, responsibilities and priorities of each p	Medium	P = 2

	ement among stakeholders on t he distribution of roles in the pro posed project.	ncertain allocation of roles and responsibilities. The eff ectiveness of project mana gement is reduced.	idated with the concerned institutions at the proje ct inception phase. Synergies and collaboration b etween all project stakeholders will be facilitated by the PMU at national, regional and local levels.		
4	Limited technical capacity to de velop and implement the project interventions.	Delayed and/or poorly desi gned project interventions, and insufficient capacity to address potential impleme ntation challenges.	The capacity of national and local authorities will be significantly strengthened to enable the planni ng and implementation of EbA measures through the capacity building and training activities of pro ject component 1, as well as project management training activities.	Medium	P=2 I=3
5	Procurement delays due to ineffi cient or overly complex administ rative procedures.	Procurement delays have a negative impact on the time ly delivery of project activiti es.	MEDD will support the PMU in the procurement an d acquisition of goods and services. A procedures manual will be developed and validated, building o n national procedures. Strict deadlines will be set for each stage of the procurement process, and pr ogress will be closely monitored by the PMU.	Medium	P=2 I=4
6	Climate change adaptation prior ities undermined by political eve nts, national emergencies or civi l unrest.	Changes in government an d project staff, or issues rel ated to safety and security, lead to a delay in the imple mentation of the project act ivities. Natural and financial capital is lost.	The Project Manager will keep abreast of national events and politics to plan contingency activities when/if necessary.	Medium	P=2 I=3
7	Limited participation of women i n project activities	Limited participation of wo men, associated with a high ly gender inequitable nation al context, would lead to th e inability of the project to b enefit women through its in terventions, in particular as it relates to increasing their capacity to adapt to CC, an d their adoption of climate-r esilient livelihoods.	The project will adopt a locally-adapted participat ory approach to include women as much as possi ble, informed by the gender consultant, and work t oward women empowerment while respecting loc al cultural norms (e.g. when necessary engaging with women in the presence of their husbands, to ensure transparency and acceptance).	Medium	P=4 I=3
Risks at the local level					
1	Limited acceptance and/or ado ption of adaptation intervention s by local communities.	Local communities may not adopt identified adaptation interventions during or after the proposed project, result	Local communities will be involved in the design a nd implementation of adaptation plans and techn ologies, which will be implemented in an equitable manner. Particular attention will be paid to workin	Medium	P = 1 I = 4

		ing in the continued unsustainable use of resources. Moreover, interventions will not be sustainable once the project is completed.	g with village elders and local community leaders to ensure their support. The project will focus on raising awareness of the local communities on the benefits of adaptation and EbA approaches through activities under components 1 and 4. Interventions generating tangible benefits (including income-generating alternative livelihoods) will be planned for the first year of the project to ensure optimal community buy-in.		
2	Lack of funds available for ensuring the sustainability of certain activities beyond the duration of the project.	The project achievements and results will not be maintained after the project finishes.	One of the key project aspects is the development and institutionalization of its sustainability strategy, which begins in the first year of the project. Financing needs and possible funding options for ensuring the long-term sustainability of project results will be identified in the sustainability strategy. Adaptation measures will also be integrated into policies and awareness raising will be conducted for decision makers. The participation of key stakeholders in implementation will be progressive and their responsibility for site management will increase by 25% each year. This will facilitate a successful transfer of ownership and responsibility at the project closure.	Medium	P=3 I=3
3	Natural hazards and climate shocks.	Limited access to project sites or damage to infrastructure hinders the implementation and monitoring of project interventions, and compromises achievement of objectives. Success of EbA interventions may be compromised (e.g. damages to restored ecosystems).	Activities will take into account and integrate climate and early warning information. EbA interventions will be designed to withstand the climate (for example, best practices will be followed in terms of climate-resilient planting operations, species selection, etc.).	Medium	P=3 I=3
4	Arid conditions in the project sites and distances between community water points.	Lack of rain or adequate watering may compromise the survival of seedlings plante	Sufficient watering and protection of the seedlings will be ensured by the project teams in all target wilayas.	High	P=3 I=4

		d for the EbA interventions.	Seedling survival and replacement rates are to be closely monitored and assessed. In case of any is sues, corrective actions will be identified to impro ve survival rates. For example, improved access t o water may be necessary, and different species o r planting / watering protocols may need to be co nsidered. Mapping of community water points, water quality and depth will help to ensure that activities requiri ng water are placed close to access to suitable so urce of water.		
5	Limited participation of women i n project activities and/or limite d access to its benefits by wom en, associated with a gender ine quitable national context.	Limited impact of the proje ct on increasing women's c apacity to adapt and their a doption of climate-resilient livelihoods.	The project will adopt a locally-adapted participat ory approach to include women in project activitie s as much as possible, informed by the gender co nsultant, and work towards women's empowerme nt while respecting local cultural norms (to ensure transparency and acceptance).	Medium	P=3 I=3

6. Institutional Arrangement and Coordination

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

Institutional Arrangements

The project will be implemented over a four-year period (see Appendix 5 of the Project Document for the project work plan). The process of hiring project staff will begin shortly after the signing of the Project Cooperation Agreement (PCA) between UNEP and MEDD, and the internalization of the project. Implementation will build on lessons learned from various projects, including the Enhancing Capacity, Knowledge and Technology Support to Build Climate Resilience of Vulnerable Developing Countries (GEF ID 4934) and the Development of an improved and innovative management system for sustainable climate-resilient livelihoods in Mauritania (GEF ID 5580) (see Section 6 for more information). During the inception phase of the project, the following steps will be undertaken: (i) organization of the inception workshop to inform existing and new stakeholders about the project and the roles of each stakeholder during the implementation phase; (ii) continued consultation with national and local stakeholders (see Section 2) to select sites for specific project interventions; and (iii) the launch of the baseline study at the selected sites to measure the baseline values of the indicators selected for the project Results Framework (see Appendix 3 of the Project Document).

UNEP will be the Implementing Agency for the project. It will oversee the project and provide the technical assistance required to achieve its objective, and to ensure consistency with GEF and UNEP policies and procedures. This supervision will be the responsibility of the Task Manager (TM), who will be appointed by UNEP. The TM will formally participate in the following: (i) Project Steering Committee (PSC) meetings; (ii) mid-term and final evaluations; (iii) the clearance of Half yearly Progress Reports and Project Implementation Reviews, expenditure reports and budget revisions; and (iv) the technical review of project outputs.

The project management structure is presented in Figure 11. This structure will comprise: (i) the PSC; (ii) the National Executing Agency (NEA), which will house the Project Management Unit (PMU) consisting of the Project Manager (PM); Part time Chief Technical Advisor, Monitoring and Evaluation specialist, Knowledge Management and Communication specialist, and Administrative and Financial Assistants. The project will adopt the principle of flexibility in terms of the mobilization of capacities and skills to support its implementation. It will rely on DREDDs and other relevant state decentralized services (such as DRHAs and DRDRs), where their mandate, skills and experience are aligned with the project's support needs, as well as on services beyond those of the government, including local contractors (NGOs and local private companies) where justified by their comparative advantages for carrying out the various activities, on a case-by-case basis.

The PSC will include national representatives from MEDD (CNOEZA, CCPNCC, ANGMV, PNA, DPN, DAPL, DPCID), ONM, MDR, CSA, MHA, MASEF and MIDEC. Members of implementing NGOs and relevant community-based organizations, as well as representatives of targeted local communities and community leaders, will also be invited to participate in the PSC in order to provide grassroots inputs and to offer more opportunities for participation, which will contribute to ensuring local ownership and guidance for the project. The composition and mandate of the PSC will be formalized at the project inception phase. PSC terms of reference are included in Appendix 8 of the Project Document.

The Secretary General of MEDD will chair the PSC. The PSC will meet twice a year, and additional ad hoc meetings will be held, if necessary, to discuss key project performance indicators and to provide guidance on project direction. Coordinating structures at the level of the wilayas and lower-level government structures will be determined during the project inception phase.

Under the framework of MEDD, CNOEZA will be the National Executing Agency (NEA) for the project. A CNOEZA PM will be hired by MEDD to lead the PMU and execute the day-to-day management of the project. He/she will operate in a transparent and efficient manner, in line with budgets and work plans. In addition, the PM will report monthly to the TM on progress and challenges encountered on the ground in carrying out project activities. In particular, the PM will: (i) lead the day-to-day planning and implementation of the project in close collaboration with the NEA; (ii) provide on-the-ground information for UNEP progress reports; (iii) engage with stakeholders; (iv) organise the PSC meetings; (v) provide managerial support to the project, including measures to address potential external and internal project implementation issues; (vi) manage the project

budget and resource allocation; and (vii) participate in training activities, report writing and facilitation of consultant activities related to his/her area of expertise. In addition, the PM will meet with the co-finance and partner projects twice a year, or more often if necessary, as part of a consultation and coordination working group. The focus will be on sharing lessons learned and preventing duplication of activities.

The PM will be assisted in the implementation of the project by a part-time international Chief Technical Advisor (CTA) and a national technical advisor, whose key tasks are to (i) organize technical support to communities, (ii) support annual planning processes, (iii) facilitate the exchange between stakeholders, associations and communities, (iv) support conflict prevention and management, (v) monitor and improve the adequacy of project strategies in line with adaptation requirements, (vi) develop and monitor the implementation of consultants' terms of reference, agreements and project implementation delegation arrangements, (vii) support the integration of EbA into local policies and planning tools, and (viii) develop and coordinate the implementation of the project's sustainability strategy.

The PM will also be supported by a monitoring and evaluation specialist, as a part-time function over the course of the project, whose tasks will include: (i) launching and overseeing the baseline study, (ii) establishing a performance monitoring framework to set bi-annual targets for the project to meet the targets, outcomes and objectives defined in the project document by the end of the implementation phase; (iii) measuring project and GEF Climate Change Adaptation Results Framework indicators at least 1-2 times per year to assess the project's progress in achieving its targets; and (iv) reporting to the PMU and PSC on project performance, based on planned project outputs and outcomes, as well as the project indicators. As part of his/her responsibilities, the monitoring and evaluation specialist will oversee and monitor the application of gender disaggregated indicators, together with the gender specialist which will also part of the PMU. If the expected ratio is not reached, corrective actions will be developed by the monitoring and evaluation and gender specialists, the PM and the expert concerned. The latter will monitor progress on the ground and will be responsible for implementing these corrective actions until a satisfactory level of women's participation is achieved.

The gender specialist will mainstream gender aspects within the project implementation strategy. He/she will:

- work with researchers and technical specialists to incorporate gender analyses, especially in community resilience assessments employed in climate vulnerability mapping
- be tasked with organising a gender engagement workshop for the target beneficiaries
- ensure that gender-responsive perspectives are mainstreamed in the creation of new ecosystem values
- ensure that social and environmental co-benefits of these EbA options are shared
- be tasked with ensuring that the publications and other knowledge products intended for decision-makers contain useful gender information, qualitative and quantitative methodological notes as well as lessons learnt / best practices
- put together a portfolio of gender actions, their mileage in the communities, reception and effectiveness, as well as replicability in other contexts

In the field, the PM will be supported by three Field Officers, one posted in each wilaya. Their essential tasks on the ground will be to support the PM as follows: (i) support the timely execution of activities and the achievement of expected results; (ii) promote dialogue between stakeholders, particularly at the local level; (iii) monitor and analyse the consideration of gender issues in project activities; and (vi) facilitate the participation of rural communities in project activities. To achieve this, they will be required to visit the intervention sites regularly and to work closely with stakeholders, including community, municipal and provincial structures and with the PM. In addition, an administrative and financial assistant will be recruited on a part-time basis to support the PM and the experts. The administrative and financial assistant will assist project staff in equipment, logistics and administration, manage the project's accounts and prepare expenditure reports to UNEP standards. A vehicle will be purchased duty-free. The procurement of services, goods and works for the project will be done in accordance with national procurement regulations.

Consultants will be hired for specific tasks requiring specific expertise and which cannot be undertaken by government staff. International technical assistance will be provided for specialized tasks only where existing national capacities are insufficient. Appropriate international expertise will be sourced with the support of UNEP’s network for procurement of consulting services, in collaboration with the PM. Each technical expert will be responsible for ensuring that the gender equity ratio for their activities (as

defined in Appendix 3) is achieved. This will be clearly stipulated in their ToRs. The project staff and key consultant ToRs are presented in Appendix 8. MEDD will support the work of project staff and consultants by providing office space and other logistical support in the three targeted wilayas of the project during the implementation phase.

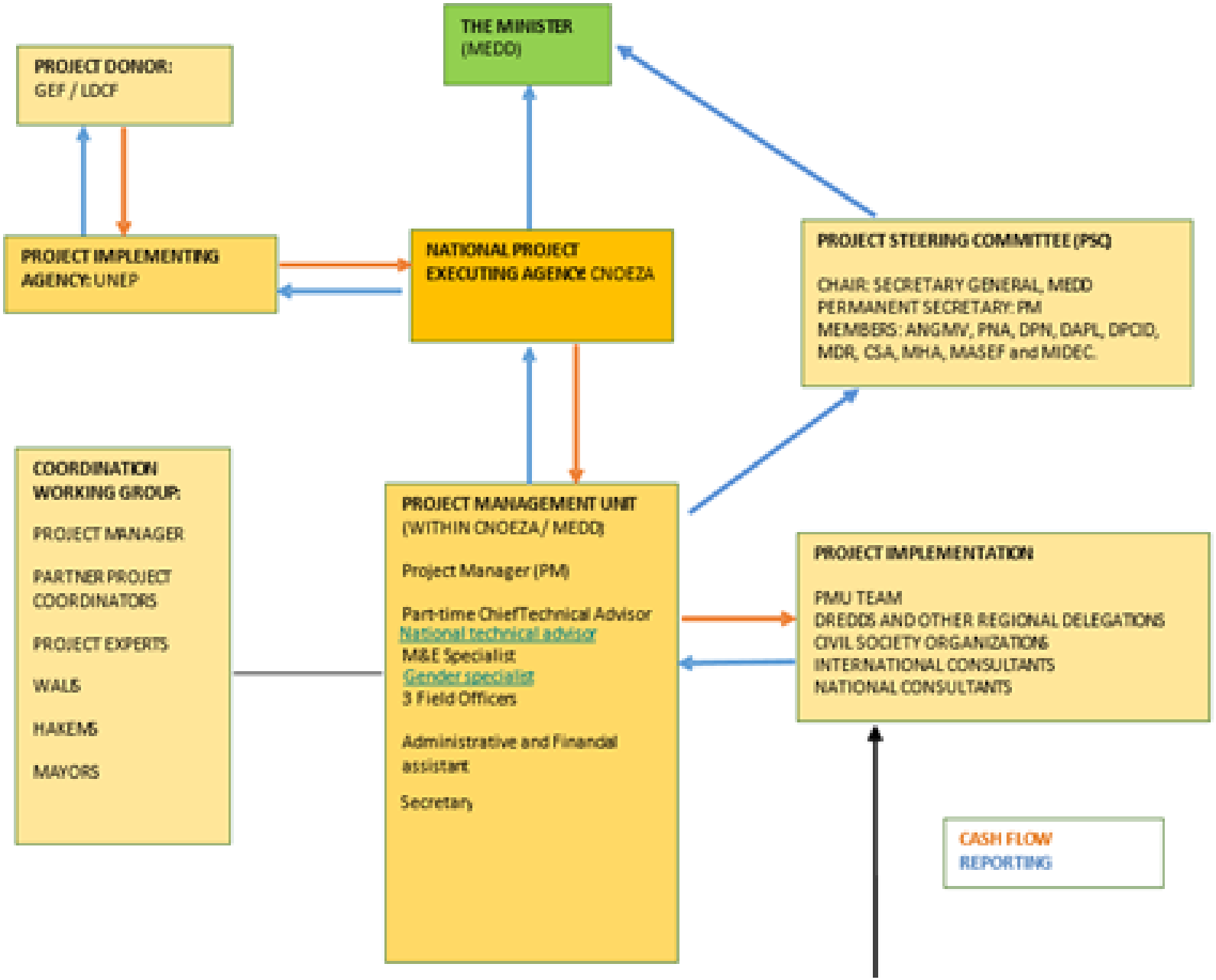


FIGURE 11 ORGANOGRAM OF THE PROJECT MANAGEMENT STRUCTURE.

Coordination with on-going initiatives

A coordination working group will be set up as part of the project management structure, to bring together co-finance and partner projects, as well as other relevant initiatives. The focus of the working group, which will meet at least twice a year, will be on identifying synergies and opportunities for collaboration, sharing knowledge and lessons learned, and preventing the duplication of activities. Relevant ongoing and recently completed initiatives are outlined below.

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 is being implemented in the wilayas of Brakna, Assaba, Gorgol, Guidimakha, Hodh El Gharbi and Hodh El Chargui from 2016 to 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 PRODEFI 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 and livelihood diversification under Component 3 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 **Great Green Wall for the Sahara and the Sahel Initiative (GGWSSI)** is an ongoing initiative, which was approved 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 on Combating Desertification), launched in 2011 with US$8 billion mobilized / committed for its support. The initiative aims to strengthen the resilience of the region's populations and natural systems to desertification and drought through rational ecosystem management, sustainable development of land resources, protection of rural heritage and provision improved living conditions for the local population. The initiative's objectives include restoring 100 million hectares of degraded land affected by desertification, sequestering 250 million tonnes of carbon and creating 350,000 jobs in rural areas by 2030. The GGW implementation area for Mauritania covers six wilayas (Trarza, Brakna, Tagant, Assaba, Hodh El Gharbi and Hodh El Chargui). The proposed GGW route crosses 15 Moughataas and 45 communes. In their various forms of organization (cooperatives, group associations, women's or youth organizations, etc.), the populations are the central pillar in the implementation of the Great Green Wall Initiative in Mauritania. For 2014-2018, these populations are estimated at 481,000 inhabitants in 1,242 localities. The Action Plan for the implementation of this National Strategy 2014-2018 had an overall budget estimated at 39,768,000,000 UM (ouguiyas), i.e. US$ 136,706,282. A continuous effort, the resources needed to finance the GGW Action Plan in Mauritania come mainly from State allocations (approximately US$ 2 M, contributions from development partners and the establishment of a multi-donor trust fund. the proposed LDCF project will be aligned with the GGWSSI through its second and third outcome, which aim at the increased resilience of local communities and ecosystems to the effects of climate change, including drought and desertification. Through the implementation of innovative EbA interventions in the arid ecosystems of the three target wilayas, the proposed project will contribute to the scaling up of GGWSSI's approaches in the regions and landscapes of Mauritania where it is not implemented. In addition, the best practices and lessons learned from the implementation of EbA interventions in arid environments will enable them to be replicated or used to document similar activities carried out under the GGWSSI.

The **Global Climate Change Alliance 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, which was launched in June 2014. Its second phase (2018-2021) was confirmed in August 2017. With a budget of approximately US$ 9.6 million, the second phase of GCCA-M will contribute to the resilience of the African population to climate change, addressing the need for improved climate information in Africa and strengthening the use of this information for decision-making. The two components of GCCA-M phase two are: (i) Strengthen the institutional mechanism in charge of monitoring and coordinating climate change issues.; and ii) Adoption of good practices for the adaptation and sustainable management of agro-sylvo-pastoral systems in the Saharo-Sahelian areas. Two lessons learned of the first phase of GCCA-M is the lack of integration of climate change adaptation in national planification and the lack of institutional strength of the MEDD as a pivotal interministerial facilitator in climate change mainstreaming. The proposed LDCF project will build on the capacity building already undertaken under the GCCA-M and, where adequate, expand it to the arid regions of Mauritania (GCCA-M is active in Assaba, Brakna, Gorgol, Guidimaka and Trarza) by providing training and institutional support to regional and local development authorities in the arid regions of Mauritania. In addition, it will complement the climate change knowledge base and awareness campaigns implemented by GCCA-M with specific knowledge on the arid ecoregion.

The **Co-Management of Marine, Coastal and Terrestrial Resources (CorMCT)** Project began in 2018 and will run until 2021, funded through the German Federal Ministry for Economic Cooperation and Development (BMZ). It intends to strengthen the resilience of vulnerable population groups dependent on marine, coastal and land resources to the consequences of climate change. The proposed project will coordinate with CorMCT in order to seek synergies with the existing and documented experiences with Local Associations for Natural Resources Management (AGLCs) for replication and adoption in the target areas, as well as to extend EbA interventions in the (semi-) arid region of Hodh El Gharbi. This may help to address the lack of locally legitimized governance structures and the prevailing “tragedy of the commons”.

The **Sustainable Landscape Management Project (PGDP)** (2014-2021) under the Sahel and West Africa Programme 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 the World Bank. The development objective of the PGDP project 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 to preserve and regenerate acacia species (including Acacia senegal) that are of economic importance. The project targets the following ecosystem goods and services: (i) gum arabic; (ii) other non-timber forest products (NTFPs); (iii) forage 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 developing similar activities in arid ecosystems (in the wilayas of Adrar and Inchiri). The proposed project will benefit from the lessons learned and markets for the NTFPs developed by the PGDP, while generating additional knowledge about 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.

Development of an improved and innovative management system for sustainable and climate-resilient livelihoods in Mauritania (DIMS) is a climate change adaptation initiative funded by the LDCF (US$ 5,000,000) to reduce the vulnerability to climate change of the national government and local communities in the forests and rangelands of the Sahelian acacia savannah ecoregion. The DIMS project is implemented by UNEP and executed by MEDD, with a 4-year implementation timeframe from 2018 to 2021. The DIMS project envisages three outcomes: 1) Strengthened capacity at the national, provincial and local levels to use EbA measures to address climate change risks in rangelands; 2) Increased provision of pastoral resources and climate resilient livelihoods via an EbA approach; and 3) Increased awareness and knowledge of climate change risks, benefits of EbA and opportunities for climate-resilient livelihoods in Mauritania. The project interventions being implemented in the wilayas of Guidimaka, Assaba, Hodh El Gharbi and Hodh El Chargui focus on EbA approaches, and in particular dune stabilization, rehabilitation of forests and rangelands, and introduction of alternative income-generating activities. While the wilayas covered by the two projects are different, the proposed LDCF project will draw on lessons learnt from the relevant DIMS project interventions, in particular dune stabilization, pasture regeneration, and livelihood diversification (including agroforestry and market gardening). The two projects will also coordinate closely on a number of activities in the context of EbA training, policy-integration, awareness raising and knowledge management, where the proposed LDCF project will draw directly on the tools and experiences of the DIMS project. The proposed project will also benefit from DIMS experiences on community engagement for strengthening the ownership and sustainability of its interventions. Finally, the upscaling strategy to be developed by the proposed project will build directly on the upscaling strategy of the DIMS project, adding a specific focus on the most arid areas of the country. The coordination between the two projects will be facilitated by both being executed by MEDD (and implemented by UNEP), and having their Project Management Units co-located.

Building core capacity for the implementation, monitoring and reporting for the Multilateral Environmental Agreements (MEAs) and relevant Sustainable Development Goals (SDGs) in Mauritania is a GEF-funded Cross-Cutting Capacity Development (CCCD) project (2019-2021). The project has a budget of US$ 950,000 and is implemented by UNEP and executed by MEDD (CNOEZA). The objective of the project is to strengthen national capacity for environmental information and knowledge management for the implementation, monitoring and reporting of MEAs and relevant SDGs. The project has two components: 1. Development of a coordinated system for managing knowledge and information on the environment and natural resources; 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 draw on the data and information systems put in place as part of the project to support vulnerability assessments and knowledge-sharing events and products. The proposed LDCF project will also coordinate with the GEF project on awareness-raising and public education activities. Furthermore, the national environmental data, information and knowledge management system/ platform developed by the CCCD project can be used to digitally record data, document and publish results and findings of the LDCF project and to widely disseminate knowledge products developed under its Component 4.

Continental wetlands adaptation and resilience to climate change is a GEF LDCF project (US$ 4,449,542), implemented by the International Union for Conservation of Nature (IUCN) and executed by the National Agency for the Great Green Wall of Mauritania (ANGMV) (2019-2023). The goal of the project is to increase the resilience to climate change of three inland wetlands ecosystems and adjacent communities through an ecosystem-based management approach. It is being implemented at three wetlands in south-eastern Mauritania (Tâmourt Bougary, Gâat Mahmoûda and Tâmourt en Na'âj) by enhancing governance mechanisms and building capacity for and establishing improved wetland management. The wetlands targeted by this project are not close to the target sites of the proposed LDCF project. However, there will be synergies and therefore a need for coordination between the two initiatives, for example in terms of vulnerability analyses, guidelines for climate-resilient agriculture, pastoralism and NTFPs to be developed by the IUCN project (component 2), identification and implementation of climate-resilient livelihoods diversification options, introduction of improved irrigation techniques, and strengthening of local natural resource management associations and monitoring practices.

The National Programme for Integrated Support to Decentralisation, Social Development and Youth Employment (PNIDDLE) is an associated project, not a baseline project, with which the LDCF project will align to maximize benefits. PNIDDLE was initiated in 2014 to: i) continue and strengthen the decentralisation process; and ii) promote democracy and social development at the local scale. This will be achieved by strengthening communal institutions through: i) increasing communal capacity for infrastructure management to improve access of local communities to basic services; ii) increasing synergy between government institutions at the national and local levels; iii) promoting employment of youth; iv) promoting participatory approaches for development planning and management at the communal scale; and v) enabling ownership of all interventions funded by the GoM by the relevant local government institutions. The first phase of the project will run for five years with a budget of US$102 million provided by the GoM, the World Bank and the European Union – i.e. US$52 million, US$25 million and US$25 million respectively. During this first phase, PNIDDLE will focus on 100 communes in 10 wilayas, including the three wilayas targeted by the LDCF project. The management of natural resources – such as forests and rangelands – is not directly part of the development planning aspects on which PNIDDLE will focus.

The Regional Pastoral Support Project in the Sahel (PRAPS) was launched in October 2015 for a six-year implementation period (ending in December 2021). It is a regional project covering the six Sahelian countries (Burkina Faso, Mali, Mauritania, Niger, Senegal and Chad), funded by the World Bank and the International Development Association, and executed in Mauritania by the Ministry of Livestock (ME). The total budget for the project is approximately US$ 250 million, of which US$ 45 million is allocated to Mauritania. In Mauritania, PRAPS is implemented in ten wilayas, including Adrar, Inchiri and Trarza. The Project Development Objective (PDO) is "to improve the access of farmers and agro-pastoralists to essential productive assets, services and markets in selected trans-border areas and along transhumance routes in six Sahelian countries, and to strengthen country capacities to respond quickly and effectively to pastoral crises or emergencies". The five components of the project include: (i) improving animal health; (ii) improving natural resource management; (iii) facilitating market access; (iv) improving the management of pastoral crises; and (v) project management and institutional support. The proposed LDCF project will build on PRAPS project's sustainable resource management objectives. Under component 2, PRAPS is strengthening extension services to pastoralists, as well as disseminating natural resources management mechanisms and promoting degraded lands restoration activities.

Development of an integrated system to promote the natural capital in the drylands of Mauritania is a recently (June 2020) approved GEF PIF in the Land Degradation Focal Area, with a budget of $3,913,626. The project will be implemented by IUCN and executed by MEDD (CNOEZA). The project aims to improve rural communities' livelihoods in the wilayas of Adrar, Inchiri and Dakhlet Nouadhibou through sustainable land restoration and management. The project will also enhance capacities of local communities to adopt drought smart land management practices and financing strategies. The project is designed to support the institutional framework on SLM and LDN, implement ecosystem restoration solutions, and develop financing strategies for scaling up. The proposed project will particularly work with CNOEZA to increase their capacity for 34 evidence-based decision making in arid ecosystems and develop synergies with various stakeholders. It will be important for the LDCF project to be engaged in the development of this new project, considering the large overlap in the intervention areas of this project and the proposed LDCF project, as well as some potential overlap in the currently-proposed co-finance plan for the project under development.

Enhancing Pastoral Farming Producers Resilience in Southeast Watersheds of Mauritania is a recently (June 2020) approved GEF LDCF PIF, with a budget of $5,000,000. The project aims to strengthen the resilience of vulnerable rural populations by improving agriculture and livestock sector planning and the application of innovative practices at the catchment level. The project will achieve its objective through (i) Adaptation and resilience practices secured through local resource use planning and decision-making frameworks; (ii) Innovations applied and supporting uptake of resilience measures by vulnerable communities; and (iii) Monitoring, evaluation, and capture of lessons learned to informed decision-making and upscale of resilience improvements. Although the project will build upon proven models, such as agro-pastoral fields schools, it will also use a watershed approach to address climate change adaptation within the livestock and farming sectors in a participatory way. Further, the project will support private sector agriculture and livestock producers deploy innovative technologies supported by creative financial instruments to adopt and benefit from climate coping practices resulting in basinwide ecological resiliency improvement. To ensure sustainability, the project will focus on community ownership and locally led action by establishing community-based governance bodies organized around each target watershed to support the completion of strategic land and resource use planning. It will also strengthen national level policies to integrate adaptation and best practices resulting from the project implementation. Although the project intervention areas are different, there will be synergies and opportunities for collaboration and knowledge-sharing between two projects, which will be further explored during the development of the new project.

Recently completed initiatives

Enhancing capacity, knowledge and technology support to build climate resilience of vulnerable developing countries (EbA South) is a recently-completed SCCF-funded project implemented by UNEP and executed by the National Development and Reform Commission of China (NDRC). In Mauritania, the project was executed jointly by MEDD and NDRC between 2012 and 2019, with a budget of US$ 928,000. EbA South project's goal was to build resilience to climate change in vulnerable countries in Africa and Asia-Pacific by supporting the planning, financing and implementation of EbA approaches in coastal, mountain and arid/semi-arid ecosystems. The project consisted of three components: (i) inter-regional coordination and capacity building for developing countries in Africa and Asia-Pacific in the planning and implementation of EbA; (ii) increased availability of synthesized knowledge about best EbA practices; and (iii) increased resilience of coastal, mountain and arid/semi-arid ecosystems in Seychelles, Nepal and Mauritania. The project provided support to the three pilot countries to develop country- and ecosystem-specific EbA protocols. These protocols formed the basis for pilot EbA activities in each of the countries. EbA South Mauritania focused on providing strategic support for climate change adaptation in agricultural production systems. This was done by increasing the resilience of plant and animal production systems that are vulnerable to climate change impacts, in particular through desertification control using multi-use greenbelts. Institutional and technical capacity was built in the development of the EbA protocols and the implementation of EbA pilot activities. The project also supported the establishment of a monitoring site in Benichab under a long- term research programme that was established in partnership with École Normale Supérieure de Nouakchott, to serve as a research area on EbA to understand the effects and benefits of EbA in the long term. The EbA pilots and research collected during the project were integrated into various national policy briefs. In Mauritania, three policy briefs (on water, pastoralism, and agriculture and food security) were delivered and disseminated to relevant actors, and a summary of policy recommendations was developed. The LDCF project will benefit from the experiences of EbA South, which generated the first factual set of knowledge on the implementation of EbA interventions in Mauritania. Many of the lessons learnt have been incorporated in the design of the LDCF project, including measures to enhance seedling survival through proper fencing, water and maintenance. Furthermore, the EbA South project Terminal Evaluation is scheduled to take place in the first half of 2020, and will be looking specifically at some of the challenges experienced by the project in Mauritania in terms of EbA interventions and their maintenance. Its findings and recommendations will be particularly helpful in further informing this LDCF project's implementation.

The project Increasing Capacity for Adaptation to Climate Change in Rural Areas (ACCMR) was initiated in 2014 and ran until 2018. This four-year project had a total budget of US$3.6 million provided by the German Federal Ministry for Economic Cooperation and Development (BMZ) and the EU through the GCCA-M. It was executed by GIZ and the MEDD. The interventions of the ACCMR focused on the wilayas of Brakna and Assaba. ACCMR was 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 contributed to advancing the NAP process and is of relevance to the LDCF project. The ACCMR interventions under Component 1 included: 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. Therefore, the documentation produced by, and lessons learnt from, ACCMR will be built upon by the proposed LDCF project to address the remaining gaps in the mainstreaming of arid zone adaptation to climate change. The ACCMR has also completed detailed vulnerability assessments for the wilayas of Brakna and Assaba to identify adaptation options and integrate these into development planning, an approach which will be replicated by the proposed LDCF project in the arid wilayas of Adrar, Inchiri and Trarza.

The programme Management of Natural Resources (ProGRN) took place in several phases between 2004 and 2017, with funding provided by the German Development Bank (GIZ). Its objective was the improvement of the sustainable management of the ecosystems and their natural resources, and was implemented nationwide. The LDCF project will build on the programme's significant contributions to the legal basis for environmental protection and sustainable resource management. Moreover, it will capitalize on the successes and lessons learnt from the introduction of decentralized management in two other regions (i.e. Guidimakha and Hodh El Gharbi). Indeed, Component 2 of ProGRN supported users to organize themselves in inter-village entities in the preservation, use, and restoration of their natural resources. The Mauritanian legal framework allows the transfer of the management mandate to these organizations which are responsible for implementing sustainable management of resources. ProGRN has developed methods to support these organizations, enabling them to apply the principles of the Mauritanian policy for the preservation of forest resources (Forest Code) and pastoral resources (Pastoral Code). ProGRN led to smallholders and livestock owners forming 37 user communities, and are now sustainably farming an area of over 10,000 km2 in demonstrable accordance with formal and legally binding user agreements. The proportion of women in key positions in the user associations has increased from six to 36 percent.

The Climate Change Adaptation in Coastal Cities (ACCVC) Project was recently concluded (2012-2017) and was funded by German Development Bank (GIZ). Its objective was to get increase the capacity, and use of tools, of relevant actors in Mauritania in the area of climate change adaptation in coastal cities. The project, while focusing mainly on Nouakchott, produced a throve of knowledge products relevant to this proposed LDCF project, including educational sheets intended to facilitate exchanges between the various stakeholders in urban planning around concrete adaptation measures to be undertaken at the scale of the municipalities. Knowledge upon which the proposed project will capitalize relates in particular to dune stabilization interventions, which may be accessed through the information system AdaptNKC accessible to all decision-makers.

The Regional Programme on Good Governance – Maghreb was commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) for Algeria, Morocco, Mauritania, Tunisia, and took place between 2003 and 2013. Its objective was "A constructive dialogue takes place between government agencies and civil society organisations in the Maghreb countries. Examples of good governance are followed up and support is provided for reform initiatives to promote the rule of law, transparency and participation.". In Mauritania, the Programme provided support to decentralization processes, including the elaboration of local development plans, an experience the LDCF project intends to learn from and replicate in its areas of intervention.

The project for Enhancing Resilience of Communities to the Adverse Effects of Climate Change on Food Security in Mauritania (PARSACC), implemented from 2014 to 2019, was funded by the Adaptation Fund and implemented by MEDD and World Food Programme (WFP). PARSACC had a budget of US$ 7,803,605, and was implemented in 75 communes in the wilayas of Assaba (14), Brakna (10), Gorgol (7), Guidimaka (4), Hodh El Chargui (6), Hodh El Gharbi (13), Tagant (5), and Trarza (16). The project aimed to strengthen the resilience of vulnerable communities to the effects of climate change on food security and contribute to the sustainable management of natural resources in these 8 wilayas. To achieve this objective, PARSACC interventions were 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 adaptation interventions to diversify and improve the livelihoods of local communities that are vulnerable to climate change. Although only one of the LDCF project's target wilayas was covered by the PARSACC project, the experiences and lessons learnt from the project have influenced the design of the LDCF project and its approach, and will continue to be of relevance in its implementation. The project Terminal Evaluation is currently underway.

Improving climate resilience of water sector investments with appropriate climate adaptive activities for pastoral and forestry resources in southern Mauritania is an LDCF-funded project (US$ 6,350,000) implemented by AfDB and executed by MEDD from 2015 to 2019. 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.

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.

7. Consistency with National Priorities

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

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

The GoM has ratified the following international conventions: Convention on the Protection of Cultural and Natural World Heritage (World Heritage Convention) in 1981; Convention on Wetlands (Ramsar Convention) in 1983; Convention on International Trade in Endangered Species of Fauna and Flora (CITES) in 1998; Convention on Migratory Species (CMS) in 1998; United Nations Framework Convention on Climate Change (UNFCCC) in 1994; United Nations Convention on Combating Desertification (UNCCD) in 1996; Convention on Biological Diversity (CBD) in 2005; and the Kyoto Protocol to the United Nations Convention on Climate Change (UNFCCC) in 2005.

In addition to the aforementioned international conventions, Mauritania is a signatory to the following regional conventions: the African Convention on the Conservation of Nature and Natural Resources in 1968; and Convention on Cooperation in the Protection and Enhancement of the Marine Environment and Coastal Areas of West and Central Africa in 1981.

The project is aligned with Mauritania's national adaptation priorities as developed in the country's Nationally Determined Contribution (NDC) (2017), as well as its fourth National Communication to the UNFCCC (2019). In particular, the project supports the NDC 2030 adaptation ambition to: (i) strengthen the resilience of natural ecosystems to the effects of climate change; (ii) strengthen the institutional and technical capacity of national and local structures to plan, finance and implement climate change adaptation measures; and (iii) strengthen the resilience of the vulnerable population, particularly in rural areas, to the effects of climate change. It also will be supporting the NAPA (2004), in particular its focus on increasing the resilience of rainfed agriculture, water-efficient technology in oases, supporting capacity-building for producer organizations, and knowledge management for improved water resources management.

The project is also aligned with the following strategies and plans:

- SCAPP 2016-2030: Accelerated Growth and Shared Prosperity Strategy (SCAPP). The SCAPP has three pillars: Pillar 1: Promoting strong, sustainable and inclusive growth; Pillar 2: Developing human capital and access to basic social services; and Pillar 3: Strengthening governance in all its dimensions. Environmental governance is thus operationally integrated in Pillar 3, in its objective of "Strategic building of better environmental governance, rational management of natural resources and disaster risk reduction." The project thus directly supports two sub policy objectives under Pillar 3: (a) the Integrated ecosystem use policy (specifically supported objective: "Fighting the effects of climate change and building resilience for populations in the face of the effects of climate change through the financing of enabling activities and the strengthening of the institutional framework at national and regional level as well as the establishment of sustainable financing mechanisms"); and b) Preservation and enhancement of resources (projects to be initiated on Protecting natural ecosystems and combating degradation; Strengthening the resilience of vulnerable populations to the effects of climate change; and Strengthening the institutional and technical capacity of national and local structures to plan, finance and implement climate change adaptation measures).

- National Strategy for the Environment and Sustainable Development and its Action Plan 2017-2021 (SNEDD) : The overall objective of the SNEDD by 2030 is not only to slow the degradation of the environment, but to reverse the degradation trends so that the development of natural resources effectively contributes to ensuring green and inclusive growth. The specific objectives of SNEDD are (i) Develop natural resources in a way that is sustainable and resilient to CC, for the benefit of the poor, and (ii) Promote the environmentally sound use of ecosystem services and natural resources.

- Rural Sector Development Strategy (SDSR) (2013-2025) developed in 2013 aims to: (i) increase agropastoral productivity and (ii) provide the tools to develop the regulatory framework for agropastoral regulatory frameworks, including strategies adapted to different production lines such as livestock/meat, leather/skins, fruits and vegetables, and non-timber forest products such as gum arabic. The project will contribute to the strategy through interventions in the project areas towards the development

of several production lines, including those for vegetables, dates, NTFPs, henna, forage plants such as alfalfa, and the protection of production sites against sand encroachment, water erosion, and various other climate change risks.

- The National Action Plan to Combat Desertification in Mauritania (PAN-LCD) of 1987 had as its the main objective of the fight against desertification, in place for more than three decades. It was adapted in 2013 to align with the National Framework for Combating Desertification (CNLCD) and to take into account the principles of: (i) a participatory approach to combat desertification; (ii) improving livelihoods combining natural resource management and poverty reduction; (iii) combining the objectives of the three conventions, namely UNCCD, UNFCCC and CBD; (iv) building on for past gains and previous initiatives to combat desertification and reduce the negative effects of drought; and v) the strategic flexibility of the PAN-LCD. This strategy is a useful framework for the implementation of the project in the intervention areas, as the project interventions relate directly to the phenomena of desertification, including dune encroachment, water erosion, deforestation, declining agricultural productivity, salinization of water, declining water tables, lack of water resources and poor natural resource management practices in arid ecosystems. Indeed the interventions such as dune stabilization (with mechanical fixation, and through nurseries and plantations), the fight against water erosion (CES, DRS, zai, etc), irrigation water-saving techniques, Waterboxx, and associations for sustainable resource management are all at the heart of technical and organisational offensives to combat desertification.

- National Biodiversity Strategy and Action Plan (SPANB) developed in 1999 includes eight key founding principles for the national vision of biodiversity. Among these principles, five are particularly relevant to the project: i) biodiversity is a priority for sustainable development; ii) biodiversity conservation and sustainable use of natural resources is the responsibility of every Mauritanian; iii) the ecosystem approach is necessary to support biodiversity conservation and sustainable use of natural resources; iv) the conservation and development of knowledge, innovations, traditions, and indigenous and local practices is of major importance; and v) collaboration and sharing of knowledge, costs and benefits between all sectors and government levels is required for the conservation of genes, species and ecosystems.

- National Food Security Strategy (SNSA) (2012-2015). The overall goal of the SNSA is to help vulnerable populations gain adequate physical and economic access to a healthy diet. The SNSA supports the revitalization of plant and animal production in order to promote food security, including through: (i) land reform to ensure secure access to land for those who exploit it; (ii) the protection of local production for internal markets, as well as improving the competitiveness of products; (iii) financial policies tailored to the rural areas, particularly for vegetable production, irrigation and livestock; (iv) policies for the processing and value-addition of products; (v) capacity building of producer organisations; (vi) reforms necessary for undertaking agricultural research tailored to the needs of producers and provisions appropriate advice; (vii) the promotion of youth employment; (viii) consideration of gender; and (ix) an effective decentralisation policy and good governance. The following principles underpin this overall objective: i) promoting a diversified rural and peri-urban economy that is adapted to climate change; ii) improving commercial trade routes; iii) strengthening mechanisms to prevent food shortage crises; and iv) promoting good governance toward food security. These principles are aligned with the project’s objectives and its activities to be implemented in the intervention areas. The project's interventions contribute to the implementation of the SNSA, and in particular its objectives of food security and fight against poverty, through the strengthening of population's resilience to climate change.

- National Strategy for Gender Equality (SNIG) (2006). The SNIG aims to improve women's social and economic rights and achieve equitable development. To this end, it promotes the integration of reduction of inequality and discrimination in national development strategies. These principles are well aligned with the project, as they highlight the rights of women who in the project areas of intervention are the key actors of the agricultural sector (horticulture, vegetables, date production...).

- The Water and Sanitation Sector Development Strategy (SDSEA) (2009) aims to improve water sector governance, develop integrated water resource management and increase access to safe drinking water and sanitation in Mauritania. Arid areas are clearly at the geographical and human front lines in terms of the need for drinking water and water for the maintenance of agricultural production (dates and vegetables). Water is also needed for carrying out major reforestation works and to stabilize dunes, which threat production sites but also the hydraulic infrastructure themselves, as well as housing, schools, and medical facilities.

- National Disaster Risk Management Action Plan (PAN-GRC) (2007). The PAN-GRC focuses on preventing and responding to risks and disasters related to: (i) food security; (ii) the environment, including drought, desertification, bushfires and pollution; and (iii) health.

- United Nations Sustainable Development Partnership Framework (CPDD) (2018-2022). The project aligns with Mauritania's CPDD, particularly Strategic Priority 1 "Inclusive growth", and its third intended result: "Institutions and communities enabled to undertake sustainable management of natural resources, in order to anticipate and deal with crises and the effects of climate change". Indeed, in support of this intended result, the project will contribute to improving governance of natural resources taking into account the effects of climate change and to strengthening national capacity for intersectoral coordination of natural resource management.

8. Knowledge Management

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

Knowledge Management is at the core of the sustainability of the project, and involves building on the lessons learnt from previous initiatives, the generation of new knowledge where gaps have been identified (in particular with regards to vulnerability and adaptation in arid regions of the country), awareness raising of climate change issues and adaptation solutions/EbA approach, as well as capitalizing on the lessons learnt through the implementation of the project.

Some outputs from Component 1, as well as Component 4, focus specifically on knowledge management in this LDCF project. The project will fund both vulnerability assessments and policy-relevant research, based on the monitoring of adaptation strategies being implemented through Components 2 and 3. This will allow the lessons from the project to effectively used by decision-makers, and develop evidence-based adaptation options and strategies in arid regions which currently lack relevant data to inform those decisions.

In addition, the project will prepare a series of EbA handbooks, each covering a specific adaptation measure. The project select the topics for the handbooks, and develop their contents, with the help of local experts, and ensure that local communities (including the illiterate) can interpret and use their contents.

Finally, the project will strive to raise community awareness of climate change, its impacts, and relevant adaptation options through the activities under project output 4.3.

All outputs relevant to knowledge management are listed in Table 12 below, along with allocated budget and an expected timeline.

Knowledge management outputs

Output	Budget (US$)	Expected timeline
Output 1.1: Climate change impact and vulnerability assessments undertaken, and adaptation options identified for each of the three target wilayas and the project sites	$164,000	The climate change and vulnerability assessments are anticipated to be completed in the first year of project implementation to allow the project to build on that knowledge to better target its interventions.
Output 4.1: 5 publications on policy-relevant research findings published based on monitoring of adaptation results generated under Components 2 and 3, and disseminated to decision-makers	$100,000	The publications will be produced in the third and fourth year of project implementation, to be able to capitalize on the data from the adaptation results generated under Components 2 and 3.
Output 4.2: A series of 4 EbA handbooks detailing best practices for arid ecosystems developed and shared with local implementation structures across the 3 target wilayas	$125,000	The handbooks are anticipated to be delivered in the second and third year, to capitalize on lessons from the project and other EbA projects in the country.
Output 4.3: 9 knowledge-sharing and exchange events, with at least 750 participants in total, organized for the 3 target wilayas.	$102,500	

The approach to KM taken by the project will also ensure to capitalize on traditional knowledge, and in particular the specific skills and capacities of women and other vulnerable groups, to ensure they can also be agents of change in decision-making processes. This will be ensabled through participatory approaches and continued engagement with the communities and vulnerable groups throughout project implementation.

Results from the project will be also disseminated beyond the project intervention zone through several existing information sharing networks and forums. In Mauritania, the national environmental data, information and knowledge management system/ platform developed by the UNEP-implemented GEF CCCD project (see Section 6) can be used to digitally document and publish results and findings of the LDCF project and to widely disseminate knowledge products developed under its Component 4.

At the regional and global level, the sharing of project experiences, lessons learnt and knowledge generated will be undertaken through by various platforms and events. The UNEP-coordinated Global Adaptation Network (GAN) and other platforms such as Friends of EbA (FEBA) will be used to disseminate project findings and knowledge products. Opportunities for featuring the project at various international and regional events will also be capitalized on, to enhance the sharing of knowledge with other countries. Furthermore, UNEP's GEF and climate change adaptation communications teams will support the development of informational materials (e.g. fact sheets, articles, short documentaries) on the project. The project will also identify and participate, as relevant, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation through lessons learned. In addition, lessons learned that may be beneficial in the design and implementation of similar future projects will be identified and shared, as part of an ongoing process.

9. Monitoring and Evaluation

Describe the budgeted M and E plan

UNEP, EbA and Monitoring and Evaluation (M&E)

The project will follow UNEP standard monitoring, reporting and evaluation processes and procedures. Substantive and financial project reporting requirements are summarized in Appendix 6 of the Project Document. Reporting requirements and templates are an integral part of the UNEP legal instrument to be signed by the executing agency and UNEP.

The project Monitoring and Evaluation (M&E) Plan is consistent with the GEF Monitoring and Evaluation policy. The Project Results Framework presented in Appendix 3 of the Project Document includes SMART indicators for each expected outcome and end-of-project targets. These indicators along with the key deliverables and benchmarks included in Appendix 6 of the Project Document will be the main tools for assessing project implementation progress and whether project results are being achieved. The means of verification and the costs associated with obtaining the information to track the indicators are summarized in Appendix 5 of the Project Document. Other M&E related costs are also presented in the Costed M&E Plan and are fully integrated in the overall project budget.

The M&E plan will be reviewed and revised as necessary during the project inception workshop to ensure project stakeholders understand their roles and responsibilities vis-à-vis project monitoring and evaluation. Indicators and their means of verification may also be fine-tuned at the inception workshop. The project baseline study, to be undertaken in the project inception phase, will further validate the indicators and their targets, and establish mid-term targets. It will also further develop the M&E plan into a detailed project M&E framework.

Day-to-day project monitoring is the responsibility of the project management team, but other project partners will have responsibilities to collect specific information to track the indicators. It is the responsibility of the Project Manager to inform UNEP of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely fashion.

The Project Steering Committee will receive periodic reports on progress and will make recommendations to UNEP concerning the need to revise any aspects of the Results Framework or the M&E plan. Project oversight to ensure that the project meets UNEP and GEF policies and procedures is the responsibility to the UNEP Task Manager. The Task Manager will also review the quality of draft project outputs, provide feedback to the project partners, and establish peer review procedures to ensure adequate quality of scientific and technical outputs and publications.

At the time of project approval, approximately 70 percent of baseline data is available. Baseline data gaps will be addressed during the first year of project implementation, and in particular through baseline study to be undertaken.

Project supervision will take an adaptive management approach. The Task Manager will develop a project supervision plan at the inception of the project which will be communicated to the project partners during the inception workshop. The emphasis of the Task Manager supervision will be on outcome monitoring but without neglecting project financial management and implementation monitoring. Progress vis-à-vis delivering the agreed project global environmental benefits will be assessed with the Steering Committee at agreed intervals. Project risks and assumptions will be regularly monitored both by project partners and UNEP. Risk assessment and rating is an integral part of the annual Project Implementation Review (PIR) process. The quality of project monitoring and evaluation will also be reviewed and rated as part of the PIR. Key financial parameters will be monitored quarterly to ensure cost-effective use of financial resources.

A mid-term management review will take place at the end of year 2 as indicated in the project milestones. The review will include all parameters recommended by the GEF Evaluation Office for terminal evaluations and will verify information gathered through the GEF tracking tools, as relevant. The review will be carried out using a participatory

approach whereby parties that may benefit or be affected by the project will be consulted. Such parties were identified during the stakeholder analysis (see Section 2). The Project Steering Committee will participate in the mid-term review and develop a management response to the evaluation recommendations along with an implementation plan. It is the responsibility of the UNEP Task Manager to monitor whether the agreed recommendations are being implemented.

An independent terminal evaluation will take place at the end of project implementation. The Evaluation and Oversight Unit (EOU) of UNEP will manage the terminal evaluation process. A review of the quality of the evaluation report will be done by EOU and submitted along with the report to the GEF Evaluation Office not later than 6 months after the completion of the evaluation.

The GEF tracking tools are attached as Appendix 12 of the Project Document. These will be updated at mid-term and at the end of the project and will be made available to the GEF Secretariat along with the project PIR report. As mentioned above the mid-term and terminal evaluation will verify the information of the tracking tool.

A costed M&E workplan is presented in the Table below.

Costed M&E plan

Type of M&E activity	Responsible Parties	Budget US$ (Excluding project team staff time)	Time frame
Inception workshop and report	PM CTA M&E Specialist UNEP TM	Indicative cost: US$12,300	Within the first two months of project start up. Will be undertaken at the national and sub-national scales.
Baseline study	PM M&E Specialist UNEP TM	Indicative cost: US$40,000	At project inception.
Measurement of means of verification of project results	UNEP TM M&E Specialist PM	To be finalised at Inception Workshop. This includes hiring of specific studies and institutions, and delegate responsibilities to relevant team members.	Start, mid and end of project (during evaluation cycle) and annually when required.
Annual project report (APR)	PM M&E Specialist UNEP TM UNEP FMO (Fund Management Officer)	None	Annually
PIR	PM M&E Specialist	None	Annually

	UNEP TM UNEP FMO (Fund Management Officer)		
Periodic status/ progress reports	PM M&E Specialist CTA UNEP TM	None	Quarterly
MTR/MTE Includes measurement and verification of results	UNEP TM/UNEP Evaluation Office	Indicative cost: US$45,000	At the mid-point of project implementation.
Terminal Evaluation (TE)	UNEP Evaluation Office	Indicative cost: US$50,000	At least three months before the end of project implementation.
Project terminal report	PM M&E Specialist UNEP FMO UNEP TM	None	On completion of the terminal evaluation.
Visits to pilot intervention sites	UNEP TM M&E Specialist PM PSC representatives	For GEF supported projects, paid from UNEP's IA fees and operational budget.	Two annuel supervision missions by UNEP.
TOTAL indicative COST **Excluding project team staff time and UNEP staff and travel expenses**		**Estimated to** **cost US$157,300**	

Project inception phase

A Project Inception Workshop will be held within the first three months of project start-up with the participation of the full project team, relevant government counterparts, co-financing partners, and the UNEP Focal Point, as appropriate. A fundamental objective of this workshop will be to help the project team to understand and take ownership of the project's goal and objectives, as well as finalise preparation of the project's first annual work plan based on the project results framework and the GEF Tracking Tool.

This will include reviewing the results framework (indicators, means of verification, and assumptions), imparting additional detail as needed, and based on this exercise, finalising the Annual Workplan (AWP) with precise and measurable performance indicators, and in a manner consistent with the expected outcomes for the project.

The purpose and objective of the workshop will also be to: i) introduce project staff to project stakeholders that will support the project during its implementation; ii) detail the roles, support services, and complementary responsibilities of UNEP staff in relation to the project team; iii) provide a detailed overview of UN Environment-GEF reporting and M&E requirements, with particular emphasis on the annual project implementation reviews (PIRs) and related documentation, the annual project report, mid-term review, final evaluation and financial reporting. In addition, the Inception Workshop will provide an opportunity to inform the project team on UNEP project-related budgetary planning, budget reviews including arrangements for annual audit, and potential budget re-phasing. The workshop will also provide an opportunity for all parties to understand their roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines and conflict resolution mechanisms.

The Terms of Reference (ToR) for project staff and decision-making structures will be discussed again, as needed, in order to clarify each party's responsibilities during the project's implementation phase. A report on the Inception Workshop is a major reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting (see details below).

Reporting responsibilities and events (see Appendix 6 of the Project Document)

A detailed schedule of project review meetings will be developed by the project management in consultation with project implementation partners and stakeholder representatives and incorporated in the Project Inception Report. Such a schedule will include: i) tentative timeframes for PSC meetings and other relevant advisory and/or coordination mechanisms; and ii) project- related M&E activities.

Day-to-day monitoring of implementation progress will be the responsibility of the Project Manager (PM) based on the project's AWP and its indicators. The PM will liaise with the PC and inform UNEP, on behalf of the Executing Agency of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely and remedial fashion. The PC will fine-tune the progress and performance/impact indicators of the project in consultation with the full project team at the inception workshop with support from the UNEP Task Manager.

Specific targets for the first-year implementation progress indicators together with their means of verification will be developed at this workshop. These targets will form part of the AWP and will be used to assess whether implementation is proceeding at the intended pace and in the right direction. Targets and indicators for subsequent years will be defined annually as part of the internal evaluation and planning processes undertaken by the project team. Measurement of impact indicators related to global benefits will occur according to the schedules defined through specific studies that are to form part of the project's activities.

Periodic monitoring of implementation progress will be undertaken by the UNEP Task Manager through six-monthly exchanges with the project implementation team, or more frequently as deemed necessary. This will allow parties to take stock of and to troubleshoot any problems pertaining to the project in a timely fashion to ensure the timely implementation of project activities. The UNEP Task Manager, as appropriate, will conduct yearly visits to the project's field sites, or more often based on an agreed upon schedule to be detailed in the project's Inception Report/AWP to assess first-hand project progress. Any other member of the PSC can also take part in these trips, as decided by the PSC. A Field Visit Report will be prepared by the UNEP Task Manager and circulated no less than one month after the visit to the project team, all Steering Committee members and UNEP-GEF.

Annual monitoring will occur through the Project Steering Committee (PSC) meetings. This is the highest policy-level meeting of the parties directly involved in the implementation of a project. The project will be subject to PSC meeting at least once every year. The first such meeting will be held within the first twelve months of the start of full implementation. The project proponent will prepare an Annual project report (APR) and submit it to UNEP GEF Task Manager at least two weeks prior to the PSC for review and comments. The PM will present the APR to the PSC, highlighting policy issues and recommendations. The PC will also inform the participants of any agreement

reached by stakeholders during the APR preparation on how to resolve operational issues. Separate reviews of each project component may also be conducted if necessary. UNEP has the authority to suspend disbursement if project performance benchmarks are not met.

The Terminal PSC review will be held in the last month of project operations. The PC, with guidance from UNEP and support from the PM, is responsible for preparing the Terminal Report and submitting it to UNEP GEF and Country Operational Focal Point. It shall be prepared in draft at least two months in advance of the PSC meeting in order to allow review and will serve as the basis for discussions in the PSC meeting. The terminal PSC review considers the implementation of the project as a whole, paying particular attention to whether the project has achieved its stated objectives and contributed to the broader environmental objective. It decides whether any actions are still necessary, particularly in relation to sustainability of project results, and acts as a vehicle through which lessons learned can be captured to feed into other projects being implemented.

Project monitoring reporting

The PC, with guidance from UNEP-GEF team and support from the PM, will be responsible for the preparation and submission of the following reports that form part of the monitoring process and that are mandatory.

A Project inception report (IR) will be prepared immediately following the inception workshop. It will include a First year/AWP divided in quarterly timeframes detailing the activities and progress indicators that will guide implementation during the first year of the project. This workplan will include the dates of specific field visits, support missions from the UNEP Task Manager or consultants, as well as timeframes for meetings of the project's decision-making structures. The IR will also include the detailed project budget for the first full year of implementation, prepared based on the AWP, and including any M&E requirements to effectively measure project performance during the targeted 12-month timeframe. The IR will include a more detailed narrative on the institutional roles, responsibilities, coordinating actions, and feedback mechanisms of project-related partners. In addition, a section will be included on progress to date on project establishment and start-up activities and an update of any changed external conditions that may affect project implementation. When finalised, the IR will be circulated to project counterparts who will be given a period of one calendar month in which to respond with comments or queries. Prior to the IR's circulation, UNEP/GEF will review the document.

The Annual project report (APR). An APR will be prepared on an annual basis prior to the PSC Review, to reflect progress achieved in meeting the project's AWP and assess performance of the project in contributing to intended outcomes through outputs and partnership work. The format of the APR is flexible but should include the following sections: i) project risks, issues, and adaptive management; ii) project progress against pre-defined indicators and targets; iii) outcome performance; and iv) lessons learned/best practices.
The Project implementation review (PIR) is an annual monitoring process mandated by the GEF. It is an essential management and monitoring tool for project managers and offers the main vehicle for extracting lessons from on-going projects. Once the project has been under implementation for one year, a PIR must be prepared by the project management and submitted by UNEP to the GEF. The PIR should then be discussed in the PSC meeting so that the result would be a PIR that has been agreed upon by the project, the EA and IE. The individual PIRs are collected, reviewed, and analysed by the UNEP Operational Focal Point prior to sending them to the GEF by UNEP-GEF Coordination Office.

Half year (July–December) progress reports outlining main updates in project progress will be provided every six months to the UNEP/GEF Task Manager. The January–June progress report stand as the PIR described above. Specific thematic reports focusing on specific issues or areas of activity will be prepared by the project team when requested by UNEP. The request for a thematic report will be provided to the project team in written form by UNEP and will clearly state the issue or activities that need to be reported on. These reports can be used as a form of lessons learned exercise, specific oversight in major areas, or as troubleshooting exercises to evaluate and overcome obstacles and difficulties encountered. UNEP is requested to minimize its requests for thematic reports, and when such are necessary will allow reasonable timeframes for their preparation by the project team.

A project terminal report will be prepared by the project team during the last three (3) months of the project. This comprehensive report will summarise all activities,

achievements, and outputs of the project, as well as lessons learned. It will be the definitive statement of the project's activities during its lifetime. In addition, it will lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's activities.

Technical reports are detailed documents covering specific areas of analysis or scientific specialisations within the overall project. As part of the Inception report, the project team will prepare a draft reports list detailing the technical reports that are expected to be prepared on major areas of activity during the project, and tentative due dates. Where necessary, this reports list will be revised and updated, and included in subsequent APRs. Technical reports may also be prepared by external consultants and should be comprehensive and specialised analyses of clearly defined areas of research within the framework of the project and its sites. These technical reports will represent, as appropriate, the project's substantive contribution to specific areas, and will be used in efforts to disseminate relevant information and best practices at local, national and international levels.

Project publications will form a major method of crystallising and disseminating the results and achievements of the project. These publications may be scientific or informational texts on the activities and achievements of the project in the form of journal articles or multimedia publications. These publications can be based on Technical Reports depending upon their relevance and scientific worth, or may be summaries or compilations of a series of technical reports and other research. The project team in consultation with UNEP and other relevant stakeholder groups will also plan and produce these publications in a consistent and recognisable format. Project resources will need to be defined and allocated for these activities as appropriate and in a manner commensurate with the project's budget.

Independent Terminal Evaluation

An independent terminal evaluation will take place at the end of project implementation. The Evaluation and Oversight Unit (EOU) of UNEP will manage the terminal evaluation process. A review of the quality of the evaluation report will be done by EOU and submitted along with the report to the GEF Evaluation Office not later than 6 months after the completion of the evaluation.

Audit clause

MEDD will provide UNEP with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of UNEP/GEF funds according to the established procedures set out in the programming and finance manuals.

10. Benefits

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

The adaptation interventions at project sites will increase the provision of socioeconomic benefits to local communities. This includes, but is not limited to: i) increased water security; ii) increased food security; iii) increased financial security through diversified livelihoods; and iv) women's empowerment (at least 7,500 women with improved access to water, 500 women with increased revenues through adoption of alternative climate-resilient livelihoods).

The project will directly contribute to improving the livelihoods and resilience to climate change of 37,867 individuals in the project intervention areas, including 60% women. In particular, the restoration of the provision of socio-economically valuable ecosystem services will increase the resilience of local communities who depend on natural resources for their livelihoods.

11. Environmental and Social Safeguard (ESS) Risks

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

Overall Project/Program Risk Classification*

PIF	CEO Endorsement/Approval	MTR	TE
	Medium/Moderate		

Measures to address identified risks and impacts

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

Identified E&S risk or consideration	Action to be taken (assessment, mitigation, monitoring)	Budget reference	Responsibility
Biodiversity, Ecosystems and Sustainable Natural Resource Management	- Selection of species to be used for dune stabilization and shelter-belt interventions will be undertaken as part of the analyses under activities 3.2.1 and 3.3.1.	Activities 3.2.1 and 3.3.1	National dune stabilization specialist and national agroforestry and oasis m

(Safeguard Standard 1): Possible use of invasive alien species, specifically *Prosopis juliflora*	- Any recommendation for the use of *Prosopis* or any other invasive alien species will be carefully considered, and only agreed to if no other species are viable and urgent intervention is required. - An invasion prevention plan will be designed and its implementation monitored under activities 3.2.4 and 3.3.5 (monitoring of dune stabilization and shelter-belt interventions).	Activities 3.2.4 and 3.3.5	anagement specialist Local authorities trained by project
Climate Change and Disaster Risks **(Safeguard Standard 2):** Extreme climate events (e.g. droughts, floods or strong winds) or other disasters may result in challenges in accessing the project sites and damages to project infrastructure and equipment	- To mitigate the risk of limited access and damage to infrastructure / equipment, climate and early warning information will be accessed and used for planning timing of interventions, field visits, etc.	N/A	MEDD
Climate Change and Disaster Risks **(Safeguard Standard 2):** Increasingly arid conditions, heavy rains and high winds may compromise the success of EbA interventions	To reduce the vulnerability of EbA interventions to climate change, best practices will be followed in e.g.: - Species selection - Planting operations (e.g. timing, location close to water source, physical protection from heavy rains and strong winds) - Ensuring sufficient watering of seedlings in the arid conditions, through e.g. the waterboxx technology - Regular monitoring of seedling survival and replacement rates - Identification of corrective actions to improve survival rates, e.g. improved access to water or use of different species or planting / watering protocols	Activities under outputs 3.1, 3.2 and 3.3 Activities 3.2.4 and 3.3.5	National dune stabilization specialist + national agroforestry and oasis management specialist Local authorities trained by project
Climate Change and Disaster Risks **(Safeguard Standard 2):** Water access interventions (new wells and boreholes) could contribute to groundwater over-extraction in partic	- Climate risk assessments of groundwater availability will be undertaken (activities 1.1.1 and 2.1.1). - Selection of the final project interventions will be informed by the outcomes of these analyses, as part of the community adaptation plans to be developed (activity 1.1.2). - The sustainable and efficient use of water resources will be strengthened, further mitigating the risk of water over-extraction: water	Activities 1.1.1 and 2.1.1	International consulting firm + national and international hydrology specialists

ular in the face of reduced rainfall due to climate change	management and distribution plans will be developed (output 2.3), efficient irrigation technologies introduced (output 2.3) and water use associations trained on water conservation and efficient use of water resources (output 2.4).		
Pollution Prevention and Resource Efficiency (Safeguard Standard 3): Possible environmental contamination due to unmanaged disposal of saline by-products (concentrated brine solutions) from water desalination installations, including soil contamination and degradation in deposit sites. Further contamination of underground and above ground water resources may occur.	- To mitigate this issue, the project will foresee technical solutions to manage this waste product in the technical studies included in output 2.1. - Identified technical solutions such as evaporation ponds (instead of discharge into water bodies) will be implemented.	Activities 2.1.1 and 2.1.2	International and national hydrology and water management specialists Two water specialized NGOs
Community Health, Safety and Security **(Safeguard Standard 4):** There may be some community safety risks involved in the construction and installation of the planned water infrastructure	Further assessment to be undertaken at project inception stage, with recommendations to be integrated in the ESMP. Undertake relevant safety and health measures for construction / infrastructure work (e.g. water infrastructure): - Install safety signs, barriers and other communication to local people on the nature, duration and implication of the works	Health, safety and labour safeguards risk study	MEDD with UNEP oversight
Community Health, Safety and Security **(Safeguard Standard 4):** Boreholes and other water sources may be contaminated by upstream sources or e.g. the mining sector, as well as by the brine waste from the desalination plants to be installed by the project (unless appropriately managed)	- Information on water quality will be reviewed and testing undertaken before installation of new wells and boreholes to be used for drinking-water purposes - After completion of a well or a borehole, water quality will be tested again, before providing community access to the water source	Activity 2.1.1	International and national hydrology and water management specialists

Displacement and Involuntary Settlement **(Safeguard Standard 6):** Possible restrictions on land/water use that deny a community the use of resources to which they have traditional or recognizable use rights	- Any possible restrictions on land use (due to e.g. establishment of agroforestry shelter-belts under component 3) or water use (as a result of water management plans developed under component 2), will be identified and agreed upon through the participatory processes of development of community adaptation plans (output 1.1) and water management and distribution plans (output 2.3) - It will be ensured that any restrictions to land or water use will be voluntary, and agreed upon and governed by the communities and resource users themselves	Activities 1.1.2 and 2.3.1	International consulting firm (1.1.2) and national hydrology and water management specialist (2.3.1)
Labour and Working Conditions **(Safeguard Standard 8):** Risk of (i) working conditions that do not meet national labour laws or international commitments; (ii) the use of forced labor and child labor; and (iii) occupational health and safety risks	- Further assessment to be undertaken at project inception stage, with recommendations to be integrated in the ESMP - Compliance with UNEP's ESSF labour and working condition requirements will be ensured - Basic pay and working condition should be respected for all community members engaged in project activities - Potential forced labor will be assessed and addressed - Safety and health-related measures (e.g. helmets, equipment, masks and appropriate distancing procedures in case of significant risk of communicable diseases, operational guidelines for health and safety) will be provided	Health, safety and labour safeguards risk study	MEDD with oversight from UNEP
Grievance mechanism	- A project grievance mechanism will be put in place - Access to the grievance mechanism will be provided through the UNEP project website, government website, as well as information to be made available at the community level - The grievance mechanism will provide access to a relevant Executing Agency official, as well as the UNEP stakeholder response mechanism and project concern form.	N/A	MEDD with oversight from UNEP

Supporting Documents

Upload available ESS supporting documents.

Title	Module	Submitted
UNEP Safeguard Risk Identification Form (SRIF)	CEO Endorsement ESS	

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

<table>
<tr><td colspan="5">Impact: Strengthened climate resilience of ecosystems, livelihoods and communities of the arid Mauritanian wilayas of Adrar, Inchiri and Trarza contributes to the achievement of the SDGs and MEAs

Intermediate state: Strengthened adaptive capacity and climate resilience of communities, and restored ecosystem functions of desert, oasis and wadi ecosystems in the arid Mauritanian wilayas of Adrar, Inchiri and Trarza</td></tr>
<tr><td colspan="5">Project objective: To increase the adaptive capacity of rural communities in the wilayas of Adrar, Inchiri and Trarza

Project objective indicator: Number of beneficiaries; % of women

Target: 37,867 beneficiaries, of which 60% women</td></tr>
<tr><td>PROJECT OUTCOME</td><td>OUTCOME INDICATORS</td><td>BASELINE</td><td>TARGETS</td><td>MEANS OF VERIFICATION</td></tr>
<tr><td>Component I</td><td colspan="4">Institutional and technical capacity development for the planning and implementation of climate change adaptation in arid ecosystems</td></tr>
</table>

Outcome 1 Stakeholders demonstrate increased technical and institutional capacity for climate change adaptation – particularly EbA – in arid ecosystems **Output 1.1** Climate change impact and vulnerability assessments undertaken, and adaptation options identified and validated by stakeholders in each of the 3 target wilayas and 8 project sites **Output 1.2** 575 representatives of regional governments, private sector, civil society organizations and community-based organizations (e.g. cooperatives, AGPOs) across the 3 target wilayas trained on adaptation approaches (including EbA) *(575 beneficiaries)* **Output 1.3** 3 Regional Development Plans (PDRs) and 8 Local Development Plans (PDLs), integrating adaptation to climate change and gender, revised or developed and shared with stakeholders **Output 1.4** An upscaling strategy and action plan for climate change adaptation in arid ecosystems of Mauritania developed in collaboration with national stakeholders, focusing on EbA approaches	**Indicator 1:** Degree to which the capacity of targeted institutions is strengthened to identify, plan, implement and monitor adaptation (including EbA) interventions	Baseline study to be conducted at the project inception stage to define the baseline level of capacity of targeted institutions to identify, plan, implement and monitor adaptation (including EbA)	Increase of 5 in the capacity score of each institution	Verified through scoring methodologies developed by the TAMD and PPCR and adapted from the GEFSec - AMAT (2014)[1]. The indicator is based on a five-step capacity assessment framework (expressed as questions): · Are the institutions in the process of identifying climate change risks and appropriate adaptation interventions? · Are the institutions prioritising adaptation interventions and specifying budget allocations and targets for these interventions? · Have the institutions defined clear roles and responsibilities for the coordination and implementation of adaptation interventions? · Is there evidence of effective implementation of adaptation interventions by the institutions? · Is there evidence of adequate institutional capacities for the continuous assessment, learning and review of adaptation strategies and measures? Each question is answered with an assessment and score for the extent to which the associated criterion has been met: not at all (= 0), partially (= 1) or to a large extent/ completely (= 2). An overall score is calculated, with a maximum score of 10 given to five criteria. These five criteria will be reviewed and validated at inception phase of the project.
Component II	**Sustainable access to and efficient use of water**			

Outcome 2 Enhanced sustainable access to and efficient use of water for increased drought-resilience of local communities and ecosystems in the wilayas of Adrar, Inchiri and Trarza **Output 2.1** 16 new efficient water provisioning systems (e.g. new wells, boreholes, solar pumps, desalination units) and 4 water collection and storage systems installed in the 8 project sites *(15,552 beneficiaries)* **Output 2.2** Small-scale infrastructures[2] implemented on 4 water courses to increase infiltration and to reduce erosion and flooding *(3,280 beneficiaries)* **Output 2.3** 8 efficient irrigation water distribution systems established (one in each project site) *(1,215 beneficiaries)* **Output 2.4** 8 community associations (e.g. cooperatives, AGPOs) trained on sustainable and efficient water management and distribution (one in each project site)	**Indicator 2.1:** Estimated number of beneficiaries with improved access to water (disaggregated by gender)		20,047 persons (50% male / 50% female)	List of beneficiaries Surveys
Component III	**Protection, productivity and diversification of local livelihoods**			

Outcome 3 Protection, productivity and diversification of livelihoods enhanced through EbA interventions to increase climate-resilience in the wilayas of Adrar, Inchiri and Trarza **Output 3.1** Regional community nurseries specialized in plant production for arid ecoregions established and operational, and training for their sustainable management provided to local communities or cooperatives in 3 wilayas **Output 3.2** EbA interventions implemented on 400 hectares of dunes to protect vulnerable communities, livelihoods and ecosystems from dune-migration *(12,800 beneficiaries)* **Output 3.3** EbA interventions implemented on 150 hectares to shelter vulnerable communities from dune migration, heat and wind and to provide forage for livestock and non-timber forest products *(2,300 beneficiaries)* **Output 3.4** Additional natural resource-based livelihoods introduced for local populations *(800 beneficiaries)*	**Indicator 3.1:** Extent to which EbA measures generate livelihood protection benefits for communities	To be determined in the baseline study[3]	Livelihoods of 30% of the communities in the three target wilayas protected against dune invasion, heat and wind through EbA measures implemeted on 550 hectares	Field observations Household surveys
	Indicator 3.2: Increase in the income of 800 producer cooperative participants as a result of the introduction of alternative income-generating activities (gender disaggregated)	Zero	Target to be established by the baseline study	Survey of beneficiaries of cooperatives
Component IV	**Knowledge for action on climate change and EbA in arid ecosystems**			

Outcome 4 Stakeholders demonstrate strengthened knowledge and action-oriented attitudes on climate change and adaptation approaches (particularly EbA) **Output 4.1** 5 publications on policy-relevant research findings published based on monitoring of adaptation results generated under Components 2 and 3, and disseminated to at least 45 decision-makers *(45 beneficiaries)* **Output 4.2** A series of 4 EbA handbooks detailing best practices for arid ecosystems developed and shared with at least 550 members of local implementation structures across the 3 target wilayas *(550 beneficiaries)* **Output 4.3** At least 750 local stakeholders informed of climate change adaptation and good EbA practices in the three target wilayas *(750 beneficiaries)*	**Indicator 4:** Proportion of the population in the three target wilayas with knowledge and action-oriented attitudes on climate change and adaptation approaches	There is limited knowledge and action-oriented attitudes on climate change and adaptation approaches in the three wilayas (less than 5%, to be confirmed by the baseline study)	At least 5 out of 10 people in the target population with knowledge and action-oriented attitude on climate change and adaptation approaches (of which ~50% are women)	Household surveys in the three wilayas, to measure the level of knowledge and action-oriented attitudes (with a scoring methodology). Indicative questions to measure knowledge and attitude are listed below. These questions should be validated at project inception and amended if necessary, and a scoring methodology developed. · What are the current and predicted climate change effects in arid regions of Mauritania? · Do you know what can be done to reduce the negative effects of climate change on your community? What about on your livelihood? · What actions are you planning to undertake to reduce your vulnerability to climate change? · What barriers do you face to taking action? What resources would you require? How could you access those resources?

[1] Adapted from TAMD (2013) and PPCR (2014) scorecard indicators.

[2] DRS : Défense et Restauration des Sols : diguettes, digues filtrantes, gabions, seuils, corrections de ravines, cordons pierreux (i.e. water speed deceleration infrastructure that increases infiltration, such as check dams, gabions, bunds, stone rows…).

[3] **Level 0:** TBD in baseline study; **Level 1:** 200 hectares of land stabilised or under agro-forestry; **Level 2:** 400 hectares of land stabilised or under agro-forestry; **Level 3**: 65% survivorship of plants achieved; **Level 4:** Dunes are fixed and livelihoods protected for 30% of people living in the three target wilayas against dune invasion, heat and wind through EbA measures implemented on 550 hectares.

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

Responses to Comments from Council

Sender:
Kordula Mehlhart
GEF Council Member
Head of Division on Climate Finance
BMZ (Federal Ministry for Economic Cooperation and Development)
Dahlmannstraße 4
53113 Bonn, Germany

Subject: Comments by Germany on the LDCF Work Programme
(GEF Project IDs: #10083; #10089; #10096; #10103; #10100; #10105)

1. Mauritania: Climate change adaptation and livelihoods in three arid regions of Mauritania. 4,416,210 USD, UNEP, GEF Project ID=10103

- Germany welcomes the proposal aiming 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 is based on a clear rationale and has potential to complement various already ongoing activities in the country, aiming at addressing climate-resilience.
- While Germany generally appreciates the project, it requests that the following comments are taken into account during finalization:
- Germany welcomes the alignment of the project objectives with the objectives of the GEF Programming Strategy on Climate Change Adaptation for the LDCF and SCCF (2018-2022). Regarding the innovative character of the project, the PIF mentions that there have been only very limited investments in climate change adaptation in arid ecosystems so far. Germany recommends elaborating further on the reasons why arid ecosystems have not or rarely been targeted so far, which could further entail additional risks for the project implementation. Furthermore, Germany would welcome an additional reference to Objective 2 “Mainstreaming Climate Change Adaptation and Resilience for Systemic Impact” of the GEF Programming Stratey on CCA.

Response: On the reasons why arid ecosystems have rarely been targeted so far, a number of reasons exist. First, populations are less dense in arid areas, and therefore they are less likely to be prioritized over more densely populated areas. Secondly, there has historically been a perception that grazing systems of arid areas are suffering from irreversible processes of desertification, and therefore that interventions in those areas would not yield the returns on investments necessary to justify them in the first place. This has been largely disproved, and there is evidence that traditional transhumance production systems can be highly efficient. This being said, the arid regions of Mauritania, and their current production systems, are vulnerable to climate change. There are indeed risks associated with climate change which could impede the project from yielding its intended impacts. These are discussed in the Project Document, in particular in Section 3.11 on Environmental and Social Safeguards, and the associated Appendix 16.
On the second point, the project alignment with the LDCF Strategy has been revised during the PPG Phase, and covers contributions to both Objectives 1 and 2 (see CEO Endorsement Request section on Alignment with GEF focal area strategies).

- Germany appreciates that the project is consistent with national strategies and plans, most notably the NAPA. However, Germany recommends to include a more detailed reference on how the proposal is aligned with and contributes to achieving the country’s NDC. Germany would also highly appreciate further elaboration of the

embedding of the project into the NAP process, which started in 2015 and is still ongoing, amongst others with support by the project “Increase Capacity for Adaptation to Climate Change in Rural Areas (ACCMR)”.

Response: The Project Document has been updated to reflect the most recent national strategies and plans, including the NDC and the NAP process. The NAP process is a source of co-financing for the LDCF project.

- Germany highly appreciates that the project targets local communities as beneficiaries, notably through capacity building trainings on EbA measures under Component 2. However, the PIF is lacking an elaboration on how the proposed EbA interventions as well as the foreseen “community-level climate action plans” (CAP) will be embedded into both local planning processes and the local institutional set-up. In this context, the proposal refers to so called Associations for Local Associations for the Management of Natural Resources (AGLC) (output 2.2) as local implementation structures, although these do not exist in the target areas. It is strongly recommended to not only invite community representatives to participate in the the Project Steering Committee, but to include them more substantially in the steering of the project to ensure ownership and guidance.

Response: The community action plans have been replaced by local adaptation plans during the PPG phase, which will be developed for each site under Output 1.1 and which will integrate the adaptation measures that will have been identified during the detailed vulnerability analyses carried out. Under output 1.3 the project will focus on building institutional capacity to integrate adaptation to climate change into development and sectoral planning at the regional and local levels. These regional and local development plans will be strengthened or their formulation will be supported, using the climate change and vulnerability assessments undertaken at the regional (activity 1.1.1) and local (activity 1.1.2) levels, as well as the local adaptation plans, as a major input. At the local level, local governments (municipalities, oasis councils and village leaders) will be supported in the development or revision of the local development plans using a participatory approach, mainstreaming climate change observations and projections and integrating adaptation considerations and interventions and making sure climate change adaptation and EbA approaches are embedded into both local planning processes and local institutional set-up.

- Linked to the point above, the coordination section states that the central level of the MEDD is foreseen to be responsible for the operation coordination, while the DREDD are not considered in the management structure. Given the strong lack of vertical integration in the MEDD between central and regional level, Germany recommends to account for an operational coordination mechanism that is sufficiently anchored in the respective target regions.

Response: The project is now reflecting the central involvement of the DREDD and other relevant state decentralized services (such as DRHAs and DRDRs) in the management structure.

- Furthermore, it is recommended to further clarify the redistribution of roles, as it appears that the mandate of the entirely new National Observation Center for Arid Areas (CNOEZA) is limited to fulfill its tasks to execute EbA interventions on the local level. The complementarity with the role of the DREDD therefore should be clarified to avoid overlaps.

Response: The roles have been clarified in the Section 4: Institutional Framework and Implementation Arrangements of the Project Document. CNOEZA will be the National Executing Agency (NEA) for the project. The regional delegations for environment and sustainable development (DREDDs) will be the operational arms of the CNOEZA in the field. The 3 Field Officers under the PMU will be posted within the DREDDs.

- Germany welcomes the considerations on gender equality and women's empowerment within the proposal. Although the objective of equal participation in training and awareness raising activities are welcomed, it is recommended that the proposal should go further and consider women not only as recipients of the capacity building measures, but also include their capacities and specific knowledge as “agents of change” in decision-making processes. The substantive inclusion of gender focal points

and women's groups is therefore highly recommended. Furthermore, gender-disaggregated data should not only document the participation rate of women in the project, but should also be designed in a manner that considers the specific needs and capacities of women and other vulnerable groups.
(to be completed)

• While the approach Ecosystem-based Adaptation (EbA) is more and more acknowledged in the international development communities (see e.g. documentation of the GIZ Global Project EbA), the proposal needs to elaborate its conceptual foundation and reasoning in contrast to other approaches as well as a concretization on the project implementation level and in the local context.

Response: The project is a combination of technological interventions seeking to increase water use efficiency, as well as EbA interventions. They are mutually supportive of each other, and address the specific climate vulnerabilities of the target communities. While the technical interventions/infrastructure typically have higher costs, this combination of EbA and technical engineering will be effective because: (i) EbA interventions are more flexible in the long term; and (ii) hard infrastructure has more direct benefits in the short to medium term. As a result, this complementary approach will further promote cost-effectiveness.The comparative advantages of the EbA approach are discussed in Section 7.3 (Project cost-effectiveness) of the Project Document.

• The proposal already elaborates on the coordination with relevant existing projects and initiatives in the country. This overview is however not up to date, since e.g. the project ACCMR executed by GIZ has terminated in May 2018. Germany therefore recommends to updated this overview and to take into account the following experiences from ACCMR for improved knowledge management:
o A comprehensive documentation of project documents such as manuals of ACCMR,
o A comprehensive documentation of implementation and capitalization documents on the approach Decentralised Ressources Management (GDRN) of the previous GIZ programme ProGRN,
o Experiences of the terminated GIZ Programme on the Climate Change Adaptation in Coastal Cities (ACCVC) that has gained and documented valuable experiences of dune stabilization,
o Experiences of the previous GIZ Good Governance Programme (PBG) on support to decentralization processes including the elaboration of local development plans.

Response: The list of projects to coordinate with has been updated during the PPG phase. Mentions of the ACCMR, ProGRN, ACCVC, and PGB have been added to highlight key lessons learnt and reflect how the LDCF project will capitalize on their experience.

• Germany furthermore encourages to make reference to existing proven achievement of the approach Decentralised Ressources Management with the creation of 39 Local Associations for Natural Resources Management (AGLC) in the south of Mauritania (Guidimakha and Hodh El Gharbi) under the previous GIZ programme ProGRN and the ongoing programme CorMCT. It is further recommended to collaborate with CorMCT in order to seek synergies with the existing and documented experiences with AGLCs for replication and adaption in the target areas as well as to extend EbA interventions in the (semi-)arid region of Hodh El Gharbi. This may help to address the lack of locally legitimized governance structures and the prevailing "tragedy of the commons."

Response: This comment is well taken into account. While these projects are implemented in wilayas where this LDCF project will not be active, collaboration will be sought during project implementation with CorMCT programme to seek synergies and documented experices with AGLCs. This is reflected in the Project Document.

Responses to Comments from STAP:

Part I: Project Information	Response
GEF ID	10103
Project Title	Climate change adaptation and livelihoods in three arid regions of Mauritania
Date of Screening	December 4 2018
Screener	Guadalupe Duron
Panel Member	Ferenc Toth

STAP welcomes UN Environment's proposal "Climate change adaptation and livelihoods in three arid regions of Mauritania". The project aims to strengthen capacity to improve the climate resilience of arid ecosystems and livelihoods in three wilayas of Adrar, Inchiri and Trarza. STAP is pleased the project plans to contribute to the evidence of Ecosystem-based Adaptation (EbA) in arid ecosystems. In doing so, STAP recomends defining the scientific and technological gaps of EbA for arid systems, citing references as needed. STAP welcomes the opportunity to draw learning from the SCCF EbA project in Mauritania on semi-arid ecosystems. STAP encourages the project team to consider the risks affiliated with the proposed EbA technologies, and to set out these possibilities (as social and environmental risks) in the risk section. Additionally, it would be useful for the project team to explain how the knowledge stemming from the successes and failures of the water conservation/adaptation measures will be applied in the project to enable continuing learning. STAP encourages the project team to develop a theory of change, develop an EbA plan, consider the effects of projected climate change over the period 2020-2050, assess risks comprehensively, and develop monitoring, evaluation and learning to track progress and facilitate adaptive management. STAP provides an advisory response of concur. Further recommendations by STAP are provided below.

Part I: Project Information B. Indicative Project Description Summary	What STAP looks for	STAP Response	Agency Response to STAP Screen
Project Objective	Is the objective clearly defined, and consistently related to the problem diagnosis?	Yes. The objective is defined clearly, and it is supported by the problem analysis.	N/A

Project components	A brief description of the planned activities. Do these support the project's objectives?	Yes. The components support the project objective.	N/A
Outcomes	A description of the expected short-term and medium-term effects of an intervention.		N/A
	Do the planned outcomes encompass important global environmental benefits/adaptation benefits?	Yes. The outcomes reflect adaptation benefits.	N/A
	Are the global environmental benefits/adaptation benefits likely to be generated?	Yes, the adaptation benefits are likely to be generated. STAP encourages the project team to identify indicators to measure and assess progress in delivering the adaptation benefits.	The GEF CCA tracking tool has been prepared and indicators identified during the PPG phase to assess progress in delivering adaptation benefits, as per the objectives and outcomes of the GEF Adaptation Program. Project outcome-level indicators, baseline, targets, and means of verification are also provided in the project Results Framework.
Outputs	A description of the products and services which are expected to result from the project. Is the sum of the outputs likely to contribute to the outcomes?	The project is expected to strengthen adaptive capacity of the communities in the arid wilayas of Adrar, Inchiri and Trarza through the introduction of ecosystem-based adaptation (EbA) approaches. The project will focus on improving water management and ot	N/A

		her natural resources in the target co mmunities. Interventions will focus a t the community and plot levels.	
Part II: Project justification	A simple narrative explaining the project's logic, i.e. a theory of change.		N/A
1. Project description. Briefly describe:			N/A
1) the global environment al and/or adaptation probl ems, root causes and barr iers that need to be addre ssed (systems descriptio n)	Is the problem statement well-defined?	Partially. The problem statement is re ferenced and provides socioeconomi c data and details on land use. The a groecological context and drivers of degradation resulting from climate c hange in Adrar, Inchiri and Trarza are described. However, the climate chan ge projections appear incomplete. Th e time period that covers the projecti ons is not provided. It also is unclear whether the projections are at the nat ional level, regional, or at another sca le.	Comprehensive cli mate change proje ctions for different RCPs for the 2050s are provided in the project document. Some information i s at the project site level, where availab le, while other infor mation is visually p resented at the nati onal scale.
	Are the barriers and threats well described, and substantiated by data and re ferences?	No. The section describing the barrie rs is very brief. STAP recomends det ailing the barriers in the project docu ment to plan how their impact may b e minimilized.	A barriers analysis has been detailed i n the project docu ment, and these ba rriers are being add ressed directly by t he project.
	For multiple focal area projects: does the problem statement and analysis id entify the drivers of environmental degradation which need to be addressed t hrough multiple focal areas; and is the objective well-defined, and can it only be supported by integrating two, or more focal areas objectives or program s?	Non-applicable.	N/A

2) the baseline scenario or any associated baseline projects	Is the baseline identified clearly?Does it provide a feasible basis for quantifying the project's benefits?	The baseline narrative is clear. For the project document, STAP encourages UNEP to identify indicators to measure and monitor the adaptation benefits.	The GEF CCA tracking tool has been prepared and indicators identified during the PPG phase to assess progress in delivering adaptation benefits, as per the objectives and outcomes of the GEF Adaptation Program. Project outcome-level indicators, baseline, targets, and means of verification are also provided in the project Results Framework.
	Does it provide a feasible basis for quantifying the project's benefits?	Non-applicable.	N/A
	Is the baseline sufficiently robust to support the incremental (additional cost) reasoning for the project?	Partly. The baseline needs to be detailed further. Indicators need to be identified, and references added to support the description of the baseline conditions.	The GEF CCA tracking tool has been prepared and indicators identified during the PPG phase to assess progress in delivering adaptation benefits, as per the objectives and outcomes of the GEF Adaptation Program. Project outcome-level indicators, baseline, targets, and means of verification are also pro-

			cation are also pro vided in the project Results Framewor k. References have been added to sup port the descriptio n of the baseline c onditions.
	For multiple focal area projects:		N/A
	are the multiple baseline analyses presented (supported by data and referen ces), and the multiple benefits specified, including the proposed indicators;	Non-applicable.	N/A
	are the lessons learned from similar or related past GEF and non-GEF interve ntions described; and	Non-applicable.	N/A
	how did these lessons inform the design of this project?	Non-applicable.	N/A
3) the proposed alternativ e scenario with a brief des cription of expected outco mes and components of t he project	What is the theory of change?	The proposed theory of change state d in the document is as follows: "The negative effects of climate change ar e threatening the livelihoods of local communities across the arid regions of Mauritania, including the wilayas o f Adrar, Inchiri and Trarza. These effe cts are predicted to become more fre quent and severe in the future. In the alternative scenario, the proposed LD CF project will increase the capacity of local, regional and national institut ions, as well as local communities, to plan and implement climate change adaptation interventions in arid ecos ystems. These interventions will rest ore arid ecosystem functioning and r	N/A

		educe the vulnerability of communiti es to climate change impacts. Capac ity-building of both national and regio nal government institutions will com plement on-the-ground implementati on of climate change adaptation inte rventions. This capacity-building will strengthen the ability of the Governm ent of Mauritania to identify, plan and implement climate change adaptatio n interventions throughout the arid re gions of the country. Furthermore, un der the alternative scenario, the proje ct will strengthen knowledge on clim ate change adaptation – particularly EbA – in arid ecosystems. This will pr omote the sustainability and replicati on of these approaches throughout Mauritania."	
	What is the sequence of events (required or expected) that will lead to the de sired outcomes?	The project aims to assess the vulner ability of communities to climate cha nge in the wilayas of Adrar, Inchiri an d Trarza. It will identify climate chang e impacts and the appropriate adapt ation strategies for each community. The adaptation measures will strengt hen the resilience of communities an d ecosystems to the effects of droug ht, desertification and dune migratio n. Climate action plans at the comm unity level will be instrumental in sele cting the adaptation measures. Enha ncing knowledge on EbA and its imp act on dry ecosystems will also be a major intervention to catalyze adapta tion outcomes.	Noted. The commu nity action plans h ave been replaced by local adaptation plans during the P PG phase, which wi ll be developed for each site under Ou tput 1.1 and which will integrate the a daptation measure s that will have bee n identified during t he detailed vulnera bility analyses carri ed out under Outpu t 1.1. The upscalin g strategy under O utput 1.4 will also be based on the ad aptation measures in arid zones which

			will have been identified under Output 4.1 and which will feed the KM strategy.
	· What is the set of linked activities, outputs, and outcomes to address the project's objectives?	See above.	N/A
	· Are the mechanisms of change plausible, and is there a well-informed identification of the underlying assumptions?	The mechanisms of change are plausible if a theory of change is developed and revised as neeed to respond to barriers, assumptions and on-going learning. The two elements in a theory of change that need to be stregthened are: 1) identifying the causal relationships between the outcomes; and, 2) defining the assumptions that must occur in order for the project's logic to hold true.	A Theory of Change was developed during the PPG phase, and clearly outlines the barriers the project will be addressing to achieve its objective. The assumptions are presented in the narrative of the Project Document, with which the ToC is aligned.
	· Is there a recognition of what adaptations may be required during project implementation to respond to changing conditions in pursuit of the targeted outcomes?	Yes. Adaptation scenarios for each component are detailed.	N/A
5) incremental/additional cost reasoning and expected contributions from the baseline, the GEF trust fund, LDCF, SCCF, and co-financing	GEF trust fund: will the proposed incremental activities lead to the delivery of global environmental benefits?	Non-applicable.	N/A
	LDCF/SCCF: will the proposed incremental activities lead to adaptation whic	Yes, if the adaptation benefits and th	The GEF CCA track

	h reduces vulnerability, builds adaptive capacity, and increases resilience to c limate change?	eory of change are closely monitore d.	ing tool has been p repared and indicat ors identified durin g the PPG phase to assess progress in delivering adaptati on benefits, as per the objectives and outcomes of the G EF Adaptation Pro gram. Project outc ome-level indicator s, baseline, targets, and means of verifi cation are also pro vided in the project Results Framewor k.
6) global environmental b enefits (GEF trust fund) an d/or adaptation benefits (LDCF/SCCF)	Are the benefits truly adaptation environmental benefits, and are they measu rable?	Yes. However, the project team may want to rephrase the wording to capt ure better the adaptation benefit. For example, the benefit on "reducing soil erosion" could be amended to "reduc ed carbon sequestration to improve a gricultural productivity and ecosyste m services".	The adaptation be nefits are presente d in the CEO endor sement document and some rephrasi ng has been done.
	Is the scale of projected benefits both plausible and compelling in relation to the proposed investment?	Yes.	N/A
	Are the adaptation benefits explicitly defined?	Yes. The PIF details the adaptation a ctivities and benefits that will increas e the climate resilience of the baselin e. In the complete project document, STAP recommends including indicat ors, or describing a methodology on how the benefits will be measured an d monitored.	The GEF CCA track ing tool has been p repared and indicat ors identified durin g the PPG phase to assess progress in delivering adaptati on benefits, as per the objectives and

			outcomes of the GEF Adaptation Program. Project outcome-level indicators, baseline, targets, and means of verification are also provided in the project Results Framework. The CEO endorsement document also outlines the M&E plan for the project. During project implementation, the baseline study will validate the outcome targets and will determine measurement approaches.
	Are indicators, or methodologies, provided to demonstrate how the adaptation benefits will be measured and monitored during project implementation?	No. STAP encourages for UNEP to detail the indicators in the project document.	The GEF CCA tracking tool has been prepared and indicators identified during the PPG phase to assess progress in delivering adaptation benefits, as per the objectives and outcomes of the GEF Adaptation Program. Project outcome-level indicators, baseline, targets, and means of verification are also provided in the project Results Framework. The CEO endorsement document also outlines the M&

			E plan for the proje ct.
	What activities will be implemented to increase the project's resilience to cli mate change?	The project will implement three acti vities to increase the climate resilien ce of the wilayas of Adrar, Inchiri and Trarza: 1) strengthen institutional cap acity to implement climate adaptatio n strategies in arid ecosystem; 2) Inc rease the resilience of the communiti es and ecosystems to climate chang e through improved water and land m anagement technologies; and, 3) stre ngthen knowledge on ecosystem-bas ed adaptation in arid regions.	The project strateg y was modified dur ing the PPG phase, and now includes f our outcomes.
7) innovative, sustainabilit y and potential for scaling-up	Is the project innovative, for example, in its design, method of financing, tech nology, business model, policy, monitoring and evaluation, or learning?	Yes. The project aims to increase the evidence base of ecosystem-based a daptation in arid regions. The project will design the interventions in a syst ematic way to enable monitoring of t he impact of the proposed EbA techn ologies, and extract the learning for f uture projects on arid ecosystems. S TAP encourages the project team to detail in the project document the me thodologies that will be used to meas ure and monitor the impact of the tec hnologies on adaptation benefits. In addition, STAP proposes to detail a s tructured approach to learning based on the evidence accumulated and ex plain how the learning will be used fo r adaptive management purposes.	The methodologies to ensure monitori ng will be develope d in the project bas eline study.
	Is there a clearly-articulated vision of how the innovation will be scaled-up, fo r example, over time, across geographies, among institutional actors?	Yes. STAP is pleased to know that le arning uptake on the proposed techn ologies will occur between the SCCF EbA South Project.	N/A
	Will incremental adaptation be required, or more fundamental transformatio	Yes. The project aims at a transform	Noted

	Will incremental adaptation be required, or more fundamental transformational change to achieve long term sustainability?	Yes. The project aims at a transformational change by introducing EbA to build climate resilience. To asssess the scale of change required, UNEP can conduct a resilience assessment using the Resilience, Adaptation Pathways, and Transformation Assessment (RAPTA) or Wayfinder: http://www.stapgef.org/rapta-guidelines https://wayfinder.earth/	Noted.
1b. Project Map and Coordinates. Please provide geo-referenced information and map where the project interventions will take place.			N/A
2. Stakeholders. Select the stakeholders that have participated in consultations during the project identification phase: Indigenous people 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.	Have all the key relevant stakeholders been identified to cover the complexity of the problem, and project implementation barriers?	Partially. STAP recommends for the project team to detail further the stakeholders by defining their roles in relation to the project components, specifying their comparative advantages. In addition, it would be useful to detail the participatory methodology mentioned in the PIF.	Extensive stakeholder engagement was undertaken during the PPG phase, and is intended to continue throughout project implementation. For this purpose, a stakeholder engagement plan has also been prepared and is presented in Section 2.
	What are the stakeholders' roles, and how will their combined roles contribute to robust project design, to achieving adaption environmental outcomes, and to lessons learned and knowledge?	Unclear. STAP recommends providing this information in the project document.	The roles of stakeholders in the context of the project are presented in Section 2.

3. Gender Equality and Women's Empowerment. Please briefly include below any gender dimensions relevant to the project, and any plans to address gender in project design (e.g. gender analysis). Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment? Yes/no/ tbd. If possible, indicate in which results area(s) the project is expected to contribute to gender equality: access to and control over resources; participation and decision-making; and/or economic benefits or services. Will the project's results framework or logical framework include gender-sensitive indicators? yes/no /tbd	Have gender differentiated risks and opportunities been identified, and were preliminary response measures described that would address these differences?	Partially. STAP is pleased the project will include gender indicators in there sults/ logical framework. STAP encourages for the project team to consider Eba in the context of gender inclusive approaches. This could include detailing gender differentiation in the development of the adaptation measures proposed in component 2, as well as analyzing the impact of these technologies through a gender lens.	A Gender Action Plan has been integrated in the Project Document.
	Do gender considerations hinder full participation of an important stakeholder group (or groups)? If so, how will these obstacles be addressed?	No.	A Gender Action Plan has been integrated in the Project Document.
5. Risks. Indicate risks, including climate change, potential social and environm	Are the identified risks valid and comprehensive? Are the risks specifically for things outside the project's control?	Partially. STAP encourages the project team to consider the risk that the EbA technologies may fail to improve t	This has been addressed in the preliminary ESMP, presen

ental risks that might prev ent the project objectives from being achieved, and, if possible, propose meas ures that address these ri sks to be further develope d during the project desig n		he climate resiliency of the targeted ecosystems, and to improved agricult ural productivity. Additionally, it woul d be useful for the project to detail ho w the project's knowledge (successe s and failures) will be managed so th e project is constantly improving bas ed on learning.	ted in Section 3.11 of the Project Docu ment.
	Are there social and environmental risks which could affect the project?	Yes, the project specifies risks on un willingness to cooperate, limited cap acity, and unwillingness to accept ad aptation interventions. However, STA P proposes that the project team ana lyze further the risks to livelihoods an d ecosystems. A tool that could be u sed to analyze the risks (as well as to plan the interventions) is Alive: http s://www.iisd.org/library/alive-adaptat ion-livelihoods-and-ecosystem-planni ng-tool-user-manual	This has been addr essed in the prelim inary ESMP, presen ted in Section 3.11 of the Project Docu ment.
	For climate risk, and climate resilience measures:		N/A
	· How will the project's objectives or outputs be affected by climate risks over the period 2020 to 2050, and have the impact of these risks been addre ssed adequately?	STAP encourages UNEP to use Alive, or a similar tool, that enables the proj ect team to describe the projected cli mate change in the target areas. This should include an analysis of the ho w the objective, or outputs, will be aff ected by climate risks over the period 2020 to 2050.	A climate change a nd vulnerability ass essment in the thre e project wilayas will be conducted during the project i mplementation an d may lead to the r efinement of the se lection of adaptati on technologies to be put in place by t he project.
	· Has the sensitivity to climate change, and its impacts, been assessed?	No. STAP encourages the project tea m to assess the sensitivity to climate change as suggested above.	See above.

	· Have resilience practices and measures to address projected climate risks and impacts been considered? How will these be dealt with?	No. See above.	See above.
	· What technical and institutional capacity, and information, will be needed to address climate risks and resilience enhancement measures?	The project will strengthen capacity on EbA for arid ecosystems, and livelihoods. In addition to this capacity strengthening, the project should consider communities in the application of EbA tools (e.g. Alive or another tool) for project design, monitoring and learning. Doing so, will also increase communities' capacities for documenting observed, and projected, climate change and its effects on the targeted sites.	N/A
6. Coordination. Outline the coordination with other relevant GEF-financed and other related initiatives	Are the project proponents tapping into relevant knowledge and learning generated by other projects, including GEF projects?	Yes. As mentioned above, STAP is pleased to know that learning uptake on the proposed technologies will occur between the SCCF EbA South Proj	N/A

		ect in Inchiri and Trarza, and other pr ojects in the target regions mentione d in the baseline narrative.	
	Is there adequate recognition of previous projects and the learning derived fr om them?	Yes.	N/A
	Have specific lessons learned from previous projects been cited?	Yes. However, STAP recommends th at the project team provide further le ssons when designing the project.	The design of the p roject document h as taken into acco unt the lessons fro m other projects, in cluding the SCCF-f unded EbA South p roject, the LDCF-fu nded DIMS project and the Adaptation Fund PARSACC pro ject. These lessons have informed, for i nstance, the selecti on of species for d une stabilization in terventions. Best p ractices for dune st

			abilization also will come from the GIZ ACCVC project. The proposed project will capitalize on the information system from ACCVC, which presents significant amounts of information of adaptation planning in Mauritania. Moreover, several relevant GIZ interventions as they relate to LDPs and decentralization have been identified, and their approaches taken into account during project implementation.
	How have these lessons informed the project's formulation?	Unknown.	Yes, see above.
	Is there an adequate mechanism to feed the lessons learned from earlier projects into this project, and to share lessons learned from it into future projects?	Partially. The intention to learn from earlier projects is indicated but the mechanism is not specified. The knowledge management component should be developed further to ensure the lessons from previous projects are embedded in this project. Similarly, component 3 should explain how learning from this project will be embedded in this project to take advantage of continuous learning.	During the PPG phase a long-list of projects currently under implementation and recently completed was developed. Specific areas of overlap and lessons learnt were identified, as well as the needs for coordination during project implementation. The new Component 4 details how the project will be em

			bedding continuous learning.
8. Knowledge management. Outline the "Knowledge Management Approach" for the project, and how it will contribute to the project's overall impact, including plans to learn from relevant projects, initiatives and evaluations.	What overall approach will be taken, and what knowledge management indicators and metrics will be used?	The project will implement a knowledge maagement approach that extracts and builds upon the lessons generated from component 1 and 2. Also, the project will build on the evidence of EbA in arid ecosystems.	N/A
	What plans are proposed for sharing, disseminating and scaling-up results, lessons and experience?	Through component 3, the project will collate lessons learns and best practices and share them with stakeholders through various means. In order to systematically collect and disseminate information and knowledge, as well as take-up learning for adaptive management purposes, STAP recommends detailing a knowledge management and learning plan as part of component 3.	Done under component 4

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

PPG Grant Approved at PIF: **Usd 150,000**			
Project Preparation Activities Implemented	*GETF/LDCF/SCCF Amount ($)*		
	Budgeted Amount	*Amount Spent To date*	*Amount Committed*
Project Personnel and Consultants	87,000	87,000	
Travels	28,000	28,000	
Meeting and Workshops	35,000	35,000	
Total	**150,000**	**150,000**	

ANNEX D: CALENDAR OF EXPECTED REFLOWS (if non-grant instrument is used)

Provide a calendar of expected reflows to the GEF/LDCF/SCCF/CBIT Trust Funds or to your Agency (and/or revolving fund that will be set up)

N/A

ANNEX E: Project Map(s) and Coordinates

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

The eight (8) project sites are located in:

The wilaya of Inchiri:

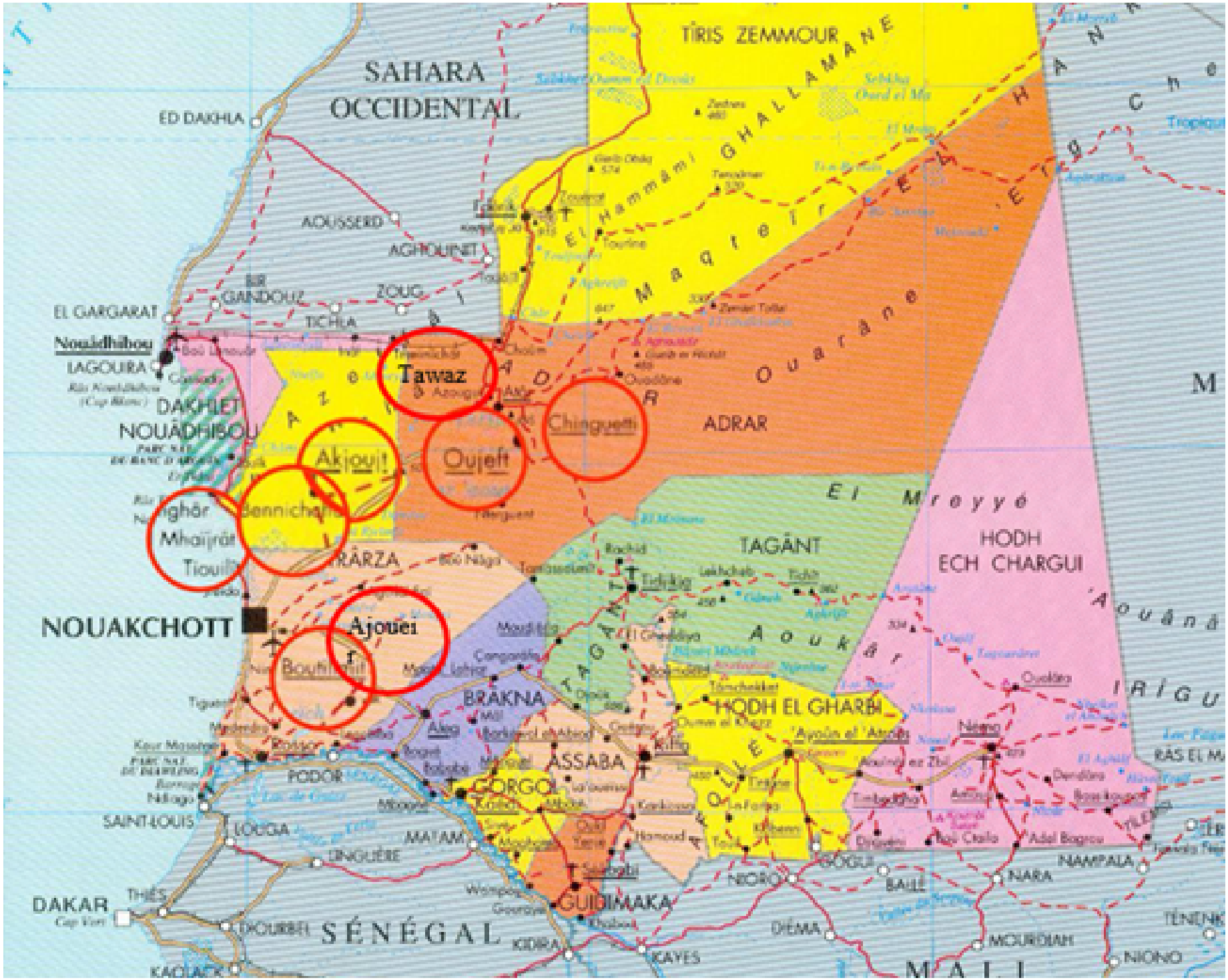
1. the city of Akjoujt 19.7461° N, 14.3879° W;
2. the municipality of Benichab 19.4714° N, 15.4288° W; and
3. the coastal borough of Mhaijratt 19°01'47.0"N 16°13'56.9"W.

The wilaya of Adrar:

4. the municipality of Tawaz 20°40'53.1"N 12°50'33.2"W;
5. the city of Chinguetti 20.4615° N, 12.3664° W; and
6. the city of Aoujeft 20.0266° N, 13.0544° W.

The wilaya of Trarza:

7. the city of Boutilimit 17.5489° N, 14.6967° W; and
8. the municipality of Ajoueir 17°12'06"N 14°52'55"W.


SAHARA OCCIDENTAL
TIRIS ZEMMOUR
ED DAKHLA
AOUSSERD
AGHOUINET
BIR GANDOUZ
ZOUG
EL GARGARAT
TICHLA
Nouadhibou
LAGOUIRA
DAKHLET NOUADHIBOU
Tawaz
Chinguetti
Oujeft
Akjoujt
ADRAR
Ouarane
Maqteir
EL Hammami GHALLAMANE
Mhaijrât
Tiouilit
TRARZA
NOUAKCHOTT
Ajouei
Boutilimit
TAGANT
HODH ECH CHARGUI
El Mreyyé
Aouka
BRAKNA
HODH EL GHARBI
ASSABA
GORGOL
PODOR
SAINT-LOUIS
LOUGA
MATAM
LINGUÈRE
THIÈS
DAKAR
DIOURBEL
SÉNÉGAL
KAOLACK
GUIDIMAKA
KIDIRA
KAYES
DIÉMA
NIORO
BAILÉ
NARA
MOURDIAH
NIONO
NAMPALA
M A L I

ANNEX F: Project Budget Table

Please attach a project budget table.

PROJECT TITLE	Climate change adaptation and livelihoods in three arid regions of Mauritania
PROJECT NUMBER	10103
Project implementing agency/organization:	UNEP
Project implementation period:	**From:** 2020 **To:** 2023

Class	Description	Year 1		Year 2		Year 3		Year 4		Total	Total
		Executing Partner	UNEP	Executing Partner	UNEP	Executing Partner	UNEP	Executing Partner	UNEP	Executing Partner	UNEP
	COMPONENT I										
010	Staff & Personnel (Including Consultants)	10.000	-	49.000	-	77.000	-	30.000	-	166.000	-
120	Contract Services	70.515	-	60.000	-	20.000	-	-	-	140.000	-
125	Operating & Other Costs	9.000	-	53.200	-	44.000	-	8.000	-	114.200	-
130	Supplies, Commodities & Materials	15.000	-	20.500	-	3.000	-	-	-	38.500	-
135	Equipment, Vehicles & Furniture	-	-	-	-	-	-	-	-	-	-
140	Transfers & Grants to Implementing Partners	-	-	-	-	-	-	-	-	-	-
145	Grants Out	-	-	-	-	-	-	-	-	-	-
150	Implementing Partners Programme Support Costs	-	-	-	-	-	-	-	-	-	-
155	UN Programme Support Costs	-	-	-	-	-	-	-	-	-	-
160	Travel	10.000	-	25.000	-	34.000	-	-	-	69.000	-
Component I Total		**114.515**		**207.700**		**178.000**		**38.000**		**527.700**	**-**

	COMPONENT II						
010	Staff & Personnel (Including Consultants)	77.250	47.250	39.250	11.250	175.000	-
120	Contract Services	-	40.000	45.000	-	85.000	-
125	Operating & Other Costs	5.625	26.625	37.625	5.625	75.500	-
130	Supplies, Commodities & Materials	-	584.300	12.000	-	596.300	-
135	Equipment, Vehicles & Furniture	4.000	-	-	-	4.000	-
140	Transfers & Grants to Implementing Partners	-	-	-	-	-	-
145	Grants Out	-	-	-	-	-	-
150	Implementing Partners Programme Support Costs	-	-	-	-	-	-
155	UN Programme Support Costs	-	-	-	-	-	-
160	Travel	17.500	24.500	26.500	7.500	76.000	-
Component II Total		**104.375**	**722.675**	**160.375**	**24.375**	**1.011.800**	**-**
	COMPONENT III						
010	Staff & Personnel (Including Consultants)	94.050	174.550	132.950	74.550	476.100	
120	Contract Services	6.000	66.667	276.667	66.667	416.000	
125	Operating & Other Costs	13.246	39.413	45.413	25.413	123.485	
130	Supplies, Commodities & Materials	82.000	70.000	554.800	-	706.800	
135	Equipment, Vehicles & Furniture	18.554	18.554	204.554	3.554	245.215	
140	Transfers & Grants to Implementing Partners	8.000	-	-	-	8.000	
145	Grants Out	-	-	-	-	-	
150	Implementing Partners Programme Support Costs	-	-	-	-	-	

155	UN Programme Support Costs	-		-		-		-	
160	Travel	16.125		52.792		43.792		9.792	122.500	
Component III Total		**237.975**		**421.975**		**1.258.175**	**-**	**179.975**	**2.098.100**	**-**
	COMPONENT IV								
010	Staff & Personnel (Including Consultants)	14.000		24.000		12.000		3.000	53.000	
120	Contract Services			74.000					74.000	
125	Operating & Other Costs			2.000					2.000	
130	Supplies, Commodities & Materials			30.000		30.000		30.000	90.000	
135	Equipment, Vehicles & Furniture			4.000					4.000	
140	Transfers & Grants to Implementing Partners			50.000		50.000			100.000	
145	Grants Out								-	
150	Implementing Partners Programme Support Costs								-	
155	UN Programme Support Costs								-	
160	Travel	750		6.250		6.250		6.250	19.500	
Component IV Total		**14.750**		**190.250**		**98.250**	**-**	**39.250**	**342.500**	**-**
	MONITORING & EVALUATION (M&E)								
010	Staff & Personnel (Including Consultants)	52.000		12.000	-	57.000	-	62.000	-	183.000	-

120	Contract Services									-	-
125	Operating & Other Costs	12.300			-		-		-	12.300	-
130	Supplies, Commodities & Materials						-		-	-	-
155	UN Programme Support Costs				-		-		-	-	-
160	Travel	5.000		5.000		5.000		5.000		20.000	
M&E Total		**69.300**	**-**	**17.000**	**-**	**62.000**	**-**	**67.000**	**-**	**215.300**	**-**
	PROJECT MANAGEMENT COSTS (PMC)										
010	Staff & Personnel	32.400		32.400		32.400		32.400		129.600	-
120	Contract Services	5.000		5.000	-	5.000	-	5.000		20.000	-
125	Operating & Other Costs	5.799		5.799		5.799		5.798		23.195	-
130	Supplies, Commodities & Materials									-	-
135	Equipment, Vehicles & Furniture	37.500								37.500	-
160	Travel									-	-
PMC Total		**80.699**		**43.199**		**43.199**		**43.198**		**210.295**	**-**
GRAND TOTAL		**621.614**	**-**	**1.602.799**	**-**	**1.799.999**	**-**	**391.798**	**-**	**4.416.210**	**-**