AFB/PPRC.9/19
7 June, 2012

Adaptation Fund Board
Project and Programme Review Committee
Ninth Meeting
Bonn, Germany, 26-27 June 2012

PROPOSAL FOR MAURITANIA (WMO)

I. Background

1. The Operational Policies and Guidelines for Parties to Access Resources from the Adaptation Fund, adopted by the Adaptation Fund Board, state in paragraph 41 that regular adaptation project and programme proposals, i.e. those that request funding exceeding US$ 1 million, would undergo either a one-step, or a two-step approval process. In case of the one-step process, the proponent would directly submit a fully-developed project proposal. In the two-step process, the proponent would first submit a brief project concept, which would be reviewed by the Project and Programme Review Committee (PPRC) and would have to receive the approval by the Board. In the second step, the fully-developed project/programme document would be reviewed by the PPRC, and would finally require Board's approval.

2. The Templates Approved by the Adaptation Fund Board (Operational Policies and Guidelines for Parties to Access Resources from the Adaptation Fund, Annex 3) do not include a separate template for project and programme concepts but provide that these are to be submitted using the project and programme proposal template. The section on Adaptation Fund Project Review Criteria states:

> *For regular projects using the two-step approval process, only the first four criteria will be applied when reviewing the 1st step for regular project concept. In addition, the information provided in the 1st step approval process with respect to the review criteria for the regular project concept could be less detailed than the information in the request for approval template submitted at the 2nd step approval process. Furthermore, a final project document is required for regular projects for the 2nd step approval, in addition to the approval template.*

3. The first four criteria mentioned above are:
   1. Country Eligibility,
   2. Project Eligibility,
   3. Resource Availability, and
   4. Eligibility of NIE/MIE.

4. The fifth criterion, applied when reviewing a fully-developed project document, is:
   5. Implementation Arrangements.

5. In its 17th meeting, the Adaptation Fund Board decided (Decision B.17/7) to approve "Instructions for preparing a request for project or programme funding from the Adaptation Fund", contained in the Annex to document AFB/PPRC.8/4, which further outlines applicable review criteria for both concepts and fully-developed proposals.

6. Based on the Adaptation Fund Board Decision B.9/2, the first call for project and programme proposals was issued and an invitation letter to eligible Parties to submit project and programme proposals to the Adaptation Fund was sent out on April 8, 2010.

7. According to the Adaptation Fund Board Decision B.12/10, a project or programme proposal needs to be received by the secretariat no less than nine weeks before a Board meeting, in order to be considered by the Board in that meeting.

8. The following fully-developed project document titled "Reducing Mauritanian Fishermen's Risk at Sea – Enhancing the Resilience of Mauritanian Coastal Communities to Adapt to Climate Change" was submitted for Mauritania by the World Meteorological

Organization (WMO), which is a Multilateral Implementing Entity of the Adaptation Fund. This is the second submission of the proposal. It was first submitted to the Board's 15th meeting but was not considered because Mauritania would have exceeded its cap had the proposal been approved. There was another proposal for Mauritania under consideration at that meeting which was prioritized by the government.

9. The current submission, a fully-developed proposal, was received by the secretariat in time to be considered at the 18th Adaptation Fund Board meeting. The secretariat carried out a technical review of the project proposal, assigned it the diary number MTN/MIE/Coastal/2011/1 and filled in a review sheet.

10. In accordance with a request to the secretariat made by the Adaptation Fund Board in its 10th meeting, the secretariat shared this review sheet with WMO, and offered it the opportunity of providing responses before the review sheet was sent to the Project and Programme Review Committee of the Adaptation Fund.

11. The secretariat is submitting to the Project and Programme Review Committee the summary and, pursuant to decision B.17/15, the final technical review of the project, both prepared by the secretariat, along with the final submission of the proposal in the following section.

Project Summary

Mauritania – Reducing Mauritanian Fishermen's Risk at Sea – Enhancing the Resilience of Mauritanian Coastal Communities to Adapt to Climate Change
Implementing Entity: *WMO*
Project/Programme Execution Cost: USD 187,750
Total Project/Programme Cost: 1,990,764
Implementing Fee: USD 169,216
Financing Requested: USD 2,159,980

Project/Programme Background and Context:

The objective of the project is to strengthen the resilience of Mauritania's coastal community by developing awareness and risk mitigation measures available to the communities that rely on fishing as their main livelihood. In the project components, actions are outlined to address adaptation through improved continuous access to weather forecasts and warnings. The project emphasizes all aspects of the risk reduction process, from user sensitization and tailoring of services though collaborative methods, institutional capacity building to sensitization, and engagement of all relevant national agencies to the early warning system. More specifically in the context of the requested financing, the project purpose is to develop institutional capacity and early warning service delivery to small-scale fishermen and coastal communities in Mauritania.

This objective will be addressed through the realization of the following outcomes:

- Reduced exposure and increased adaptive capacity of small-scale fishermen to weather and climate change induced hazards
- Strengthened awareness and ownership of adaptation and climate risk reduction processes at local levels
- Improved capacity of ONM to deliver marine weather and early warning services to help reduce risks associated with climate related losses and contribute to socioeconomic development and poverty alleviation
- Strengthened capacity of national centers and networks to respond rapidly to climate change induced extreme weather events

Component A: Implementation of Sensitization Measures to Reduce the Vulnerability of Small-scale Fishermen (USD 348,514)

The concrete adaptation approach of the project is to target small-scale fishermen and coastal communities dependent on the fisheries sector in Mauritania through user sensitization, awareness and consultations (to better understand climate change's threats to their lives and livelihood) and the provision of regular marine weather bulletins via radios out to sea. All services provided to the safety and benefit of the marine users in Mauritania will be developed through a consultative and transparent process engaging actors across the governmental sector and coastal community.

Component B: Institutional and Technical Capacity Development of the Mauritania National Meteorological Services. (USD 1,172,138)

One of the crucial factors currently limiting preparedness and disaster risk reduction in Mauritania is the lack of observations and high-resolution forecasts. The collection of observations and production of forecasts and warnings is the responsibility of the national

meteorological and hydrological service, ONM, is struggling to develop institutional capacity with its current resources. Project component B will provide focused human and technical capacity development designed to improve the provision of marine weather services. The institutional capacity building of the ONM will at the same time have major benefits to all national development areas, notably agriculture, health and environment that will benefit from improved observations and services.

Component C: Improving the quality and availability of coastal and maritime weather and early warning services (USD 282,362)

The work dedicated to improving the ability of national institutions to deliver services does not result in real development impacts without reaching the communities and individuals making choices based on their best knowledge about the current and future weather and climate. The dialogue between ONM, the Fishing Safety and Control Agency, the Federation of Artisan Fishermen and the fishermen themselves must be continuous and evolving to sustainably serve end user needs. The project will reach users through tested, robust and low-cost dissemination channels and will develop models for scaling up operations into nation-wide multi-user services with small additional funding.

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: REGULAR PROJECT DOCUMENT

Country/Region: **Mauritania**
Project Title: **Reducing Mauritanian Fishermen's Risk at Sea – Enhancing the Resilience of Mauritanian Coastal Communities to Adapt to Climate Change**
AF Project ID: **MTN/MIE/Coastal/2011/1**
NIE/MIE Project ID: **WMO ID** ____
Regular Project Concept Approval Date: **n/a**
Reviewer and contact person: **Shyla Raghav**
NIE/MIE Contact Person: **Josephine Wilson**

Requested Financing from Adaptation Fund (US Dollars): **2,159,980**
Anticipated Submission of final RP document (if applicable): **n/a**
Co-reviewer(s): **Andrew Hume**

Review Criteria	Questions	Comments on 5/10/2012	Comments on 5/30/2012
Country Eligibility	1. Is the country party to the Kyoto Protocol?	Yes	
	2. Is the country a developing country particularly vulnerable to the adverse effects of climate change?	Yes, Mauritania is a costal West Africa country that is particularly vulnerable to increased mean annual temperature and sea level, variable rainfall, and increased frequencies of climatic hazards such as floods and droughts. The lack of meteorological information limits adaptation responses in Mauritania.	
Project Eligibility	1. Has the designated government authority for the Adaptation Fund endorsed the project/programme?	Yes, letter dated April 30, 2012	
	2. Does the project / programme support concrete adaptation actions to assist the	While it is clear that climate change will impacts the coastal regions of Mauritania substantially, the proposal should provide more information on climate change	

	country in addressing adaptive capacity to the adverse effects of climate change and build in climate resilience?	projections for Mauritania in addition to the African continent or West African region. The project heavily employs a capacity building focus for relevant institutions in Mauritania. The proposal suggests a number of soft adaptation actions including workshops and training of staff/stakeholders to better understand coastal climate change issues and ocean meteorological data and models (training comprises 42% of the project budget). The concrete adaptation actions are fewer and include improving weather monitoring stations, establishing a new data center, hired staff, and modelling activities. In addition, portable radios will be distributed to approximately 60% of the daily fishing fleet. To justify the proposed activities as concrete adaptation, they should be linked to climate change projections and impacts. Further, the benefits for agriculture, health, and the environment are not particularly justified given the project's focus on the coastal zone. Due to the emphasis on capacity building in the project, the link to communities themselves is not always direct. Many activities are also vague in demonstrating how they deliver impacts and linkage to the rest of the project (particularly component D). **CR1**: Please elaborate on the climate change projections for Mauritania's coast.	CR1: Not addressed. The climate change projections (even if extrapolated) are addressed in Mauritania's Second National Communication to the UNFCCC, or through studies on which this project is based (presumably identifying the increased threat of coastal storms). The outputs of other projects such as Marinemet also have produced some prediction of wave height, wind speed, and coastal wave forecast. The inability of the project to identify specifically the climate change impacts casts doubt on

		CR2: Please elaborate on how the project goes beyond business as usual development and capacity building needs for the ONM to respond to climate change – including how the project will deliver a substantive and tangible impact for the vulnerable communities themselves.	the extent to which this project is adaptation – or just enhancing the capacity of a government meteorological institution. CR2: Somewhat addressed. The proposed interventions must be directly linked to climate change impacts (measured or projected) to be concrete climate change adaptation. It cannot be assumed that climate change will exacerbate storms and therefore the project is adaptation. Presumably, the threats identified in Mauritania's SNC such as sea level rise, coastal flooding, or infrastructure protection may be a higher priority/need. The proposal should therefore elaborate on the extent to which the project is linked to measurable climate change impacts (observed or projected).
	3. Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations?	Requires clarification. A safe fishing community well informed of weather hazards will provide valuable economic, social, and environmental benefits to both genders. However, the government is a main beneficiary of the project. **CR3**: Please clarify how the project will benefit women (presumably a majority of fishermen are men). **CR4**: Besides training on reading meteorological bulletins and sensitization on climate change, please expand on how the communities will benefit from the project (i.e, institutions or platforms that may be formed or linked to enhance social organization or processing of information).	CR3: Somewhat addressed. Women are mainly benefitted in the project through indirect means, such as fish processing or through the safety of their husbands. It is not clear how women will be engaged in trainings and project delivery. CR4: Somewhat addressed. Less than a third of the budget is focused on the coastal community, and over two thirds are ONM. While it is understood that a functioning ONM is necessary to provide the information to the coastal fishermen, perhaps the project can be oriented more towards the coastal community.
	4. Is the project / programme cost effective?	Yes but requires clarification. The majority of the funding ($1.17M out of $1.99M) is for Component B and concrete adaptation measures. The proposal will build off existing	

		infrastructure and previous projects, keeping cost at a minimum. However, the proposal states that there are no alternatives to the proposed activity. This is implausible. Even if socially infeasible, alternatives exist such as alternate livelihoods for fishermen. **CR5**: Please compare the proposed intervention to alternatives (particularly those that focus on the communities themselves) to justify the project.	CR5: Not addressed. The alternative to business as usual has not been thoroughly considered. There are other options to protect the lives and livelihoods of coastal communities that should be mentioned in the proposal and discussed with stakeholders. The review does not accept that there is no alternative to a proposed project with an intended outcome of protecting and enhancing coastal community livelihoods and resilience. One example is upgrading the fleet. Even if implausible, alternatives must be considered and comprehensively discussed with communities.
	5. Is the project / programme consistent with national or sub-national sustainable development strategies, national or sub-national development plans, poverty reduction strategies, national communications and adaptation programs of action and other relevant instruments?	Yes, the proposal is in alignment with government priorities and plans including their National Action Plan for Adaptation (NAPA), Strategic Framework for the Fight against Poverty (PRSP), and Sustainable Development Strategy (NSDS) as well as Millennium Development Goals (MDG).	
	6. Does the project / programme meet the relevant national technical standards,	The proposal does not identify any specific national standards to be met, but will be in line with WMO Standards for Observation Systems.	

	where applicable?		
	7. Is there duplication of project / programme with other funding sources?	Requires clarification. While there is no direct duplication, the proposed project shares similarities with the Marinemet project. Sustainability was highlighted as a problem with the Marinemet project and had many similar objectives. **CR6**: Please expand on how the proposed project has built in lessons learned from other efforts in the region, including how efforts will be made to synthesize and consolidate the outputs of all initiatives in the country.	CR6: Addressed. However, see CR1 as well.
	8. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	Yes. Capacity building is integral to mainstreaming adaptation to the key users, namely the meteorological staff and fishermen. Presumably, the activities related to service improvements will allow for the collections and dissemination of information – which can then be utilized in the improvement of project outputs.	
	9. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations?	Requires clarification. The consultative process with the community seems limited. The Annex provided (Annex II) suggests mostly ministries were consulted. Only a community organization seems to have been consulted from the Federation of Artisan Fishermen. **CR7**: Please clarify and expand on the community consultations conducted and their outcome (and influence on project design). Please note that all AF projects must be designed following a comprehensive consultative process.	CR7: Somewhat addressed. There is a strong assumption that the fishermen will be quick to adopt this project, and is also largely driven by the government stakeholders. The proposal should expand on the immediate community needs identified during consultations in the context of the climate change impacts experienced.
	10. Is the requested financing justified on the basis of full cost of	Requires clarification. The justification of the project on the basis of the full cost of adaptation is linked to the response to CR2,	

	adaptation reasoning?	emphasizing how the project goes beyond existing capacity building needs.	
	11. Is the project / program aligned with AF's results framework?	Yes, the overall objectives of the project align with the AF's results framework.	
	12. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	Requires clarification. It is not clear how the ONM intends to sustain the office improvements (staff, data centre, new instruments) after the project ends. Budget issues are cited for the current state of the ONM. **CR8**: Please clarify how the project intends to sustain the capacity of the ONM financially, how it will keep fishermen informed at sea with portable radios that will only last a short time in marine conditions, and how national platforms formed will be sustained.	CR8: Mostly addressed, however the commitment of the ONM to sustain any outputs of the project should be demonstrated (signed letter) given the strong emphasis of this project on the capacity of that institution that will require maintenance and upkeep, as well as safety equipment that is costly for fisherman.
Resource Availability	1. Is the requested project / programme funding within the cap of the country?	Yes, the other project for Mauritania under consideration is US$ 7.839 million.	
	2. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee?	Yes, 8.5%	
	3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?	Yes, 9.4%	

Eligibility of NIE/MIE	4. Is the project/programme submitted through an eligible NIE/MIE that has been accredited by the Board?	Yes, through WMO, a MIE	
Implementation Arrangement	1. Is there adequate arrangement for project / programme management?	Yes, the proposal has outlined the arrangements for the execution and implementation of the project.	
	2. Are there measures for financial and project/programme risk management?	Yes, the project has considered a number of risks.	
	3. Is a budget on the Implementing Entity Management Fee use included?	Yes	
	4. Is an explanation and a breakdown of the execution costs included?	Yes	
	5. Is a detailed budget including budget notes included?	Yes. **CR9**: Please clarify how the cost for fixed assets in activities B.4 and B.5 were arrived at.	CR9: Addressed.
	6. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators?	Yes. However, monitoring & evaluation appears in many places in the project budget itself. Project activities also include initial stakeholder engagement (which is typically part of stakeholder consultations during project design, or inception workshop). **CR10**: Please clarify the M&E functions of the project and justify why M&E activities are included within the project budget.	CR10: Not addressed. It is still not clear why a project kick-off workshop is included under the project budget, and an inception workshop is budgeted under M&E. The activities listed under the project kick-off are typically

			undertaken at the inception workshop.
	7. Does the M&E Framework include a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function?	Yes	
	8. Does the project/programme's results framework align with the AF's results framework? Does it include at least one core outcome indicator from the Fund's results framework?	Yes.	
	9. Is a disbursement schedule with time-bound milestones included?	Yes	

Technical Summary	The project identifies a high priority need in Mauritania to establish capacity building activities to inform and sustain climate change adaptation in the country. The technical review does not question the impacts of climate change on the coastal zone in Mauritania. However, the proposal should reflect clearly the climate change impacts and subsequent linkage to how the project will reduce vulnerability in coastal communities aside from soft activities such as training. While capacity building is recognized as important and welcomed if complementary to core project objectives, it should not constitute the sole and primary project objective and set of activities. The justification of the project clearly driven at the community level would resolve identified issues regarding the project impact, sustainability, and cost-effectiveness. The following clarification requests are made: **CR1**: Please elaborate on the climate change projections for Mauritania's coast. **CR2**: Please elaborate on how the project goes beyond business as usual development and capacity building needs for the ONM to respond to climate change – including how the project will deliver a substantive and tangible impact for the vulnerable communities themselves. **CR3**: Please clarify how the project will benefit women (presumably a majority of fishermen are men).

	CR4: Besides training on reading meteorological bulletins and sensitization on climate change, please expand on how the communities will benefit from the project (i.e, institutions or platforms that may be formed or linked to enhance social organization or processing of information). **CR5**: Please compare the proposed intervention to alternatives (particularly those that focus on the communities themselves) to justify the project. **CR6**: Please expand on how the proposed project has built in lessons learned from other efforts in the region, including how efforts will be made to synthesize and consolidate the outputs of all initiatives in the country. **CR7**: Please clarify and expand on the community consultations conducted and their outcome (and influence on project design). Please note that all AF projects must be designed following a comprehensive consultative process. **CR8**: Please clarify how the project intends to sustain the capacity of the ONM financially, how it will keep fishermen informed at sea with portable radios that will only last a short time in marine conditions, and how national platforms formed will be sustained. **CR9**: Please clarify how the cost for fixed assets in activities B.4 and B.5 were arrived at. **CR10**: Please clarify the M&E functions of the project and justify why M&E activities are included within the project budget. Final review: The review acknowledges the undeniable increased intensity of storms as a result of climate change on the global and regional scale. Climate hazards place a significant amount of stress on coastal communities that rely on marine resources for their livelihoods. However, without climate projections (even if extrapolated), it cannot be presupposed that climate change uniformly negatively impacts coastal communities simply because climate change exists. The project must therefore demonstrate the climate change impacts (observed and projected) and frame the project accordingly. Further, among other areas requiring additional information, the following specific issues should also be addressed: • The proposal should elaborate on the extent to which the project is linked to measurable climate change impacts (observed or projected). • The proposal should clearly justify the project relative to alternatives at the community level according to the climate change impact targeted. • The proposal should expand on the immediate community needs identified during consultations in the context of the climate change impacts experienced. • The proposal should elaborate and enhance the measures to ensure long-term project sustainability (including evidence of commitments made). • The inclusion of a project kick-off within the project should be revaluated due to the direct overlap with the inception workshop budgeted under M&E
Date:	5/11/2012, 5/29/2012

ADAPTATION FUND

DATE OF RECEIPT:
ADAPTATION FUND
PROJECT/PROGRAMME ID:
(For Adaptation Fund Board Secretariat Use Only)

PROJECT/PROGRAMME PROPOSAL

PART I: PROJECT/PROGRAMME INFORMATION

PROJECT/PROGRAMME CATEGORY:	REGULAR SIZED PROJECT PROPOSAL
COUNTRY/IES:	MAURITANIA
SECTOR/S:	COASTAL / FISHERIES
TITLE OF PROJECT/PROGRAMME:	REDUCING MAURITANIAN FISHERMEN'S RISK AT SEA – ENHANCING THE RESILIENCE OF MAURITANIAN COASTAL COMMUNITIES TO ADAPT TO CLIMATE CHANGE
TYPE OF IMPLEMENTING ENTITY:	MULTI-LATERAL IMPLEMENTING AGENCY
IMPLEMENTING ENTITY:	WORLD METEOROLOGICAL ORGANIZATION
EXECUTING ENTITY/IES:	OFFICE NATIONALE DE LA MÉTÉOROLOGIE, MAURITANIE (ONM)
AMOUNT OF FINANCING REQUESTED:	**$2,159,980.00** (IN U.S DOLLARS EQUIVALENT)

PROJECT BACKGROUND AND CONTEXT:

The Islamic Republic of Mauritania, located in the north-western part of the African continent, is a vast but sparsely populated country of approximately 3.2 million inhabitants (2011). The highest density is recorded in the coastal cities of Nouakchott, where a third of Mauritanians live, Nouadhibou and along the Senegal River in the southern part of the country. The Atlantic coast of Mauritania is 724 km long and its land area is 1,030,700 km^2.

Mauritania remains among the world's poorest countries, ranked 136th of 169 countries in the United Nations Human Development Index in 2010. Poverty still affects close to 42%[1] of the Mauritanian population, despite a steady decrease in the level of poverty for more than a decade. Rural poverty is aggravated by the acute lack of basic infrastructure such as water, energy and transport. The rather poor performance of the social sectors indicates the likelihood that the Millennium Development Goals (MDG) will not be achieved by 2015.

Economically, Mauritania has one of the lowest GDP rates in Africa, despite being rich in natural resources. A majority of the population still depends on agriculture and livestock for a livelihood, even though most of the nomads and many subsistence farmers were forced into the cities by recurrent droughts in the 1970s and 1980s[2]. Mauritania has extensive deposits of iron ore, which account for almost 50% of total exports[3]. Mauritania has been hard hit over the past three years by the combined effects of external and internal shocks that have hindered its growth. The structure of the Mauritanian economy, characterized by the predominance of the secondary and tertiary sectors (with 34.7% and 44.8% of GDP respectively) remained almost entirely unchanged between 2009 and 2010[4]. After a fall in GDP of 1.2% in 2009, the economy rebounded in 2010, with a 4.9% GDP[5]. This is expected to become stronger in the coming years.

Climate Change Scenarios

Mauritania is highly vulnerable to extreme climate events such as severe storms, high temperatures, rising sea-levels and irregular rainfall patterns that are sometimes inadequate leading to droughts, and at other times excessive leading to flooding and inundation. The amount of precipitation is extremely sensitive to the variation in the north-south latitudinal movement of the Inter-tropical Convergence Zone (ITCZ)[6] from one year to another, causing large inter-annual and inter-decadal variations.

In recent years, incidents of disaster caused by heavy thunderstorm and gale winds are occurring in the early months of rainy seasons. Each year, heavy rains and gale force winds wreak havoc in different districts around the country by destroying houses, schools and other community-based infrastructure. As on most parts of the globe, most natural disasters in Mauritania are related to hydro-meteorological phenomena.

[1] Africa Economic Outlook, 2011
[2] Islamic Development Bank, Member Country Partnership Strategy, 2011 – 2015
[3] Islamic Development Bank, Member Country Partnership Strategy, 2011 – 2015
[4] Africa Economic Outlook, 2011
[5] Africa Economic Outlook, 2011
[6] The location of the ITCZ varies throughout the year and while it remains near the equator, the ITCZ over land ventures farther north or south than the ITCZ over the oceans due to the variation in land temperatures. The location of the ITCZ can vary as much as 40° to 45° of latitude north or south of the equator based on the pattern of land and ocean. In Africa, the ITCZ is located just south of the Sahel at about 10°, depositing rain on the region to the south of the desert.

According to the IPCC Fourth Assessment Report, climate change projections for Mauritania include:

- An increase in mean annual temperature of 3 to 4.5℃ by 2075
- A variable rainfall pattern going from -59% to +29% of a baseline of average 878mm/yr by 2100
- A sea level rise of 0.2m by 2100 (baseline scenario)
- Increased frequencies of climatic hazards such as flooding and droughts

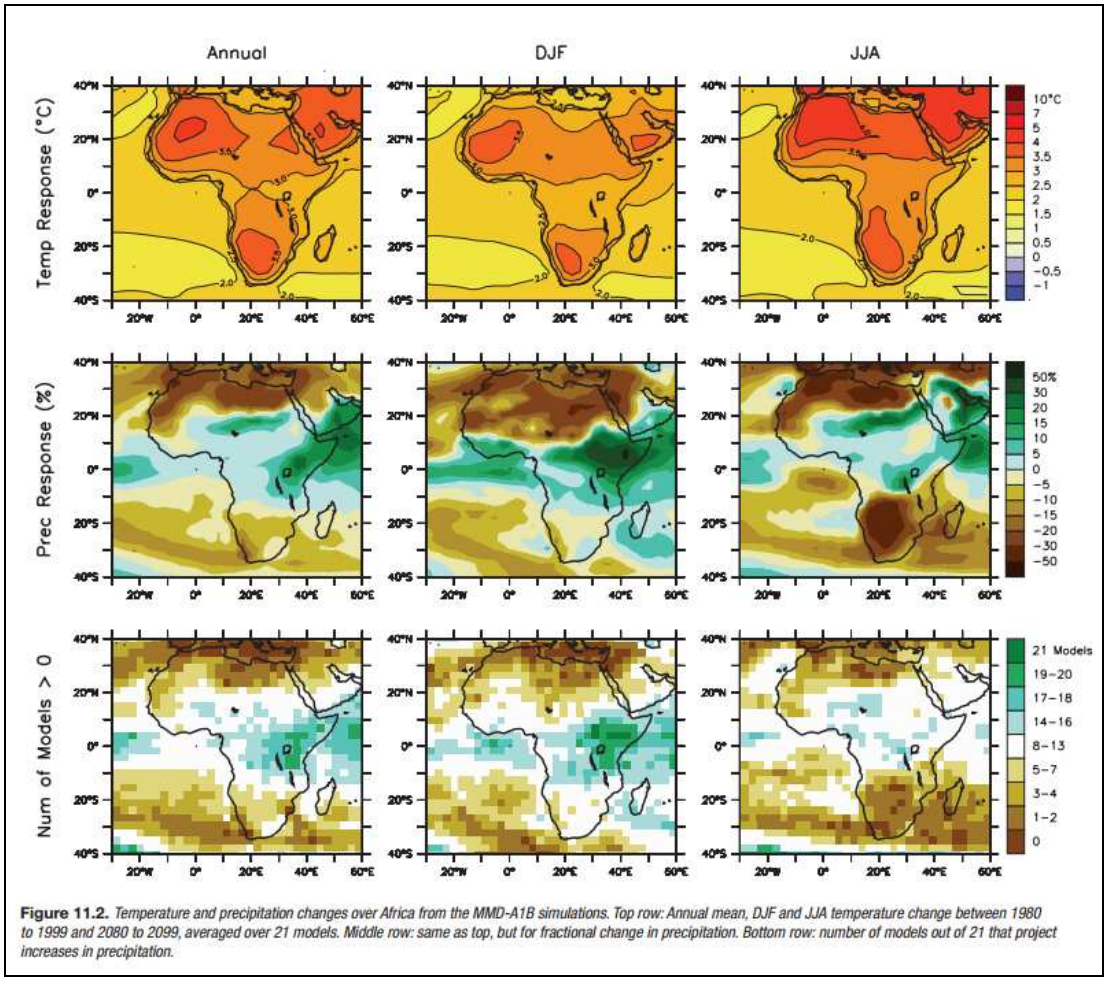


Figure 11.2. *Temperature and precipitation changes over Africa from the MMD-A1B simulations. Top row: Annual mean, DJF and JJA temperature change between 1980 to 1999 and 2080 to 2099, averaged over 21 models. Middle row: same as top, but for fractional change in precipitation. Bottom row: number of models out of 21 that project increases in precipitation.*

Figure 1: *IPCC Fourth Assessment Report outcomes for the African region for Temperature and Precipitation*

Climate change will thus have significant negative impacts on various sectors of the economy. It is clear that climatic hazards, such as storms, floods and droughts, have negative impacts on the economic sectors that will affect the overall economic growth and development plans of Mauritania, as well as its ability to meet the Millennium Development Goals. Despite some passive attempts to adapt to these climate hazards, the capacity to address climate change impacts in Mauritania is still limited. The national and local administrations have limited

systematic knowledge of climate change risks, adaptation needs and options, and individual, institutional and systemic capacities to act on such risks remain low.

The current best information available on climate change projection for Mauritania's coast are those based on the IPCC Fourth Assessment Report (AR4), which unfortunately does not provide the level of detail to make specific arguments about the future climate for such a small area. For this region, there is great uncertainty as to future trends and indeed IPCC themselves are recommending further research into this aspect of the science. Improved weather and climate monitoring in this area, which could be made available through this project, will provide an important basis in future IPCC reports.

According to the recent Special Report of the Intergovernmental Panel on Climate Change (IPCC), *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*, "a changing climate leads to changes in the frequency, intensity, spatial extent, duration and timing of extreme weather and climate events, and can result in unprecedented extreme weather and climate events." Adaptation measures must consider these changes for the investment to be appropriate. While the actual climate trend in the Mauritanian coast is uncertain, there are measures that can be taken that would increase or improve resilience in this region. This proposal is in line with these measures through the improvement the monitoring system in the coastal region of Mauritania.

A key aim of the project is to build resilience for the coastal and fishing communities of Mauritania to enable them to cope with current climate variability. The extreme weather events that the country is currently experiencing can be attributed to the natural variability of the climate. The proposed project will allow stakeholders, both the government and the fishing community, to make decisions based on improved knowledge of when and where severe weather and/or climate events are likely to occur under current levels of warming. As the benefits roll-out, the components of the project will significantly strengthen the ability of the region to better cope with future trends.

Oceans: risks and resources changing with climate

In Mauritania, a large percentage of the population inhabits the coastal regions and often depends on the marine environment and the maritime transportation for their livelihoods, making them especially vulnerable to marine meteorological extreme events. For those working at sea, or simply living near the coast, forecasts of maritime weather and ocean conditions are extremely important. Rough seas, high waves and storm surges can be dangerous to mariners.

The oceans are also under stress due to the pressures of coastal development, industrial pollution and over-fishing. Ocean currents and winds can transport and disperse oils slicks and other forms of pollution. Changes in ocean temperatures can also significantly affect the marine ecosystem, from plankton to fisheries. Understanding, monitoring, mapping and predicting maritime weather and ocean conditions offers the opportunity for adequate planning of the coastal zone and marine activities, and provide a structure for early detection and warning, and mitigating the risks of marine-related hazards.

Meteorological and oceanographic data and services are vital to the understanding, protection and sustainable management and exploitation of the global ocean and coastal environment, and the National Meteorological Services have an increasing role to play in delivering the relevant information.

Fisheries Sector

Along Mauritania's 750 km Atlantic coastline are some of the world's richest fishing areas. The fisheries sector consists of two sub-sectors, namely the traditional and industrial fisheries. According to the Food and Agricultural Organization (FAO), the industrial fisheries export 800,000 metric tons of fish per year, and estimates that the small-scale fisheries export 80,000 metric tons per year.

The European Commission reports that the fisheries sector represents 10% of the Mauritania's GDP and between 35-50% of its exports and contributes 29% to the national budget revenue. In addition, the sector also generates 45,000 jobs, directly and indirectly; and accounts for 36% of the country's total employment, with 31% of these jobs stemming from artisanal fishing and 12% from industrial fishing[7]. According to Mauritania's Poverty Reduction Strategy Paper, 2011-2015 (PRSP), the potential for export development in this sector lies in the expansion of artisanal and coastal fisheries. The paper also indicated that the fisheries sector should be the "driving force in combating food insecurity."

At present, fisheries and marine resources, which account for more than 12.5%[8] of Mauritania's GDP, will also be affected by the adverse effects of climate change, through the disturbance of the biotopes of some species and the dwindling stocks of some populations. This could result in a fall in economic growth, a considerable loss of foreign exchange (decrease in exports) and an increase in the unemployment rate (in 1996, traditional fisheries generated 21,000 jobs in the country[9]).

With regard to marine and coastal ecosystems, the adverse effects of climate change can be observed through the rising of the sea level and temperatures, the increased frequency and intensity of major storms and the consequences they generate. Simulations carried out by experts during the Initial National Communication on Climate Change in 2001 estimated that the potential damage of marine related hazards resulting from climate change could generate losses amounting to US$ 3,956 million by 2020 and US$ 6,330 million by 2050.

The traditional fisheries sector has been growing very fast. According to the Federation of Artisanal Fisheries of Mauritania, there are approximately 30,000 fishermen at sea on a daily basis. These include a fleet of 4,000; namely 2,790 national *pirogues* (canoes), 1,114 chartered boats and 249 with free licenses. During stakeholder consultations in February 2012, the representatives of the Federation highlighted the increase in accidents and fatalities of small-scale fishermen due to lack of accurate weather forecasts, lack of tools to communicate with coastal authorities and lack of training on the vital culture of safety at sea. This is especially the case for artisanal fishermen at sea for extended periods of 2 to 3 weeks, and who go out as far as 100-120 kilometres from the shore.

In collaboration with the *Délégation à la Surveillance des Pêches et au Contrôle de Mer* (The Fishing Safety and Control Agency, DSPCM), the *Office Nationale de la Météorologie* (the National Meteorological and Hydrological Service of Mauritania, ONM) has developed a marine weather bulletin system (See Figure 2) that advise fishermen of the state of the ocean before going out to sea. The forecast is provided twice a day and the system involves colour-coded flags that are hung from flag posts at fishing ports in Nouakchott, Nouadhibou, PK144 and Mamghar that enable illiterate users to quickly analyze the dangers at sea. However, feedback

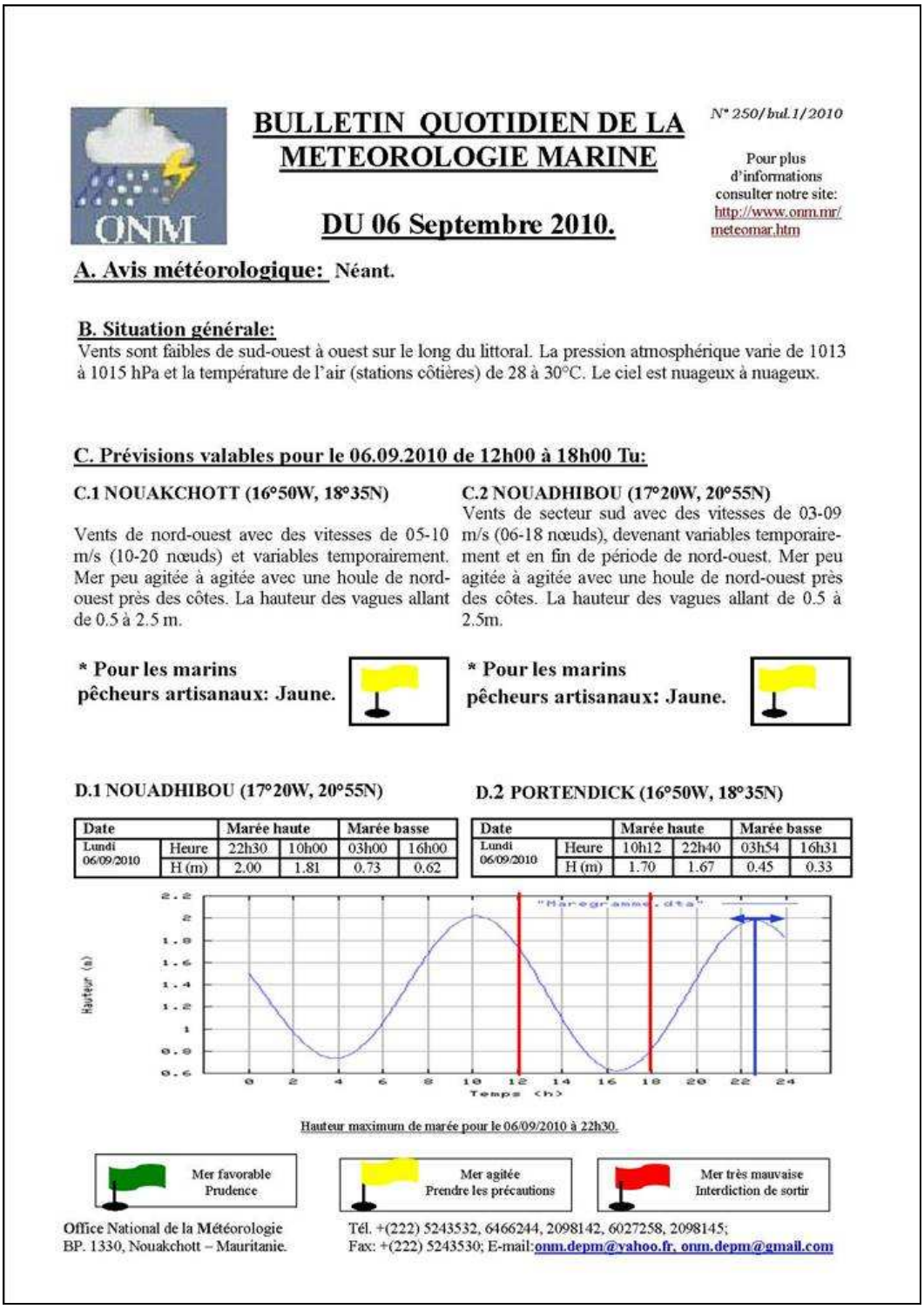
[7] http://www.europarl.europa.eu_sides_getDoc
[8] http://www.europarl.europa.eu_sides_getDoc
[9] http://www.europarl.europa.eu_sides_getDoc

from the DSPCM indicates that while the information provided is appreciated, it is not localized enough to serve the four different fishing domains in Mauritania and hence there is an overly cautious warning practice in place. Subsequently, most fishermen ignore the warnings, risking their lives and livelihoods. Over the last 10 years, it is conservatively estimated that at least 177,000[10] people have been affected by storm surges and associated disasters.

Each year, life and property are lost due to climate change induced weather hazards, such as storm surges, wind-induced waves, rough seas and their combined effect with river flooding. In combination, these hazards lead to coastal inundation resulting in catastrophic damage and disruption. Local fishing communities, ferries and commercial shipping as well as major parts of the population are often affected and are without timely warning. Coastal industries such as fisheries, oil drilling, transport and tourism are prone to severe weather impacts. These events contribute greatly to the perpetuation of the poverty these communities continue to face despite technological advances achieved in the science of meteorology, forecasting and related information products and services. In a changing climate, both the frequency and intensity of the storms will change, making the requirement for an effective early warning system increasingly essential.

Despite the vulnerability of the coastal waters and land in terms of weather hazards, forecasts and warnings for the marine and coastal area are still at infancy stage. A WMO survey revealed that most West African countries, including Mauritania, lack the expertise in marine meteorology to implement an effective warning system and disaster mitigation strategy. ***The lack of maritime and meteorological information limits the adaptation responses of Mauritania.*** Better observations and forecast for marine related hazards, combined with improved skills of local forecasters and coastal authorities are required to develop an enhanced early warning system for coastal risk management that adequately addresses societal needs (safety and health) for the protection of life and property along coastal areas.

[10] Source: "EM-DAT: The OFDA/CRED International Disaster Database"



BULLETIN QUOTIDIEN DE LA METEOROLOGIE MARINE

N° 250/bul.1/2010

Pour plus d'informations consulter notre site: http://www.onm.mr/meteomar.htm

DU 06 Septembre 2010.

A. Avis météorologique: Néant.

B. Situation générale:
Vents sont faibles de sud-ouest à ouest sur le long du littoral. La pression atmosphérique varie de 1013 à 1015 hPa et la température de l'air (stations côtières) de 28 à 30°C. Le ciel est nuageux à nuageux.

C. Prévisions valables pour le 06.09.2010 de 12h00 à 18h00 Tu:

C.1 NOUAKCHOTT (16°50W, 18°35N)

Vents de nord-ouest avec des vitesses de 05-10 m/s (10-20 nœuds) et variables temporairement. Mer peu agitée à agitée avec une houle de nord-ouest près des côtes. La hauteur des vagues allant de 0.5 à 2.5 m.

*** Pour les marins pêcheurs artisanaux: Jaune.**

C.2 NOUADHIBOU (17°20W, 20°55N)

Vents de secteur sud avec des vitesses de 03-09 m/s (06-18 nœuds), devenant variables temporairement et en fin de période de nord-ouest. Mer peu agitée à agitée avec une houle de nord-ouest près des côtes. La hauteur des vagues allant de 0.5 à 2.5m.

*** Pour les marins pêcheurs artisanaux: Jaune.**

D.1 NOUADHIBOU (17°20W, 20°55N)

Date		Marée haute		Marée basse	
Lundi 06/09/2010	Heure	22h30	10h00	03h00	16h00
	H (m)	2.00	1.81	0.73	0.62

D.2 PORTENDICK (16°50W, 18°35N)

Date		Marée haute		Marée basse	
Lundi 06/09/2010	Heure	10h12	22h40	03h54	16h31
	H (m)	1.70	1.67	0.45	0.33

Hauteur maximum de marée pour le 06/09/2010 à 22h30.

Mer favorable Prudence

Mer agitée Prendre les précautions

Mer très mauvaise Interdiction de sortir

Office National de la Météorologie
BP. 1330, Nouakchott – Mauritanie.
Tél. +(222) 5243532, 6466244, 2098142, 6027258, 2098145;
Fax: +(222) 5243530; E-mail:onm.depm@yahoo.fr, onm.depm@gmail.com

Figure 2: W*eather bulletin system developed by ONM – same colour flags are hung at the ports to advises fishermen of the state of the ocean before going out to sea*

Office Nationale de la Météorologie

Prior to the inception of the *Office Nationale de la Météorologie* (the National Meteorological and Hydrological Service of Mauritania, ONM), meteorological functions performed[11] were related only to aeronautical activities; and the maintenance of existing weather stations used for weather predictions for the safety of planes coming in and out of Mauritania. However, in 2005 due to an increase in storm surges and noticeable increase in related accidents, loss of property and deaths, and following a ministerial report on inadequateness of the current services to ensure the security of the lives and livelihoods of Mauritanians, ONM was established in December 2006 under the auspice of the Ministry of Transport and Equipment. Its mandate is ***"the observation and study of weather, climate and atmospheric components of the environment to ensure the safety of persons, goods and contribute to economic and social development of Mauritania by the provision of meteorological information appropriate for all users."*** ONM was also asked undertake national hydrological activities as part of its mandate.

Over the last five years, ONM, with a limited investment from the government and in partnership with the World Meteorological Organization and other related weather and climate centres was able to begin providing services. See Annex I for complete baseline information on ONM, including budget, human resources, equipment and services currently provided.

While the ONM monitors weather parameters and provides forecasts on a daily basis, albeit not with sufficient detail in most coastal areas, they have not begun to analyze how the information they provide is utilized for decision-making by the end-users. More specifically, there is still a lack of knowledge in two key aspects: a) what are the appropriate formats for dissemination of the information and b) how channels of communication can be improved for effective integration of weather / climate in decision-making. In general, the delivery of services stays at the administrative level, (e.g. warnings are only sent to governmental institutions in charge of disaster management and sea safety through administrative channels). General forecasts, typically valid for 24 hours are issued on a daily basis and delivered to the public through classic media (TV, radio, newspaper) but these forecasts are not specific enough to meet the needs of vulnerable communities, as is the case with the fishermen and the coastal communities.

Discussions with stakeholders in maritime / coastal activities have begun. These include local communities involved or benefiting from marine / coastal resources or those living near the coast. This engagement has begun the process of understanding the user requirements more comprehensively. However, due to the lack of equipment and training, the services provided, (as noted from the feedback of the Marine Rescue Centre), the weather bulletins are not sufficient and sometimes not useful at all. Further investment in ONM, in terms of observation network, training and telecommunications, is still needed to improve communications and service delivery to vulnerable communities in coastal areas. Appropriate formats and distribution channels can be determined with the targeted communities through workshops and consultations. Delivery of forecasts and early warnings, from daily, seasonal and longer timescales, can be preceded by sensitization actions on climate change and variability and their impact on coastal environment and activities and the necessity to adapt to the increased intensity and frequency of weather hazards.

11 Aeronautical activities were performed solely by the Agency for Aerial Navigation Safety in Africa and Madagascar (L'Agence pour la Sécurité de la Navigation aérienne en Afrique et à Madagascar, ASECNA), an air traffic control agency based in Dakar, Senegal.

Project Sustainability

Led by the ONM, the proposed project was formulated following consultations and explicit requests from the Ministries of Equipment and Transport, Environment, Fishing, Interior and Civil Protection as well as representatives from the Federation of Artisanal Fishermen and DRCPM. Each institution has highlighted the need for a coastal early warning system to sustainably build the resilience of coastal communities to climate change and to overcome the barriers to adaptation. See Annex II for a complete list of stakeholder consultations.

The proposed project is also in-line with the priorities identified in the National Adaptation Programme of Action (2004), Second National Communication (2008), Islamic Development Bank Partnership Strategy (2011-2005) and the Poverty Reduction Strategic Framework (2011-15). The project is further aligned with the National Action Plan for the Environment (PANE), and the National Strategy for Sustainable Development (SNDD) thereby ensuring support at the national and departmental levels providing a framework whereby lessons learned from ground are incorporated at the broader national strategy for climate change adaptation. The broad scope of the project is also aligned with the government's structural policies and strategies as they relate to poverty reduction and better control of the effects of climate change, specifically the building national capacity to monitor climate change.

The proposed project is sustainable as it begins with ensuring the ownership is rooted in country. Due to the lack of in-country observation systems and IT capacity, means of providing weather and climate services typically entails relying on international service providers for a service fee. The challenge with an outsourcing scenario (such as ASECNA) is that it does not build the capacity of the local meteorological service to develop its own weather forecasting services. It also means that the services they provide are limited, as they are not fully tailored to the needs of specific sectors and communities. This project builds on currently deficient systems in place through the:

a. Reinforcement of the coastal observation network ensuring availability of raw data;
b. Development the necessary tools to allow ONM to develop forecasts and warnings tailored to community needs;
c. Improvement of the telecommunications system to enable ONM to disseminate the information to end-users; and
d. Provision of an improved system of targeted delivery of information and feedback mechanisms.

These improvements will ensure that information is not only accurate but is also in a format that is understandable by both intermediary and end-users, in particular representatives of ministries, local agencies and communities. The project components are outlined under Project Justification.

At the present, ONM does not have the capacity provide vulnerable communities in the coastal areas reliable information on e.g. sea level, storm surge, flooding, thunderstorms that will directly affect their fishing livelihood and life in villages. The ONM is not currently equipped to deliver the essential weather and climate information services required to strengthen resilience in coastal communities, especially in terms of establishing direct links into the communities themselves. "Business as usual" would be just that, continuing to issue daily forecasts without awareness of community needs or mechanisms for reaching the communities. The project

proposes service-focused concrete actions that would go far beyond current development of the ONM and form the basis and culture for a strong service oriented institution.

Responding to the potential impacts of climate change requires strong institutions that will be able to serve the population and provide assistance and services to the vulnerable communities. By supporting ONM to deliver information and guidance to vulnerable coastal communities, the project will strengthen the interaction of communities and government institutions. The project, in collaboration between ONM, the Port Authorities and the National Civil Protection Agency, will have a substantive impact on the lives of the fishing communities through significantly enhanced understanding of the consequences of weather, climate and hydrological events. The tangible impacts will be the actions taken as a result of the improved information and ***knowledge to act upon this information*** by the fishermen and their communities. Tangible impacts will be decreased fatalities of fishermen, decreased loss of their vessels and decreased loss of livelihood. The improved quality and access to information will form the basis for planning further adaptation measures.

PROJECT OBJECTIVES:

The **overall objective** of the project is to strengthen the resilience of Mauritania's coastal community. In particular, to undertake concrete actions to allow local communities to adapt to weather and climate change induced hazards. More specifically in the context of the requested financing, the **project purpose** is to develop institutional capacity and early warning service delivery to small-scale fishermen and coastal communities in Mauritania.

The project contemplates the following main outcomes:

1. **Reduced exposure and increased adaptive capacity of small-scale fishermen to weather and climate change induced hazards**. While some 30,000 fishermen in Mauritania are out at sea at any given moment, none of them carry any means of obtaining information about the state of the ocean or atmosphere during their excursion lasting up to 15 days at a time. An Early Warning System (EWS) will be developed and a pilot project dedicated for the fishermen will be implemented to provide continuous and updated marine weather bulletins and warnings. The project will be executed by the Mauritanian National Meteorological and Hydrological Service (l'Organisation Nationale de la Météorologie de Mauritanie, ONM), in cooperation with the *Délégation à la Surveillance des Pêches et au Contrôle de Mer* (The Fishing Safety and Control Agency, DSPCM), and the Federation of Artisanal Fisheries of Mauritania. The adaptive capacity will be built upon existing structures and institutions using national radio, existing warning mechanisms for fishermen and new services such a marine weather hotline at the ONM. The outcome will reach the majority of the coastal population composed nearly of 1.5 million inhabitants or half the population. The outcome will demonstrate a radio communication system with a pilot of 6000 fishermen and presents good opportunities for scaling up. The continuity of the outcomes will require investment into the ONM and operational resources to be provided to the national institutions. The project will support the development of institutional frameworks, monitoring and evaluation techniques and continuous stakeholder training and cooperation to ensure sustainability of achieved outcomes.

2. **Strengthened awareness and ownership of adaptation and climate risk reduction processes at local levels**. The ability to reduce risks associated with natural disasters depends on the effective, timely and reliable communication between a number of national institutions to assess vulnerability and capacity of the local communities. The safety of the

coastal communities depends on their own actions to mitigate risks associated with threats. For effective mitigation, the threats need to be identified and discussed with communities, and relationships built with the national safety organizations to coordinate the response. Climate change will pose a threat in the form of sea level rise, increased frequency and severity of storms leading to e.g. storm surges, sand storms, flooding, high seas and high wind. The conditions leading to dangerous weather and climate events will be addressed with local communities and appropriate protection and adaptation measures discussed jointly with national civil protection, maritime safety and meteorological agencies. The capacity of the national civil protection agencies to engage with local communities to design appropriate disaster risk reduction measures will be developed and trust in government developed at the community level. The awareness and ownership process will directly reach 6000 fishermen from four coastal communities in Mauritania, representing the main fishing hubs in the country. Indirectly, the entire coastal community in Mauritania will be the first to benefit from improved provision of products and services.

3. **Improved capacity of ONM to deliver marine weather and early warning services to help reduce risks associated with climate related losses and contribute to socio-economic development and poverty alleviation**. The ability to reduce risks associated with natural disasters relies, in addition to the national processes being implemented, on the availability of reliable information on the current and future state of the natural environment. Modern technologies in the field of meteorology, hydrology and oceanography form the foundation for any disaster risk reduction effort and guarantee accurate, efficient and cost-effective provision of data on the natural state. Observation forms the basis of a forecast, which is delivered as a tailored service to a user. The capacity to deliver hydro-meteorological services to end-users is a national concern that serves all domains of the public sector, from transport to health to environment and agriculture.

4. **Strengthened capacity of national centres and networks to respond rapidly to climate change induced extreme weather events**. The capacity for quick response requires real-time information about several variables and well-established processes with established lines of communication and responsibility to function. In its current state, the national agencies do not have the means for real-time monitoring of the ocean or the atmosphere and thus are already delayed by a significant margin in their response. Through implementation of robust telecommunication technologies with automated observing systems for weather and ocean, the capacity to react will significantly increase. In parallel, processes with maritime safety and civil protection will be streamlined for all weather and climate related information in rapid response cases. Investment into data management and transmission will ensure fast delivery of information and will be complemented by developing atmospheric and ocean state numerical modelling facilities at the ONM to improve early warning reliability, accuracy and relevance.

PROJECT COMPONENTS AND FINANCING:

Fill in the table presenting the relationships among project components, activities, expected concrete outputs and the corresponding budgets. If necessary, please refer to the attached instructions for a detailed description of each term.

PROJECT COMPONENTS	EXPECTED CONCRETE OUTPUTS	EXPECTED OUTCOMES	AMOUNT (USD)
Component A: Implementation of Sensitization Measures to Reduce the Vulnerability of Small-scale Fishermen	1200 boat captains trained on weather, climate and ocean, and associated dangers Design for the forecast and early warning services delivered by ONM, in collaboration with fishermen and local intermediary organizations Mauritanian Fishing Safety and Control Agency and the Federation of Artisanal Fisheries trained on weather, climate and ocean and associated risks	Reduced exposure and increased adaptive capacity of small scale fishermen and coastal communities to climate change induced weather hazards Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	348,514
Component B: Institutional and Technical Capacity Development of the Mauritania National Meteorological Services	Two new marine meteorological automatic weather stations installed and operational at the coast of Mauritania Data management solution for real-time observation data developed and operational at ONM Numerical coastal ocean state model adopted and operational at ONM 2 permanent ONM staff trained on marine meteorology and numerical ocean state modelling Modern data centre established at the ONM for weather, climate and ocean data	Improved capacity of ONM to deliver marine weather and early warning services to help reduce risks associated with climate related losses and contribute to socio-economic development and poverty alleviation	1,172,138

Component C: Improving the quality and availability of coastal and maritime weather and early warning services	Weather hotline for fishermen receives at least 50 calls per day 1200 boat captains trained on the operation of hand-cranked and solar-powered radios and the interpretation of weather bulletins At least 6000 fishermen reached daily through the radio weather bulletins	Strengthened capacity of national centres and networks to respond rapidly to climate change induced extreme weather events	282,362
4. Project/Programme Execution cost			187,750
5. Total Project/Programme Cost			1,990,764
6. Project Cycle Management Fee charged by the Implementing Entity			169,216
Amount of Financing Requested			**2,159,980**

PROJECTED CALENDAR:

MILESTONES	EXPECTED DATES
Start of Project Implementation	1 January 2013
Mid-term Review	30 May 2014
Project Closing	31 December 2015
Terminal Evaluation	31 December 2015

Start date assumes September 2011 AFB approval.

PART II: PROJECT JUSTIFICATION

A. Describe the project components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience.

The Project is divided into functional components based on the model of early warning services to benefit Mauritanian fishermen. In the project components, activities are focused and concrete actions are outlined to address adaptation through improved continuous access to weather forecasts and warnings. The project emphasizes all aspects of the risk reduction process, from user sensitization and tailoring of services though collaborative methods, institutional capacity building to sensitization and engagement of all relevant national agencies to the early warning system. The project has been designed to be very concrete, focused and streamlined to maximize benefits to the final end users, namely, Mauritanian marine users, in particular small-scale fishermen. Climate resilience is built by developing awareness and risk mitigation measures available to the communities that rely on fishing as their main livelihood.

Component A: Implementation of Sensitization Measures to reduce the vulnerability of small-scale fishermen

The concrete adaptation approach of the project is to target small-scale fishermen and coastal communities dependent on the fisheries sector in Mauritania through user sensitization, awareness and consultations (to better understand climate change's threats to their lives and livelihood) and the provision of regular marine weather bulletins via radios out to sea. All services provided to the safety and benefit of the marine users in Mauritania will be developed through a consultative and transparent process engaging actors across the governmental sector and coastal community.

Activity A.1: Project Kick-off Workshop

An initial engagement with all stakeholders of the project will develop guidelines for the project implementation and outline the format and means of dissemination of the pilot phase services to end users. For maritime safety, a multi-stakeholder body addressing the risk reduction and early warning needs of end users from the governmental standpoint does not exist. This engagement will form a national platform for maritime risk reduction that will receive regular reports for this project and take on additional work as it sees appropriate.

Activity A.2: Marine risk sensitization for government actors and officials

The main agencies related to marine safety in Mauritania are the National Civil Protection Agency under the Ministry of Interior, the Fishing Safety and Control Agency under the Ministry for Fishing and the National Meteorological and Hydrological Service under the Ministry of Transport and Equipment. All of these agencies will be subject to activities to sensitize their operations to the growing needs by marine users for early warning and forecast information on natural hazards via a series of consultative, result-oriented and non-discriminatory workshops.

Activity A.3: Disaster Risk Sensitization for Fishermen

With 18% of the Mauritanian GDP produced from fishing, a growing offshore oil exploration program and majority of the population living on the coast, there are major threats associated with the changing climate. For fishermen, the traditional livelihood is becoming dangerous if they are not properly sensitized to the risks associated with the weather, climate and ocean. The 6000 fishermen the project aims to sensitize over a series of consultative community-based actions in the main fishing hubs of Mauritania represent over half of the boats out at sea each day, significantly reducing the number of lives at risk.

Component B: Institutional and Technical Capacity Development of the Mauritania National Meteorological Office

One of the crucial factors currently limiting preparedness and disaster risk reduction in Mauritania is the lack of observations and high-resolution forecasts. The collection of observations and production of forecasts and warnings is the responsibility of the national meteorological and hydrological service, ONM, is struggling to develop institutional capacity with its current resources. Project component B will provide focused human and technical capacity development designed to improve the provision of marine weather services. The institutional capacity building of the ONM will at the same time have major benefits to all national development areas, notably agriculture, health and environment that will benefit from improved observations and services.

The project will also strengthen regional cooperation and exchange of observation data with neighbouring countries by connecting the Mauritanian observation network to the WMO Integrated Global Observing System (WIGOS) through ONM. The exchange of data currently takes place through ASECNA and is thus limited to synoptic observations at airports in the international aeronautical format. This Project component will improve the situation by making data available from other observation stations and by developing the capacity of ONM to receive observation data from the region directly and use it in their service delivery. Currently, Mauritania does not have the capacity to receive and use oceanographic and climate data beyond its borders with the exception of the aeronautical data through ASECNA, a few new marine products through the Marinemet[12] project (finishing in 2012) and global products through EUMETCast[13] as there is no data exchange between neighbouring countries. This is mainly due to lack of ICT infrastructure and agreements with other NMHSs. ONM cannot, for example, share marine observation data with Senegal in real time, which would be critical input for its coastal ocean models and would provide information about incoming dangerous weather, which typically arrives from South-West of the country. The implementation of a data management centre will address this issue and allow ONM to fully utilize existing regional and global resources. The national data itself is not sufficient for weather forecasting purposes, as weather does not follow borders. Data from especially those countries where severe weather typically crosses into Mauritania is extremely important to expand the horizon for weather events and increase lead time for warnings. By sharing its data, ONM will contribute positively to the accuracy of global numerical models and thereby also on the accuracy of its own numerical forecasts, further improving reliability and accuracy of services.

12 See page 22 under Relevant Projects and Initiatives for an overview of the Marinemet Project

13 EUMETCast is a multi-service dissemination system based on standard Digital Video Broadcast (DVB) technology. It uses commercial telecommunication geostationary satellites to multicast files (data and products) to a wide user community. See: http://www.eumetsat.int/Home/Main/DataAccess/EUMETCast/index.htm

Baseline for the technical capacity of the ONM and as of January 2012:

The existing national weather observation network is composed of 14 weather observation stations located at regional airports, of which 7 are automatic and 7 are manual; 1 Automatic Marine Weather Station with tide gauge at Nouakchott Port and 2 Atmospheric Sounding Stations operated by ASECNA at Nouakchott and Nouadhibou with two soundings per day. Through the Marinemet project, there will be additional equipment implemented Q3 of 2012 comprised of 3 additional Automatic Weather Stations along the Mauritanian coast and 1 Tide gauge to Nouadhibou Port.

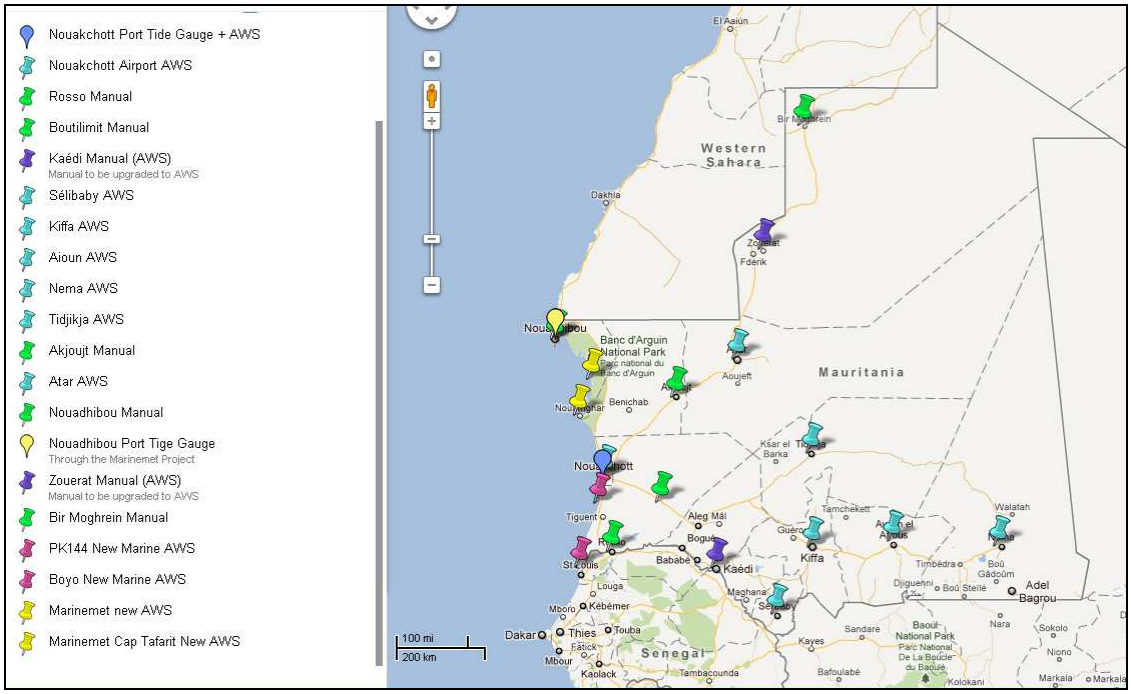


Figure 3: *Current and planned observation network of the ONM*

The IT infrastructure of ONM includes 5 computers at the airport and 18 desktops in Nouakchott headquarters. Currently the facilities have no centralized system for data management, only stand-alone computers without data backup arrangements. There is no dedicated computer room or backup power. There are no high-performance facilities to support numerical models. In addition, ONM has 1 colour printer at the airport and 1 colour and 4 black-and-white printers in Nouakchott. ONM has two data servers, one for real-time data and another for the climate database. The real-time server is non-operational as data connections not implemented to stations. The current Internet connection to the headquarters is: download 1 Mb/s, upload 0.5 Mb/s and to the airport: download 2 Mb/s, upload 0.5 Mb/s. At the Nouakchott airport, there is a Puma[14] workstation (through the EU-funded AMESD Project) with a EUMETCast receiver and access to remote sensing and numerical products.

[14] Preparation for Use of Meteosat Second Generation in Africa (PUMA) project is an international collaborative venture which provides the continent's National Meteorological and Hydrological Services with operational access to state-of-the-art satellite technology. PUMA has created a pan-African network of 53 countries and five regional centres and equipped them with the infrastructure, training and support required for receiving the latest space-based meteorological and environmental data, images and products from EUMETSAT via the EUMETCast distribution system.

Activity B.1: Marine meteorology and coastal ocean numerical modelling training program

The lack of capacity for numerical modelling for weather and ocean applications in Mauritania is currently resulting in a lack of spatial and temporal resolution needed to produce early warning services. Through this activity, ONM staff members will specialize in modelling techniques and have the capacity to continuously develop and maintain numerical weather and ocean models running on ONM computers.

Activity B.2: Implementation of a numerical coastal ocean state model at ONM

To develop early warning services, a numerical weather and ocean state model must be adapted, integrated, installed and run locally from within Mauritania. In addition to personnel capable of maintenance and development work, the models will be installed on ONM computers and developed to use observation data from Mauritania and its neighbours. International experts will work with ONM staff to localize the model and define model output relevant to Mauritania.

Activity B.3: Operationalization of a data processing centre at ONM

The key element to rapid response and early warning is the acquisition of real-time information. The observation carried out by an automatic sensor is stored locally at the weather station, but must also be transferred, checked for quality and stored at a database for visualization and product generation. A data centre for collecting, storing and using observational, remote sensing and numerical weather prediction information will be implemented at the ONM. This facility will serve as the heart of the ONM service delivery system and will be duly backed up, maintained and controlled 24/7/365 for continuous operation. The centre will be a room with air conditioning and filtering at ONM headquarters with computer rack(s) that hold the computers, routers, switches, etc. to process the real-time data, archive the data with real-time backup (the system is mirrored) and to process the numerical models and generate necessary products. The number of elements and the final configuration of the system will be specified by experts and subject to a tender process for procurement. Archived data will be regularly stored in physical format.

Activity B.4: Improve marine meteorological and oceanographic observations on the coast of Mauritania

As the baseline indicates, the capacity of ONM to deliver forecast and warning services to its coastal users is limited by the capacity to observe basic parameters such as wave height, swell, sea level, wind speed, wind direction, temperature, sea surface temperature, air pressure, sea current and rainfall. In addition, numerical coastal models that form the backbone of forecast products require at least three observation points along the coast to be able to deliver sufficient resolution of ocean and weather variables. To support early warning, forecasting through numerical models, and climatological data collection, two new automatic marine meteorological stations complete with sensors for the ocean and atmospheric conditions and real-time telecommunications, will be installed along the coast of Mauritania. The real-time data feed will be connected to the data processing centre at ONM headquarters (Activity B.3) and will be used for product generation (Activity B.5).

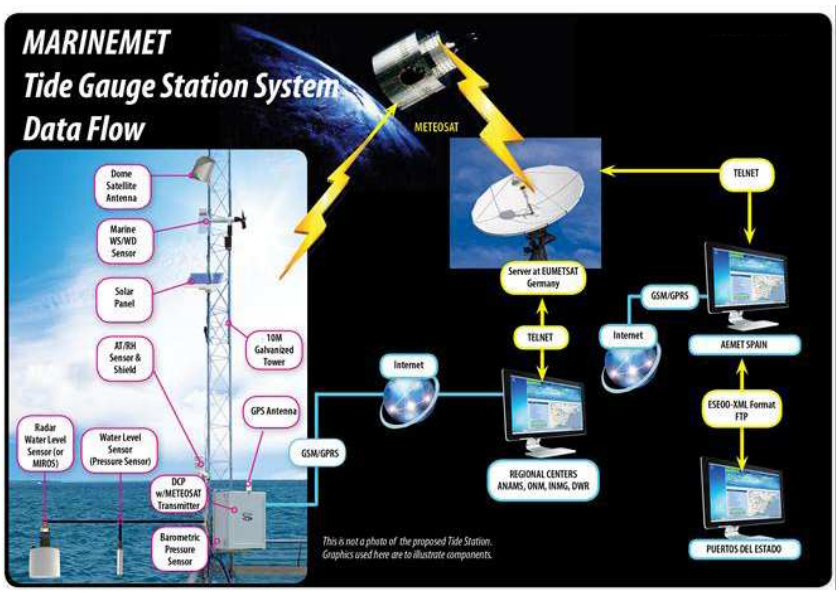


Figure 4: *The Marine Automatic Weather Station System Data Flow in the Marinemet project as proposed by the contracted supplier. This Project will use a similar setup of equipment for two new stations and data adapted to the needs of end users and ONM.*

Activity B.5: Develop tools and capacity for weather and marine product generation

As capacity has been developed to use, run, develop and manage the observation data process and numerical prediction; tools must be available for the ONM forecasters to visualize, edit and generate products for end users. The products include, for example, graphic weather charts for web pages, text for radio/internet and weather graphics for newspapers, TV or mobile platforms. Tools will be implemented at ONM and staff trained on operation and development of user-specific tailored products.

Component C: Improving the quality and availability of coastal and maritime weather and early warning services

The work dedicated to improving the ability of national institutions to deliver services does not result in real development impacts without reaching the communities and individuals making choices based on their best knowledge about the current and future weather and climate. The dialogue between ONM, the Fishing Safety and Control Agency, the Federation of Artisan Fishermen and the fishermen themselves must be continuous and evolving to sustainably serve end user needs. The project will reach users through tested, robust and low-cost dissemination channels and will develop models for scaling up operations into nation-wide multi-user services with small additional funding.

Activity C.1: Development of dissemination tools to end users

As early warning information is only useful if it actually reaches the persons making decisions based on that information, a crucial activity in the project is to develop and define the tools and products that will make available the forecasts and warnings to the fishermen. The tools include a hotline for marine weather bulletins, regular marine weather radio transmission and marine section in the daily TV weather forecast. The services will be set up based on recommendations by the WMO, the national safety agencies and end user

groups, taking into account best practices in other developing and developed countries on the provision of marine weather services.

Activity C.2: Provision of safety tools to fishermen

A major security issue for small-scale fishermen operating on small boats with a crew of 5-7 persons up to 10-15 days out at sea and as far as 100km from the nearest coast is access to information on the state of the ocean and weather at sea. Currently there is no mobile telephone coverage to that distance, nor do the boats have any VHF/UHF radio equipment due to the lack of electricity on the boats and their small size. To this end, the project shall equip 1200 boats (roughly 60% of boats at sea every day) with a robust, hand-cranked, battery equipped and solar powered FM/AM radio small enough to carry on the boat but enough reserve energy to last out at sea. The radios will be purchased by the project and donated to the fishermen in cooperation with the Fishing Safety and Control Agency.

Activity C.3: Coastal safety weather delivery pilot phase

Once the flow of information from observations to final weather services has been established, all concerned parties sensitized and operations documented, a pilot delivery phase will begin and the ONM will broadcast a marine weather bulletin over the national radio channel four times a day and update a marine weather bulletin hotline at the same frequency. The Fishing Safety and Control Agency will update a marine weather billboard at all four fishing ports every day before fishermen go out to sea. National TV stations will include a marine weather section in the weather forecast. All user experiences will be documented and any issues in service provision recorded.

Activity C.4: Pilot phase evaluation and service improvements

After completion of the pilot phase, all recorded experiences and issues will be examined. A report on the pilot phase delivery will be completed by an evaluation consultant and key recommendations discussed with project stakeholders on the continuous improvement of the marine weather service to fishermen. The key recommendations will be implemented and appropriate changes to the service delivery made.

Activity C.5: Operational service delivery start-up

Following the experiences of the pilot phase, the marine weather bulletin service will be become part of ONM regular activities and of annual budgeting. Following start of operational activities, scaling up and branching out to other sectors will be discussed with key stakeholders and required additional funding applied from relevant agencies. The operational model presented here for fishermen can be adapted to e.g. farmers without a significant additional cost as the main investment has been made in the implementation phase. For each new user group, services need to be designed and developed in close cooperation with national institutions, end users and communities and any deficiencies in ONM resources addressed accordingly.

B. Describe how the project provides economic, social and environmental benefits, with particular reference to the most vulnerable communities, and groups within communities, including gender considerations.

Direct project beneficiaries are 6000 small-scale fishermen from the coastal communities of Nouakchott, Nouadhibou, PK144 and Mamghar through the provision of solar powered, hand-cranked radio that will allow them to receive marine forecast every four hours as well as training in how to interpret and use the marine forecast in decision making while at sea.

While the project builds institutional capacity at the government level, the government is not the main beneficiary of the project, as the main beneficiaries are the coastal communities of Mauritania making their livelihood through fishing activities. The role of the government is to ensure these people have the necessary information when they make the decision to go out to or already are at sea concerning their immediate safety, and in the case of an emergency to assist in their rescue. The communities cannot produce the necessary information themselves. ONM is mandated for this role.

Meteorological Bulletins or Forecast Warnings are issued by ONM and highlight likely impacts of events – such as danger for boat capsizing, dangerous disembarkation conditions, danger of being swept by strong currents, poor visibility and resulting navigation difficulties, etc. These bulletins are valuable tools which contain ***actionable information*** that protect fishing communities from high-impact weather events so long as they are produced regularly, are of a high quality and formulated in a language local communities understand.

The users need to fully understand these services and how to interpret the output correctly. This requires a process of sensitizing communities to the exact meaning of the Bulletins to the potential actions to be taken. Communities will also be able to participate in the development of services (providing feedback etc.) and should know what to do when certain information is presented to them; i.e. if a high waves or strong winds are forecast, what measures should be taken to protect themselves and their families. Effective training can assist in being able to extract the maximum value from these services.

All of these agencies will be subject to activities to sensitize their operations to the growing needs by marine users for early warning and forecast information on natural hazards via a series of consultative, result-oriented and non-discriminatory workshops. The project will promote organization of the fishing community into social groupings and use existing structures, such as the association of artisan fishermen, to discuss maritime safety and the threat by weather and climate events.

The ONM will receive equipment to improve the observation network in the above-mentioned coastal areas as well as training to help improve the quality of marine forecast provided. The activities will benefit all hydro-meteorological service consumers in coastal areas due to increased reliability and timeliness of forecasts. The benefits include reduced human vulnerability to natural hazards, reduced risk of damage to property and the potential for overall reduction of economic losses resulting from marine related natural disasters.

Estimating the number of indirect beneficiaries is inherently difficult given the public goods nature of the products and services that the project will provide. Communities living close to the sea, farmers, fishermen, schools / youth, hospitals / public health authorities, the disabled and the tourist population from the targeted islands will also directly and benefit from this project. Furthermore, critical facilities such as airports, seaports, hotels, schools and health care facilities will be directly benefit from this project through the development of

targeted warning messages and dissemination channels that can help them respond more effectively.

As highlighted in the Organization for Economic Cooperation and Development (OECD) (2008) study, the most extensive evidence base on the costs and benefits of adaptation is in the coastal sector. More importantly, cost effectiveness of such efforts in protecting human lives and properties emphasizes the need for immediate action toward a reliable coastal protection system. It also applies to Africa.

As economic activities in the coastal zone are widely varied, it is anticipated that women will benefit equally with men in the project in particular those in fishing communities that are amongst the poor and vulnerable.

Women and men are engaged in complementary activities in small-scale fisheries. The men typically go out to sea to catch the fish and women are mainly responsible for performing the skilled and time-consuming jobs that takes place on-shore, such as net making and mending. More importantly, women are actively involved in the processing of fish catch (i.e. sun-drying, salting, smoking and preparing fish and fish-derived foods). They are also often the responsible for subsequently selling the fish products.

Ensuring the safety of the fishermen while out at sea enabling their return to shore with their catch also ensures the overall welfare of women and children.

Furthermore, the implementation of the proposed project will be carried out in alignment with the WMO Policy on Gender Mainstreaming (See Annex III) and with consideration for the following critical principles:

- Active involvement of women and men in designing services for users, to ensure the appropriate consideration of the specific needs of women and men, specifically in the disaster risk management, water and the agriculture sectors

- Attention to gender equality when selecting participants to trainings and workshops

In addition, weather and climate information can yield multiple indirect benefits for the public and private sectors in the longer term by generating more reliable data that can support economic activities in sectors such as agriculture, energy and transportation. For example, if farmers were interested in insurance products to cover weather risks, insurance firms would need reliable weather information to provide relevant products and services. This project could help provide such information in the medium-term.

In the process of achieving enhanced disaster preparedness, community members and community-based organizations will be enabled to improve their communication and outreach activities, and engage with the coastal and early warning systems in important relay functions. This will contribute to broader economic and social development benefits for local communities in the area. At the policy level, the project will provide an enabling environment for the integration of climate change adaptation and risk management considerations into affected sectors, such as land use planning, agriculture, forestry and disaster management. The interface between institutions in the policy and local levels will be enhanced, ensuring evidence-based policy making based by community needs.

C. Describe or provide an analysis of the cost-effectiveness of the proposed project.

There has been little work done to date in Africa on cost-effectiveness of investing in modernization of National Meteorological and Hydrological Services (NMHS) and enhancement of service delivery to support economic sectors and community safety. Studies underway in Kenya[15] are focusing on the agricultural sector only.

For most NMHS, this type of assessment poses a great challenge due to the absence of a generally accepted methodology for assessing the effectiveness of NHMS delivery or modernization programs; lack of basic econometric information needed to assess losses and benefits, and the shortage of expertise in NMHS and weather dependent sectors capable of making this assessment. The process of collection and evaluation of the information is time-consuming and requires substantial funding which is often unavailable.

As an example of the assessed benefits from improved hydro-meteorological services, the WMO, with UNISDR and World Bank, and jointly with a number of NMHSs in Europe and Asia (among them Albania, Armenia, Azerbaijan, Belarus, Croatia, Montenegro, Serbia) has been engaged in developing and piloting new approaches for estimating additional economic benefits from the modernization of National Meteorological and Hydrological Services (NMHS), as well as for assessing the current economic benefits from existing NMHS[16]. These efforts were driven primarily by practical considerations in the process of development modernization initiatives and fostering a better dialogue between HMS and national economic and fiscal authorities.

The estimates of economic losses from hazardous weather events varied between 0.32 per cent of GDP for Kazakhstan and 1.25 per cent of GDP for Armenia. For the target countries, the assessment of the prevented losses was undertaken for the first time and while the results should be viewed as tentative, nonetheless, they indicate a high economic value of the hydro-meteorological services and information. Estimates of relative economic efficiency of the existing NMHS, calculated by comparing the estimates of prevented losses and the cost of NMHS funding, show that the efficiency (or benefit-cost ratio) is rather high, ranging from 165 per cent for Azerbaijan to 568 per cent for Albania. ***Overall, for each dollar spent for supporting the existing NMHS, the countries usually gain two or more dollars through the avoided economic losses.***

The study indicated that annual incremental benefits of the proposed modernization (improving the status of NMHS and HMS delivery from 'poor' to 'adequate') would be quite substantial for all the countries concerned. The repayment period of investments in NMHS modernization will be within two to three years. The economic efficiency of the proposed modernization approach (assumed to be accrued evenly over the seven year period), ranges from 210 percent for Armenia to 880 percent for Serbia as assessed by the benchmarking method. Estimates based on sector-specific assessment show even more favourable efficiency ranging from 500 percent for Belarus and Albania to 1,440 percent for Azerbaijan.

It is anticipated that benefit-costs for Mauritania would likely be in these ranges and be strongly positive overall.

[15] Socio-Economic Benefits of Meteorological Information and Services in Kenya – The Agriculture Sector: Kenya Meteorological Department (KMD) in collaboration with the University of Nairobi, Ministry of Agriculture, Ministry of National Planning, Kenya Agricultural Research Institute (KARI), and IGAD Climate Prediction and Applications Centre (ICPAC)

[16] Strengthening the Hydro-meteorological Services in South Eastern Europe - South Eastern Europe Disaster Risk Mitigation and Adaptation Programme (UNISDR, WB, WMO, FMI 2009).

There are no alternative avenues for provision of weather and climate information and Early Warning Services for Hydro-Meteorological events in Mauritania other than the Government mandated services addressed here. Lack of significant improvements in these services will continue to result in significant loss of life and damage to property and economic infrastructure in coastal and floodplain areas.

Without AF intervention, the impacts of climate change such as extreme weather conditions will have devastating effects on a population already rendered vulnerable as a result of poverty and environmental degradation. Without such vital support, the Mauritanian government will be unable to provide early warning alerts, and development planning will go on disregarding the potential impacts and opportunities arising from climate change.

All the project's components target a specific level of activity in which adaptation is urgently needed. In addition, interventions done at each level are intended to inform and build upon those of other levels. This multiple stakeholder approach will be undertaken in order to demonstrate how several adaptation options can be implemented simultaneously, along a large continuum of stakeholders varying from communities to government bodies, in order to achieve of common goal.

This project seeks to promote activities that are new and additional compared to those that are currently under implementation in the country and are designed to address baseline issues, more particularly disaster risk and poverty reduction.

The project seeks to support the adaptation of small-scale fishermen to the potential negative and long-term impacts of climate change, including the occurrence of severe weather events. Efforts must be taken to allow fishermen to continue with their way of live, and preserve the only way they know how to make a living. The biggest risk for a fishermen going out to sea is the uncertainty of weather conditions. To minimise this risk, the government, specifically ONM, has the responsibility and the mandate to provide fishermen with accurate weather predictions and early warning services. This service which is for public good can be made available through the Components of this project.

The concrete adaptation measures of the project, specifically Component B, while on the outset would seem only as a benefit to the government, is actually for the benefit of the communities served. Implementing this Component will provide the necessary sustainable tools to better help vulnerable communities, not just to understand the weather bulletins (forecast warnings) but, through the complementary training components, learn how to use weather bulletins to make informed decisions that will help small-scale fishermen and coastal communities to positively affect their livelihoods thereby reducing poverty and saving their lives.

The proposal maintains that there are no sustainable alternatives to the proposed activities. The government has the responsibility to provide the proposed improved service, in cooperation with relevant government bodies, to the vulnerable coastal communities to reduce risk to small-scale fishermen's lives and livelihoods with the inadequate services they are currently providing.

NOTE: Small-scale fishing is the primary economic activity in Mauritania's coastal zone. The life of a fisherman is hard and there is high risk of loss of life at sea. It is likely that if safer alternatives exist, the social demographic would differ from what they are currently.

D. Describe how the project is consistent with national or sub-national sustainable development strategies, including, where appropriate, national or sub-national development plans, poverty reduction strategies, sector strategies, national communications or national adaptation programs of action, or other relevant instruments, where they exist.

The proposed project is consistent with national strategies and development plans, and contributes to meeting the objectives set forth by government policies and programs. Furthermore, the project outcomes serve as a baseline in achieving sustainable growth, increasing resilience to climate change induced hazards and implementing effective climate change adaptation programs.

Second National Communication (2008): The project has direct links with priorities to eradicate poverty and support sustainable development programs undertaken in the country. In this context, the project will work for the preservation and safety of lives and property. All of these policy instruments pursue a common goal of ensuring sustainable development through the rational utilization of a limited natural resource endowment. A goal that is also shared and reflected in the policies of several sectors and services such as: agriculture, fisheries and forestry; health delivery services; and coastal zone management, a particularly vulnerable sector.

More specifically, the project meets the objective identified on the Second National Communication of Mauritania where it calls for the establishment of an observation and monitoring system off its coast. Activities include expanding the spatial coverage of meteorological observation network, installation of tide gauges and capacity building of stakeholders, among others. The expected result is the establishment of an early warning system for extreme weather events.

Strategic Framework for the Fight against Poverty (PRSP III) 2011-2015: Mauritania's strategic framework to fight against poverty draws its legitimacy from the participatory process and is the reference of the government in formulating economic policy and development plans both in the medium and long term. The strategy's significance is that it enshrines poverty eradication as a national imperative and is the priority of all policies of the country.

Specifically, the project contributes to meeting ***risk reduction measures*** related to natural disasters "in particular global warming and its consequences… and their impact on the rural economy." The strategy also states "the government, with the support of its partners, will make efforts to draft and implement the new national strategy to reduce disaster related risks, ***which include an early warning system***."

Furthermore, the project is in line with priority actions under the *Development of growth-supporting infrastructure*, where it explicitly states that actions taken in the field of meteorology will include ***(i) outfitting weather stations; (ii) installing observation instruments across the country; and (iii) building the National Meteorological Office.*** It further states that attention will be given ***to the modernization and development of maritime and river infrastructure.***

Additionally, under *environmental governance*, the PRSP states that *combating global warming and sustainable environmental management are key pillars of governance at the heart of the strategic vision*. The government therefore prioritizes environmental

governance by actively seeking to understand the environmental and climatic problems related to the various sectors. Main objectives identified include taking into account climate risk and sustainable resource management in the development of programs and the building of national capacity to monitor climate change.

Islamic Development Bank – Member Country Partnership Strategy (MCPS) for Mauritania (2011-2015) Preparation for the MCPS was based on extensive consultation with the government, development partners and civil society. The MCPS is based on the vision and priorities of the PRSP III (2011-2015). The MCPS strongly recommends, among other items, the establishment of an early warning system for natural hazards in order to successfully implement the activities under the Pillar of Rural Development and Food Security.

The National Strategy for Sustainable Development (NSSD): In its objectives, the NSDS places the highest priority needs of the poorest and most marginalized. The NSDS intends to build on a common vision of a long-term sustainable development in the country through a strategic approach that integrates social, economic and environmental considerations. These five priority pillars are: (i) the strengthening institutional and political capabilities as well as effective management of the environment and natural resources, (ii) the provision sustainable access to basic services as a strategic means to fight against poverty, (iii) the support given to an integrated and participatory management for efficient use of natural resources, (iv) the management of local and global environment in accordance with commitments in international conventions; (v) the development and implementation of a funding mechanism for its National Action Plan for the Environment and Sustainable Development.

The Millennium Development Goals (MDGs): The project will contribute to the achievement of MDGs, in particular of MDG 1 ("eradicate extreme poverty and hunger") and 7 ("ensuring environmental sustainability"), by reducing vulnerability to climate change through a strengthened early warning and information sharing mechanism. This will facilitate informed decision-making by the government, intermediary institutions and the affected population, which in turn is expected to improve the lives and livelihoods of communities in the face of a changing climate.

The National Action Plan for Adaptation (NAPA): The project is highly consistent with Mauritania's national plans and reflects priority activities identified in NAPA (November 2004). National priorities, concerning climate change events and its multiple impacts, are comprehensively taken into account. The project's expected outcome, specifically the provision of an early warning and coastal observation system is in line with the NAPA's identified priority adaptation activities for the coastal region.

E. Describe how the project meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc.

Site selection and installation of observation systems will be done in accordance to established standards. As a Member of the World Meteorological Organization (WMO), Mauritania has adopted the WMO Standards for Observation Systems - according to WMO Guidelines for Automatic Weather Stations (AWS) and Hydrological Observing Stations as determined on a continuing basis by the WMO Commission on Basic Systems and Commission on Instruments and Methods of Observation (CIMO Guide) for standard meteorological and hydrological parameters.

The project will also take into account relevant national standards and follow technical standards as identified by the National Implementing Entity. Where necessary, the project will propose potential solutions including the identification of sources of technical assistance and knowledge transfer.

F. Describe if there is duplication of project with other funding sources, if any.

There is no duplication with other sources of funding. However, the project will be leveraging on existing regional projects and will build on the lessons learned from these projects and will apply best practices extracted from them. Furthermore, the proposed project provides an end-to-end solution by focusing on a specific solution to a target community with a view to improving lives and livelihood within the context of climate change, rather than providing a broad regional solution for climate change adaptation.

The project builds upon the results of the regional Marinemet project and takes the project outcomes into operational use. The Marinemet project aimed to provide numerical model products from the centres of the Spanish national meteorological service AEMet to West African meteorological services and build national institutions and capacity to incorporate model outputs into operational services, thus providing sustainability to project outcomes and services. The outcomes of this project will further operationalise the multi-hazard early warning system of the government of Mauritania and will be funded through the national budget as guaranteed by the ONM host ministry during project development stage. The project will make use of the existing numerical modelling experience developed in the Marinemet project and implement the technologies and results to serve the people of Mauritania.

Relevant Projects / Initiatives:

A WMO survey revealed that most West African countries lack the expertise in marine meteorology to implement an effective warning system and disaster mitigation strategy. However, an important part of the population in these countries lives in coastal cities and areas, focusing their economic activities there. It is therefore essential to enhance the capacity of the National Meteorological and Hydrological Services (NMHSs) of West African coastal countries and provide them with the relevant tools that will allow them to contribute to the sustainable development of their respective countries and enhance the delivery of products and services to the various socioeconomic sectors.

WMO has initiated the ***Marinemet*** pilot project under the Spanish-funded West Africa Cooperation Programme on Marine Meteorology (Monitoring and Services) for the Northwest African Basin. The project was launched in July 2009 for four yeas and concerns for its pilot phase four countries: Mauritania, Senegal, Cape Verde and The Gambia. It aims at providing specific tools and technology transfer to West African National Meteorological Services to improve marine meteorology predictions and enhance maritime safety and fisheries management. Tools and technology developed from the West Africa Cooperation Program will be transferred to ONM through the proposed project. Further training is planned to enable ONM to fine-tune the technology to suit the specific needs of Mauritania, in particular its coast.

Specific goals of the Marinemet project include:

- Reduction of loss of lives and property;

- Reduction of damage to infrastructure;
- Provision of data for safe Navigation;
- Disaster prevention and preparedness;
- Improved fishing activities;
- Increased scientific and technical capacity;
- Improved knowledge of marine meteorology and ecology in West Africa and their relation with global change;

The Marinemet project is expected to end Q4 of 2012. The Marinemet project has accomplished the following as of Feb 2012:

- Real-time Chlorophyll-a concentration (mg/m^3) updated once a day available online for Mauritanian coast
- Real-time Sea Surface Temperature (SST) updated once a day available online for Mauritanian coast
- Real-time Thermal Ocean current fronts updated once a day available online for Mauritanian coast
- Numerical prediction of wave significant height 0-72h with a 3h time step updated once a day available online for Mauritanian coast
- Numerical prediction of wind speed and direction at 10m from surface 0-72h with a 3h time step updated once a day available online for Mauritanian coast
- Coastal wave forecast maps, graphs and tables for Nouakchott Port 0-72h with a 1h time step updated once a day available online
- Purchase of AWSs and a schedule of installation missions before July 2012
- Knowledge transfer through a series of workshops and roving seminars

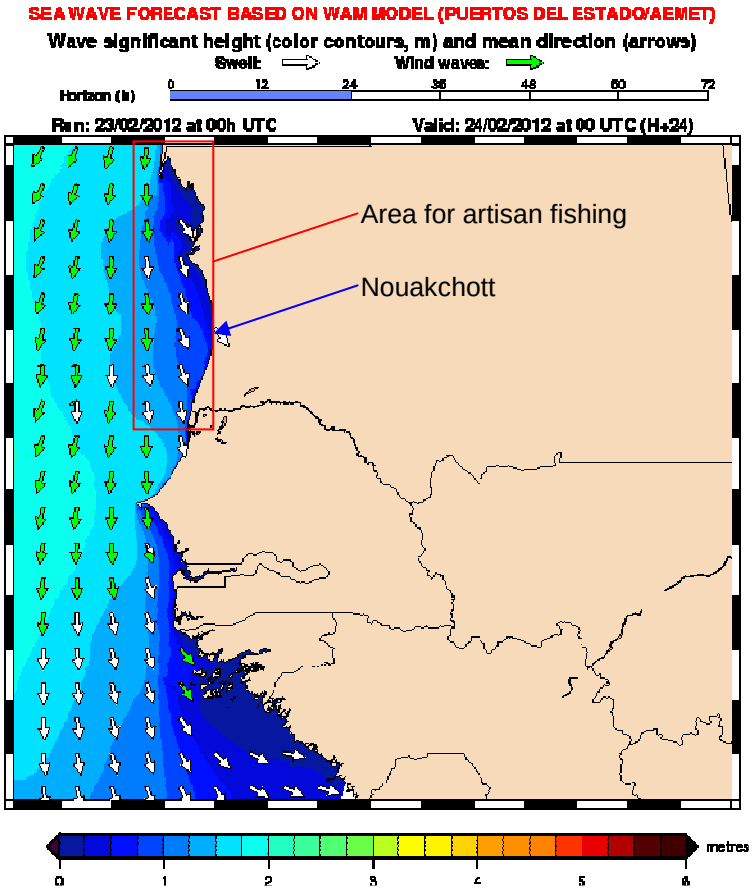


Figure 5: *Marinemet Deep Sea Wave Forecast for West Africa with the area of artisan fishing activities off the coast of Mauritania*

The proposed AF project will continue where the Marinemet project has concluded and ensure that the knowledge acquired will be further developed in Mauritania for marine information users. The current agreement will allow for the transfer and downscaling of developed numerical models for independent operation in Mauritania from its current location in Las Palmas, Canary Islands. This proposed project would provide a very valuable transfer of developed products to ONM. The project will also refine the forecast area from the current one (see Figure 4) to a higher resolution for the coastal fishing area of Mauritania (see boxed area in Figure 4). This project can greatly benefit from the work already completed and save over one year and over $250,000 in development resources by collaborating with Marinemet, also managed by the WMO.

In 2008, the West African Economic and Monetary Union (UEMOA) established the "***Common Politics for Environment Improvement*** (PCAE)" in the sub-region. Under this framework, a diagnostic study of the littoral in terms of coastal erosion, environmental characteristics, occupation, activities, coastal management and initiatives has been undertaken for the West African littoral, from Mauritania to Benin. At the conclusion of this study coordinated by International Union for Conservation of Nature (IUCN), UEMOA has identified the creation of the Regional Observatory of the West African littoral as a priority to implement their PCAE. The Observatory is partially funded by UEMOA, coordinated by the Ecological Monitoring Centre (CSE) based in Dakar and will benefit 12 West African countries, including Mauritania. The observatory will initiate the foundation for a unified

Information system of the littoral to measure qualitative and quantitative changes affecting coastal and marine ecosystems in the sub -region and to develop synergies with the other large-scale programs on West Africa coastal region. Furthermore, it aims to value strategies against coastal erosion at the level of the various countries in West Africa: national strategies against coastal erosion, initiatives in regard to protection, rule of coastal occupation, among others.

The proposed AF project complements PCAE as it sets up the foundation that enables Mauritania to provide more accurate scientific information to the Observatory regarding its coast. Coastal erosion is greatly aggravated by storm surges, high wind and rising sea levels, all expected results of climate change and all phenomena that fall under the responsibility of ONM to forecast. By improving the institutional capacity at ONM to assess and forecast these parameters, the PCAE project will gain a better understanding and be able to achieve better results through the improvements of observation data and services. The project will benefit from the improved level of understanding on the issues threatening the Mauritanian coast and will be able to better target their services and investments to support efforts to combat coastal erosion.

The ***West African Regional Marine and Coastal Conservation Programme (PRCM)*** is a joint initiative of four international organizations: the International Union for Conservation of Nature (IUCN), World Wildlife Fund (WWF), Wetlands International (WI) and the International Foundation of "Banc d'Arguin" (FIBA) in partnership with Sub-Regional Fisheries Commission (SRFC) during the second phase of the project (2008-2011) (http://www.prcmarine.org). The project covers 7 countries: Mauritania, Senegal, Gambia, Guinea Bissau, Guinea, Sierra Leone and Cape Verde sharing 3700 km of coast, for a population of more than 35 million inhabitants. The coordination unit is based at Nouakchott. The PRCM is a coalition of more than 90 institutions operating on the coastal zone. These include public administrations, research centres, professional organizations, associations and non-governmental organizations. The PRCM aims to coordinate the efforts of institutions and individuals in favour of preserving the West African coast. It aims, in particular, to strengthen the cooperation in the sub-region by offering development partners optimal working conditions as well as regional and inter-sectoral coordination mechanisms that allow diverse actors to influence policies.

The Marinemet project will install two new automatic weather stations within the Banc d'Arguin National Park, thereby providing the first observations on the climate and weather in the national park. This project will further enhance that investment by improving data management, archiving and processing at ONM to deliver products to the users of the National Park and tailor specific products to users such as the PRCM project. The information provided through this project will affect decision-making and will be considered in conservation efforts. This project will benefit from improved integration of weather and climate services in the international conservation initiative to improve visibility and thereby sustainability of the investments into ONM.

The ***Adaptation to Climate and Coastal Change in West Africa*** (ACCC) was funded by the GEF Strategic Priority on Adaptation at the level of 14 millions USD. The project has been implemented by UNDP/GEF in Mauritania, Senegal, the Gambia, Guinea Bissau and Cape Verde (http://www.accc-africa.org/). A regional coordination unit, based at UNESCO Regional Office for Education in Dakar, executed the program in collaboration with national teams comprised of target institutions and UNDP national offices. The project focuses on implementing measures to strengthen the resilience of vulnerable communities to the

impacts of climate change on coastal resources. The project stressed to meteorological services the need to monitor marine meteorological parameters to confirm if coastal erosion is exacerbated by stronger swell and westerly wind.

There is a great potential for this project and ACCC to complement their activities. Whereas the ACCC is directed towards community-based adaptation measures in a very tangible manner and on the other hand in the strategic planning of the national governments, this project addresses the need for reliable information about the future threats in weather and climate. This project enhances products and services and their dissemination and the ACCC builds physical adaptation measures to combat foreseen climate change consequences (i.e. floodwalls, river routings, tree planting, etc.). Both sides of the adaptation spectrum are needed, there cannot be true adaptation without accurate information about the past, current and future temperatures and without taking the measures to protects against these threats. The project will work together with the best practices information centre to be set up through the ACCC and create the information link for the Mauritanian component. The Project will benefit from the grassroots experiences and contacts on the ground to disseminate products and collect end user feedback on weather and climate services.

G. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

The project will use interactions with pilot communities to show how properly packaged and well-targeted weather and climate information early warning messages could help communities living in vulnerable areas to prepare for and adapt to climate change induced severe weather events. These lessons learned will then be synthesized for replication and scale-up with the ultimate goal of improving Early Warning System performance nationwide.

Building on the participative processes initiated and drawing on the technical experiences in the establishment of an early warning system, the proposed project will introduce targeted activities to enable the analysis, replication and up-scaling of the project approach more widely as part of the routine services of the ONM. This will entail a campaign to present the findings from the project to different public entities, notably the Project Board as defined in the Implementation Arrangements, development partners, as well as other district entities with similar degrees of vulnerability.

This systematic documentation of experience in interaction with communities will assist the replication of early warning systems. Other maritime countries in the region will also benefit from the knowledge generated through the project. The proposed initiative will contribute to a mass of experience and enhance systematic regional cooperation on this critical adaptation issue.

Additionally, surveys will be undertaken in target communities to assess perceptions on the benefits and successes of the project and to further refine the services provided by ONM.

A communication strategy for the project will be developed, which will highlight dissemination of project experiences to communities, educational institutions, NGOs, civil society organizations, relevant private sector institutions, and the public at larger. This strategy will entail the use of print and electronic media and other communication channels

(roundtables, participative community workshops, posters, brochures, booklets, pamphlets, news articles, radio and TV broadcasts and web-based items).

The project will also generate evidence on the cost effectiveness of building institutional adaptive capacity in order to develop a case for policy and budgetary adjustment to ensure greater sustainability. The project is designed to complement other ongoing and planned projects and programs without duplicating them and to build on the existing systems in place, as previously mentioned on "Relevant Project and Initiatives."

H. Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations.

This project was developed through the initiative of the Office National de la Météorologie (ONM), with strong commitment and support from the Ministry of Equipment and Transport. ONM requested the WMO to help prepare a comprehensive proposal to increase the resilience of Mauritania's coastal communities to the negative impacts of climate change induced weather hazards through the provision of an early warning system that targets small-scale farmers and the coastal community, as the first batch of end-users.

The needs of coastal communities and fishermen have been discussed during field visits undertaken during the preparation stages. The Ministers of Equipment and Transport, Interior and Decentralization, Environment, as well as the delegates of the Minister of Fisheries have been briefed on the proposed project and its components. Furthermore, the need for the project and the various activities it entails has been discussed with the Port Authorities of Nouakchott, Civil Protection Authorities, Federation of Artisan Fishermen, DSPCM and the UNDP. All identified stakeholders confirmed that the project is fully aligned with government priorities on climate change adaptation and the cost-effectiveness of such an approach. They further reiterated the necessity of such a project and assured the WMO of the necessary support during its implementation stage as well as follow-up and post-project support to ensure its sustainability.

Consultations and joint site visits were carried out with ONM, the national executing agency for the project. Further consultations will be undertaken after the approval of the proposal to fine-tune the proposed approach and make adjustments as needed.

ONM has existing relationship with fishermen at the fishing Ports. When budget allows, ONM provides ad-hoc training to fishermen on the potential risks of weather and climate when out to sea. As the National Executing Agency, ONM performed extensive consultations with small-scale fishermen in target areas (Ports of Nouakchott, Nouadhibou, PK144 and Mamghar). These consultations highlighted the weakness and minimal usefulness of the existing weather information and bulletins provided by ONM. Fishermen also advised ONM what services or information they would like to receive, how the information should be provided to suit their purposes. Following these discussions, ONM approached WMO to formulate the project proposal.

Consultations with Ministers were carried out to ensure proposed activities are in-line with the priorities of relevant ministries. They were also undertaken to secure governmental support at all stages of the project as well as after the project is completed thereby safeguarding the investment.

Furthermore, consultations with the communities will continue throughout the life of the project, and beyond to establish a mechanism that would allow a feedback process between the service providers and the communities they serve, ensuring high level of service oriented to meet existing and changing needs.

I. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

Activities were developed and prioritized using a cost-benefit analysis, in order to maximize adaptive capacity benefits in relation to the required investments. Material costs have been kept as low as possible considering that an efficient climate-monitoring infrastructure can help leverage significant benefits in multiple sectors, i.e. infrastructure from the proposed project will complement the existing observation network as well as new equipment ONM will receive from another complementary project. Furthermore, options were selected that will enable the Mauritanian Government to cover its maintenance after project completion and ensure that existing meteorological employees will have the necessary expertise to perform the maintenance of the entire network. The Early Warning System will be tested in the coastal region and will apply lessons learned for its up-scaling and extension, allowing for further cost-effectiveness considerations during the national-level planning.

For local level activities, options proposed in this project were selected based on best available knowledge regarding proven or promising adaptation technologies. Concerning policy and awareness enabling activities proposed in this project, the options and activities were selected for their potential to yield high short- and mid-term results in terms of awareness (through training) as well as for developing new partnerships (through inter-sectoral platforms) and policies. They allow for capacity building along a continuum of policy making (from vulnerability analysis to policy making at the highest level).

Component A: Implementation of sensitization measures to reduce the vulnerability of small-scale fishermen.

Baseline: There are few organized efforts to raise awareness of climate change in Mauritania, and even less in the coastal areas. Climate change awareness programs have not yet been integrated in district (wilaya) and municipality levels. Resources have not been sufficient for awareness and outreach activities to the reach the intermediary and end-user levels. Furthermore, the country continues to lack the human capacity it needs to adapt to climate change as a society, including scientists, policy-makers and the media.

With AF intervention: This component of the project aims at attaining a critical mass in the general coastal community's awareness of climate change related issues. This will act as a vital support to public policy development and help build a long-term national capacity for addressing climate change. The project will collaborate with and support local and national media outlets to maximize our outreach efforts. It is expected that as a result of this component, Mauritania will be capable of providing local training to government staff, notably representatives of the Ministry of Fisheries, Interior, Environment as well as Equipment and Transport. End-users will gain an understanding of climate change issues and how they can use information received from ONM and other intermediaries to make informed decisions concerning their lives and livelihoods.

Without AF Intervention: There would be little or no means of experimenting and demonstrating locally acceptable, no-regrets options for coastal development in Mauritania. Coastal communities would remain vulnerable because of climate change, unpredictable weather conditions and unsustainable fishing practices at sea. In addition, without a viable means of demonstrating the benefits of adaptation at the local level, the Mauritanian government would not be able to make realistic policy development decisions. Finally, without testing of the potential opportunities arising from climate change, the country will not be able to invest in them as they arise.

Component B: Institutional and technical capacity development of the Mauritania National Meteorological Services

Baseline: The observation network (as shown on Figure 2) has several constraints that hinder efficiency in the collection and dissemination of accurate forecasts and warnings. Major constraints include non-serviceable and un-calibrated equipment as well as poor communication facilities for the transmission of observed data. Most of the equipment installed was donated and are now outdated technology that either poses problems of compatibility or cannot be easily repaired due to lack of spare parts. Other constraints include low human capacity and poor archiving structures. As a result, the country currently runs an operational basic weather forecasting service, issuing short-term forecasts of routine weather and extreme events based mostly on data provided by international centres. This methodology results in coarse levels of spatial and temporal resolution, resulting in uncertainties under extreme weather and climate conditions and not tailored to sector-specific needs.

This system is insufficient for effective understanding of local climate and early warning systems and does not meet the requirements to enable the ONM to fulfill its mandate. The Government of Mauritania through its national budget has allocated some resources to the Ministry of Equipment and Transport to improve the situation of the stations including for the training of the staff, however this does not meet the required capacity to have an operational Early Warning System in place.

With AF intervention: This project component will strengthen the technical capacity of ONM employees and its observation network to predict weather and climate events and risk factors, and improve efficiency of climate information dissemination / delivery to end-users. International peers will perform the training of ONM personnel in Mauritania. This has important implications on the country's institutional capacity and decreases the risk of human capital flight. A robust monitoring system is also crucial to improving weather and climate models and helps in the development of more accurate prediction, necessary for informed decision making at national, regional and global levels.

The project will also increase the capacity of relevant governmental institutions, like the DSPCM, to respond effectively and in a timely manner to warnings and to put in place effective preventative measures.

Without AF intervention: Even without the current climate change induced extreme events, the existing hydro-meteorological services and networks are not enough to meet the needs of the country. With the additional burden of longer-term climate change projections and forecasts to warn the population on extreme events and prepare them for response reactions will not be available exacerbating the already precarious conditions of coastal communities.

The current annual government budgetary allocation to ONM is not sufficient to improve the current observation network and human resource capacity limitations. The costs associated with climate change induced damage in Mauritania without effective adaptation are likely to increase over time.

Component C: Improving the quality and availability of coastal and maritime weather and early warning services

Baseline: The current Early Warning System does not, and cannot provide credible weather and climate data and information required to sensitize, stimulate and encourage community stakeholders to take appropriate adaptation measures and policy makers to respond through appropriate policies. Decision-makers and disaster management planners at all levels do not have sufficient knowledge to assess the impending consequences of severe weather and climate events on their constituencies.

The rudimentary nature of the current forecasts and early warning service of the coast of Mauritania is ineffective. Specifically for fishermen who go out to sea for days at a time without taking into consideration the weather bulletins currently provided by ONM, because they are aware of how inaccurate the forecasts are and are not willing to lose the opportunity to make a living. The Marine Rescue Centre does not have a system in place in place to communicate with fishermen at sea in the event of a severe weather event resulting in risking their lives and meagre property.

With AF Intervention: Efforts under this component are designed to operationalise and strengthen the existing meteorological services to provide the information local users and sectoral ministries require for proactive climate change adaptation and better natural resources management. Through the strengthening of the existing coastal climate-monitoring network and its extension to local communities, the project will ensure that climate risk management will become an essential part of local development efforts. In anticipation of the likely impacts, the project will contribute towards reducing anticipated costs by strengthening the early warning system and enabling it to function in a sustainable manner. Furthermore, the results of this project could be used to advocate for increased attention and future budgetary allocations.

Without AF Intervention: The Mauritanian government and coastal communities will continually be faced with an uncertainty with regards to climate change. The government will continue to implement ad hoc emergency response measures to climate related disasters rather than take a proactive approach to climate risk management. Similarly, local populations, faced with unpredictable and extreme climate conditions, may no longer be able to live adequately. This preventable situation will inevitably increase the precariousness of already marginalized Mauritanian population.

In the absence of this project, climate change will continue to affect the livelihoods of the communities that rely in climate sensitive systems. Decision makers will continue to be deprived of required information and early warning messages, and hence the mainstreaming and integration of climate change into national development planning and policies will continue to be neglected and when considered the costs associated with such considerations will not be taken into account and secured for their implementation.

J. Describe how the sustainability of the project outcomes has been taken into account when designing the project.

For Mauritania and other developing regions, sustainable Early Warning Systems are among the ***most cost-efficient and effective concrete interventions to support climate change adaptation***. Establishing tailored weather and climate services, specifically, sustainable Early Warning Services will reduce communities' vulnerability and increase their adaptive capacity to climate variability and change. The proposed project is therefore a "no regrets" intervention, which will reduce mortality rates, as well as minimize the economic and social impacts of today's climate variability and enhance the resilience and adaptive capacity communities to climate change induced weather hazards.

The proposed activity is not a "one-off" intervention that will initiate a new set of interventions or small-scale pilots that will only last for the life of the project. Rather, this project will leave a lasting legacy as it builds on systems already in place, albeit currently deficient ones. Deficiencies at the ONM will be addressed through the:

a. Reinforcement of the coastal observation network ensuring availability of raw data;
b. Development the necessary tools to allow ONM to develop forecasts and warnings tailored to community needs;
c. Improvement of the telecommunications system to enable ONM to disseminate the information to end-users; and d) provision of an improved system of targeted delivery of information and feedback mechanisms

These improvements will ensure that information not only accurate but is also in a format that is understandable by intermediary and end-users, more specifically representatives of ministries, local agencies and communities. The project will therefore build on foundations already in place for concrete and durable outcomes.

The ONM struggles to gain increased funding due to the lack of visibility and recognition of benefits to be gained from improved services. By piloting an end-to-end system with community engagement, this project will showcase the potential and concrete uses of improved weather, climate and hydrology services, thus improving both relevance and visibility of ONM and providing an improved financial standing in the national budget. During stakeholder consultations in country, the parent ministry of ONM pledged to sustain any improvements made by the project as this was seen as a very valuable initial investment that would benefit the entire country. The ONM is also following a new strategy since it was established as an independent institution from the civil aviation authority in 2004, and while it has gained significant new funding it has not yet developed to a level to provide crucial services.

The project has been designed to provide critical services. The sustainability is thus based on demonstrating benefits and uses that are in operation in many other countries across the world. The project will demonstrate the socio-economic benefits from improved services through concrete actions and impacts in the communities and will highlight the cost effectiveness of a strong national institution. The national platforms created in the project are designed to require little additional funding to be sustained and made operational by the government.

The radios distributed in the project are as durable as possible, but will not withstand the conditions at sea for years. It is expected that the unit price for radios will not exceed $30 and that significantly cheaper options will be available. The project will stock enough radios to last an additional year of service, but beyond that the purchase of radios will be at the responsibility of the fishermen and communities. The project will work with the associations and government institutions and importing companies to ensure that radios will be available at an affordable rate. The radio as a security equipment should be carried in the boats regardless of the coastal safety service and is an aim expressed by Delegation a la Surveillance des Peches et au Controle de Mer (DSPCM) that fully support the approach taken in the project. The government may also wish to make radios a mandatory safety requirement as in some countries for fishing vessels.

Strengthening the availability and quality of forecasts and warnings available to communities on hazardous weather (and related events) and climate change information will support the development and implementation of appropriate strategies for vulnerable communities, coastal areas and ecosystems and urban areas. Shorter-range warnings will enable disaster responders and individuals to minimize the loss of lives due to extreme weather and related events.

Sustainability lies in improving national observation systems and continuing to assess the means by which scientific knowledge and advanced technological products (e.g., early warning systems, seasonal forecasts). Continuous education and training could be used to enhance the resilience of vulnerable communities in developing regions such as Mauritania in order to improve their capacity to cope with current and future climate variability and change and related hazards.

PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project implementation.

The project will be coordinated by the WMO and implemented by l'Office National de la Météorologie (ONM) with the following project management structure:

Project Board (PB): will be established and shall be comprised of the Ministry of Transport and Equipment, Ministry of Environment, the Ministry of Fisheries and the Ministry of Interior and Decentralization. The Board will be provided bi-annual work plans, budget and implementation updates. Their involvement, albeit minimal, is critical in ensuring political support and high-level awareness as to the tangible added-value of ONM as well as for the long-term support of the measures that will be put in place throughout this project. More importantly, the Board plays a critical role in the commitment to building their awareness and capacity to take action for longer-term sustainable solutions in face of climate of change.

Project Steering Committee (PSC): will be established under the coordination of La Cellule de Coordination du Programme National Changement Climatique (CCNPCC) and l`Office National de Météorologie (ONM). The committee shall be comprised of the First Advisor to the Minister of Environment, the Director-General of the National Office of Meteorology as well as representatives from the Fédération Nord et Sud des Pêches Artisanaux (Federation of Artisanal Fishermen), the

Delegation a la Surveillance des Peches et au Controle de Mer (DSPCM), National Civil Protection Agency and a representative from WMO. The primary role of PSC is to provide overall oversight, review the overall progress, financial aspects, address any major challenges and risks confronted, and provide guidance pertaining to identification of synergies and leveraging opportunities with relevant regional strategies, and other key development projects and initiatives in the region.

Project Implementation Unit (PIU): will be established at ONM and chaired by the Director-General of ONM. The Project Implementing Unit will be composed of the Managers of the relevant sections at ONM. Primary responsibility of the PIU is to facilitate the development of the project work plan, oversee its implementation, monitor progress and address coordination and cooperation issues at national and regional levels. The PIU will meet monthly and communicate regularly via email and/or teleconference to share information on implementation progress of all partners, to take joint decisions on implementation of activities, and corrective actions as needed.

National Project Coordinator: will be responsible for overall coordination across different segments of the work plan, development bi-annual Interim Progress Reports of Activities and annual Activities and Financial Progress Reports for the Project Steering Committee, the Project Implementation Unit and the Project Board.

WMO Secretariat: The Project will be supervised by the WMO Project Coordination Unit Chief (C/PCU) and supported by designated staff from the WMO departments that have significantly contributed to the design and will be supporting the implementation of the project. The WMO departments include:

- Climate and Water Department (CLW)
- Development and Regional Activities Department (DRA)
- Observation and Information Systems Department (OBS)
- Weather and Disaster Risk Reduction Department (WDS)
- Resource Management Department (REM)

The WMO Secretariat, as the Multilateral Implementing Entity, will facilitate, i) execution of the different segments and activities of the project as per project work plan, ii) financial control and reporting over project funds, iii) procurement and contracting as requested by the NIE and iv) addressing technical challenges and risks of the project with their respective network of experts and centres in the region. A project website will be set up and maintained to make available all the reports, materials and concrete developments associated with all components of the project.

B. Describe the measures for financial and project risk management.

With consideration for the anticipated risks of the proposed project and building on the WMO Risk Management Policy, a Preliminary Project Risk Profile is presented in Table 6 below. This table links the overarching risks and the measures taken to

minimize them to ensure the successful achievement of the project outcomes. Risk management is an ongoing process that will be continually assessed. The Project Coordinator, Implementation Team and Steering Committee are responsible to monitor and address all risks associated with the project throughout its lifecycle and keep a risk log. The risk log will be a "living" document and will be updated and revised annually following each Implementation Team meetings. Overall, the anticipated risks can be categorized into four areas, (1) Operational Risks, (2) Financial Risks, (3) Development Risks and (4) Reputation Risks. Among these risks, three areas may be highlighted, including:

(i) *National commitments and institutional risks:* There is a risk that stakeholder commitment may be weaker than initially claimed, especially, government ministries' commitment to cooperation. For example, there is a risk that a Ministry could unilaterally decide to limit or stop sharing information or participating. However, steps have been taken to reduce this risk. Along with ongoing efforts leading up to the design of the project and to develop supportive constituencies, a Memorandum of Understanding will be established with the various government Ministries to support relevant areas of cooperation. WMO will also sign a specific Implementation Agreement with the ONM to deepen the technical and operational cooperation. WMO guidelines and manuals and will be practiced throughout this project. This framework has proven, over the past decades, to yield strong buy-in at the technical and operational levels, which has in turn increased cooperation among stakeholders.

(ii) *Performance and project management risks*: among contributing risks are potentially unclear roles and responsibilities of different stakeholders at different levels, weak coordination of project among multi-stakeholders, weak monitoring and reporting on results, limited understanding of Financing Agency policies and procedures and weak communications. WMO has extensive experience in successfully planning, implementing, monitoring and evaluating these types of projects and has performed similar projects in the last 4 years Africa and other sub-regions. Through a project management framework that engages all the relevant stakeholders at the right level of decision-making and operations, WMO will address various project management and policy issues. Furthermore, extensive consultations with the various Ministries and the directors and experts of WMO Technical Programmes have been conducted to develop the project logic model and its results to ensure a realistic approach. Throughout the project, WMO will work very closely with the Project Steering Committee and the Implementation Team to ensure project activities, progress, successes and lessons learned are communicated regularly to the various project management structures and stakeholders.

(iii) *Risk of recurrent and concurrent disasters and subsequent post-disaster setbacks:* Should a significant disaster or chain of disasters happen with impacts on the beneficiary countries causing one or more activities of this project to be delayed, the project is designed in such a way that activities' timeline can be reviewed and adjusted accordingly.

Table 6: *Project Risk Profiles*

Criteria	Low (1)	Medium (3)	High (5)
Probability of Occurrence	Unlikely	Likely	Very Likely
Potential impact on ability to meet objectives / deliver outcomes of the project	Standard procedures should be sufficient to address risk	Likely threat to outcomes: requires action and ongoing review	Definite threat to outcomes – requires mitigation actions and ongoing management

Table 7: *Project Risk Analysis*

	Risk Definition	Risk Level	Risk Response
R 1 – National commitment and institutional risks	- Commitment may be weaker than initially claimed, especially, government commitment and cross-ministerial cooperation - Involvement of different Ministries leading to different priorities and outcomes than those identified	Low (2)	- As part of the ongoing due diligence leading up to the design of the project, efforts have been made to develop supportive constituencies within the Government of Mauritania and WMO - Relevant Ministries consulted will be members of Project Board - A Memorandum of Understanding will be established with the government to support relevant areas of cooperation - As part of the preliminary assessments for the project, we have established an understanding of capacities and challenges of the ONM and as part of the design of the project, these issues are already addressed
R 2 - Performance and project management	- Unclear roles and responsibilities of different stakeholders - Weak coordination of project among stakeholders - Weak monitoring and reporting on results - Limited understanding of Financing Agency policies and procedures - Weak communications strategy	Low (2)	- WMO ensures a field support that will be critical for the project implementation - WMO is highly competent in all areas of this project and has performed similar projects in various countries, and has extensive experience in successfully planning, implementing, monitoring and evaluating these types of projects - Project Management Framework involves: (1) Steering Committee, (2) Implementation Team, (3) Project Coordinator, (4) WMO Secretariat to address various project management and policy issues - Extensive consultations with ONM and experts of WMO Technical Programmes have been conducted to develop the project logic model and its results to ensure a realistic approach - The Project management framework will ensure that project activities, progress, successes and lessons learned are communicated regularly to the various project management structures and stakeholders
R 3 – Financial Risks	- Inadequacy of funding - Improper financial control and oversight - Weaknesses in procurement and selection - Currency exchange	Low (2)	- A trust fund will be established that will be managed by the WMO Project Coordination Unit Chief with support of the Project Coordinator, under the supervision of WMO Resource Mobilisation Office and Resources Management Department - Management of funds will be the

	Risk Definition	Risk Level	Risk Response
			responsibility of the WMO following transparent and reliable financing procedures. Only specific and very limited funding for local costs may be channelled through national agencies for local costs of workshops and meetings - WMO has established a strong cooperation with its network of national agencies and regional partners, and is fully aware of the local financial regulations, practices and procedures of its partners - WMO follows UN Procedures for Financial Management, Audit and Reporting
R 4 Socio-political and policy risks	- Differences in socio-political conditions, political conflicts and economic atmosphere - National and Sectoral policies and planning on DRR and Climate Change Adaptation - Gender policy biases that limit women's participation	Medium (3)	- Continued political stability at national levels is a pre-condition for effective implementation of the project and sustainability of its results. Risk of political instability in Mauritania is considered low to moderate by UNDSS. The risk to the project from political instability will be mitigated by a continued, appropriate high-level engagement to ensure benefits of project are understood - WMO and ONM have gender inclusive policy that applies to all programmes and activities, equal opportunities principles and requirements have been considered in designing the project and will be thoroughly considered during its implementation
R 5 - Disasters caused by natural hazards	- Risk of recurrent and concurrent disasters and subsequent post-disaster setbacks	High (4)	- Should a significant disaster or chain of disasters happen with impacts on Mauritania that causes one or more activities of this project to be delayed, the project is designed in a way that activities' timeline can be reviewed and adjusted accordingly
R 6 – MIE Risks	- International standing (multilateral and donors, bilateral partner institutions, and recipients and beneficiaries) - Inability to produce results.	Low (2)	- WMO is globally recognized as the United Nations leader in weather, water and climate services - WMO has strong governance mechanisms supported by 189 Member States and six regional associations WMO has ensured a strong engagement of national and regional partners in this project from very early stage of the process

C. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan. Include break-down of how Implementing Entity's fees will be utilized in the supervision of the monitoring and evaluation function.

Transparency, inclusiveness and measures that prevent corruption are the foundation of the Project's reporting activities. Reporting will be based on concrete outcomes and will highlight lessons learned, best practices and key recommendations for future activities. The Project will produce annual progress reports, a mid-project report and a completion report. Reporting shall follow the components and activities described in this document and will be subjected to the approval of the Project Board and Steering Committee. The Project Board will meet to approve implementation plans, work plans reports and will address any challenges on the project implementation. The Steering Committee shall provide a link between the PIU and Project Board and meet twice a year in connection to other project activities where applicable.

A Project Inception Workshop will be conducted within four months of project start up with the full project team, relevant government counterparts, national stakeholders, partners and WMO. The Inception Workshop is crucial to building ownership for project results and to plan the first year annual work plan. A fundamental objective of the Inception Workshop will be to present the modalities of project implementation and execution, document mutual agreement for the proposed executive arrangements amongst stakeholders, and assist the project team to understand and take ownership of the project‘s goals and objectives. Another key objective of the Inception Workshop is to introduce the project team, which will support the project during its implementation. An Inception Workshop Report will be prepared and shared with participants to formalize various agreements decided during the meeting.

Each installation and completion of activity will be followed by a report on the implementation and associated Site Acceptance Tests. All international experts' missions will have a mission report detailing progress achieved, next steps and key issues for project implementation.

The Project will have an independent evaluation at three points of implementation, mid-term evaluation, pilot phase evaluation and final evaluation. The project will undergo an independent Mid-Term Evaluation (MTE) at the mid-point of project implementation, which will determine progress being made toward the achievement of outcomes and identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; highlight issues requiring decisions and actions and present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for the final half of the project‘s term.

Table 8: *Monitoring & Evaluation Budget*

M&E Activity	Responsible Parties	Budget (USD)	Timeframe
Inception workshop and report	• Project Coordinator • WMO	$13 815	Within two months of Project start
Mid-term Evaluation	• Project Coordinator, • Project Execution Team, • WMO C/PCU, • WMO C/FIN, • External consultants	$15 000	At mid-point of project implementation
Periodic progress reports	• Project coordinator • Project execution team • External consultants	Included in Execution Cost	Quarterly
Pilot project Evaluation and Report	• Project coordinator • Project execution team • External consultants	$17 095	Within two years from project start
Final Evaluation	• Project Coordinator, • Project Execution Team, • WMO C/PCU, • WMO C/FIN, • External consultants	$15 884	Three months ahead of ending of project implementation
Project Final Report	• Project coordinator • Project Execution team	Included in Execution Cost	Three months ahead of project closing
Total indicative cost		**$61 794**	

D. Include a results framework for the project proposal, including milestones, targets and indicators and sex-disaggregate targets and indicators, as appropriate. The project or programme results framework should align with the goal and impact of the Adaptation Fund and should include at least one of the core outcome indicators from the AF's results framework that are applicable[17].

Table 9: *Logical framework matrix*

		Measurable indicators	**Sources of verification**	**Risks and Assumptions**
Overall Objective	Strengthen ability of small-scale fishermen, and Mauritania's coastal community at large, to undertake concrete actions to adapt to climate change induced hazards	30% reduction in the loss of life and property resulting from extreme weather-related events	Statistics by the National Fishing Safety Administration	
Project Purpose	Develop Institutional Capacity and Early Warning Service Delivery to Small-Scale Fishermen in Mauritania	- A new weather bulletin designed for fishermen disseminated via radio four times a day - Hand-cranked and solar-panel equipped radios in use by 6000 fishermen out at sea to receive weather bulletins - A hotline for weather information for fishermen available 24/7 and updated four times per day - Billboards at fishing ports with the latest weather bulletin maintained and updated by the fishing safety authority	- Statistics of delivered weather bulletins via radio - User feedback surveys - Call Statistics to the hotline number	- Radios are not stolen/destroyed/sold on by the fishermen - Relevant authorities are engaged in the entire process - A business model is developed with networks for the hotline operation

[17] Please refer to the *Project level results framework and baseline guidance* for the Adaptation Fund's results framework and guidance on developing a results framework and establishing a baseline [add link here].

Project Components		Expected Outcomes	Measurable indicators	Sources of verification	Risks and Assumptions
A.	Implementation of Sensitization Measures to Reduce the vulnerability of small scale fishermen	Reduced exposure and increased adaptive capacity of small scale fishermen to climate change induced weather hazards	1200 boat captains trained on weather, climate and ocean, and associated dangers	Training reports, feedback forms	Insufficient engagement from fishermen, communication barriers
		Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	Design for the forecast and early warning services delivered by ONM, in collaboration with fishermen and local intermediary organizations	Design documents, weather bulletins, hotline and billboard services	Telecommunication challenges, lack of understanding and/or disregard of forecast and warnings
			Mauritanian civil protection and fishing agencies trained on weather, climate and ocean and associated risks	Training reports, feedback forms	Agencies able to send right personnel for training events Engagement of national agencies
B.	Institutional and Technical Capacity Development of the Mauritania National Meteorological Services	Improved capacity of ONM to deliver marine weather and early warning services to help reduce risks associated with climate related losses and contribute to socio-economic development and poverty alleviation.	Two new marine meteorological automatic weather stations installed and operational at the coast of Mauritania	Site acceptance test reports	Agreement on GPRS data transmission with operators reached or optional solution developed

			Data management solution for real-time observation data developed and operational at ONM	Time series of weather information available at the ONM databases	
			Numerical coastal ocean state model adopted and operational at ONM	Model product archives	
			2 permanent ONM staff trained on marine meteorology and numerical ocean state modelling	Training reports by staff members	Availability from hosting institutions
			Modern data centre established at the ONM for weather, climate and ocean data		ONM headquarters established at a permanent location with a dedicated server room
C.	Improving the quality and availability of coastal and maritime weather and early warning services	Strengthened capacity of national centres and networks to respond rapidly to climate change induced extreme weather events	Weather hotline for fishermen receives at least 50 calls per day	Statistics from operators	Hotline pricing by operators at sustainable level
			1200 boat captains trained on the operation of hand-cranked and solar-powered radios and the interpretation of weather bulletins	Training reports	
			At least 6000 fishermen	User feedback	

			reached daily through the radio weather bulletins	surveys	

Table 10: *Results Framework Alignment Table*

Project Objective	Project Objective Indicator	Fund Outcome(s)	Fund Outcome Indicator(s)
Strengthen ability of small-scale fishermen, and Mauritania's coastal community at large, to undertake concrete actions to adapt to climate change induced hazards	30% reduction in the loss of life and property resulting from extreme weather-related events	Outcome 1: Reduced exposure at national level to climate related hazards and threats Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic & environmental losses Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis 2.1 No. of targeted institutions with increased capacity to minimize exposure to climate variability risks 2.2 Number of people with reduced risk to extreme weather events 3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses 4.1. Development sectors' services responsive to evolving needs from changing and variable climate
Project Outcomes	**Project Outcome Indicators**	**Fund Output**	**Fund Output Indicator**
Reduced exposure and increased adaptive capacity of small scale fishermen to climate change induced weather hazards	1200 boat captains trained on weather, climate and ocean, and associated dangers	Output 1: Risk and vulnerability assessments conducted and updated at a national level Output 3: Targeted population groups participating in adaptation and risk reduction awareness activities	2.1.1. No. of staff trained to respond to and mitigate impacts of climate related events 2.1.2. Capacity increase of staff from targeted institutions trained to respond to and mitigate impacts of climate related events
Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	Design for the forecast and early warning services delivered by ONM, in collaboration with fishermen and local intermediary		

	organizations		
	Mauritanian civil protection and fishing agencies trained on weather, climate and ocean and associated risks		
Improved capacity of ONM to deliver marine weather and early warning services to help reduce risks associated with climate related losses and contribute to socio-economic development and poverty alleviation.	Two new marine meteorological automatic weather stations installed and operational at the coast of Mauritania	Output 1: Risk and vulnerability assessments conducted and updated at a national level Output 2.1: Strengthened capacity of national and regional centres and networks to rapidly respond to extreme weather events	1.3 Early warning systems developed 2.1 No. of targeted institutions with increased capacity to minimize exposure to climate variability risks
	Data management solution for real-time observation data developed and operational at ONM		
	Numerical coastal ocean state model adopted and operational at ONM		
	2 permanent ONM staff trained on marine meteorology and numerical ocean state modelling		
	Modern data centre established at the ONM for weather, climate and ocean data		
Strengthened capacity of national centres and networks to respond rapidly to climate induces extreme weather events	Weather hotline for fishermen receives at least 50 calls per day	Output 3: Targeted population groups participating in adaptation and risk reduction awareness activities Output 6: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	2.2.1. Percentage of population covered by adequate risk reduction systems 3.1.1 No. and type of risk reduction actions or strategies introduced at local level 3.1.2 No. of news outlets in the local press and media that have covered the topic 6.1.1.No. and type of adaptation assets (physical as well as in terms of knowledge) created in support of individual or community livelihood strategies
	1200 boat captains trained on the operation of hand-cranked and solar-powered radios and the interpretation of weather bulletins		
	At least 6000 fishermen reached daily through the radio weather bulletins		

E. Include a detailed budget with budget notes, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs.

The budget includes a strong investment component to develop national observation infrastructure, data processing and management facilities and telecommunications. These investments enable the provision of high-resolution, real-time products and services for the coastal communities along with investments into human resources at ONM.

The figures for fixed assets are based on the real costs for previous similar installations previously done in Mauritania and in the region. The tender, purchase, installation, configuration and training for two complete automatic marine meteorological stations including civil works, permits and transportation & storage costs (activity B.4) is formulated as follows:

- Automatic Weather and Marine Station sensors and equipment: 2 x 50,000 = 100,000
- Civil works with electricity and data communications: 2 x 27,500 = 55,000
- Tide gauges: 2 x 50,000 = 100,000
- Satellite and GPRS modems: 2 x 5,000 = 10,000
- Shipping costs: 2 x 2,500 = 5,000
- Installation missions by provider: 2 x 15,000 = 30,000
- Total: 300,000

In similar fashion, the fixed assets of activity B.5 are based on recent cost estimates, tenders and contracts of the WMO in other similar projects. The cost estimate for fixed assets (300,000) is based on the recent average purchase price of a weather production tool suite (e.g. MFI MeteoFactory: http://www.mfi.fr/en/public-weather-services-solutions.html) and includes the setup, installation and licences for a full production suite to service various users vie different channels.

Table 11: *Project Budget by Activity*

Activity	Cost			
	Year 1	**Year 2**	**Year 3**	**Total**
Activity A.1: Project kick-off workshop				
First meeting of all project stakeholders, Project Board and Steering Committee to define and approve first Annual Work Plans. Budget costs including venue costs, training fees and travel for participants				
Training expenses	$33,870.00	$0.00	$0.00	$33,870.00
Fixed Assets	$0.00	$0.00	$0.00	$0.00
Sub-total Activity A.1	$33,870.00	$0.00	$0.00	**$33,870.00**
Activity A.2: Marine risk sensitization for government actors and officials				
Sensitization measures as a series of interventions by the project members to sensitize the national agencies in Mauritania to the risks of marine users and increasing threats from climate change				
Training expenses	$31,670.00	$24,038.00	$0.00	$55,708.00
Fixed Assets	$0.00	$0.00	$0.00	$0.00
Sub-total Activity A.2	$31,670.00	$24,038.00	$0.00	**$55,708.00**
Activity A.3: Community-focused Climate Change Adaptation methods for Fishermen and their				

communities				
A series of interventions by the project members to work with the small-scale fishermen communities in Mauritania to the risks associated with weather, climate and ocean and how to mitigate them				
Training expenses	$127,960.00	$127,960.00	$0.00	$255,920.00
Training Material	$1,500.00	$1,516.00	$0.00	$3,016.00
Sub-total Activity A.3	$129,460.00	$129,476.00	$0.00	**$258,936.00**
Sub-total Component A	**$195,000.00**	**$153,514.00**	**$0.00**	**$348,514.00**
Activity B.1: Marine meteorology and coastal ocean modeling training program				
Dedicated and tailored training programme for two ONM permanent staff members to be trained as fellows through the WMO fellowship programme for six months on location in Madrid, Spain				
Training expenses	$28,000.00	$0.00	$0.00	$28,000.00
Fixed Assets	$0.00	$0.00	$0.00	$0.00
Sub-total Activity B.1	$28,000.00	$0.00	$0.00	**$28,000.00**
Activity B.2: Implementation of a numerical coastal ocean state and weather model at ONM				
Twinning with a leading modeling institution for the development and training of numerical ocean modeling capacity on location at the ONM. Budget for international experts training fees and associated costs.				
Training expenses	$126,840.00	$126,840.00	$0.00	$253,680.00
Fixed Assets	$15,000.00	$0.00	$0.00	$15,000.00
Sub-total Activity B.2	$141,840.00	$126,840.00	$0.00	**$268,680.00**
Activity B.3: Operationalization of a data processing centre at ONM				
Tender, purchase, installation, configuration and training for a data management center at the ONM including works for a server room, ICT equipment and spare parts.				
Training expenses	$18,420.00	$33,420.00	$0.00	$51,840.00
Fixed Assets	$100,000.00	$50,000.00	$0.00	$150,000.00
Sub-total Activity B.3	$118,420.00	$83,420.00	$0.00	**$201,840.00**
Activity B.4: Improve marine meteorological and oceanographic observations on the coast of Mauritania				
Tender, purchase, installation, configuration and training for two complete automatic marine meteorological stations including civil works, permits and transportation & storage costs				
Training expenses	$21,254.00	$12,044.00	$0.00	$33,298.00
Fixed Assets	$150,000.00	$150,000.00	$0.00	$300,000.00
Sub-total Activity B.4	$171,254.00	$162,044.00	$0.00	**$333,298.00**
Activity B.5.: Develop tools and capacity for weather and marine product generation				
Tender, purchase, installation, configuration and training for a forecaster workstation with automatic product generation for web, radio and TV.				
Training expenses	$0.00	$40,320.00	$0.00	$40,320.00
Fixed Assets	$0.00	$300,000.00	$0.00	$300,000.00
Sub-total Activity B.5	$0.00	$340,320.00	$0.00	**$340,320.00**
Sub-total Component B	**$459,514.00**	**$712,624.00**	**$0.00**	**$1,172,138.00**
Activity C.1: Development of dissemination tools to end users				
Development of the hotline service, radio transmission, billboards and TV broadcasts for the pilot phase operations including licenses, work fees, permits, equipment and parts				

Training expenses	$0.00	$15,472.00	$15,472.00	$30,944.00
Fixed Assets	$0.00	$30,000.00	$0.00	$30,000.00
Sub-total Activity C.1	$0.00	$45,472.00	$15,472.00	**$60,944.00**
Activity C.2: Provision of safety tools to fishermen				
Tender, purchase, training and donation of hand-cranked, solar powered FM/AM radios to 1200 captains of fishing vessels				
Training expenses	$0.00	$33,844.00	$0.00	$33,844.00
Fixed Assets	$0.00	$60,000.00	$0.00	$60,000.00
Sub-total Activity C.2	$0.00	$93,844.00	$0.00	**$93,844.00**
Activity C.3: Coastal safety weather service delivery pilot phase				
Delivery of a coastal safety weather service over radio, updating of billboards at fishing ports, weather bulletin hotline and TV broadcast for six months by ONM in cooperation with maritime safety agency, national radio and TV. Purchase of a vehicle to maintain observation stations and address urgent needs.				
Training expenses	$0.00	$13,168.00	$0.00	$13,168.00
Fixed Assets	$40,000.00	$0.00	$0.00	$40,000.00
Sub-total Activity C.3	$40,000.00	$13,168.00	$0.00	**$53,168.00**
Activity C.4: Pilot phase evaluation and service improvements				
Evaluation report and required modifications leading up to the operationalization of the services				
Training expenses	$0.00	$0.00	$34,190.00	$34,190.00
Fixed Assets	$0.00	$0.00	$0.00	$0.00
Sub-total Activity C.4	$0.00	$0.00	$34,190.00	**$34,190.00**
Activity C.5: Operational service delivery startup				
Launch of new services based on the experiences from the pilot phase and additional requests from the national government				
Training expenses	$0.00	$0.00	$40,216.00	$40,216.00
Fixed Assets	$0.00	$0.00	$0.00	$0.00
Sub-total Activity C.4	$0.00	$0.00	$40,216.00	**$40,216.00**
Sub-total Component C	**$40,000.00**	**$152,484.00**	**$89,878.00**	**$282,362.00**
Sub-total Project Components	**$694,514.00**	**$1,018,622.00**	**$89,878.00**	**$1,803,014.00**

Table 12: Project Execution Costs

	Year 1	**Year 2**	**Year 3**	**Total (USD)**
Project Coordinator	$20 000,00	$20 000,00	$20 000,00	$60 000,00
Telecommunications Expert	$12 500,00	$12 500,00	$12 500,00	$37 500,00
Weather and Climate Expert	$12 500,00	$12 500,00	$12 500,00	$37 500,00
Maintenance Vehicle Fuel and Repair	$6 000,00	$6 000,00	$6 000,00	$18 000,00
ICT Costs and Fees	$6 000,00	$6 250,00	$6 000,00	$18 250,00
Consumables and admin costs	$5 500,00	$5 500,00	$5 500,00	$16 500,00
Total	$62 500,00	$62 750,00	$62 500,00	**$187 750,00**

The MIE management fee will be utilized by WMO to cover its indirect costs in the provision of general management and specialized technical support. The table below provides an indicative breakdown of the estimate costs in providing these services. If the national executing entity requests additional Implementation Support Services (ISS), an additional fee will apply in accordance with WMO fee policy regarding ISS and would be charged directly to the project budget.

Table 13: *MIE Management Fee Costs*

Project Cycle Management Costs (WMO)		
Category	**Indicative Services Provided by WMO**	**Estimated Service Cost (USD)**
Identification, Sourcing and Screening of Ideas	• Provide information on substantive issues in adaptation associated with the purpose of the Adaptation Fund (AF). • Verify soundness and potential eligibility of identified idea and match with AF expectations. • Provide technical support and backstopping to write technically and operationally viable project. • Source technical expertise in line with the scope of the project needs.	***11,064***
Development & Preparation	• Negotiate and obtain clearances by AF. • Respond to information requests	***15,366***
Project Support and Implementation Cost	• Provide technical monitoring, progress monitoring and evaluation, and validation and quality assurance throughout • Support from WMO corporate systems • Allocate and monitor Annual Spending Limits based on agreed work plans. • Receipt, allocation and reporting to the AFB of financial resources. • Oversight and monitoring of AF funds. • Provide technical and operational information as needed to facilitate implementation of project activities • Return unspent funds to AF	***142,786***
Total		***169,216***

F. Include a disbursement schedule with time-bound milestones.

Table 14: *Project Timeline. X = Milestone and Reporting deadline*

	Year 1												Year 2												Year 3											
	1	2	3	4	5	6	7	8	9	#	#	#	1	2	3	4	5	6	7	8	9	#	#	#	1	2	3	3	4	5	6	7	8	9	#	#	#
Activity A.1: Project Kick-off Workshop																																				
Activity A.2: Marine risk sensitization for government actors and officials																																				
Activity A.3: Disaster Risk Sensitization for Fishermen																																				
Activity B.1: Marine meteorology and coastal ocean modeling training program																																				
Activity B.2: Implementation of a numerical coastal ocean state and weather model at ONM																																				
Activity B.3: Operationalization of a data processing centre at ONM																																				
Activity B.4: Improve marine meteorological and oceanographic observations on the coast of																																				

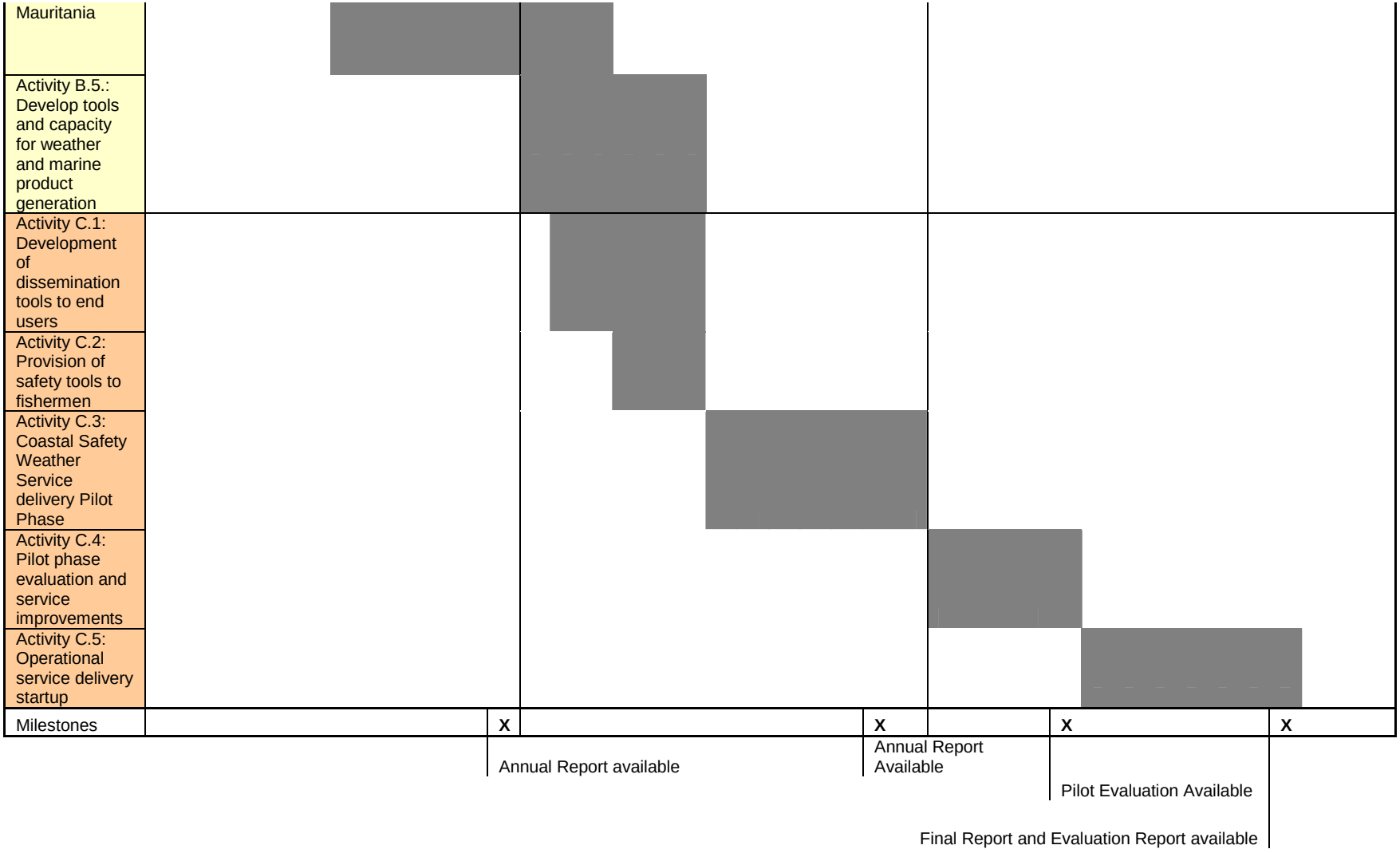

Mauritania
Activity B.5.: Develop tools and capacity for weather and marine product generation
Activity C.1: Development of dissemination tools to end users
Activity C.2: Provision of safety tools to fishermen
Activity C.3: Coastal Safety Weather Service delivery Pilot Phase
Activity C.4: Pilot phase evaluation and service improvements
Activity C.5: Operational service delivery startup
Milestones
X
X
X
X
Annual Report available
Annual Report Available
Pilot Evaluation Available
Final Report and Evaluation Report available

Table 15: *Disbursement Schedule*

	Upon Agreement signature	One Year after Project Start	Year 2	Total
Scheduled Date	30 September 2012	31 December 2013	31 December 2014	
Project Funds	$620,026.00	$1,031,258.00	$151,730.00	$1,803,014.00
Project Execution Costs	$62,500.00	$62,750.00	$62,500.00	$187,750.00
Implementing Entity Fee	$56,405.33	$56,405.33	$56,405.33	$169,216.00
			Grand Total	$2 159 980,00

☐ PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. RECORD OF ENDORSEMENT ON BEHALF OF THE GOVERNMENT[18] *Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:*

Ministère Délègue Auprès du Premier Ministre Chargé de l'Environnement *Sidi Mohamed Ould El Wavi* *Charge de Mission (1ere Conseiller du Ministre)* *Coordinateur de la Cellule national Changement Climatique* *Rue 21 185 Ksar Nouakchott, Mauritanie* *Tel : +222 524 3985* *Fax : +222 524 3138*	Date*: (Month, day, year)* 14/03/2012 

[6] Each Party shall designate and communicate to the Secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

B. IMPLEMENTING ENTITY CERTIFICATION *Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address*

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans of Mauritania and subject to the approval by the Adaptation Fund Board, understands that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.
 *Mary Power* *Director, Resource Mobilisation Office* *World Meteorological Organization* Implementing Entity Coordinator 21 March 2012
Date: *(Month, Day, Year)* | Tel. and email: +41. 22 730.8003
Project Contact Person: Josephine Wilson
Tel. And Email: +41 22 730 8303; jpwilson@wmo.int

Annex 1: Office National de la Météorologie (ONM), Mauritania – Baseline Information

Prior to the inception of the National Meteorological Office (ONM) of Mauritania, meteorological functions performed[18] were related only to aeronautical activities and the maintenance of existing weather stations used for weather predictions for the safety of planes coming in and out of Mauritania. However, in 2005 due to an increase in storm surges and noticeable increase in related accidents, loss of property and deaths, and following a ministerial report on inadequateness of the current services to ensure the security of the lives and livelihoods of Mauritanians, ONM was established in December 2006 under the auspice of the Ministry of Transport and Equipment. Its mandate is "the observation and study of weather, climate and atmospheric components of the environment to ensure the safety of persons, goods and contribute to economic and social development of Mauritania by the provision of meteorological information appropriate for all users." ONM was also asked undertake national hydrological activities as part of its mandate.

Over the last five years, ONM, with a limited investment from the government and in partnership with the World Meteorological Organization and other related weather and climate centres was able to begin providing services. ONM currently employs 80 people from meteorologists to observers. The Office comprises of 8 Managers, 1 agro-meteorologist, 3 technicians, 4 meteorologists (3 forecasters and 1 geographer), 21 technicians, 43 observers and the rest miscellaneous support staff.

The annual budget of ONM is 90 Million MRO and 50 Million MRO for investment. This equates to approximately 490,000 USD. In 2011, ONM's revenue for value added services was roughly 8 Million MRO (27,000 USD). ONM provides climate information to port institutions as well as offshore oil and mining companies.

The existing national weather observation network, as was shown in Figure 2, is composed of 14 weather observation stations located at regional airports, of which 7 are automatic and 7 are manual; 1 Automatic Marine Weather Station with tide gauge at Nouakchott Port and 2 Atmospheric Sounding Stations operated by ASECNA at Nouakchott and Nouadhibou with two soundings per day. Through the Marinemet project, there will be additional equipment implemented Q3 of 2012 comprised of 3 additional Automatic Weather Stations along the Mauritanian coast and 1 Tide gauge to Nouadhibou Port.

The IT infrastructure of ONM includes 5 computers at the airport and 18 desktops in Nouakchott headquarters. Currently the facilities have no centralized system for data management, only stand-alone computers without data backup arrangements. There is no dedicated computer room or backup power. There are no high-performance facilities to support numerical models. In addition, ONM has 1 colour printer at the airport and 1 colour and 4 black-and-white printers in Nouakchott. ONM has two data servers, one for real-time data and another for the climate database. The real-time server is non-operational as data connections not implemented to stations. The current Internet connection to the headquarters is: download 1 Mb/s, upload 0.5 Mb/s and to the airport: download 2 Mb/s, upload 0.5 Mb/s. At the Nouakchott airport, there is a Puma workstation (through the EU-funded AMESD Project) with a EUMETCast receiver and access to remote sensing and numerical products.

[18] Aeronautical activities were performed solely by the Agency for Aerial Navigation Safety in Africa and Madagascar (*L'Agence pour la Sécurité de la Navigation aérienne en Afrique et à Madagascar*, ASECNA), an air traffic control agency based in Dakar, Senegal.

The following provides a comprehensive list of technical training received by ONM Personnel.

Project / Institution (Training Provider)	Training Topic	Venue and Date
WMO & African Centre of Meteorological Application and Development (ACMAD)	Climatological Data Quality Control and how to calculate climate indices	2012
Marinemet Project	Dust and sandstorm warning	Barcelona, Spain / 2011
Marinemet Project	Marine meteorology course in general use of Marinemet models (does not include training specific to Mauritania models)	Toulouse, France / 2010
WMO & UK Meteorological Office	Quality Management Systems workshop	Istanbul, Turkey / 2011
WMO	New technologies in agriculture and agro-meteorology	Kuwait / 2011
UK Meteorological Office	Communicating forecasts via television	2003, 2007
WMO	Numerical Weather Prediction Workshops on how to analyse models outputs and use for forecasts	2005
European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT)	Interpretation of weather satellite images	Annual

Annex II: List of Stakeholder Consultations, Mauritania, February 2012

Name	Title / Organisation	Contact
Hon. Yahya Ould Haddemine	Minister of Equiment and Transport	Contact through Mr. Bechir
Hon. Amedi Camara	Minister of Environment	Contact through Mr. Bechir
Sidi Mohamed Ould El Wavi[19]	First Counselor to the Minister, Focal Point of the National Climate Change Unit	elwavi.sm@gmail.com
Mohamed Bechir Ould Mohamed	Director General, Office National de la Meteorologie (ONM)	email: mbechirml@yahoo.fr t: +222 45 24 3531
Sidi Ould Mohamed Lemine	Director of Exploitation and Forecasting, ONM	email: sidiloudey2@yahoo.fr
Coulibiely Hemwlin	Chief, Agro-meteorology, ONM	email: coulibaly_hamido@yahoo.fr
Dia Thierno Yoyo	Chief, Marine Meteorology, ONM	t: +222 45 24 3531
Béchir Ould Bardas	Secretary General, Port Authorities, Nouakchott	t: 00 222 36362592
Mohamed Elhacen Ould sidi Mohamed	Vice Director, Port Authorities, Nouakchott	tel: 00 222 36302049
Mohamed Mahmoud Ould Mohamedna	Technical Director, Port Authorities, Nouakchott	t: 00 222 36683780
Sidina Ould Aly	Coordinator, DSPCM	e: alysidi@yahoo.fr t: 00 222 22376336 t: 00 222 22412671
Dahoud Ould Banine	Assistant Director, Ministry of Interior	t: 00 222 22253559
Mohamed Mahmoud Ould Ahmed Abdellahi	Assistant Director, National Civil Protection Agency	e: didi.taki@yahoo.fr t: 00 222 44481280
Dowfa lopes	National Civil Protection Agency	e: dowfalopes@yahoo.fr
Sid Ahmed Ascid	Federation of Artisan Fishermen	e: pechesartisenale@yahoo.fr t: 22360087 / 2236360087 o: 2246517780 / 2246952794
Ilaria Carnevali	Deputy Resident Representative – Programme, UNDP Mauritania	ilaria.carnevali@undp.org
Alain Olive	Program Office, Environment and Energy Unit, UNDP Mauritania	alain.olive@undp.org

[19] Did not meet Mr. El Wavi in February, but had numerous consultations via email and through Mr. Mohamed Bechir, Director General of ONM

Annex III: WMO Gender Mainstreaming Policy and Related Activities (an excerpt)

A number of major studies and surveys over the last 15 years have drawn significant attention to the under-representation of women in fields of physical sciences, engineering and computing. This has been attributed to many factors such as discrimination towards women's enrolments in secondary to higher education, lack of incentives and awareness to motivate women to engage in science education, training, and research, lack of female role models, and failure of science faculties and enterprises to actively recruit women.

With respect to WMO, women have always participated in the activities of the Organization. However, traditionally it has been in limited numbers and generally not at levels involved with important decision making. With the goal to develop a strategy on Gender Mainstreaming, WMO conducted two global surveys of its 189 Member States on the "Participation of Women and Men in the Activities of the World Meteorological Organization" in 1997 and 2001 (WMO, 1997a and 2001) to establish baseline information on these issues[20]. In addition to the two surveys, WMO also convened two conferences on the "Participation of Women in Meteorology and Hydrology" (WMO, 1997b and 2003). The conferences produced a number of recommendations that were incorporated into the WMO Policy on Gender Mainstreaming, adopted by WMO Congress-XV (WMO, 2007)). At the core of WMO Policy on Gender Mainstreaming is the vision "to provide world leadership in expertise and international cooperation in weather, climate, hydrology and water resources, and related environmental issues, and thereby to contribute to the safety and well-being of people throughout the world and to the economic benefit of all nations".

Through the Gender Mainstreaming Policy, WMO is promoting, encouraging and facilitating gender equality across all levels of WMO by providing balanced and equal opportunities in recruitment, retention and promotion of personnel at all levels of WMO and NMHSs. In addition, the policy aims to facilitate the delivery of weather, climate and water services by the NMHSs targeted at both women and men and establish a mechanism by which progress can be measured. Specifically, the policy provides a foundation for gender-sensitive actions according to its framework for action, which provides guidance and direction to WMO and its Members along four main areas: (i) governance, (ii) employment, (iii) enhanced service delivery, and, (iv) effective monitoring and evaluation. The policy is implemented through national and international coordinated activities of WMO Programmes, regional associations, technical commissions and the NMHSs of the Member States. In particular, NMHSs must develop action plans that are appropriate for addressing gender issues with consideration to the political, cultural and socio-economic issues of each Member State.

The WMO Executive Council (EC) overseas and advises on the implementation of WMO Policy on Gender Mainstreaming at all levels. Following the adoption of the Policy, the EC established an "Advisory Panel of Experts on Gender Mainstreaming" under the leadership of Dr Linda Makuleni (The Permanent Representative of South Africa with WMO and Chief Executive Officer of the South African Weather Service) to assist with the implementation of the policy and to monitor and evaluate progress, which met for the first time in Geneva, Switzerland, February 2010. To date, WMO Secretariat, technical commissions, regional associations and some NMHSs of Member States have already designated their gender focal points.

During WMO Congress XVI (held in Geneva in May/June 2011), the WMO Strategic Plan (WMO, 2011a) was adopted with particular attention to activities dealing with gender issues within key thematic areas such as service delivery, capacity building and disaster risk reduction. The Congress

[20] Among others, the surveys indicated that globally, over 90% of the NMHSs of Members States had very low rates of employment of women in the work force. Furthermore, the surveys indicated that women constitute only 10 – 15% of the participants in most of the WMO activities.

also highlighted the vital role of women in areas such as agriculture and food security, water resources management, family health and overall family wellbeing and management. Furthermore, the Congress urged NMHSs and all projects of WMO to take into account gender aspects in the development and delivery of weather, climate and water services. More information about WMO Policy on Gender Mainstreaming and related activities can be accessed through a dedicated webpage (see reference section).

Implementation of the WMO policy on gender mainstreaming has resulted in a positive trend with respect to the numbers of fellowships awarded to women and an increase of women employed at the WMO Secretariat[21],

[21] The numbers of women being approved for long-term fellowship has increased from 55 in 2004 to 177 in 2010 and at the WMO Secretariat there has been an increase from 28% to 32% in the number of women in the professional category, and similarly an increase from 20% to 26% in the number of women in the director and above categories in the last 5 years.