United Nations Development Programme

Country: The Gambia

PROJECT DOCUMENT[1]

Project Title: Strengthening climate services and early warning systems in the Gambia for climate resilient development and adaptation to climate change – 2nd Phase of the GOTG/GEF/UNEP LDCF NAPA Early Warning Project

UNDAF Outcome(s):

UNDAF Pillar 1 Outcome 3 Environmental Sustainability and Disaster Risk Reduction Systems and Services Operationalised

Expected CP Outcome(s):

Outcome 2: Sustainable livelihood security enhanced for the disadvantaged groups through the promotion of income diversification opportunities and better management of environmental resources

Expected CPD Outputs

Output 2: Policies on climate change, low-carbon emission, land use renewable energy and coastal/marine ecosystems strategic plan established; DRR staff trained

Executing Entity/Implementing Partner: Department of Water Resources, Ministry of Fisheries and Water Resources

Responsible Party: United Nations Development Programme

Responsible Partners: Department of Water Resources, Department of Agriculture, National Disaster Management Agency, National Environment Agency, Ministry of Forestry and Environment, Ministry of Finance and Economic Affairs, Gambia Radio & Television Services

[1]For UNDP supported GEF funded projects as this includes GEF-specific requirements

Brief Description

The Gambia does not have an effective early warning system to generate knowledge of climate change risks, vulnerabilities and hazards, and this prevents the country from planning, monitoring, responding and adapting to climate change risks.

The Gambia is particularly vulnerable to the increasing frequency and severity of droughts, floods, severe lightning, wind storms and other climate events, and their negative impacts on sectors such as agriculture, fisheries, tourism, health and infrastructure. Such climate-related hazards are having increasingly adverse effects on the country. A large proportion of the Gambian population is highly dependent on rain-fed agriculture and natural resources, which makes it vulnerable to rain variability and other climate events. In order to invest in The Gambia's capacity to adapt to climate-related hazards, it is necessary to strengthen climate monitoring, analysis and dissemination.

This LDCF project addresses the current EWS-related gaps which include: a limited understanding of current and future climate risks; limited monitoring and forecasting of climate-related hazards; inappropriate communication and packaging of warnings; restricted adaptive responses to impending disasters; and constrained planning for slow-onset changes due to climate change that will require a transformational shift in economic development and risk reduction efforts.

This project will invest in strengthening current systems to lead to a fully operational EWS for the Gambia at the institutional level which can in turn serve local communities particularly in remote and vulnerable regions. This will be carried out through improving national capabilities to generate and use climate information in the planning for and management of climate-induced hazard risks, developing core skills and competencies to analyse the climate risks at hand, acquiring relevant technologies to generate accurate and reliable data, improving early warning dissemination and advisory communications; and supporting communities in the uptake of climate information at the local level.

Barriers that need to be overcome to establish an effective EWS in The Gambia include the following: i) weather and climate monitoring infrastructure is obsolete and inadequate, limiting data collection, analysis and provision of meteorological services; ii) knowledge and capacity to effectively predict future climate events is limited by a shortage of skilled human resources; iii) climate information is not packaged, translated and disseminated in a user-relevant manner; iv) community-level usage of climate information and responses to received warnings is poor.

This LDCF financed project, implemented by the Ministry of Water Resources and Fisheries will: i) establish a functional network of meteorological and hydrological monitoring stations and associated infrastructure to better monitor climatic changes; ii) strengthen the skills and provide capacity building to bolster the basic competencies required to run an effective EWS; iii) develop and disseminate tailored weather and climate information to government entities, private sector, civil society, development partners and local communities; and iv) support uptake of climate information and integration of climate knowledge into local development plans in 14 pilot sites distributed across the country.

UNDP as per its comparative advantage will be supporting the implementation of activities under Outcome 2 (Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by recent needs assessment reports in the Gambia) as well as the project management cost of the midterm and final evaluation.

P A P P S E M P	Total resources required	$ 31,660,000
	Total allocated resources:	$ 31,660,000
	• Regular	
	• Other:	
	○ GEF	$ 8,000,000
	UNDP	$3,000,000
	UNEP	$5,000,000
	○ Co-financing	$ 23, 660,000

Agreed by (Government):

Date/Month/Year

Agreed by (Executing Entity/Implementing Partner):

Date/Month/Year

Agreed by (UNDP): Date/Month/Year

Date/Month/Year

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List of Acronyms

AMESD	African Monitoring of the Environment for Sustainable Development
ACMAD	African Centre of Meteorological Applications for Development
ACPC	African Climate Policy Centre
AfDB	African Development Bank
APR	Annual Project Review
BTOR	Back To Office Report
CAADP	Comprehensive Africa Agricultural Programme
CAP	Country Action Plan
CBO	Community-Based Organizations
CCA	Climate Change Adaptation
CCEWS-1	Climate Change Early Warning Project - Phase 1
CILIP	Community-based Infrastructure and Livelihood Improvement Project
CRR	Central River Region
CTA	Chief Technical Advisor
DCD	Department of Community Development
DMP	Disaster Management Plan
DMS	Directorate of Meteorological Services
DNMS	Direction Nationale de la Météorologie au Sénégal
DOF	Department of Fisheries
DRR	Disaster Risk Reduction
DWR	Department of Water Resources
ECOWAS	Economic Community of West African States
EWS	Early Warning System
GAN	Global Adaptation Network
GBA	Greater Banjul Area
GDP	Gross Domestic Product
GEAP	Gambia Environmental Action Plan
GEF	Global Environmental Facility
GFDL	Geophysical Fluids Dynamic Laboratory
GIS	Geographical Information System
GNAIP	Gambian National Agricultural Investment Programme
GOTG	Government of The Gambia

GRTS	Gambia Radio and Television Services
GSM	Global System for Mobile communications
GTA	Gambian Tourism Association
HDI	Human Development Index
IA	Implementing Agency
IC	International Consultant
ICAO	International Civil Aviation Organization
ICZM	Integrated Coastal Zone Management
IMO	International Maritime Organization
IPCC	Inter-Governmental Panel on Climate Change
KMC	Kanifing Municipal Council
LCD	Least Developing Countries
LDCF	Least Development Country Funds
LHDP	Livestock and Horticulture Development Project
LRR	Lower River Region
M & E	Monitoring and Evaluation
MDG	Millennium Development Goals
MDFT	Multidisciplinary Facilitation Team
MDT	Multidisciplinary Team
MEPID	Ministry of Economic Planning and Industrial Development
MOA	Ministry of Agriculture
MOFEA	Ministry of Finance and Economic Affairs
MOFEN	Ministry of Forestry and Environment
MOFWRNAM	Ministry of Fisheries, Water Resources and National Assembly Matters
NAP	National Action Plan on Desertification
NAPA	National Adaptation Plan of Action
NBR	North Bank Region
NC	National Consultant
NCC	National Climate Committee
NCSA	National Capacity Self-Assessment
NDMA	National Disaster Management Agency
NEA	National Environmental Agency
NEMA	National Environment Management Agency
NEPAD	New Partnership for African Development

NGO	Non-Governmental Organizations
NMHS	National Meteorological and Hydrological Services
NMS	National Meteorological Services
OECD	Organisation for Economic Cooperation and Development
PAGE	Gambia's National Development Plan
PC	Project Coordinator
PCU	Project Coordinating Unit
PD	Project Director
PIR	Project Implementation Review
PPG	Project Preparation Grant
PRSP	Poverty Reduction Strategy Programme
PSC	Project Steering Committee
QMS	Quality Management System
RAC	Regional AGRHYMET Center
SC	Steering Committee
SRFC	Sub-Regional Fisheries Commission
SSA	Sub-Saharan African
TM	Task Manager
TOR	Terms of Reference
UN	United Nations
UNCBD	United Nations Convention for Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
UNISDR	United Nations International Strategy for Disaster Reduction
UNWTO	United Nations World Tourism Organization
URR	Upper River Region
VRA	Vulnerability Rapid Assessment
WCR	West Coast Region
WMO	World Meteorological Organization
WSSITF	Water Sector Reform in The Gambia Project

1 SITUATION ANALYSIS

1.1. Climate change– induced problem

1. Climate change impacts in The Gambia are likely to include increased upstream migration of saltwater, increased salinization of coastal ecosystems, reduction in yield of major crops and receding coastline.[2] The limited availability of climate information is leading to increased challenges in managing, planning and coordinating the response to severe weather events such as droughts and floods in The Gambia. An insufficient coverage by observational infrastructure (both climate and hydrological stations) combined with low capacity to analyse and model the climate and environmental data, have resulted in inadequate information to support decision-making processes at short and long-term ranges. In addition, this prevents the creation of an effective and comprehensive early warning system that helps protect people and productive assets. This weak observational and analytical capability compounds the difficulty to foresee and manage extreme weather events, and to mitigate long term impacts of climate change on various sectors of the economy. Assessments by the National Climate Committee of The Gambia have revealed that the sub-national systems and communities are highly vulnerable to the negative impacts of climate change and at the same time they lack the capacity to adapt to climate change.

2. The projections of future climate in the Gambia indicate that average temperature in the Gambia will increase between 3- 4.5 degrees Celsius, bringing with it an increase in potential evapotranspiration by the year 2075.[3] The temperature predictions as per different General Circulation Models (GCM) can be summarized in the table below. With respect to projected rainfall, model outcomes vary widely between -59% and +29% of the 1951-1990 average of 850mm per annum (GOTG 2003).

[2] First National Communication, 2003

[3] Jaiteh, M.S & Sarr, B. Climate Change & Development in The Gambia; Challenges to Ecosystem Goods & Services; 2010.

Figure 1: Mean Temperatures of The Gambia Using Three GCMS (Source: Second National Communication)

3. Despite the lack of downscaled climate models, there is a reasonable degree of certainty that climate variability and extreme events such as droughts, floods, windstorms and dust-storms will increase in frequency, compounded by land use and land cover change, sea level rise, and coastal erosion.[4]

1.1.1 Impacts on Agriculture

4. The Gambia's economy is predominantly agrarian, with about one third of the land area under some form of agricultural use. The agriculture and natural resources sector contributes 26% of GDP and employs about 68% of the labor force, as well as providing the major source of food for the majority of Gambians. On average an estimated 320,000 ha (57% of total arable land of 558,000) was cultivated annually between 2000 and 2010. Cereals make up about 51.6% of this area, with the remaining 48.4% under cash crops, namely groundnut and sesame.

5. Climate change impacts and associated rainfall variability have had and will continue to have significant economic costs in the Gambia. Agriculture in the Gambia is almost entirely rain-fed cash and food crop production. High population pressure has severely degraded croplands and crop yields are highly dependent on the amount and distribution of seasonal rains. It is estimated that despite the adoption of improved technologies such as crop diversification and the introduction of early maturing and drought resistant seed varieties, crop yields fluctuate by as much as 50% from year to year.

6. GCM analyses also project a decrease in productivity of all major crops due to increase in Potential Evapotranspiration (PET), runoff, and drainage by year 2075. The economic impacts of droughts include increased food insecurity, loss of export earnings over the short-term, and increased rural-urban migration in search of alternative livelihoods.[5]

1.1.2 Impacts on Water Resources

7. Water resources in The Gambia include surface and groundwater. Surface water is comprised of the Atlantic Ocean and the River Gambia and its tributaries. During the height of the flood season, inland surface water including the river can extend over 1,965 km2, about 18% of the total area of the country. Much of The Gambia is low-lying in flood-prone areas.

8. It is projected that increased PET as a result of future climate change, combined with construction of dams in upper Gambia River, will result in reduced freshwater recharge downstream, causing hyper-salinity in mangrove and other wetlands along the river's

[4] Second National Communication, 2013.

[5] Ibid.

estuary zone. Hyper-salinity in rice growing swamp areas could negatively impact the food production and livelihoods associated with production.[6]

1.1.3 Impacts on Fisheries

9. The fisheries sector is comprised of the industrial and artisanal fisheries sub-sectors and contributes about 12% to GDP employing about 36,000 people. Fish is the major source of protein for most Gambians, with per capita fish consumption about 23 kg higher than other sources of protein (livestock and poultry). The marine and coastal fisheries provide for the bulk of the fish; consequently, any negative fluctuation in fish stocks in these areas— which various climate change scenarios predict will occur—will severely impact the wellbeing of the population[7].

10. The Gambia's fisheries and fish resources are vulnerable to climate change and variability in a number of ways. Hyper-salinity in mangroves and other wetland ecosystems could result in systematic spawning and recruitment failures and reduced population of economically important fisheries species. Increase in average temperature and reduced precipitation projected by GCM models could affect the fisheries sector by altering fish habitat availability, quality, and potential for the habitat to sustain fish communities.[8]

11. Moreover, storms and other severe climate events will impact fisherfolk safety at sea and impact coastal livelihoods. As it is, fish production is negatively impacted by the monsoons; increasing variability in rainfall and other weather patterns will impact the ability to fish during other parts of the year.

1.1.4 Impacts on Urban Infrastructure

12. Windstorms and flash floods cause the most damage to property in The Gambia. Each year these hazards result in significant infrastructure damage, injuries and fatalities, and loss and damage to agricultural crops. It is estimated that each year property damage from windstorm, floods, and loss from crop yield amount to tens of millions of Dalasis[9]. In 2010 alone, urban floods affected more than 35,000 people and damaged 2,371 houses and unknown amount of food and cash crops. There are also wider impacts from extreme climate events. Flooding in urban areas increase exposure to malaria and other waterborne and water contact diseases, which can quickly affect many people due to population density.

13. Coastal zones that house the majority of the population are particularly vulnerable to climate change. Key concerns include sea level rise, land loss, changes in maritime storms and flooding, and salinization of coastal water resources. According to some estimates, global sea level could rise between 80cm and 95 cm by 2100 (IPCC 2001). The whole of Barra and over

[6] Ibid.

[7] Jaiteh, M.S & Sarr, B. Climate Change & Development in The Gambia; Challenges to Ecosystem Goods & Services; 2010.

[8] Ibid.

[9] 1 USD equivalent to 38 Dalasi at the time of writing (November 2013)

50% of Banjul including Banjul Port, the country's only deepwater seaport, are at risk of inundation.

1.1.5 Impacts on Biodiversity

14. The extensive wetland systems along the River Gambia harbor a wide range of habitat types supporting a diverse plant and animal species. There are an estimated 104 species of mammals, about 549 species of birds, 59 species of reptiles, and 27 species of amphibians known to be native to the Gambia (GOTG 1998; Barnnet and Emms 2000). Unfortunately, little is known about the status and distribution of biodiversity in the Gambia and how climate change may impact it. What has been noted however is that some wildlife has been changing its behavioural patterns due to seasonal variations.[10]

15. Mangroves and coral reefs are at great risk from climate change as they are completely dependent on sea level variations, rainfall, and salinity, as well as rate of sedimentation.[11] These are also globally significant in that mangroves are the earth's natural filtering system, capable of absorbing pollutants such as heavy metals and other toxic substances, as well as nutrients and suspended matter. They also facilitate soil accretion, by catching sediment washed downstream, which protect coral reefs and seagrasses that have developed an interactive relationship with mangroves over thousands of years. Corals and seagrasses use clear water generated by mangroves in order to feed, photosynthesise and thrive creating yet more habitat for globally diverse marine creatures.

16. Impacts assessments conducted under the Gambia Second National Communication project (GOTG/SNC, 2013) suggest that the country's forest cover will fit less into a tropical dry forest categorization and more into a dry forest and tropical very dry forest categories with approximate sub-division into tropical very dry forest (35 - 40%) and tropical dry forest (45 - 60%), due to climate change.

17. Rangelands will be degraded under warmer and drier climate projections. Lower average soil moisture will affect the nitrogen uptake of plants and their palatability to grazing animals, but of significantly greater importance is the sharp drop in biomass production under projected natural growing conditions. Long-term loss of ecosystem productivity is likely to adversely affect biodiversity in rangelands, even though soil carbon stocks look likely to increase as a consequence of biomass production failures. Elevated atmospheric CO_2 concentrations are expected to increase crop yields, but higher temperatures and water shortage may act to counterbalance this beneficial effect. Simulation results to 2100 suggest that maize production will decrease by 28-40%, late millet production will decrease by 25-44%, early millet production will decrease by 1-21%. Efforts to promote food security and food self-sufficiency will be undermined.

1.1.6 Impacts on Health

18. There is a shortage of research on climate change and its health impacts in The Gambia; the effects of weather and climate inclusive of extremes (droughts, floods, storms) on human

[10] Consultation with Momodou Kassama Acting Director Parks & Wildlife Management, 28/2/2013

[11] Barnett, L.K., Emms, C. and Santoni, C. (2001) *The Herpetofauna of Abuko Nature Reserve, The Gambia*. Herpetological Bulletin 77, 5-14.

health are difficult to quantify because of poor reporting and paucity of research into secondary and delayed impacts. It is assumed however, that climate change impacts on the environment could alter breeding habitats of disease vectors and vector-borne transmission pathways, and endanger the survival of floristic species essential to traditional/alternative medicine.[12] Climate-related illnesses such as malaria which peaks in the rainy season (July-October) and diarrhoeal diseases which increase during the monsoons due to inadequate water handling practices and environmental sanitation exacerbated by uncontrolled runoff and flooding[13], are likely to be impacted by climate variability.

1.1.7 Policy Responses

19. The Gambian Government has acknowledged the climate change risk the country faces and has stated it as a priority for the country in its NAPA. As a part of this plan to address climate change, the need for enhanced weather forecasting and analysis is recognised as crucial both for short-term warnings and long term planning for adaptation.

20. The Programme for Accelerated Growth and Employment (PAGE), which is the successor to the Gambia's Poverty Reduction Strategy Paper II and has a time period from 2012 to 2015 (MoFEA, 2011), is the four-year blueprint for the implementation of the Gambia Vision 2020. This documents builds up on the gains of the PRSP II and lessons learnt from the challenges experienced therein. Pillar 1 and 5 of the PAGE on Accelerating and Sustaining Economic growth and Reinforcing Social Cohesion respectively lay emphasis on addressing Climate Change and Disaster Reduction.

21. The key policy responses that document The Gambia's response to climate change include:

- GOTG/GEF/UNEP Greenhouse Gas Inventory of 1997;
- GOTG/USA Climate Change Vulnerability Assessment of The Gambia in 1997;
- GOTG/GEF/UNDP National Capacity Self Assessment of 2002;
- GOTG/GEF/UNDP Initial National Communication of the Republic of The Gambia to the UNFCCC in 2003;
- GOTG/GEF/UNEP National Adaptation Program of Action (NAPA) in 2007;
- GOTG/GEF/AfDB Nationally Appropriate Mitigation Actions (NAMA) in 2011;
- GOTG/GEF/UNEP Second National Communication (SNC) of the Republic of The Gambia to the UNFCCC in 2013.

1.2 Long-term solution

22. The problem that this project seeks to address is that rural populations and major settlements are severely exposed to climate variability, extreme climate events and erratic

[12] Second National Communication, 2012

[13] Ibid.

rainfall regimes. Long-term climate impacts are also likely to further erode The Gambia's economic development opportunities and livelihoods. The preferred solution to this problem is an effective early warning system, along with development planning processes that are based on accurate and reliable climate information and hydrological services.

23. As a foundational adaptive measure, the deployment of effective hydro-meteorological services and early warning systems benefits the poorer segments of society, who do not necessarily benefit from large protective infrastructure projects[14]. It also provides benefits for long term planning and helps the NHMS and other institutions build capacity to service other needs e.g. for land-use and agricultural planning, hydro-electric power, etc., in the face of a changing climate.

24. The proposed solution to enhance the country's capacity to gather and analyse climate and environmental information involves:

i) establishing a functional network of meteorological and hydrological monitoring stations and associated infrastructure to better understand climatic conditions and changes at short, mid-term and long-term ranges;

ii) strengthening the skills, competencies, standards and procedures required to run an effective hydro-meteorological system, and early warning network;

iii) developing and disseminating tailored weather and climate information to government entities, private sector, civil society, development partners and local communities; and

iv) supporting the uptake of climate information and integration of climate knowledge into local routine development plans.

25. Based on consultations with stakeholders (see complete consultation report in Annex), the key needs for effective messaging, dissemination at the regional and local levels include:

- Targeted user-friendly early warnings that can be understood by targeted audience
- Use of local languages in disseminating information
- Use of mobile phone technology and community radios to reach greater audiences
- Climate change and adaptation training of extension workers and MDFTs that can be disseminated at the local level
- Inclusion of women Kanyaleng groups to rapidly disseminate information
- Supporting villages, in particular Village Development Committees, in climate-proofing local development plans
- Enhanced collaboration between hydro-meteorological and disaster management entities to issue warnings and respond
- Enhance understanding of weather forecasts and what they mean
- Rendering the information, communication and sharing system versatile by using a variety of communication media, and partners including the media and civil society organizations that are active at the local community level in recognition of their capacity for public sensitization and education e.g print and electronic media for literate stakeholders and the Multi-Disciplinary Facilitation Teams (MDFT) and Community Radios for illiterate and grassroots level stakeholders. (The MDFT is composed of Extension Agents from all central government sectors, Civil Society Organizations and Local Government personnel.)

[14]World Bank (2010). Natural hazards, Unnatural disasters: Effective prevention through an economic lens. World Bank and United Nations.231 pp.

1.2.1 Adaptation planning and integrated adaptive management

26. To support improvements in weather forecasting in The Gambia, EWS for floods and droughts, and long term planning for climate change adaptation, there is a need for effective institutional capacity to be fostered on hydro-meteorological issues. This involves:

- Enhanced technical assistance and procurement of upgraded hydro-meteorological equipment, to improve weather predicting and forecasting techniques.
- Linking meteorological and sectoral information more effectively
- Improved capacity building to adopt new technologies and use them to make more timely and accurate weather/climate forecasts in both the short term and the long term.
- Enhanced technical capacity of hydro-meteorological staff to maintain, repair and manage equipment
- Establishing a cadre of professional, certified hydro-meteorological staff
- Build relationships with private partners for cost-recovery
- Working in collaboration with other governmental partners to streamline activities, feedback into processes, harmonise activities and reduce costs. Linkages between institutions involved in issuing early warnings, disseminating the warning and taking mitigating actions will have to be strengthened and standardised. Standard operating procedures (SOPs) describing the processes, communication channels and responsibilities of each agency and institution involved in the early warning, dissemination and preparedness need to be developed and enacted to provide the country with a clear and effective system of early warning where each institution is aware of its responsibilities and can act accordingly.

27. This LDCF project will target the inclusion of women in several ways:

- Increase the number of female participants in trainings and capacity building workshops
- Establish sex-disaggregated targets
- Identify high female participation in strategic Human Resources Development Plans
- Attract female participation to hydro-meteorological school most notably in the Water Resources Training School and Extension Services certification
- Engage the use of female MDFTs and extension staff in mobilising communities
- Depend heavily on Kanyaleng women (traditional female communicators) to disseminate climate information and early warnings.

1.3 Barriers

28. The Gambia currently has a hydro-meteorological data generation, information monitoring and early warning system managed by the National Meteorological and Hydrological Service (NHMS). The NHMS is housed in the Department of Water Resources (DWR) of the Ministry of Fisheries, Water Resources (MoFWR) and is comprised of the following: (figure 2 organogram)

29. The current policy focus of the NMHS is to use its network of weather, climate and freshwater observing and monitoring stations to collect data and information that will enhance short to medium term weather forecasting, climate change monitoring, including early warning of hydro-meteorological related hazards and the status of freshwater.

30. There is currently limited capacity to assess and respond to climate change impacts. The national and local administrations have limited systematic knowledge of climate change risks, adaptation needs and options. Moreover, individual, institutional and systemic capacities to act on climate risks remain low. Although some indigenous coping mechanisms such as crop diversification towards production of drought tolerant crops are observed, more systematic adaptive planning is not currently taking place and local communities are not yet fully engaged in desperately needed adaptation action.[15]

31. The current hydro-meteorological system cannot meet country needs and remains ineffective due to critical gaps in the system. These include:

- Irregular and unreliable collection and processing of hydro-climate information and data;
- Low levels of capacity, skills and human resources to operate an adequate early warning system; and
- Ineffective communication of climate information and early warning messages to end users.

32. The following main barriers have been an impediment in achieving the preferred solution and will be targeted in this project:

1.3.1 The lack of a central, legally and financially autonomous meteorological services

33. The institutional context in which the NHMS functions, does not allow the system to attract financial and human resources, leading to severe shortcomings in annual budgets for operations and investments, as well as understaffing in all key professional and technical functions. As a result, only basic climate services are being provided and the country remains underserved.

34. Furthermore, the division of labour between the units responsible for various hydro-meteorological operations, as well as the other institutional stakeholders such as the National Environment Agency (NEA) or the Department of Agriculture (DoA) have created inefficiencies and inconsistencies in the quality of service delivery. There is a need for a transformed institution with the capacity to expand current services and improve on the quality of service delivery and as such contribute effectively to national food security, poverty reduction, environmental sustainability and safety of lives and properties.[16]

35. The transformed institution should be vested with authority to generate revenue from its services and thereby reduce its dependence on the national budget. With considerable increases in resources, and the said resources being more readily at hand, the improved institution's transactions can be expected to be swifter, more effective and efficient.

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[15] Sock, D. & Ngum, A. Designing a Climate and Climate Change Early Warning System for The Gambia Through Identification, Collection, Processing and Inclusion of Representative Socio-Economic Data for Impacted Communities: Socio-Economic Consultancy Report. 2012. Page

[16] WMO Office for North, Central and West Africa (2008). Proposal for the Transformation of the Meteorological Services of The Gambia.

36. It is anticipated that a transformed meteorological services institution will provide better contributions towards accelerating and sustaining national development efforts, which currently depend significantly on climate sensitive sectors, ensuring that the climate resource is harnessed fully, that climate is seen as a 'development' issue and that the negative impacts of climate hazards on lives and properties are minimized.[17] (Additional information on current resources and capacity of NHMS is in Section 2.4)

1.3.2 Inadequate or insufficient infrastructure, technologies, equipment and human resources

37. In the Gambia only 10 land stations (synoptic), one marine station and one Satellite Receiver are operational. Some of the land stations were closed due to operational difficulties arising from limited availability of instruments and inadequate staff numbers. The Satellite Image Receiver at the Central Forecast Office at the Banjul International Airport in Yundum captures and records cloud pictures. However, the existing receiver system is limited in terms of the software for digital capture and display of the products. The 17 Hydrological stations distributed along the River Gambia and its tributaries are either non-functional or are equipped with obsolete instruments. No Pilot Balloon or Radiosonde stations are operational. There is no equipment for the sounding and recording of upper air and atmospheric meteorological parameters.

38. In terms of monitoring, most hydro-climate data collection is conducted manually in sites across the country and therefore depends on availability of staff, accessibility of sites and financial considerations. Night measurement values are not recorded as most of the sites are severely understaffed, and there are very long work hours for the personnel at these locations. Information is mostly recorded from 6 a.m. to 9 p.m. The collected data is called in to the forecast office, but there is only one line and it is not staffed all the time.

39. The functional weather station sites across the country are typically composed of a Stephenson screen and manual rain gauges. These are highly vulnerable to the elements and can be damaged by strong winds. These stations are also unable to record the intensity of rainfall (which is very relevant to The Gambia, given its vulnerability to erosion); level of humidity, and sunlight. There are no autographic records.

40. The number of meteorological and hydrological stations is currently inadequate to address all of the aforementioned climate risks. The spatial distribution and density is poor as there are some large areas of the country that are not covered by observation stations. Only 50% of the territory is covered by some form of manual monitoring network. In addition to data collection systems, there are weak data analysis functions that are exacerbated by the lack of human resources, skills and tools. (Additional information on baseline capacity is provided in Section 2.4)

1.3.3 A shortage of skilled hydrometeorological staff

41. As noted above, due to its financial constraints, the Gambian NMHS has an inadequate number of qualified technical and professional staff to enable it to function optimally as required by its mandate.

42. There is a severe shortage of human resources capacity to carry-out:

[17] Ibid.

- Data collection, processing, interpretation and dissemination of information climate prediction and provision of appropriate weather warnings and advisories
- Effective maintenance of instruments and equipment,
- Day-to-day operations at the climate stations;
- Sensitization of local communities on climate risks and how to adapt to them

43. Access to capacity building and training is a central concern as there are limited resources domestically and often staff members do not have the necessary prerequisite accreditations to obtain training abroad and enhance the necessary levels. Inability to attract qualified staff, visa challenges for foreign training, retirement and retention of personnel, and high costs associated with hydro-meteorological training further exacerbate this problem. Meteorological equipment and carrying out forecasts requires highly skilled and specialized personnel, which poses challenges to the existing system. There is also the major barrier of not having in-country engineering capacities for maintenance and repair of existing equipment.

44. The Hydrology Division for instance, is unable to provide the required minimum of two trained WMO Class IV (entry level technicians) personnel to operate a Hydrological Station. The limited number of existing staff also puts a great burden on the existing personnel who have to put in long hours with few resources. The staff of the Central Forecast Office at the Banjul International Airport and Basse Meteorological Station in URR operate 24 hours a day and staff at other Meteorological and Hydrological stations operate 12 to 15 hours a day. These long hours of work put very serious stress on this limited number of workers.

45. If left unaddressed, the issue of qualified personnel will become an even bigger challenge given that 40 percent of the existing trained and experienced staff of the National Meteorological and Hydrological Services will be reaching the statutory retirement age from the civil service within the next three years. In order to capitalize on the experience and knowledge of current staff, it will be necessary for any successful recruitment strategy to have some overlap between the new generation of the hydro-meteorological staff and the retiring ones.

1.3.4 Ineffective communication of climate information at all levels

46. The Gambia has weak communication links which prevent the transfer of effective early warnings down to the local level. This challenge exists at all levels: within the hydro-meteorological network, intra-governmentally, down to the regional level, and finally down to the village level. The challenge exists both at the information generation level (obtaining data in real time from across the country, covering remote areas) and at the dissemination level (early warning transmission or longer-term climate communication).

47. Based on baseline studies, the inability to disseminate hydro-meteorological and climate information was found to be the most serious failing of the National Meteorological and Hydrological Services. This is due in large part to the absence of an effective information and communication sharing capacity and infrastructure. The inability to provide effective warnings of severe weather includes low awareness of the user community about the hydro-meteorological services, the language and time of broadcasts of the TV weather forecasts, the absence of formalized operational procedures, and the lack of formalized user feedback mechanism between the provider and users of hydro-meteorological information.

48. The information generated is also not disseminated to the target audience in a timely fashion and in the format and language understood by the user communities. The weather forecast bulletin is generated and

broadcast at a fixed time once a day and the forecast is not amended even if weather conditions have changed within the 24-hour period. Consultations revealed that very few people follow the Gambian television forecast, do not fully understand what the forecasts mean both due to language and technicality, and have low confidence in its reliability. Many of them also do not have access to televisions and electricity to be able to watch it.

1.3.5 Inability to integrate climate information into development planning

49. The shortage of accurate and reliable climate information prevents such information from being integrated into local, regional and national development plans. Given the population's dependency on rain-fed agriculture, fisheries, and tourism industries, improved climate knowledge is essential for future development planning, particularly as those sectors of the economy may be at future risk.

50. One of the issues for sectoral institutional partners is that they do not receive sector-relevant climate advice that they can integrate into their development planning. This is a result of all the other barriers in that currently NHMS does not have the optimal equipment to generate such information, sufficient skilled staff to interpret it, strong communication links to communicate it effectively, and there is also a lack of understanding of the kind of tailored climate products that are needed to serve the development needs of sectoral partners, and the resources to fund them.

51. Sectoral institutional partners are also unaware of the kind of services that can be provided to them to obtain development-relevant advisories and warnings. At the local level, visits to the pilot sites revealed that although there are village development committees in all villages, they have had no knowledge or concept of including climate change risk planning into their development plans. Similarly, at the regional level, climate change is not incorporated into yearly planning. In addition to the lack of climate information, this is also due to a lack of public sensitization on climate change impacts and how they may impede future development.

2 STRATEGY

52. The project will address these barriers by supporting the transition of the NHMS into an autonomous and financially viable agency; enhancing the climate monitoring and collection of information and data; strengthening the skills and human resources to operate an adequate early warning system; and enhancing the effectiveness of the communication of climate information and early warning messages to end users.

53. Central to this strategy are the Multi-Disciplinary Facilitation Teams (MDFT), which operate in every Region as a structure that is responsible for extension service in the country. The Regional MDFT is composed of Extension Agents from all central government sectors (Agriculture, Livestock, Fisheries, Health, Water Resources, Environment, Forestry, Wildlife and Biodiversity, Media/Communication (GRTS and Community Radios), etc), Civil Society (NGOs, CBOs, Women and Youth Groups, etc) and Local Government (Elected leaders, Local and Religious Leaders and Regional, District and Village Development Committees). These will act as key intermediaries among the national, regional and local levels.

54. This project is conceived as the second phase of a project addressing the first priority project of the Gambia NAPA. It will build on the achievements of the first phase, which successfully piloted and demonstrated the use of climate change early warning system at smaller scale. The first phase was

funded through an LDCF-supported project, implemented with UNEP support, which is ending in 2014[18]. This second phase LDCF project will operate in 14 project sites (2 in each Region), in order to effectively improve and upscale the results of the first phase. The 14 pilot sites are:

- Tanji and Kanlagi of the West Coast Region
- Jappeni and Kwinela of the Lower River Region.
- Salikene and Kerr Ardo of the North Bank Region.
- Bansang and Kuntaur of the Central River Region.
- Ndingri and Dasilameh of the Upper River Region.
- Crab Island and Soldier Town Wards of Banjul City Council.
- Dippa Kunda and Ebou Town Wards of Kanifing Municipal Council.

55. LDCF financing will contribute towards helping The Gambia become more resilient to climate change by improving its capacity to monitor and forecast extreme weather and long-term climatic changes. This initiative will also support the planning authorities to routinely include climate risks into their planning processes, and will lead to a more informed public at the local level that is cognisant of climate risks and threats, and can plan their activities with such knowledge.

56. LDCF financing will also increase analytical skills and capability of hydrological and meteorological staff to better analyse/model and package weather, climate and hydrological information. It will improve the effective and efficient functioning of these crucial monitoring and forecasting institutions to deliver their mandate, including the timely issuing of forecasts and warnings. It will also help the Gambia's current NHMS transition towards a sustainable, autonomous institutional setup, with adequate financial and human resources and systems in place for continued operation.

57. The project will invest in the acquisition and deployment of effective communication messaging and vehicles of dissemination and will seek to ensure that this project does not just focus on information generation at the government level (both equipment and institutional-wise). The project promotes the analysis of hydro-meteorological information and its conversion into effective, targeted communication to various stakeholders that serve to inform people at the community level across the country. Feedback mechanisms are built into the project (Component 2), so as to regularly review whether EW are reaching the local level, whether they are being understood, and whether they are being responded to through adaptation plans.

58. This strategy also ensures that environmental and social impacts are mitigated (see Annex 9 for the UNDP Environmental and Social Screening Template (ESSP)). For instance, the installation of climate monitoring equipment (Ouputs 2.1, 2.2, and 2.3) will involve a number of considerations so as to prevent harmful environmental and social impacts. These include:

- Climate monitoring equipment and any infrastructure to host such equipment (Outputs 2.1, 2.2 and 2.3), will mostly be installed on sites of previous weather monitoring stations, or on land that has already been determined for this purpose.
- For any construction of infrastructure (Output 2.1--hydrological station at Bansang) the buildings will adhere to planning rules and regulations in place and already have

[18] Strengthening of The Gambia's Climate Change Early Warning Systems (2011-2014)

government and stakeholder agreement. It has been determined that no new significant land clearing will take place for the installation of hydrological or climate monitoring equipment. Should these occur, however, EIA will be conducted and its cost will be borne by the Gambian Government.

- In line with current local practice, equipment will be established with permission and collaboration with regional governors and local chiefs so as not to impede on any regional and community level livelihood, spiritual or leisure activities. Regional Governors have been/will be engaged in determining the sites of any installations, as will village-level leadership to determine ideal placement and protection of equipment
- Greenhouse gas emissions may be emitted due to soil disturbance during mowing of grasses and trimming of tree branches in and around the climate observing stations. However, this is comparatively insignificant and impacts would be minimized.
- In the case of the buoy marine station, in addition to being monitored by the Department of Fisheries and Water Resources, fishermen will receive sensitization on what the equipment is and how to protect it. This will ensure that those that are most in contact with this installation are able to understand what it is, avoid being disturbed by it and prevent its damage in their usual activities. Given the small size of this equipment, it will not disrupt fishing practices.

2.1 Project rationale and policy conformity

2.1.1 Project Rationale

59. The Gambia does not have a fully effective early warning system to generate knowledge of climate change risks, vulnerabilities and hazards, and this prevents the country from planning, monitoring, responding and adapting to climate change and climate variability risks.

60. This project addresses the current EWS-related gaps which include: i) a limited understanding of current and future risks; ii) limited monitoring and forecasting of climate-related hazards; iii) inappropriate communication and packaging of warnings; iv) restricted responses to impending disasters and v) constrained planning for slow-onset changes due to climate change that will require a transformational shift in economic development and risk reduction efforts.

61. This project will invest in strengthening current systems to lead to a fully operational EWS for the Gambia at the institutional level, which can in turn serve local communities particularly in remote and vulnerable regions. This will be carried out through improving national capabilities to generate and use climate information in the planning for and management of climate induced hazard risks, developing core skills and competencies, acquiring relevant technologies, improving early warning dissemination and advisory communications; and promoting the uptake of climate information at the local level.

2.1.2 Policy Conformity

62. The Gambia is a Party to the three Rio Conventions on Biodiversity, Climate Change and against Desertification. It ratified the Conventions on Biodiversity and Climate Change on June 10, 1994 and that on Desertification on June 11, 1996. The Gambia has also ratified other international and regional environmental conventions, such as: the Ramsar Convention on Wetlands, CITES, the Bonn Convention on the Conservation of Migratory Species of Wild Animals, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, the Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa, the Cartagena Protocol on Biosafety, the Montreal Protocol, as well as the Abidjan Convention. This project conforms to broader government policies, goals and commitments The Gambia has made under the Rio Conventions.

63. The project is well aligned in addressing the goals espoused in the NAPA as projects in the NAPA portfolio seek to address urgent and immediate climate threats through actions that: (i) deliver immediate adaptation benefits; (ii) contribute to building local and national adaptive capacities; and (iii) create awareness and build foundations for maximising long-term adaptation benefits. This project is designed to deliver immediate adaptation benefits by making available real-time climate data, building local and national adaptive capacities through various institutional and community level capacity-building exercises (most notably strengthening hydro-meteorological capacity, increasing climate change and adaptation training for extension workers/MDFTs to be delivered at the local level), and to incorporate climate knowledge to promote long-term climate benefits by creating the necessary institutional structures and policy tools, as well as assess the adaptation needs revealed through more complete climate information. The Gambia's number one priority NAPA intervention is related to EWS, titled, "Rehabilitation of Early Warning Systems on Climate Related Natural Hazards."

64. The project is consistent with the adaptation capacity building measures suggested in the NAPA that include: 1) public awareness building on climate change, development, and livelihood issues; 2) enhancement of technical and managerial capacities of implementing agencies, beneficiaries (artisans, technicians, civil society organizations) and extension workers; 3) participatory planning and implementation; 4) provision, construction and upgrading of physical assets essential to the reduction of sectoral vulnerabilities; 5) introduction of new/alternative technologies and production methods; and 6) institutional re-alignments and mainstreaming of adaptation.

65. The NAPA also articulates the need for securing, transferring and installing critical technologies, as well as developing the necessary systems for climate change-related information to permeate into decision-making processes. The technologies required to achieve these aims will increase the capacity of the national early warning network to forewarn and rapidly respond to extreme climate events. Because accurate climate information forms the basis of many sectoral decisions, this project provides the foundational capacity with which The Gambia will be able to address its other priority adaptation needs in the short and longer term.

66. The project supports the **Gambian Environmental Action Plan (GEAP)**, which integrates the obligations associated with the Rio conventions into a national planning framework. The GEAP was adopted by Government in July 1992 to provide the overall national environmental policy framework. The 2008 GEAP recommends a focus on climate change through actions that: deliver

immediate adaptation benefits; contribute to building local and national adaptive capacities; and build foundations for maximising long term adaptation benefits.

67. The project also addresses one of the main issues identified in The Gambia's **National Capacity Self-Assessment (NCSA)** in regards to implementation of the UNFCCC. The NCSA notes that there are inadequately developed environmental information systems, and the national meteorological and hydrological service that monitor the climate systems, need to be improved. Relevant priority actions include: To replace and upgrade the conventional equipment to digital equipment; to provide continuous recording of the meteorological, hydrological and climatological elements and phenomena; to rehabilitate and expand the existing station networks for more representative monitoring of weather, climate and other environmental issues; to provide better and bigger capacity data processing and storage equipment for the upgrading, networking and inter connectivity of the various data systems of the DWR and other collaborating institutions. This project fulfils all of these relevant priority actions.

68. The project also conforms to a number of national policy instruments such as the **PAGE**, which discusses the need to mainstream environmental issues as one of its five main priority areas. It also addresses Priority Area 1 of the **UNDAF on Poverty Reduction and Social Protection** whose main outcome is: "Poverty reduction and social protection strategies and systems are established that enable the poor, vulnerable, women and youth to increase their productive capacities and generate sustainable livelihoods while protecting the environment". Specifically the project will contribute to the country programme outcome 1.3.3: Establishment of a national Early Warning system, national Emergency preparedness and relief plans development and implementation supported. The project is also consistent with the current UNDP Country Program (CPD) that includes the theme 'Promoting Inclusive Equitable Growth & Reducing Vulnerabilities' and dwells on environmental vulnerabilities, identifying climate change as a major environmental challenge for the Gambia.

69. In adherence with current planning rules and regulations, any installation of infrastructure will comply with land tenure agreements, have government and stakeholder agreement, and in any case of physical construction (Output 2.1), will require an EIA. Please refer to ESSP in Annex 9 for additional details on environmental and social risk management.

2.1.3 LDCF Conformity

70. This project is fully in line with LDCF/SCCF focal area objective 2 "Increase adaptive capacity to respond to the impacts of climate change, including variability, at local, national, regional and global level" and objective 3: "Promote transfer and adoption of adaptation technology".

71. The LDCF was created with the objective of funding urgent and immediate adaptation needs in the LDCs as identified in the NAPAs. The project conforms to the LDCF's eligibility criteria, namely: i) undertaking a country driven and participatory approach; ii) implementing the NAPA priorities; iii) undertaking a multi-disciplinary approach; iv) promoting gender equality; and v) undertaking a complementary approach, as described below:

- Country drivenness and undertaking a participatory approach: Activities to be undertaken by the project were selected through numerous stakeholder consultations (Phase 1 of the project, Phase 2 PIF development, PPG, and NAPA).
- Implement NAPA priorities: the project addresses the first NAPA adaptation priority and provides a basis for addressing all others more effectively and sustainably.

- Multi-disciplinary approach: the project addresses multisectoral concerns (fisheries, water, finance, disaster risk reduction, public works, coastal management, environmental management), and works with various institutions to enhance the dissemination and application of climate information. The project will also work at different institutional levels (national government, regional level, community level).
- Gender equality: The project is designed with realistic and ambitious targets for female inclusion and participation in the acquisition of climate information (enhancing female hydro-meteorological staff and level of skills), dissemination of climate information and recommended adaptative interventions (enhancing female extension workers/MDFTs training); and ensuring that women at the local level receive capacity building. Female stakeholders have also played a key role in the design of the project through various consultations.
- Complementary approach: In order to build upon existing plans and avoid the duplication of efforts, the project will work in conjunction with relevant on-going projects in The Gambia (see Section 2.3.1 for details). The fact that this project is a joint UNDP-UNEP project also creates synergies and opportunities for the alignment of the various projects developed under the two institutions.

2.1.4 Overall GEF Conformity

72. The project has been designed and will be implemented to meet GEF requirements in terms of:

a) Sustainability: The project has been designed to have a sustainable impact, at community, and at national level. See section on sustainability below for more details;

b) Replicability: The pilot approach of establishing a functional early warning system in 14 pilot sites across every region of the country will generate approaches, tools and methods that can be addressed elsewhere in The Gambia and finally lead to the establishment of a fully functional national approach. See section on replicability below for more details.

c) Monitoring and Evaluation: The project has an in-built, effective and well-resourced M&E framework, that will not only ensure that project implementation is as planned, but also provide information through regular progress reports for necessary corrective actions and adaptive management decisions to be taken, and for lesson learning to take place.

d) Stakeholder involvement: The project was designed in a participatory manner to ensure significant stakeholder inputs, and will be implemented in a way to ensure their full participation in all implementation aspects including monitoring and evaluation.

2.1.5 Stakeholder Analysis

73. Consultations with stakeholders underpinned the project preparation stage so as to ensure broad participation and ownership of this project (see Annex 8.6 for a summary of consultations). Given the multidimensional aspect of EWS and the necessity for effective coordination and communication among different partners, the PPG involved diverse stakeholder consultations. In particular, the goals of stakeholder consultations were to:

- Review and analyze current and past interventions by government, donors, NGOs and private sector institutions that are related to EWS and their intended objectives Identify the

successes, failures, limitations and benefits of previous EWS-related initiatives for lessons learned

- Gauge the political climate: political will on the part of stakeholders to participate; understand competing interests, identify coordination and political challenges
- Clearly understand what are the most pressing sector-relevant needs relative to EWS, and if these were to be resolved, what benefits they would they yield to the broader population and vulnerable groups. Understand both the needs of providers and end-users.
- Identify which are the most strategic, cost-effective and impactful activities.
- Understand which stakeholders are best poitioned to carry out which activities
- Identify the limitations of current capacity and the weaknesses of data generation, analysis/interpretation, dissemination and uptake by stakeholders, in order to determine the absorptive capacity for the types of activities initially proposed by Government (as per the Council approved PIF)
- Achieve consensus on the scope and activities of this project and how various stakeholders will participate, contribute and benefit
- Review of existing technologies for EWS at the country level including their capabilities, manufacturers, capacity of existing technical personnel for operation & management in order to identify capacity gaps and needs in the context of information useable for the planning purposes of different stakeholders (users).
- Identification of training needs and review previous trainings and how they will or will not support EWS
- Generate improved knowledge on how to reach vulnerable communities
- Establish national partnering opportunities among organisations and stakeholders
- Identify of institutional bottlenecks and challenges
- Confirm co-financing partners, and identify potential long-term co-financing streams for sustainability of the project
- Assessments of potential sites for infrastructure, equipment, pilot activities
- Assessment on the ability of the NHMS and other ministries/departments to budget, plan and accommodate for the human and technical costs of the proposed project

74. A first round of consultations with key sectoral institutional stakeholders at central level provided initial input into the project design, including through the distribution of a survey and the conduct of bilateral meetings where needs were expressed as regards climate and hydrological servies.

75. At the local level, The project preparation phase involved initial bilaterals during the first mission 18-21 March with:

- Department of Water Resources,
- Department of Agriculture,
- FAO Country Office in The Gambia,
- UNDP Country Office,
- Gambia Chamber of Commerce and Industry,
- Stay Green (NGO),
- Governor of North Bank Region,
- National Disaster Management Agency (NDMA),
- Central Weather Forecast Office – Banjul International Airport,
- Kanifing Municipal Council (KMC),
- National Environment Agency (NEA),

- Livestock & Horticulture, Department of Agriculture,
- Water Monitoring Lab, Department of Water Resources,
- Communication, Education and Extension Services, Department of Agriculture,
- Department of Parks & Wildlife Management,
- Minister of the Environment, and
- Community radio

76. These bilaterals were followed by a workshop inviting all government ministries, municipal level governments, private sector actors, academic organisations and NGOs to describe the project, discuss the outcomes, identify challenges, barriers and discuss sites where the work could be implemented (for complete report, please refer to annex). The workshop was followed up with a series of bilaterals as well as by the distribution of a survey to all government ministries. Government ministries were requested to feedback on what their most pressing needs are vis-à-vis EWS, and what the barriers have been in either producing, analyzing, disseminating or using climate data (sector feedback is in the Annex). The National consultants followed up with the survey with numerous bilaterals in order to generate high participation from stakeholders.

At the local level, the national consultants met with regional and municipal partners in order to help identify locations for pilot activities. One of the overwhelming feedback that was received from the inception workshop and from follow-up bilateral consultations was that pilot activities should be carried out in every region so as to increase coverage and ensure equality of participation in the project. It was determined that two villages per region would be adequate in covering most of the country, its sub-climate differences, and the linguistic and ethnic diversities. The governors of each region helped designate the pilot villages. Ultimately 14 villages were identified by the regional governors based on their large size, their basic capacity to participate, the existence of village institutions, proximity to neighbouring villages, vulnerability to climate change and interest in participating. The designated villages self-identified and established contact groups, composed of the village head/Chief, Kanyaleng women's group, representatives from the main livelihood groups, representatives of different clans, youth, the village development chair and MDFTs. The national consultants held meetings with these contact groups so as to explain the parameters of the project (a complete list of local level consultations is annexed), and understand the various weaknesses and challenges that currently exist relative to EWS, as well as the pressing needs for climate information in the local communities.

77. Following national-level and contact group consultations, a revised project framework was presented and discussed at a second workshop in August 2013. Relevant partners such as DWR, MOA, NDMA, NEA, MOFEN, Ministry of Local Governments, GRTS, reviewed the contents line by line so as to identify the value of each activity, assess its cost-effectiveness, discuss its feasibility, identify barriers and impacts. Following rigorous discussion and debate a final project results framework was validated, which forms the basis of this document. (see Section 3).

Given the wide-ranging impact of EWS and the high level of interest and buy-in at all levels, this project includes numerous stakeholders and beneficiaries. The following table highlights the key stakeholders, and partners identified to date, which will be involved in delivering and supporting the implementation of activities:

Stakeholders	Outcomes Stakeholders will be involved in	Outputs Stakeholders will be involved with
National Government Institutions		
Ministry of Fisheries, Water Resources and National Assembly Matters	1 The Gambia National Meteorological Services is supported in its transition to becoming a financially sustainable Meteorological Agency 2 Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by recent needs assessment reports in the Gambia 3 A critical mass of skilled human resources is able to operate the Gambia Early Warning System and perform medium and long-term adaptation planning beyond the project 4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	1.1 A comprehensive business plan for deployment of effective hydro-met service developed 2.1 Effective, timely and accurate flood warnings issued 2.2 Increased availability of real time climate data 2.3 A marine meteorological station network is operational 2.4 The water quality monitoring system is upgraded 2.5 A comprehensive data base and data management system is established and centralized 3.1 A cadre of certified maintenance and repair technicians exists within the NHMS 3.2 A recruitment and retention strategy is developed 3.3 A cadre of certified hydromet professionals is established 4.1 Targeted climate products are produced for sectoral institutional partners 4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up. 4.3 Underserved communities receive early warning messages 4.4 Climate change issues are integrated into local development plans in 14 sites 4.5 Knowledge, data and information on climate impacts on local biodiversity is available 4.6 Knowledge management structures for effective feedback and incorporation of lessons learned are created
Ministry of Forestry and Environment & National Environment Agency	2 Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by	2.5 A comprehensive data base and data management system is established and centralized 4.1 Targeted climate products are produced for sectoral institutional partners

Stakeholders	Outcomes Stakeholders will be involved in	Outputs Stakeholders will be involved with
	recent needs assessment reports in the Gambia 4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up. 4.5 Knowledge, data and information on climate impacts on local biodiversity is available
Ministry of Agriculture	2 Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by recent needs assessment reports in the Gambia 4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	2.5 A comprehensive data base and data management system is established and centralized 4.1 Targeted climate products are produced for sectoral institutional partners 4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up. 4.3 Underserved communities receive early warning messages 4.4 Climate change issues are integrated into local development plans in 14 sites 4.6 Knowledge management structures for effective feedback and incorporation of lessons learned are created
National Disaster Management Agency (NDMA)	2 Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by recent needs assessment reports in the Gambia 4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	2.5 A comprehensive data base and data management system is established and centralized 4.1 Targeted climate products are produced for sectoral institutional partners 4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up. 4.3 Underserved communities receive early warning messages 4.4 Climate change issues are integrated into local development plans in 14 sites 4.6 Knowledge management structures for effective feedback and incorporation of lessons learned are created

Stakeholders	Outcomes Stakeholders will be involved in	Outputs Stakeholders will be involved with
Department of Parks and Wildlife Management	2 Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by recent needs assessment reports in the Gambia 4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	2.5 A comprehensive data base and data management system is established and centralized 4.5 Knowledge, data and information on climate impacts on local biodiversity is available 4.6 Knowledge management structures for effective feedback and incorporation of lessons learned are created
Ministry of Works, Communications & Infrastructure	2 Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by recent needs assessment reports in the Gambia 4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	2.1 Effective, timely and accurate flood warnings issued 2.2 Increased availability of real time climate data 4.3 Underserved communities receive early warning messages
Ministry of Local Governments and Lands	4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up. 4.3 Underserved communities receive early warning messages 4.4 Climate change issues are integrated into local development plans in 14 sites
Ministry of Finance and Economic Affairs	1 The Gambia National Meteorological Services is supported in its transition to becoming a financially sustainable Meteorological Agency 3 A critical mass of skilled human resources is able to operate the Gambia Early Warning System and perform	1.2 A comprehensive business plan for deployment of effective hydro-met service developed 3.3 A cadre of certified hydromet professionals is established

Stakeholders	Outcomes Stakeholders will be involved in	Outputs Stakeholders will be involved with
	medium and long-term adaptation planning beyond the project	
Ministry of tourism and Culture	2 Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by recent needs assessment reports in the Gambia 4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	2.4 The water quality monitoring system is upgraded 4.5 Knowledge, data and information on climate impacts on local biodiversity is available
Department of Community Development	4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up. 4.3 Underserved communities receive early warning messages 4.4 Climate change issues are integrated into local development plans in 14 sites
Gambia Radio and Television Services	4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.1 Targeted climate products are produced for sectoral institutional partners 4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up. 4.3 Underserved communities receive early warning messages
Crown Corporations		
Gambia Ports Authority (GPA)	2 Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by	2.3 A marine meteorological station network is operational 4.1 Targeted climate products are produced for sectoral institutional partners

Stakeholders	Outcomes Stakeholders will be involved in	Outputs Stakeholders will be involved with
	recent needs assessment reports in the Gambia 4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	
Gambia Civil Aviation Authorities (GCAA)	2 Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by recent needs assessment reports in the Gambia 4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	2.2 Increased availability of real time climate data 4.1 Targeted climate products are produced for sectoral institutional partners
Regional and Local Governments		
Local Regional Governments of NBR, BCC, KMC, WCR, LRR, CRR, URR,	4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up. 4.3 Underserved communities receive early warning messages
Academic institutions and Research Institutes		
University of The Gambia	3 A critical mass of skilled human resources is able to operate the Gambia Early Warning System and perform medium and long-term adaptation planning beyond the project	3.2 A recruitment and retention strategy is developed 3.3 A cadre of certified hydromet professionals is established
Gambia college: training of extension staff	3 A critical mass of skilled human resources is able to operate the Gambia Early Warning System and perform	3.2 A recruitment and retention strategy is developed 3.3 A cadre of certified hydromet professionals is established

Stakeholders	Outcomes Stakeholders will be involved in	Outputs Stakeholders will be involved with
	medium and long-term adaptation planning beyond the project	
Local Communities, NGOs and Community-based organizations		
Local Communities-Fishermen, Kanyaleng women's groups, farmer organizations, Herdsmen Group and Vegetable Growers Group, youth for information dissemination (designated by the contact groups in pilot sites)	4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up. 4.3 Underserved communities receive early warning messages 4.4 Climate change issues are integrated into local development plans in 14 sites
Village Development Councils	4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.4 Climate change issues are integrated into local development plans in 14 sites
Community radio stations	4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.3 Underserved communities receive early warning messages
NGOs: TANGO, Stay Green, Famers Platform	4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up. 4.3 Underserved communities receive early warning messages
Private Sector		

Stakeholders	Outcomes Stakeholders will be involved in	Outputs Stakeholders will be involved with
Telecommunications	4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.3 Underserved communities receive early warning messages
Energy, Construction, Hotels, Transport	1 The Gambia National Meteorological Services is supported in its transition to becoming a financially sustainable Meteorological Agency	1.3 A comprehensive business plan for deployment of effective hydro-met service developed

2.2 Country ownership: country eligibility and country drivenness

2.2.1 Alignment to National Strategy

Consistency with VISION 2020 and the PAGE

78. The Government of The Gambia is committed to reducing poverty and improving the well-being of its population. This commitment is driven by the Government's long-term strategy, VISION 2020, which is being executed through a series of medium-term development plans since 1994.

79. The current medium-term plan is the Programme for Accelerated Growth and Employment (PAGE), which is the national development strategy and investment programme for the period 2012 to 2015.

80. This GOTG/LDCF project is in line with the PAGE (2012-2015) as both are addressing the vulnerability of the population to natural and economic shocks, accelerate pro-poor growth and generate employment. The Project will contribute to the improvement and modernization of infrastructure through investments in information and communications technology (Pillar 2 of the PAGE); improvement of human capital stock by training meteorologists, hydrologists and other representatives of stakeholder institutions (Pillar 3 of the PAGE), improvement of the public service quantitatively and qualitatively (Pillar 4 of the PAGE); and improvement of food security, gender equality and environment and climate change, paying particularly attention to the green economy initiative to foster green growth, green investment and green jobs (Pillar 5 of the PAGE).

81. Climate change issues and risks have successfully been integrated in the PAGE (2012 - 2015) as a cross-cutting theme. The implementation of PAGE 2012-15 will be done through the Priority Action Plan (PAP) estimated at US$3.08 Million and it is to enable mainstreaming of climate change into the national development process through the development of Low Carbon Strategy, integration of climate change into national and sectoral policies and programmes, integration of climate change into education curricular from basic to higher education and to try and address the climate data needs of the country. This proposed GOTG/LDCF project and its previous phase will also enable mainstreaming of climate change.

2.2.2 Consistency with other National Policies and Strategies

Agriculture and Natural Resources Policy and Plan

82. This GOTG/LDCF Project conforms to the Agriculture and Natural Resources (ANR) Policy and the Gambia National Agricultural Investment Plan (GNAIP). The ANR Policy, the GNIAP and this proposed Project will combine policy, institutional, infrastructure, and technology measures with the availability and utilization of climate change early warning information sharing mechanisms to improve farm level decision making and address the multiplicity of supply-side constraints of Gambian agriculture.

83. The overall objective of the ANR Policy and Plan is to increase the agriculture sector's contribution to the national economy by increasing productivity through commercialization and greater private sector participation predicated on a sound macroeconomic framework aimed at enhanced growth and employment creation. The ANR policy is intended to improve and sustain measurable levels of food and nutrition security in the country in general and vulnerable populations in particular. The policy has sharpened the focus on transformation of the sector from a traditionally low output, subsistence economy with centralized structure, to a modern, market led sector with efficient value chains, diversified production base and effective decentralized structures. This proposed LDCF Project will provide the prerequisite hydro-climate and early warning information to enable the achievement of these objectives. The Project will also continue to train and capacitate Agricultural Extension Agents to serve as communicators of the information needed by the farmers for timely and effective planning and operations.

84. While the ANR policy is the overarching framework, sub-sectoral policies exist for Fisheries (2012 – 2015), Forestry (2009 – 2019), Water Resources (2009 – 2019) and the Wildlife Policy. Complementary policies also exist for nutrition (2010 – 2020) and gender (2010 – 2020). The objective of the Forestry Policy is to maintain 30 percent of the total land area of The Gambia under forest cover and thus increasing the carbon sink of the country. The Fisheries Policy emphasizes the maximization of yields through fish farming and protecting the fish landing sites and facilities from flooding, identified as one of the adaptation activities to address the adverse impacts of climate change on the sector and the national economy.

Decentralization Policy and Strategy

85. Under the First Phase of the Project, integration of climate change in the Decentralization Policy has been initiated and will be strengthened by mainstreaming climate change in all Regional, District and Village Development Plans and planning processes. During the implementation of the proposed project, Local Government Authorities (Regional Administrative Governors, District Development Committees (DDCs) and Village Development Committees (VDCs) will be fully engaged nationwide as already piloted in four Administrative Regions of the country.

86. During the First Phase, experience has shown that engaging the Multidisciplinary Facilitation Team (MDFT) and training the membership on climate change science, risks, impacts and response measures and on the communication of climate and climate change early warning information from the providers to the users has been very fruitful under the First Phase. The MDFT is a decentralized structure developed as part of the implementation of the decentralization policy and is composed of extension agents from public and private sectors, national and international NGOs, Media Houses and other stakeholder groups such as women and youth. This Project will work with these decentralized structures to disseminate climate and climate change early warning information to all the citizens of the country.

Disaster Management Policy and Strategy

87. The National Disaster Management Policy articulates the vision and principles for disaster management in The Gambia. The objectives of the Disaster Management Policy and Strategy are to integrate disaster risk reduction into sustainable development policies and planning; develop and strengthen institutional mechanisms and capacities to build resilience to hazards; systematically incorporate international, regional, national and local disaster risk reduction strategies and approaches into the implementation of emergency preparedness, response and recovery; prepare

communities to ensure that they are fully equipped to anticipate and respond to disaster events; promote a transparent, systematic and consistent approach to disaster risk assessment and management; and develop a database and information exchange system at national and international levels.

88. The proposed Project is in conformity with and complements the strategic objectives of the disaster management policy objectives and strategies.

2.3 Design principles and strategic considerations

89. Hydrological and climate monitoring is recognized by the GoTG as a core public service provided to all economic sectors. As such this project is founded on a baseline of ongoing national programming that provides the existing infrastructure, staff and resources of the early warning network, including the first early warning project. This includes all programming deployed by the MFWR, NDMA, Ministry of Agriculture (MOA) and the National Environment Agency (NEA). This project fulfils the additionality requirements by climate proofing these ongoing initiatives to ensure that climate change dimensions are taken into account in the deployment of short-, medium- and long-term weather and climate services.

90. A key principle governing the design of this LDCF initiative is that, while the project cannot cover all needs in terms of infrastructure and climate-related information, it can provide the means by which national coverage by an efficient EWS will be increased to a level able to cope with climate change induced shocks in the future. It is assumed that this increased coverage, along with the (existing and new) technical capacity to analyse climate information, will allow the country to benefit from efficient, and accurate climate services on which to underpin development planning. Furthermore, the project also proposes that activities at the local level to demonstrate the efficiency of the early warning system will serve as lessons towards the development of improved messaging and communications. This initiative therefore aims to deliver concrete lessons towards the sustainable deployment of EWS at all levels in the country.

91. Another strategic principle that governs the design of this initiative is the use of LDCF funding to provide value added to nationally-led baseline programming. This provides long-term anchoring for LDCF interventions, ensures that the conditions for long-term sustainability continue to be present even after the end of the intervention, and encourages stronger ownership. This project is therefore building on ongoing programming delivered by GoTG. This project is also anchored to existing international projects to avoid duplication, ensure coordination and harmonisation and to make full use of resources. The consultations during the project preparation phase connected this project to numerous others so as to add value. The numerous sources of co-financing also reveal how diligently this project has been integrated with other initiatives.

92. This LDCF project is closely connected to a wider multi-country programme that implements similar initiatives in 10 countries in Africa[19]. Synergies between these projects will be sought during implementation and potential joint implementation will be explored to enhance coordination of data and information and to take advantage of joint opportunities including training and the sharing of best practices.

[19] Benin, Burkina Faso, Ethiopia, Liberia, Malawi, Sierra Leone, São Tomé & Príncipe, Tanzania, Uganda and Zambia

93. In all project countries, upgrades and rehabilitation of the hydro-meteorological monitoring network will be complemented by providing local stakeholders with training and capacity-building in operation and maintenance of the improved infrastructure (Component 1). In addition, project countries will be provided with training and capacity-building for modeling and forecasting climate and weather, as well as generating tailored climate information packages and sector-specific Early Warnings (Component 2). It is anticipated that there will be scope for much of these training and capacity-building activities to be undertaken in coordination with other project countries, which will result in an increase in the cost-effectiveness of LDCF project investments. See section 8 "Linkages with other projects".

94. The project is designed to have minimal negative impacts on the social and environmental context, as highlighted in the attached ESSP in Annex 9. Regional and local level stakeholders have been and will continue to be consulted in terms of implementation sites and interventions.

2.3.1 Links to other baseline initiatives

95. This project builds on a number of national programmes/projects that address baseline related problems:

1. **Technical Support Programme to The Gambia on Climate and Development by United Nations Economic Commission for Africa (UNECA), African Climate Policy Center (ACPC).** The overall objective of the project is to upgrade the meteorological stations and rescue existing data. This baseline project will procure and install 10 automatic weather stations in the country to strengthen the current synoptic stations with real time data availability. However, this project does not have any component on training meteorologists to analyse data content, provide early warnings, disseminate them effectively at the local level, and ensure uptake of early warnings. In order to promote cost-effectiveness, avoid duplication and enhance harmonisation, the LDCF project will coordinate with this baseline project. As this project is focused on the installation of equipment, the LDCF project will provide value added by enhancing capacity building in the area of analysis of data generated, data storage and application, and early warning dissemination. As the ACPC investments in AWS will not be sufficient for optimum coverage of the country, the LDCF project will complement the ACPC project by procuring and installing 7 additional automatic weather stations (5 will be installed at previously closed stations which had to shut down due to the shortage of human resources to man the manual stations, and 2 will be established in underserved areas of the country which have not previously had coverage). This project will also complement the ACPC project by developing skills in maintenance and repair of equipment and professional training of staff up to degree levels, with the end product of providing reliable data/information, forecasts and tailored messages to end-users/stakeholders, while ensuring long-term use of investments in equipment. To further harmonize the projects, this project will align its procurement AWS with the ACPC to ensure that the same source and/or identical models of equipment are purchased.

2. **African Development Bank supported National Water Sector Reform Project** The purpose of this AfDB (ADF-WSSITF) funded grant is to reform the water sector and strengthen the hydrological network. The core activities under this project include: (a) to revise the Water Bill of 2004 to provide legislation that fully incorporates the provisions of the new National Water Policy so as to establish IWRM in The Gambia; (b) to develop an institutional set up for water resources management in The Gambia; (c) to develop a water resources management strategy and implementation plan; (d) to develop and implement a

water training programme for MoFWRNAM; (e) to rehabilitate and improve the hydrological, hydro-geological, meteorological and water quality monitoring networks in The Gambia; (f) to develop and implement a water resources management information system; (g) to conduct assessments of groundwater resources; (h)to develop and implement a water sector related communications strategy.

These different axes are in various phases of development. The LDCF project will coordinate heavily with this project particularly on the hydrological and meteorological front. The baseline project will operationalize 11 hydrological stations by rehabilitating them and installing new recording equipment. The LDCF project will complement the AfDB (ADF-WSSITF) project by providing capacity building on flood modelling and forecasting, and through skills development (analysis of data, operation and maintenance of equipment) in generating information, with the end result of providing appropriate climate messages/information to end-users/stakeholders. As in the case of the previous baseline project, this baseline project will make the investments in hydrological infrastructure without the capacity building on analysis of data generated and its application so as to effectively disseminate early warnings. The LDCF will provide value added to the investments in equipment so as to ensure their long-term and optimised use. In addition, the LDCF investment of the rehabilitation of the Bansang hydrological hub will lead to enhanced communication between the various hydrological stations and lead to an efficient network whereby information can be exchanged in real-time.

3. **African Development Bank supported Rural Water Supply and Sanitation Project**. This project will focus on (a) water supply and infrastructure; (b) institution building and training; (c) institutional reform and capacity development. Overall this project seeks to improve access and provision of safe drinking water along with appropriate sanitation facilities. The project will focus on reducing the burden on girls and women for procuring water to allow them to take part in education and other income generating activities. This baseline project does not have an early warning component. The LDCF project will build on the baseline by enhancing information on climate events that may have impacts on water availability, accessibility and quality. This project also does not take into account climate change impacts on water quality. The LDCF project, through improved data collection, monitoring and analysis will be able to better inform communities on forthcoming climate risks and their impacts on water supply. Moreover activities under Output 2.4 in the LDCF project are intended to improve water quality monitoring which will complement this project and provide additional resources in gauging what water sources are safe, and if contaminated, what actual risks people face and issue warnings on these.

4. **African Monitoring of the Environment for Sustainable Development (AMESD).** The European Union funded project Preparation for the Use of MSG in Africa (PUMA) made data and products available from EUMETSAT's latest satellites, helping African National Meteorological and Hydrological Services to provide accurate weather forecasts, monitor extreme weather phenomena, and improve disaster management. The African Monitoring of the Environment for Sustainable Development (AMESD) extends the use of remote sensing data to environmental and climate monitoring applications. Of this, $2 million will count as baseline for this project of which The Gambia Meteorological Services is a beneficiary. The LDCF project will make use of these resources to enhance the hydro-meteorological infrastructure and support the investment goals of the AMESD.

5. **ECOWAS supported Gambia National Agriculture Investment Programme (GNAIP) 2010-2015**. The overall aim of GNAIP is to increase the agriculture sector's contribution to the national economy, enhancing growth and reducing poverty. One of the specific objectives of the programme is to promote lowland development for rice cultivation and targets 24,000 ha of land to do so. The investment programme also aims to expand rice production to attain an annual production of 70,000 metric tons of paddy rice as well as promote aquaculture to optimize yields per year. All of this cannot be achieved in the absence of targeted weather, climate and climate change early warning advisories and information. This programme will provide $5 million in co-financing to the LDCF project.

6. **IFAD** supported **Livestock & Horticulture Development Project (LHDP)** 2010- 2016. The project engages the active involvement of communities in a participatory monitoring and evaluation system, including the use of a voucher-based remuneration system for the delivery of agricultural extension services. Agricultural and other field extension agents will serve as important stakeholders in the LDCF project as conduit of meteorological, hydrological and environmental information to vulnerable farmers and other communities. These agents understand the language of the grassroots level communities and are able to translate the meteorological and hydrological technical language for easy communication to the local level. The IFAD project also provides practical support to the kafos (community associations), enabling farmers to build on their existing activities and improve their use of increasingly scarce water and land resources. These activities will complement the climate change trainings that will be provided to extension workers and MDFTs and disseminated at the local level, and will support adaptive practices. $5 million of the IFAD project will provide co-financing to the LDCF project.

7. **USAID supported Gambia-Senegal sustainable Fisheries Project** (**$12m**) 2009 -2014. The "Ba Nafaa" (translated as Value of the Sea) project is a five-year regional initiative supported by USAID West Africa Regional Mission. The World Wide Fund West Africa Marine Eco-Regional Program is the regional implementing partner. Project activities are carried out in partnership with the Department of Fisheries and stakeholders in the fisheries sector in The Gambia and in Senegal. The national meteorological and hydrological Services of The Gambia are important stakeholders and currently provide tailored weather forecasts and warnings to the fisherfolk when required. However, these are limited due to the lack of accurate and reliable forecasting abilities. The fisheries sector has a vested interest in receiving accurate information, as does this project which focuses on sustainable fisheries management including the shared marine and coastal resources between The Gambia and Senegal. This project will be providing $150,000 in co-financing to the LDCF project.

8. **FAO support to strengthen capacities in the Gambia Government for policy planning, programming, statistics & monitoring in the Agriculture & Natural Resources sector.** This programme will support the development of a revitalised Planning Services Unit of the Ministry of Agriculture, which will be upgraded to a Division. The purpose of this division will be to provide information products for agricultural policy, planning and monitoring. The programme will also update agricultural and NR statistics, data, and information. Data will also be gathered on food availability and nutrition on the household and national levels. There are strong linkages between this programme and the LDCF project. Accurate and reliable climate information will be invaluable to the Planning Services Division. The LDCF project will allow the development of tailor-made agro-meteorological products which will

be used by this Division (Output 4.1). The LDCF project will also support investments in a consolidated database through which sectoral partners can generate statistics and data (Output 2.5), which will be particularly useful to the FAO funded programme in enhancing its data and information requirement. The LDCF project will help unveil the interactions between climate and agriculture with more reliable and user-friendly information. This programme will provide $380,000 in co-financing to the LDCF project.

9. **UNEP supported A Global Early Warning System for Climate Change**. This project is the first stage in developing "CLIM-WARN", a robust and integrated global early warning system for climate change. CLIM-WARN is aimed at providing actionable warnings that can be directly translated by decision makers and citizens into actions for coping with imminent extreme climate events. Activities include: the identification of users of early warnings; developing prototype plans for uptake of warnings; improving efficiency of delivery of climate data to users; and designing a comprehensive CLIM-WARN system. The LDCF project can use some of the lessons learned from Clim-warn and integrate it into its national context, particular in regards to activities under Component 2 which seek to identify the needs of end users and deliver tailored and effective warnings. This project will provide 500,000 in co-financing.

10. **UNEP** supported **Programme of Research on Climate Change Vulnerability, Impacts and Adaptation (PROVIA)** is a global initiative which aims to provide direction and coherence at the international level for research on vulnerability, impacts and adaptation. PROVIA, hosted at UNEP in Nairobi, will act as a new and growing network of scientists, practitioners and decision-makers working towards identifying research gaps and meeting policy needs in climate change vulnerability, impact and adaptation research. PROVIA will deliver improved coordination of international research on the impacts of and responses to climate change, and provide the credible scientific information that will be useful to The Gambia. The knowledge being generated from this programme will benefit the strengthening of climate services and early warning systems in the Gambia and serve as a forum for exchange on the most up to date research on vulnerability and impacts of climate change.

11. **GOTG Assets (infrastructure, personnel, utilities) grant:** In addition to the baseline projects, the LDCF project will build on the ongoing national processes, policies, staff time and skills, and interventions, particularly those aimed toward establishing a new, independent meteorological agency. The goal of establishing an autonomous hydrometeorological institution is one that has been explored in the national context and will need to be approved at the parliamentary and presidential levels. This project will build on the effort underway to obtain support and approval for establishing such an institution. GOTG assets include time input from the director, assistant director, 2 director heads, and 6 unit heads on approving transactions, and incorporation of project activities into yearly programmes of work. Grant also includes staff salaries of High Level GOTG personnel involved in negotiations, parliamentary processes and presidential approvals regarding the establishment of the new hydrometeorological agency, as well as the reviewing and development of architectural plans and infrastructure development for the new agency. The grant also includes the salaries of low-skilled GOTG staff involved with the administration of project and establishment of the new agency.

2.3.2 Summary of Co-financing

Source	Amount USD $	%
Grant		
African Monitoring of the Environment for Sustainable Development (AMESD) Project	2,000,000	8.5
ECOWAS supported Gambia National Agriculture Investment Programme (GNAIP)	5,000,000	21.1
USAID supported Gambia-Senegal sustainable Fisheries Project	150,000	0.6
FAO support to strengthen capacities in the Gambia Government for policy planning, programming, statistics & monitoring in the Agriculture & Natural Resources sector	380,000	1.6
African Development Bank supported Rural Water Supply and Sanitation Project	4,000,000	17
African Development Bank supported National Water Sector Reform Project	2,600,000	11
Technical Support Programme to The Gambia on Climate and Development by United Nations Economic Commission for Africa (UNECA), African Climate Policy Center (ACPC)	2,930,000	12.4
IFAD supported Livestock & Horticulture Development Project (LHDP)	5,000,000	21.1
A Global Early Warning System for Climate Change (UNEP)	400,000	1.7
In-Kind		
GOTG Assets (infrastructure, personnel, utilities)	1,000,000	4.2
UNEP's Programme of Research on Climate Change Vulnerability, Impacts and Adaptation (PROVIA)	200,000	0.8
Total Co-financing:	23,660,000	100

The co-financing letter obtained is from the government of the Gambia's Ministry of Finance and Economic Affairs, signed on behalf of their colleagues in charge of Environment, Agriculture and Water have been involved in the project formulation. Although the baseline projects themselves are funded through multilateral and bilateral donors, they are all channelled and executed through the GoTG. The fact that the letter is signed by the GOTG Ministry of Finance and Economic Affairs demonstrates that the GOTG as the main Executing Agency takes ownership of these baseline projects that are proposed as co-financing for this LDCF project. This consistency will also help provide a steamlined approach through which the Ministry of Finance and Economic Affairs will help monitoring, communicating and reporting back on co-financing provided to the LDCF project.

2.3.3 National and local benefits

96. This LDCF initiative will improve the EWS and long term planning for climate change adaptation. At the local level, the project will enhance the resilience of livelihoods and assets of some of the most marginalized and vulnerable communities. Providing accurate and timely early warning on severe weather and long term adaptation strategies has the potential to enable poor communities to make informed decision about their livelihood activities and protect their assets.

97. Early warnings and climate hazard mapping can provide economic benefits through reducing losses of agricultural produce, infrastructure (roads and bridges) and disruption to people's livelihoods, particularly in the agriculture, fisheries, and tourism sectors. Communities will immediately benefit through warnings related to agriculture, coastal management, water and flood management, wildfires and strong winds and storms, which can have catastrophic impacts. Communities have the potential to plan if they are aware of oncoming climate threats and can be better prepared in the procurement of food, water and other basic necessities to weather the vagaries of the climate. This will decrease death and destruction.

98. Regarding flooding for instance, about 20% of The Gambia's territory is within the River Gambia's historical floodplain. Although people had initially limited development in those areas, dedicating the land for lowland rice, pasture, and forest products, population pressures in urban areas have resulted in urban build-up in flood prone areas. Flood risk maps and analysis (Output 2.1) will help guide future development and settlements, and allow current occupants to receive relevant information on their risk levels. In the area of Kombo, for instance, Kombo North has registered the largest increase of populated and built-up area (2,100 ha) followed by Kombo South (1,500 ha) and Kombo Central (835 ha). New settlements in KMC are located in reclaimed swamps and flood-prone zones in Jeshwang, Talinding Bakau and Kotu Stream greatly increasing their vulnerability to flooding. These areas would benefit significantly from increased flood information as well as sensitization on adaptive activities to address some of these risks.

99. Greater information generated through this project will help protect infrastructure. The Gambia's climate is monsoon, with the beginning and end of the rainy season characterized by strong winds with speeds as high as 50km (GOTG 2009). Most property damage during the rainy season in The Gambia is the result of windstorms. These windstorms have over the last decade caused serious damage to properties in the north and east of the country, notably in the North Bank Region and the Upper River Region. Improved forecasting on wind storm can prepare residents for the onslaught of winds, and data on winds can support the justification for stronger and fortified physical development.

100. Coastal communities will greatly benefit through tailored information as they are particularly at risk to floods, storms and sea level rise. There is heavy population concentration in the coastal cities of Banjul, Kanifing, and Brikama. About 27% of the population lives in the city of Banjul and Kanifing, a combined area of 88 sq. km. More than 52% of the population lives within 20 km of the Atlantic Ocean, an area less than 10% of the total land area. The information obtained through activities under Output 2.1, Output 2.2 and Output 2.3 will support the provision of timely climate alerts to address the particular climate risk at hand.

101. There will also be other benefits at the local level such as the development of improved communication and telecommunications systems associated with early warnings. For instance community radios can also be used for arranging medical evacuations, mobile text messaging alerting of risks, and enhanced NDMA call centre protocols will benefit people at the local level (Output 4.3). Further, close and strengthened partnerships and communication channels between the NDMA and DWR will improve the efficiency and effectiveness of the disaster risk reduction systems to deliver relief, goods and services. This has further knock-on effects on people's health and wellbeing and thus affects communities and social structures

102. Those working in transport industry and planning will also receive large economic benefits associated with improved transport planning, especially shipping which will take advantage of improved forecasts of winds and waves. Similarly, aviation which is one of the key consumers of current climate information which can take advantage of improved local forecasts. These and commercial agriculture likely represent some of the largest private clients for early warning services and tailored forecasts. Together with satellite imagery used for land-use planning and monitoring these can provide environmental benefits, including monitoring of illegal logging which has global consequences in terms of deforestation and the global carbon budget, but also in terms of national biodiversity and for those working in the tourism industry.

103. The project will indirectly benefit the entire population of The Gambia by creating capacity at the national level to produce more accurate weather forecasts and train government staff in planning long-term strategies for climate change adaptation, as well as disseminating early warnings to the community level in a comprehensible way.

104. In order to connect with populations across the country, the project has two pilot sites in every region. This is to avoid marginalizing the already vulnerable, or concentrating resources in one region. This supplements the first phase of the project, which was piloted in the North Bank. Contact groups have been established in every region to act as conduits, liaisons and monitors of project activities so that experiences at the local level can feedback into the project. The goal of working closely with contact groups is also to ensure that the climate messages that are being generated are being understood and utilized in long-term adaptation planning and yield to local benefits (Output 4.4)

2.3.4 Gender benefits

105. Improving the EWS and the long term planning for climate change adaptation in The Gambia should improve the resilience of both women and men to climate related shocks, and create opportunities for building resilience. This LDCF project will tackle gender issues by:

- Targeting the inclusion of women at all stages of project development
- Increasing the number of female participants in trainings and capacity building workshops
- Promoting high female participation in strategic Human Resources Development Plans
- Attracting female participation to hydro-meteorological school most notably in the Water Resources Training School, University of the Gambia and Extension Services certification
- Engaging the use of female MDFTs and extension staff in mobilising communities
- Depending heavily on Kanyaleng women (traditional female communicators) to disseminate climate information and early warnings.
- Establishing sex-disaggregated targets

106. Employing women in the generation, analysis and dissemination of key meteorological data is particularly relevant, as women generally gravitate towards the main sectors of the economy: agriculture, re-exportation of used goods, and tourism. These sectors however cannot always provide waged income for women. Agriculture, which employs two-thirds of the workforce, is a low-paid sector very much dominated by older women[20]. As for tourism, which generates 16% of national income and over 30% of export earnings[21], although there are 10,000 and 16,000 'direct and indirect jobs' in the industry even in conjunction with fisheries and construction, tourism occupies only 10% of the Gambian labour force[22]. Also, given the seasonality of The Gambia's tourist season, most workers are laid off during the rainy season from June to September. Including women in the civil service can thus provide an avenue for employment for women relative to other sectors.

[20] Chant, S & Touray, I (2012). Gender in The Gambia in Retrospect and Prospect. Gamcotrap Working Paper No 1.

[21] Mitchell, J.& Faal, J. (2008). The Gambian Tourist Value Chain and Prospects for Pro-Poor Tourism, Working Paper 289 (London: Overseas Development Institute).

[22] Heintz, James; Oya, Carlos and Zepeda, Eduardo (2008) Towards an Employment-centred Development Strategy for Poverty Reduction in The Gambia: Macroeconomic and Labour Market Aspects. Country Study No.16 (Brasilia: International Poverty Centre in cooperation with Carnegie Endowment for International Peace).

2.3.5 Linkages with other donor funded initiatives

107. The multilateral agencies also support a range of projects and initiatives that include non-climate related problems, which this project will complement, but that are not providing co-financing. These include the following:

Linkages of the project to GEF and Non-GEF projects

Project Title	Implementing Agency	Executing Agency	Strategic objectives	Funding Agency	Linkage
Water related projects					
Provision of 100 water points in 4 regions (2009 – 2013)	(IDB)/GOTG	Ministry of Fisheries and Water Resources and Department of Water Resources	Design and Supervision of Civil works Civil Works: (10 with solar and reticulation system, 90 with hand pumps- counterpart contribution 24 sites Training of DWR staff and communities	(IDB)/GOTG	Both projects are within the same Ministry and Department and can be therefore complementary. This project will benefit from climate information and water quality monitoring.
Health Related projects					
National Leprosy & Tuberculosis Control Program (2010 – 2015)	Global Fund	Ministry of Health & Social Welfare	To reduce transmission, morbidity and mortality of TB so that it is no longer a public health problem in The Gambia	Global Fund	The project will contribute to the Global Fund project by providing information that would enhance planning in reducing diseases transmission and improve livelihoods
To reduce malaria related morbidity and mortality in the entire population to reach pre-elimination stage by 2015 (2010 – 2015)	Global Fund Grant	Ministry of Health & Social Welfare	To increase to and sustain at 85% the proportion of malaria cases correctly managed according to the National Standard Treatment Guidelines within 24 hours of the appearance of symptoms by 2015	Global Fund Grant	Malaria is highly influenced by weather conditions. Increased accuracy and reliability of forecasts can help prepare and mitigate the spread of disease.
Climate Change related project					

Enhancing Resilience of Coastal Areas and Communities to climate change in The Gambia (2013 – 2017)	UNDP	National environment Agency	It addresses immediate and urgent needs, such as creating the institutional and policy environment for effective implementation of sustainable coastal management and engineering of measures to respond to coastal erosion and flooding, raising awareness and understanding of local communities and national policy makers about the necessity and benefits of preparedness for climate change and climate hazards.	GEF/LDCF	This is a GEF-LDCF funded, project, and like the EWS LDCF project is a priority in the country's NAPA. The proposed project will provide climate and adaptation information to safe guard properties and livelihoods, whilst the other will build protective structures along coast line. Both are engaged in capacity building and institutional strengthening and the proposed project will support this LDCF project by providing climate information pertinent to the coastal region.
Integrated Coastal Zone Management and Climate Change Project 2012-2015 /$ 5,148,000	EU	National environment Agency	Establishment of a participatory and self-sustainable Integrated Coastal Zones Management (ICZM) process.	EU	While this project is yet to commence, there are linkages between both projects. Both projects will build resilience to climate change and can be also complementary in the areas of save guarding livelihoods and properties as well as capacity building and institutional strengthening. The EU project will be focused on the coastal zone while the proposed one is regional in scope. The LDCF project can also support the EU project by enhancing accurate forecasting abilities which will shape the development of the EU project.

GFGAM-11001 "Promoting Renewable Energy based mini grids for productive uses in rural areas in The Gambia 3 years (2012-2015)	**UNIDO**	Ministry of Energy (MOE), National Environment Agency (NEA) and National Water and Electricity Company (NAWEC)	The project will add to the GHG reduction over life time of the technology and will mean an additional energy access in the country	GEF/UNIDO	This is also a climate change oriented project. The EWS project can contribute in the capacity building of staff and facilitate information that is vital in the design of renewable tectnologies
Gambia – Adoption of Ecosystem Approach for Integrated Implementation of MEAs at National and Divisional Levels (48 months)	**UNEP**	National Environment Agency (NEA)	Strengthening the national institutional framework for integrated management of global environmental priorities. Integrating global environmental issues into divisional level planning and implementation through the application of ecosystem approach	**UNEP/NEA**	Institutional changes such as enhanced coordination and training of staff and a clearer articulation of mandates under the EWS project will support this UNEP project.
Agriculture related projects					
NERICA Rice Dissemination Project (P-Z-I-AAO-069) 2005 – 2012	ADF	Ministry of Agriculture	Improved rice production from less than 1.0 metric ton per ha to more than 1.5 in the traditional farming system where no fertilizers are applied	**ADF**	The EWS project will contribute to enhancing production through the use of its climate information in which will be applied in agronomic practices.
Regional Project on Sustainable Management of Endemic Ruminant Livestock in West Africa (PROGEBE-Gambia) 2008 – 2013	AFDB	Department of Animal Reproduction and Health and the Ministry of Agriculture and	Conservation and improvement of productivity and exploitation of globally significant ERL (N'Dama, Djallonke, WAD)	Grant AFDB	The Project's contribution is providing weather and climate information that will be useful in the AFDB project activities
Sustainable Land Management 2010 – 2014	UNDP	Ministry of Agriculture	Seeks to address interlinked problems of rural poverty, food insecurity and land degradation	GEF grant	The LDCF project will support this project in improving food security climate and food security alerts

Gambia National Agriculture & Natural Resources Investment Programme (GNAIP) **2010-2015**		Ministry of Agriculture	To increase the agriculture sector's contribution to the national economy, growth enhancing and poverty reduction. One of the specific objectives of this programme is to promote lowland development for rice production. The GNAIP is aiming to facilitate the exploitation of tidally irrigable areas suitable for rice production, improve access and promote rice production in seasonally saline tidal swamps.		The project's contribution will be providing early warning information to guide agronomic activities in order to enhance production
Gambia Lowland Development Project (5 years)	IDB	Ministry of Agriculture and Department of Agriculture	Development of 1400ha of lowlands for rice production and development of 100ha of uplands for horticulture production	IDB	The project's contribution will be providing early warning information to guide agronomic activities in order to enhance production
Livestock and Horticulture Development Project (LHDP) 7 years	ADB, IFAD	Ministry of Agriculture and Department of Animal Reproduction and Health	To increase on a sustainable basis the production, processing and marketing of horticultural and livestock products and by-products	ADB, IFAD	The project's contribution will be providing early warning information to guide agronomic activities in order to enhance production
Fisheries related projects					

AfDB supported Gambia artisanal fisheries development project (GAFDP) 2009-2011	AfDB	Department of Fisheries	Rehabilitate the Banjul fisheries Jetty and the three other fish landing sites at Albreda, Bintang, and Tendaba including access road and associated facilities; Construct a fish central market. These are to allow for an increase in the quantity of fish for markets, to contribute to reduced fish spoilage, to stabilize fish prices and increase opportunities for fishermen as well as sellers to receive higher incomes and to contribute to the improvement of nutritional standards of the population.	AfDB	The project will contribute to further enhancing knowledge on climate change issues and the importance of weather and climate information in fisheries' related activities through tailored climate products.
Others					
Capacity Development for Achieving sustainable Development 2007 – 2011	UNDP	Office of the President and National Environment Agency		UNDAF	Accurate climate information and integration of climate knowledge into local level development will greatly support this sustainable development project.
Entrepreneurship Promotion & Microfinance Development Project (EPMDP)	The Social Development Fund (SDF)	Ministry of Agriculture, Department of Community Development	Contribute to reducing socio-economic imbalances in The Gambia by increasing social and economic opportunity for the poor and vulnerable groups by diversifying income generation sources and improving access to financial services.	The Social Development Fund (SDF)	The LDCF project can provide climate information relevant in development considerations.

Community-based Infrastructure and Livelihood Improvement Project (CILIP) (2011-2015)	Islamic Development Bank	Ministry of works and Infrastructure	The project will empower communities and improve their livelihood and welfare through financing demand-driven community infrastructure and livelihood activities. The project will include Community Infrastructure Facility, Livelihood Improvement Fund, Institutional and Development.	Islamic Development Bank	The project will support the CILIP's objective of sustainably improving community livelihoods by sensitization and encouraging the integration of climate change concerns into the design and building of relevant community infrastructures. Climate information generated by the LDCF project can be integrated into design plans.

2.3.6 UNDP Comparative Advantage

108. The proposed project is aligned with UNDP's comparative advantage, as articulated in the GEF matrix, in the area of capacity building, providing technical and policy support as well as expertise in project design and implementation. Additionally UNDP has a high level of experience managing other LDCF projects in the region, in particular those with an early warning component. Along with projects in Asia and the Pacific, these contribute to the UNDP-GEF signature programme "Strengthening Climate Information and Early Warning Systems for Climate Resilient Development and Adaptation to Climate Change" which, as of 2012, is helping 36 countries develop and implement38 projects focused on EWS, with a total value of USD 587 million. Of these funds USD 148 million is grant funding from the GEF LDCF/SCCF Trust Funds, and the Adaptation Fund.

109. In 2012, projects focused on strengthening EWS in 10 African countries were approved by the GEF council for funding through the LDCF. The outcomes, outputs and activities of these projects are similar in scope to those proposed here for the Gambia. Having UNDP as an implementing partner will therefore enable this project to more easily benefit from synergies with these activities in the region, including economies of scale for training, partnerships, exchanges and sharing of lessons learned.

110. The UNDP has been instrumental in supporting various processes against poverty and to enhance institutional structures and civil society. UNDP contributed to the establishment of the National Disaster Management Agency and the National Disaster Management Council, and supported the promulgation of the Act, which is particularly pertinent to this project. UNDP thus has a clear understanding of the challenges that the NDMA faces particularly in response to climate threats and in coordinating with other government institutions.

111. UNDP helped develop the first comprehensive habitat and species map for protected areas. This enabled the Government to consolidate protected-area boundaries and redefine the ecological features for better conservation measures. UNDP took on the issues of coastal adaptation and climate change through supporting, jointly with the Global Environment Facility (GEF), sensitization,

advocacy and a series of interventions. UNDP is also the implementing agency for the next GEF Coastal Adaptation Programme, which has many linkages with this project.

112. Since 2007, UNDP has been helping to finance the development of Gambia's national disaster management framework, leading to the development of policy and legal structure, as well as a national implementation framework based on regional and local disaster management bodies. On the basis of this work, a long term Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) programme for The Gambia (2009 – 2013) has been elaborated, providing a starting point for the proposed integration of climate risk management principles into national and regional planning.

113. The UNDP Country Programme Document (CPD) 2012-2015 is guided by UNDP's comparative advantage in the pillars articulated in the United Nations Development Assistance Framework (UNDAF 2012-2015) and is based on "promoting inclusive/equitable growth and reducing vulnerabilities". The integrated programme includes three components: economic, environmental and governance. The CPD 2012-2016 is also based on consultations with the Government of the Gambia, United Nations agencies, civil society and other stakeholders and also reflects emerging national priorities as expressed in the Programme for Accelerated Growth and Employment (PAGE) 2012-2015.

114. Under the poverty reduction and social protection pillar of the UNDAF, UNDP has partnered with the Ministry of Finance and Economic Affairs (MoFEA), and key departments in the sectors, to strengthen planning, monitoring and budgeting processes. It has also partner with the Gambia Bureau of Statistics (GBOS) to address significant data and resource-related gaps. Within the context of the Enhanced Integrated Framework, UNDP works with the Government to identify and strengthen the capacities of key institutions, such as the ministries of tourism, agriculture and fisheries, to promote inclusive growth and poverty reduction. The programme builds upon previous UNDP assistance to the MoTRI to update the national employment action plan and implement pilot projects for youth and women's employment. UNDP, along with the International Labour Organization (ILO) and the United Nations Economic Commission for Africa (UNECA), will conduct a green jobs pilot initiative and conduct a value-chain analysis to facilitate the identification of investment programmes that will provide employment opportunities for youths and women.

115. UNDP program of work also involves strengthening institutional capacities and coordination of environmental management and disaster risk reduction (DRR), which is a particular asset to this project. These institutions include the National Environmental Agency, Ministry of Forestry & Environment, Ministry of Fisheries & Water Resources, Ministry of Energy and the National Disaster Management Agency. UNDP will collaborate with development partners to improve programme management and the mainstreaming of environmental concerns into the PAGE and sectoral plans. Strengthened capacities for DRR and climate adaptation and mitigation will contribute to reducing vulnerabilities and to improving sustainable livelihoods, thus contributing to poverty reduction. UNDP works with government, private-sector and other partners to scale up interventions that address the negative consequences of climate change and build social resilience mechanisms for the poor and vulnerable, which can be in part delivered through this LDCF project.

116. There are also strong linkages between the proposed LDCF project and the UNDP Strategic Plan 2014-2017. In particular, the project is in line with Outcome C- Countries have strengthened institutions to progressively deliver universal access to basic services; and Outcome E- Countries are able to reduce the likelihood of conflict, and lower the risk of natural disasters, including from climate change. The project is intended to increase climate knowledge, data, and information so as to support

planning and development initiatives. Such planning will also serve to improve disaster management, mitigating crises and future losses.

2.4 Project Objective, Outcomes and Outputs/activities

117. This project's **objective** is to strengthen the climate monitoring capabilities, early warning systems and available information for responding to climate shocks and planning adaptation to climate change in The Gambia. The project seeks to transfer weather and environmental observation technology, as well as to build capacities for climate data analysis and modelling, and to effectively communicate early warnings and advisories to stakeholders and local populations. This will be done so by delivering four complementary outcomes:

118. The four complementary outcomes are:

1. Outcome 1: The Gambia National Meteorological Services is supported in its transition to becoming a financially sustainable Meteorological Agency
2. Outcome 2: Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by recent needs assessment reports in the Gambia
3. Outcome 3: A critical mass of skilled human resources is able to operate the Gambia Early Warning System and perform medium and long-term climate adaptation planning beyond the project
4. Outcome 4: Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans

Outcome 1: The Gambia National Meteorological Services is supported in its transition to becoming a financially sustainable Meteorological Agency (supported by UNEP)

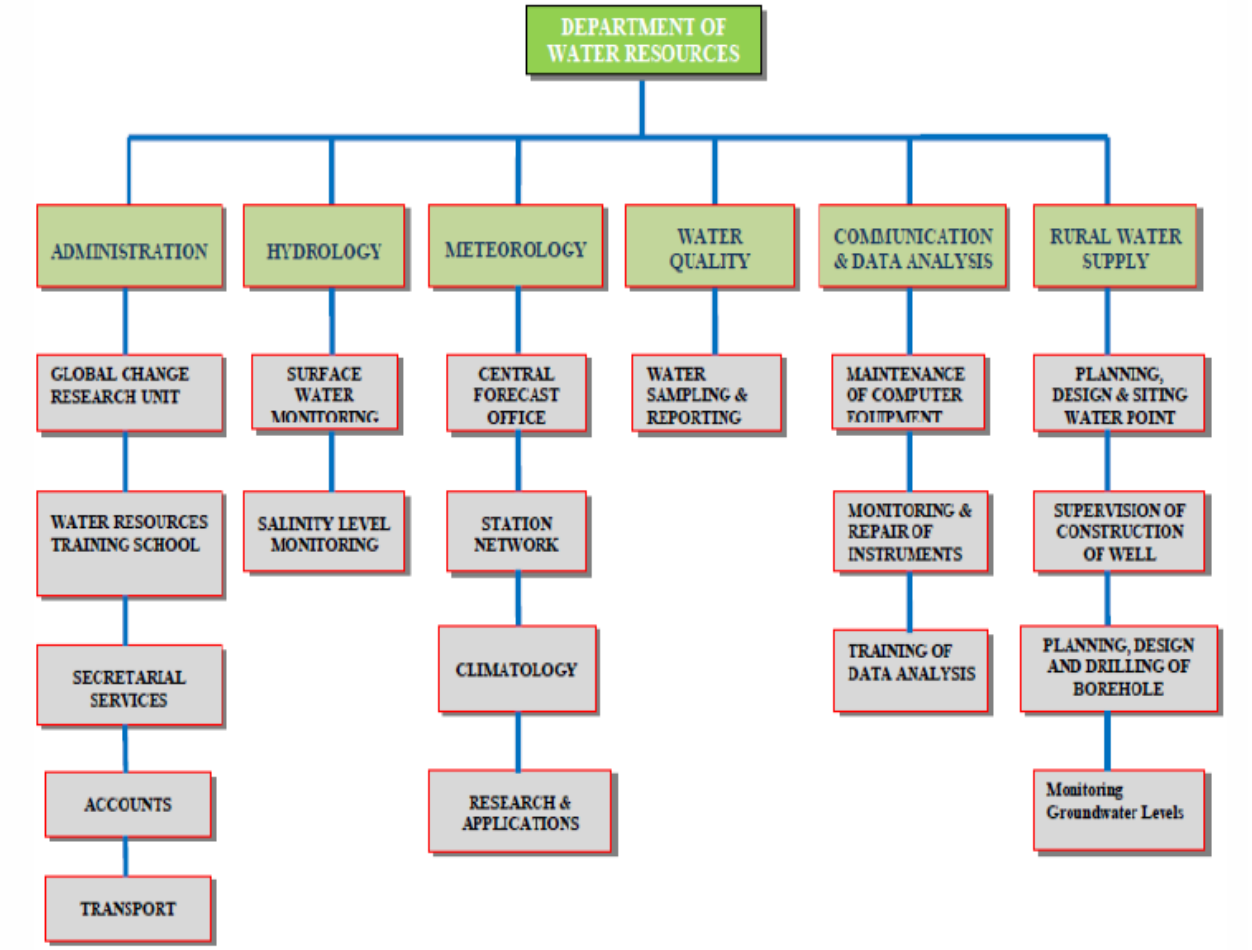
LDCF project grant request is: 112,200 USD

Co-financing for this outcome is: 2,200,000 USD

Without LDCF Intervention (baseline):

119. Currently the Meteorology Division of the Department of Water Resources (MET-DWR) is the main mandated issuer of weather warnings, advisories and seasonal climate predictions. The Hydrology Division in the Department of Water Resources (Hydro-DWR) is mandated to provide warnings related to river flooding, coastal flooding and flash floods. The Central Forecast Office (CFO) provides weather alerts and warnings and provides marine forecast and warning services to mariners and coastal zone users. Together, these divisions form the core of the NHMS. The organogram below highlights how the Department of Water Resources is structured: together, these three divisions form the core of the NHMS.

Figure 2: Current Organogram of the Department of Water Resources



120. In addition, the National Environment Agency (NEA) provides warnings on selected environmental hazards and disasters, such as oil spills and the Planning Services Unit of the Department of Agriculture (DoA) provides information on status of production and marketing of cereals and other food products that are weather and climate related.

121. The division of labour between the divisions and agencies is not always very clear, and each unit operates with its own quality standards, resources and constraints. Being subsidiary to the DWR, the NHMS does not have the legal autonomy to negotiate with potential donors and partners, to establish its own recruitment and financial plans, and to acquire infrastructural operational resources. The need for an autonomous Meteorological Services Agency has been recognized as a priority by the government, and efforts are underway to proceed to its creation through legal means and through an initial endowment of infrastructure. However, the internal procedures and the financial sustainability of such an Agency remains to be determined.

122. At present only a limited part of the national annual budget allocation to DWR ultimately trickles down to the meteorological services and this limited funding severely hampers the work of

meteorological staff which requires a more core institutional support— for year 2010 this amounted to around $90,000 USD, with half of the amount spent on staff salaries and the balance on equipment and operational costs. From 2004-2009 The Gambian government allocated about $225,000 from its annual budget to NHMS. Only 20% of this budget went to cost items related to research and observations. In 2009, the government allocated less than 0.2% of total government expenditures to NHMS.[23] With competing demands, debt servicing, this creates pressures on the funding available for NHMS[24].

123. The Meteorology Division has attempted to recover the costs of some of its services to users, but the revenue generated has been minimal, partly because an initial reluctance to monetize what is perceived as a public service[25], but mostly because the hydro-meteorological products have not been tailored adequately to users due to a lack of capacity and infrastructure. From consultations with the CEO of The Gambia Chamber of Commerce, it is apparent that the private sector is awaiting some direction from the Government as to what role it can play as consumers of climate information. The private sector is increasingly incorporating climate change considerations into its practices and has the potential to become a bigger client for hydro-meteorological services, particularly in the area of tourism, energy, transportation, construction and health, in addition to civil aviation, telecommunications and port authority. However, the services have to be articulated clearly, and priced sustainably and attractively, which has not yet been done.

124. The establishment of the autonomous meteorological agency will be receiving support from baseline projects identified above. Financing from other projects such as the African Development Bank supported National Water Sector Reform Project and the African Monitoring of the Environment for Sustainable Development (AMESD) Project will support the establishment of the new meteorological agency. These projects will support DWR in their organisational plans and HR plans and will try to support the full modernization of hydro-meteorological services.
Under the AfDB project an institutional study will be carried out to define an apex institution, under the MoFWR, for policy, coordination and regulation of water resources throughout the country. This will include specification of a comprehensive organizational structure, operational budget and establishment costs, and development of a five-year business plan. A study will be also carried out, building on recent studies, for the establishment of a Meteorological Agency to provide high level and high quality meteorological services for The Gambia[26].

125. The baseline projects have recognized the crucial need of long-term sustenance of hydro-meteorological services, through cost-recovery of hydromet services, commercialization of certain hydromet products and linkages with government and private institutions to ensure improvement and sustainability of the provision of forecasting and early warning services and provision of information for disaster reduction. However, a cost-recovery plan, market analysis or economic analysis has not been initiated, and the baseline projects will channel this work through the proposed LDCF project, which through its investments in infrastructure and capacity building, can provide a more accurate snapshot of the possible revenue streams that exist for meteorological services.

[23] BlueGold Solutions (2009): Earth Systems Research and Systematic Observations in The Gambia, Volume 1: Current Situation and Future Directions

[24] Peacock, J. G. 2012: Baseline Needs Assessment for the strengthening of the Gambia Early Warning System

[25] WMO Office for North, Central and West Africa (2008). Proposal for the Transformation of Meteorological Services of The Gambia,

[26] African Development Bank (2010). The Gambia Support for National Sector Reform: Appraisal Report.

126. While the need for sustainable financing is well understood by government stakeholders, and has been articulated in the Needs Assessment Report of 2012, a viable financial strategy for the NHMS, regardless of the institutional setup it takes in the medium-term, has not yet been developed. As a result, the government is missing opportunities for funding beyond national budgets and development cooperation.

With LDCF Financing:

127. The project will support the transition of the NHMS into a full-fledged agency by supporting the development of a comprehensive business plan for its sustainable financing. The LDCF financing will build on current political processes underway to help articulate the economic possibilities and realities of the new agency. LDCF financing will help produce a cost-recovery policy, including a list of hydro-meteorological products, services, tariffs and prices for public and private clients. These findings will support the establishment of economic structures to help the National Meteorological Service gain the ISO 9001-2008 certification as required by Annex 3 to ICAO Convention and the WMO Quality Management Systems for the provision of weather and climate information and early warning services.

128. LDCF financing with support from co-financing from AfDB and AMESD funded projects, will help provide the financial blueprint of how the new hydromet agency is to be sustainable. Although the political planning for such an entity is underway, funds have thus far not been allocated from the central government. Due to the fact that the LDCF project is examining hydromet capacities and early warning possibilities in its entirety, this gives a considerable advantage to the EWS project to help identify the new services the hydromet services can provide by virtue of investments in infrastructure and human capacity. This provides an entry point for this project to help identify and shape the economic partnerships and possibilities that can render the institution sustainable, and to galvanize and coordinate the support from the baseline projects in doing do.

129. As mentioned previously, consultations with private sector stakeholders during the PPG has revealed that these partners are seeking for clearer indications of what services hydrometeorological services can provide in a sector-relevant way. With the LDCF grant, The Gambia meteorological services can provide a wider gamut of cost-recovery services and provide tailored products that it was previously unable to due to skills and infrastructural constraints. This creates greater clarity for the private sector as to what services it can obtain and at what cost.

130. Investing in the development of a cost-recovery policy (including a list of hydro-meteorological products, services, tariffs and prices for public and private clients), will also help mitigate against project risks. In the case where the establishment of an autonomous meteorological suffers delays, the LDCF investment will still ensure that hydrometeorological services can attract viable sources of funding. This will lessen the competition for central government resources, and the barriers that currently exist due to the lack of adequate budgets. One can also anticipate that the reduced dependence on the national budget, with considerable increases in resources, will result in swifter, more effective and efficient transactions.

131. It is also anticipated that sustainable hydromet services will provide better contributions towards accelerating and sustaining national development efforts, which currently depend significantly on climate sensitive sectors.

Outputs and Indicative Activities under Outcome 1- supported by UNEP

132. Output 1.1: A comprehensive business plan for deployment of effective hydro-met service is established - This output will ensure that the met agency is sustainable in the long run, past the duration of the project. Developing a sustainable financing plan in collaboration with public and private partners will ensure a long-term strategy and support for such an agency. Indicative activities for delivering this output are:

- Complete a market analysis to identify services that the new agency can provide and a possible fee management structure
- Develop a cost-recovery policy and comprehensive sustainable business plan, including list of hydro-met products, services, tariffs and prices for public and private clients
- Develop a cost-benefit and economic model analysis for NHMS and EWS
- Conclude an MOU between Minister of Department of Water Resources and Minister of Information on use of airwaves and radio frequencies for climate services
- Conclude a Tripatite MOU between Ministry of Environment, Parks and Wildlife, Ministry of Fisheries and Water Resources and Ministry of Information and Communication in order to identify which services will be provided by which entity and what the cost-recovery mechanisms will be.

Outcome 2: Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by recent needs assessment reports in the Gambia(supported by UNDP)

LDCF project grant request: 2,855,000 USD
Co-financing for this outcome: 10,765, 000 USD

Without LDCF intervention (baseline scenario):

133. **a) Hydrological monitoring:** The Hydrological Network consists of 17 hydrological stations that are supposed to measure tide, salinity and discharge/flow gauges and water level recorders located at strategic positions on the River Gambia and its tributaries. These include Banjul, Albreda, Bintang Bolong, Balingho, Pakaliba, Sambang, Kaur, Kuntaur, Jahali, Pacharr, Janjanbureh, Bansang, Sami Tenda, Basse, Dampha Kunda/Prufu, Suduwol and Fatoto. None of these stations is currently functional because outdated equipment, missing spare parts, or destructions. Autographic recorders that back up manual observations are not commonly used in the network, even though they are essential given the high data demand for parameter intensity measurements by various users. Data is reported to the Hydro-DWR by telephone and entered manually into a computer. The computer is outdated and slow and has low storage capacity. Telecommunications equipment at the DWR is also slow and outdated, and telephone lines have a tendency to become jammed during high traffic or bad weather. There is no flood forecasting software, system or tool and no staff is currently qualified to undertake flood forecasting or flood risk management. As a result, flood warnings are rarely emitted in a timely or accurate manner. The Bansang hydrological station, which is the coordinating hub for other hydrological stations, is in a severe state of disrepair both in terms of site and the equipment. This prevents it from serving as the Regional Headquarter of the Hydrological Services of the country which is desired by the five administrative regions and hydrological services, due to its central location.

134. The baseline projects do not specifically target the issue of floods. While the AfDB financed Water Sector Reform project is expected to rehabilitate and upgrade 11 hydrological stations, it is aimed at improving the management of water resources to meet higher demands for domestic water supply and sanitation, expanding irrigated agriculture to strengthen food security, and sustaining environmental integrity, it does not invest in the improvement in flood forecasting, modeling, and prediction. Although it will invest in the procurement of hydrological stations which will inevitably lead to more data useful for flood risk management, it does not specifically address this issue in terms of capacity building or information generation to carry out adaptation activities or help build resilience at the local level to manage negative impacts of floods.

135. **b) Climate monitoring**: For climate and weather parameters, there are currently ten (10) manual synoptic stations that make up the Meteorological Network in the country, only two of which operate 24 hours per day. These stations measure temperatures, rainfall, wind run, sunshine duration, evaporation, soil temperatures, and take hourly readings. Observers at these stations report data via phones, but to only one line at the central forecast office, which can get blocked due to traffic and which is not manned 24 hours per day. The main challenges at the stations include:

- Broken parts and delayed replacement
- Insufficient spare parts
- Inadequate human capacity to carry out observation and maintain/repair equipment
- Poor infrastructure for enhanced operational observing capacity

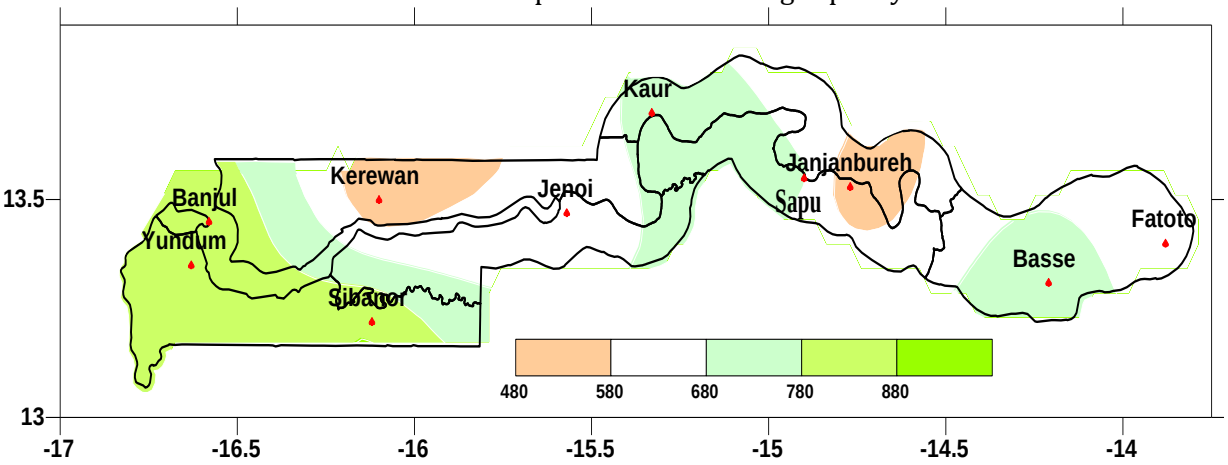


Figure 1: The Meterological network of The Gambia. (Source: Peacock, 2012)

136. As mentioned previously, there is no upper air station, lightning detection, pilot balloon station or radar, which prevents the gathering of information on atmospheric and upper air variables such as pressure, temperature, humidity, wind speed and direction through the troposphere and lower stratosphere. As a whole, only 50% of the country's total area is covered by a manual monitoring system, and none of the country is currently covered by an automated system. Maintaining a dependency on manual monitoring could create increased recurring operational costs that are not sustainably covered by national budgets.

137. The central office uses MSG and SADIS to receive satellite data, however the SADIS system is now outdated and needs to be upgraded. There are limited skills to fully operate or receive data from Geostationary and Polar orbiting Satellites. The visualization systems are also outdated and there is insufficient power, computing and storage capacity within the Forecasting Office or the Met-DWR to conduct now-casting or longer-term forecasting. There is insufficient trained staff to run and

interpret Numerical Weather Prediction models.[27] The Central Forecast Office service runs with only one on-duty forecaster who has to analyze up to four datasets - surface data, satellite data, data on the vertical profile of the atmosphere and outputs from global/regional models. Given the volume of each of the datasets, each should ideally be handled by a forecaster. A complete staff list is in Annex 8.8.

138. The transmission and telecommunications capacity in the current facilities are in need of an upgrade. Real-time data transmission is impossible due to manual recording, data archiving and storage is not available, and transmission of warnings to the public is hampered by the lack of an adequately resourced media studio. The Forecasting Office does not have a reliable internet connection and is often forced to use the Central Aviation servers, which prevents them from downloading satellite information.

139. The ACPC-supported project will install 10 automatic weather stations to strengthen the current synoptic stations with real time data. However it does not intend to provide training on the interpretation and analysis of data generated, or on how to disseminate this content for various users. Given that the lack of hydrometeorological skills and competencies have been a major barrier in developing an effective EWS, the purchase of equipment under these two baseline projects will not be sufficient in addressing the needs for users as current staff will be unable to generate the kind of data and applications that will be useful for a diverse set of users. Without LDCF support there is thus the risk that installation of equipment, without proper training, could lead to underuse of equipment without generating the kind of hydrometeorological information needed by national and local level users.

140. **c) Marine monitoring**: Despite the importance of the coastal and marine zone to the Gambian economy, there is operational 1 marine station. Currently measurements of winds, waves, currents and other biophysical parameters of interest to maritime activities and safety, marine emergency response and ecosystem management among others, are sorely lacking. Sea surface temperature (SST) and sea surface salinity (SSS) are not measured in Gambian coastal waters. [28] Equipment was acquired by the WMO with support from the Spanish government and a marine station was installed in the port at Banjul (2012), as part of a regional West-African project. At the time of writing however, the equipment was still awaiting calibration by project technicians. The project has also not yet delivered any training on data generation and use. While the hopes are that technicians will be sent from the company that installed the equipment to calibrate and provide basic training on usage of the equipment, this will not be sufficient in generating the information needed for an effective EWS, nor will it be sufficient to ensure that The Gambia can autonomously monitor its marine conditions.

141. Without LDCF financing coastal communities, fisherfolk, marine-based economic activities will continue to be vulnerable in the face of unpredictable and variable weather patterns. A large part of The Gambia's economy is rooted in maritime activity, and in order for this sector to contribute to livelihoods and economic growth, improved weather forecasting and climate data would be highly beneficial. During consultations with fisherfolk it was noted that many fishermen risk their lives without knowing that the weather may suddenly change, and in tandem many of the women in coastal communities that are in charge of bringing fish to the market and selling it, are left in

[27] BlueGold Solutions (2009): Earth Systems Research and Systematic Observations in The Gambia, Volume 1: Current Situation and Future Directions

[28] BlueGold Solutions (2009): Earth Systems Research and Systematic Observations in The Gambia, Volume 1: Current Situation and Future Directions

precarious socioeconomic situations without sufficient fish stock and spouses to depend on. Without LDCF financing, the lack of understanding at the local level on climate events and the lack of accurate information at the institutional level, will reduce people's chances of making informed decisions regarding their coastal activities.

142. **d) Water quality monitoring:** The baseline for water quality monitoring system is very low. Climate change, severe weather events and water-related natural disasters such as flooding, droughts and storms can have significant impacts on water quality and supply, impacting the health and sustainability of communities. The concrete links between climate and water quality issues remain unexplored.

143. Currently, the water monitoring lab has very basic equipment and cannot conduct sophisticated analyses of water to reveal a complete list of health and bacterial risks that the population faces in different parts of the country. It can run some basic fecal, chemical and microbiology tests, but the equipment cannot test for a wide sample of chemicals. The lab lacks basic equipment such as filter papers and pads to can hold water samples, as well as gloves and masks, putting the staff at risk. There is no air conditioning to keep the water samples at cooler temperatures to prevent bacterial compositions from changing. There are several revenue streams available for this unit, which in the long term could adequately provide for some of these shortages (interest has already been expressed by the tourism industry which would like to have beach water and pools tested), but given the lack of organisational resources these have not been fully explored.

144. There is also a major capacity constraint in this unit given the severe lack of trained staff. Many of the current staff do not have the educational prerequisites, and are unable to obtain education domestically or abroad to advance their knowledge in water quality monitoring. Most of the staff have been trained through a learning-by-doing approach, which means that they are restricted to whatever activities they have conducted and cannot apply broader theoretical and practical applications to their work. For some of the newer recruits from The University of The Gambia, there is the reverse problem. They did not have access to water monitoring labs in their studies and do not have the training to do the field work.

145. Coverage is also a major issue for water quality monitoring. Given the limitations of staff and transport resources--sampling boat--, the samples drawn are from a limited geographic scope.

146. There are currently discussions underway to have St. Mary's University of Canada fund the training of Gambian water quality monitoring staff. The idea is that trainers would come from Canada to The Gambia so as to train a greater number of staff. At the time of writing this exchange had not been finalized. It is unclear what exact level of training people would receive, what kind of certification they would obtain and whether this would be followed up with more advanced and rigorous training. It does however open the door for such possibilities.

147. There is almost no national capacity for performing basic tasks of repair and maintenance on the available equipment, which indicates a costly reliance on international support. Given the delays in receiving international technical support in calibrating existing equipment, it is likely that without national capacity in maintenance and repair, future equipment breakdowns will also mean long delays for repair thereby resulting in sub-optimal use of equipment and lapses in climate information. In the baseline situation the pre-existing maintenance and repair staff has retired, and

the skills required for upgrading more modern software and equipment are not present within the current staff. While older equipment could be maintained by a more technical/mechanical staff repair team, newer equipment requires more specialised engineering skills that are lacking.

148**. e) Data coordination:** In the baseline situation, one of the challenges is that information is not centralized in a user-friendly manner from which different sectors can extract data. Information relevant to climate change is collected disparately and is managed in an uncoordinated manner. The linkages between different kinds of data are not made (eg climate change and health) which leads to lost opportunities for data analysis and policy-relevant information. Procedures for data sharing, harmonization of datasets, methodologies and cost-recovery for data services, are inexistent. There had been an initiative a decade ago to establish a centralized databank in the National Environment Agency, but without leadership, resources, database architecture, and a clear vision of what this would entail, this remained undeveloped.

149. Maintaining the baseline scenario will consequently lead to gaps in effective and timely flood warnings; a lack of real-time data from across the country that can be collected, analysed and then disseminated effectively to diverse end-users; an inoperable marine meteorological network; an unsustainable and limited water quality monitoring system that is unable to issue water quality warnings to local populations across the country; uncoordinated data collection and application; and a severe shortage of trained staff in all aspects of hydrometeorological activities.

With LDCF Financing (adaptation alternative):

150. **a) Hydrological monitoring**: Seeing that many of the hydro-meteorological staff do not have some of the basic credentials to conduct advanced hydro-meteorological analysis, the LDCF will support the necessary capacity building and training on flood modelling and forecasting, general meteorological skills development, and the development of annual flood risk maps. It will provide trainings on analysis of data, operation and maintenance of equipment in generating information, with the end result of providing appropriate climate messages/information to end-users/stakeholders. This will build on the baseline projects that are investing in equipment but are not providing the capacity or skills building that will optimise the use of such equipment and support the establishment of an effective EWS. LDCF funding will also be used to supplement and rehabilitate other elements of the hydrological monitoring system, by investing in small equipments. The LDCF grant will also rehabilitate the Bansang hydrological hub to enhance the hydrological network. The Bansang station will serve as the Regional Headquarters of the Hydrological Services of the country and will be responsible for the monitoring of all the hydrological activities in the Five Administrative Regions (West Coast Region, North Bank Region, Lower River Region, Central River Region and Upper River Region) of the country. Through LDCF financing, the procurement and installation of appropriate communication equipment and processing equipment and software, the Bansang Hydrological Station will collect, process and share all the data and information generated in the 5 Administrative Regions with the Head Office in Banjul and also collect and share data and information collected and processed by Banjul. Rehabilitating this station is also supportive of the decentralization policies and processes underway in the Gambia to have institutional activities occur outside of the capital. The data generated by the Bansang station will include: water temperature profiles, tides, salinity and other water quality parameters; discharge, flooding and flood prediction and projections, and potential fish biomass of the River Gambia. As per the ESSP in Annex 9, an environmental impact assessment will be carried out by the Gambian government to prevent negative environmental or social impacts.

151. **b) Climate monitoring**: The LDCF project will also complement the ACPC baseline project by installing 7 automatic weather stations to enhance coverage and cover more vulnerable areas. Together these two projects will allow for coverage of 85% of the Gambian territory by an automated system (this project will contribute to 35% coverages). LDCF funds will also be used to upgrade the telecommunications equipment used for real time data collection and distribution, and to design communications protocols. All equipment acquisitions will be accompanied by appropriate training on operations and maintenance. The project will also support the acquisition of 3 pilot balloon stations, as well as lightning detection equipment to enable early warnings. Data storage facilities will be acquired or upgraded where necessary.

Staff within the NHMS will be trained in the use and operation of up to date visualization and numerical prediction systems and tools. Finally, the communications facilities will also be upgraded to enable rapid dissemination of Early warnings.

152. **c) Marine Monitoring**: The LDCF project will provide funding for two automatic marine weather stations with Remote Tide Guages to be installed at Buniadu Point (North Bank) and Gunjur (South Bank), as well as one buoy marine station, and an acoustic wave and current profiler, along with relevant training for staff in the hydrological division.

153. **d**) Water quality monitoring: While a more comprehensive funding strategy for water quality monitoring is devised, the LDCF will assist the Department of Water in performing basic water quality monitoring tasks. This will include the acquisition of adequate lab equipment and the publication of an annual water quality report, which will serve as a basis for the development of a funding or cost-recovery strategy. Moreover, LDCF support for improved transportation will allow water monitoring to occur in more remote and underserved parts of the country, where risks are currently not known or identified regularly.

154. **e) Data coordination:** The project will support the development of an integrated database for centralized climate and environmental data, including cost recovery and data sharing protocols. Integration of data from various sources, including where feasible historical data, will allow for the development of downscaled climate models, supported by training. The LDCF funds will also support the development of a climate atlas, which will consolidate all relevant baseline climate information.

155. The following outputs and activities will be pursued through the LDCF grant so as to build on the baseline and address the gaps identified earlier.

Outputs and Indicative Activities for Outcome 2- supported by UNDP:

156. Output 2.1 Effective, timely and accurate flood warnings issued. The activities under this output ensure that the reliability, accuracy and frequency of flood warnings are enhanced. Floods pose a veritable risk to vulnerable communities and as such this output responds to this urgent need. Aside from the equipment investments, the activities under this output promote capacity building and training in the area of hydrology so as to build a national threshold of knowledge on flood risks, how to assess and manage them, and how to respond to them. While other international interventions which this project will be coordinating with are providing some of the hydrological equipment that will also serve this component, this project is more focused at building long term capacity in acquiring climate information, analyzing it, recording and centralizing it, and then disseminating it to the end-user in a comprehensible way. Each investment is therefore matched with appropriate training as well as peer training so as to decentralize knowledge and make most of resources invested. Under this output, there will be equipment purchases so as to develop the Bansang hydrological station

which will serve as a hub for all other hydrological stations. This site will provide interconnectivity and networking and ensure that information is exchanged in real time across different points in the country. This will also allow communication with more remote parts of the country. The following activities will be carried out to lead to this output:

- Provide training on flood modelling, flood forecasting and flood risk management
- Rehabilitate and repair the Bansang hydrological station which is the coordinating hub for all hydrological stations
- Acquire flood forecasting software and hardware
- Develop annual flood risk maps for vulnerable areas and sensitize targeted communities
- Build interconnected network between stations using a database with integrated analytical functions
- Upgrade network of hydrological stations
- Training of 15 Hydrology Staff on management, use and operations of Automatic Hydrological Stations and analysis of data generated.

157. Output 2.2 Increased availability of real time climate data. Under this output, the activities will lead to increased availability of real time climate data that is accurate, will generate coverage of a greater part of the country including remote and vulnerable areas, and will be analyzed and disseminated appropriately for end-users. The information generated will be collected by the new meteorological agency (Outcome 1) and disseminated to stakeholders from this central point. The purchases of equipment under this output respond to the gaps in current weather and climate information. All of the activities are anchored in training and capacity-building to ensure the ongoing knowledge and skills required to manage the equipment, operate and repair it and to apply it to generate optimal information for stakeholders. Some of the upgrades to the meteorological tools are also necessary given that many of the conventional tools (rain gauges, Stephenson screens) are subject to the elements (windstorms), have been damaged, have not been updated in decades, and require constant monitoring by staff to record data by hand. This means that if one of the two staff that are located at current weather station are ill or absent, that data may be lost. This limits the accuracy of data and how it may serve to predict future climate scenarios.

158. Moreover, the manual equipment has several challenges such as: manual rain gauges do not measure intensity of rainfall which would be particularly relevant information especially in regards to issues with erosion; recording only happens from 6 a.m. to 9 p.m. which means that data is not collected at night and there is a lapse information; and finally there is no measure of humidity or autographic record.

159. In order to transmit data it is also vital that accurate and reliable climate data be made available to media sources immediately. As such, activities under this project also seek to enhance the systems that allow for the transmission of such forecasts.

160. The activities under this output include:

- Upgrade telecommunications equipment for internal MET service communications and real time data transmission, and design communication protocols
- Procure and install 7 automatic weather stations (AWS) for synoptic, climatological and agro-meteorological observations in underserved parts of the country

- Train 20 staff members on management, use, and operations of automatic weather stations, and on analysis of data generated
- Acquire and install 3 pilot balloon stations
- Provide training to persons for management, operation and data collection and dissemination from pilot balloon stations
- Create data storage facility for satellite receiving station with back up power source and capacity to transmit information to other users
- Provide training to 4 persons for management, operation and data collection from Geostationary and Polar orbiting Satellite imagery products
- Conduct peer training workshop with those accredited with specialized Geostationary and Polar orbiting Satellite training
- Upgrade the visualization systems at the central forecast office
- Conduct maintenance and repair training for visualization systems
- Provide training to 10 persons (2 per shift) for interpretation of NWP, management, operation and data analysis of content generated from visualisation software
- Upgrade conventional meteorological measurement tools
- Establish lightning detection including EWS Platform (Software application & contents services) as an alternative to weather radar. This will include 7 sensors; severe storm cell (identification, tracking and alerting); PulseRad (radar proxy for storm rainfall estimates and flood warning); enterprise site licenses to web browser-based display and alerting tools; Application Program Interfaces; and total lightning data and metadata management, processing and archiving; with national coverage.
- Upgrade the Media Studio at the Central Forecast Office to allow timely transmission of the TV Weather forecast to the Gambia Radio and Television Services and other media

161. Output 2.3 A marine meteorological station network is operational. The Gambia has low-lying coastal areas that are particularly vulnerable to climate change impacts, including sea-level rise, increased saline intrusion and flooding during torrential rains. Although adaptation efforts are under way as part of other project interventions (most notably the UNDP LDCF project: Enhancing Resilience of Vulnerable Coastal Areas and Communities to Climate Change) to enhance adaptive capacities of coastal communities, these cannot be fully achieved without accurate and reliable climate data to be used by coastal communities. As such, this LDCF project, invests in the infrastructure required to monitor and predict climate information necessary for disseminating early warnings. Current coastal erosion is occurring at an alarming rate where in some Atlantic coastlines the beach has been retreating at a rate of 1-2 metres per year. The activities under this output will support the meteorological services to gather much needed marine information, which will in turn protect coastal communities and their livelihoods.

162. Activities under this output will also seek to build the capacity of existing professionals so that they may deepen their understanding of marine issues and in turn provide peer training on any capacity building they receive to their peers. As all other outputs, capacity building is a central tenet to ensure sustainability and that the general knowledge base is enhanced with hydro-meteorological staff. This will also ensure that use of investments in equipment are optimized. The activities under this project include:

- Procure and install 2 tide marine meteorological stations at Buniadu point and Gundjur
- Procure and install 1 buoy marine station
- Provide oceanography and marine meteorology training to 2 persons

- Peer training workshop on core aspects of oceanography and marine met training to 5 marine met personnel
- Procure and install one acoustic wave and current profiler (AWAC)

163. Output 2.4 The water quality monitoring system is upgraded. Climate change, severe weather events and water-related natural disasters such as flooding, droughts and storms can have significant impacts on water quality and supply, impacting the health and sustainability of communities. This project takes on a holistic approach to early warnings in light of climate change and therefore includes activities to build capacity to monitor water quality and supply, and carry out analyses for purposes of warning dissemination and to identify more concrete links between climate and water quality issues.

164. In order to ensure that water quality monitoring is sustainable beyond the duration of the project, a long-term cost-recovery plan and financing strategy will be developed. Already, stakeholders such as tourist hotels are interested in receiving regular updates on water quality at the beach to ensure safety for their customers. There is the potential of providing targeted analyses for particular users (health, environment, agriculture etc…), and developing a viable financing plan can render this entity more sustainable.

165. The specific activities under this output include:

- Acquire lab equipment for monitoring of salinity, turbidity, pollutants, organic and chemicals contamination
- Publish annual water quality report
- Provide certification and upgraded training for water quality monitors
- Develop a long-term cost recovery plan and financing strategy

166. Output 2.5 A comprehensive database and data management system is established and centralized. This output ensures that the climate information that is gathered is not done so in a vacuum. Rather, to bolster the capacity of the national meteorological services, the activities under this output are geared towards improved data sharing and management, effective dissemination of tailored data to end users, and a tool to enhance coordination among various governmental stakeholders. Specific activities under this output include:

- Develop database for centralized climate and environmental data
- Capacity building on data management and analysis is conducted
- Procurement, installation and use of user-friendly computer software packages for data processing, dissemination and archiving; including back-up systems
- Installation of model for climate projections and downscaling
- Training for climate modelling and projections and downscaling
- Peer training workshop on climate modelling and scenario building
- Develop climate atlas to generate baseline information
- Develop appropriate procedures and strategies for centralizing data and providing services to users

Outcome 3: A critical mass of skilled human resources is able to operate the Gambia Early Warning System and perform medium and long-term adaptation planning beyond the project (supported by UNEP)

LDCF project grant request: 1,626,750 USD
Co-financing for outcome: 1,430,000 USD

Without LDCF intervention (baseline):
167. There is currently a serious shortage of skilled hydro-meteorological staff, and an even greater shortage looming as 60% of the current staff will be retiring in the next four years. The baseline situation can be summarized by the table below:

Current human resources situation			
METEOROLOGICAL SERVICES		**HYDROLOGICAL SERVICES**	
Optimum	**Current Status**	**Optimum**	**Current Situation**
CLASS I- Meteorologist • PhD Degree - 2 • MSc Degree - 5 • BSc Degree - 14	**CLASS I- Meteorologist** • PhD Degree - none • MSc Degree - 2 personnel • BSc Degree - 5 personnel	**CLASS 1- Hydrologist** • PhD Degree - 1 • MSc Degree - 2 • BSc Degree – 2	**CLASS 1- Hydrologist** • PhD Degree - none • MSc Degree - none • BSc Degree - 1
CLASS II- Senior Level Technician (SLT) • 12	**CLASS II- Senior Level Technician (SLT)** • 3 Personnel	**CLASS II- Senior Level Technician (SLT)** • 4	**CLASS II- Senior Level Technician (SLT)** • None
CLASS III- Middle Level Technician (MLT) • 20	**CLASS III- Middle Level Technician (MLT)** • 6 Personnel	**CLASS III- Middle Level Technician (MLT)** • 8	**CLASS III- Middle Level Technician (MLT)** • 4 Personnel
CLASS IV- Entry Level Technician (ELT) • 40	**CLASS IV- Entry Level Technician (ELT)** • 31 Personnel	**CLASS IV-Entry Level Technician (ELT)** • 15	**CLASS IV-Entry Level Technician (ELT)** • 11 Personnel
SUPPORT STAFF • **24**	**SUPPORT STAFF** • 47 Personnel (without any formal training)	**SUPPORT STAFF** • **8**	**SUPPORT STAFF** • 4 Personnel

168. There is currently no project enhancing the hydro-meteorological skills on a systemic level so as to ensure a basic threshold of skills, competencies that will support the country's hydro-meteorological needs.

169. The First Phase of the Project has focused on targeted training, instead of addressing hydrometeorological human resources development on the whole. The first phase of the project has trained 18 junior level technicians in 2012 and a current team of 14 technicians is due to graduate in December. The training is conducted at the Water Resources Training School. Also two First degree-holders from the Meteorological Services were sent to the Met. Office in the UK but only one of the staff was able to pass the Course. The Course in the UK (US$45,000 per student) was on Mid-latitude meteorology.

170. There has been a real challenge in The Gambia to hire qualified staff due to the lack of national system for professional training and accreditation. The Water Resources Training School has already begun training WMO Class IV students for two semesters, but this is at a preliminary stage, only provides entry level training and will be insufficient to ensure that all the human resources needs are met.

171. The shortage of staff means that many manual weather stations are unmanned and non-operable, and that an effective, national EWS is not functional. According to the 2012 needs assessment, there is currently not sufficient staff to carry out all the analytical and technical functions that are required for a strengthened National Hydrological and Meteorological network that will provide inputs for climate and weather early warning, monitoring, prediction and generation of adequate and accurate data for climate impacts assessment at the appropriate geographical scales country- wide.

172. There is also shortage of staff to maintain and repair hydrometeorological equipment which creates time lags when equipment breaks down, or becomes obsolete. Not having adequately trained repair and maintenance staff also means that there are greater costs associated with equipment as it is often expensive to transport for repair (transportation can also create time lags), and often sensitive equipment can be damaged during transport. This reduces the cost-effectiveness of equipment investments, and creates a lapse in data collection which can have long-lasting impacts.

173. There is a baseline project that addresses the issue of public sector reform: UNDP and Spanish Fund supported public service reform and institutional capacity development project (PSRICD). The project has two goals: (1) strengthened human & institutional capacities for improved economic governance, policy formulation, strategic management & implementation of development programmes by beneficiary institutions; and (2) improved effectiveness, efficiency, responsiveness, accountability & transparency in the delivery of public goods and services to the citizens of The Gambia.

174. However, the project did not target hydrometeorological services. The thirteen beneficiary government institutions under the PSRICD project are the Ministry of Health & Social Welfare; Ministry of Basic & Secondary Education; Ministry of Agriculture; Ministry of Finance & Economic Affairs; Ministry of Local Government & Lands; Ministry of Youth & Sports; Ministry of Information & Communication Infrastructure; Public Service Commission; Management Development Institute; Personnel Management Office; Office of the President; National Audit Office; and Gambia Revenue Authority. While there is overlap with many of these institutions, hydro-meteorological activities are primarily grounded within the Ministry of Fisheries and Water Resources which were not direct beneficiaries to this program. The LDCF grant is thus needed to specifically target hydrometeorological human resources.

175. One of the more worrying aspects of this lack of capacity is what it means in the mid to long-term future as climate impacts increase. Without adequate training and skills-building and attraction of new hydro-meteorological staff, the country will lose current expertise while forgoing the capacity to predict and analyse future scenarios that will support development initiatives.

176. In a business as usual scenario, reliable and accurate forecasts will not be generated thereby subjecting the population and economy to risk. There will continue to remain a shortage of targeted services, leading to a lack of understanding on the part of sector-relevant stakeholders and local populations as how to plan and manage climate change risks. One can also foresee a degradation of services as current staff retires and is not replaced at an adequate rate.

With LDCF financing (adaptation alternative):
177. The LDCF project will ensure that any equipment that is installed is associated with capacity building of personnel, followed by a peer training so that those receiving training can disseminate information to their peers. The LDCF project will seek to build a cadre of professionals that can utilize sophisticated hydro-meteorological equipment and generate the kind of complex information that will support adaptation activities. The LDCF project will build on the baseline and attempt to use a similar model as the one as University of Saint Mary's whereby trainers can come to the country and accreditate several staff at once. This will limit costs for sending staff internationally and will allow the participation of a greater number of staff in their local context.

178. One of the most significant contributions of this project will be to take a mid to long-term view of how to continuously generate sufficient staff for hydrometeorolgical services. The project will support alignment between academic institutions and the civil service so as to identify national needs that academic institutions can fulfill. It will also assess the incentives and bonding practices which currently hinder recruitment[29].

179. Lessons will be drawn from the PSRICD project and applied where applicable to the LDCF project. The LDCF grant will allow HR issues to be addressed in a holistic level: providing training for skills development; attracting new staff; attracting more women staff; identifying incentives to ensure retention; increasing accessibility for hand-on experiences through use of improved technologies and equipment. The LDCF will be addressing personnel issues at all levels related to EWS: collection of hydro-meteorological data, analysis of data; and effective dissemination data.

180. In particular, the LDCF grant will make the following outputs and activities possible:

Outputs and Indicative Activities for Outcome 3- supported by UNEP
181. Output 3.1 A cadre of certified maintenance and repair technicians exists within the NHMS**.** This output addresses the fact that there is a shortage of maintenance and repair technicians required to maintain and sustain the equipment being used by hydro-meteorological staff. Creating national "in-house" capacity means that expertise and skills are fostered nationally so as to maintain equipment and make full use of investments as well as provide continuous climate monitoring, cost effectively. The specific activity contributing to this output is:

- Provide training on maintenance and repair of hydro-met monitoring equipment.

182. Output 3.2 A recruitment and retention strategy is developed. This output takes a long-term strategic approach. Instead of merely focusing on immediate staffing and training, the activities under this output are geared to developing a plan to ensure competent personnel and skills in the long-run. Activities under this output will be geared not only at the government level, but will explore linkages with the University and colleges to develop a symbiotic relationship, whereby institutions produce the kind of credentials that are needed to fulfil specific long-term meteorological needs. This will involve curriculum development and a sound understanding of the needs well into the future. Activities under this output will also explore incentives to attract qualified personnel to join the civil service, which remains a challenge. In particular, bonding practices that require putting up land as collateral before receiving training, which new recruits are often required to do, can create great

[29] Bonding practices are the commitments that staff have to make in order to receive training, particularly training abroad. These can include, financial commitments, putting land down as insurance. For those without land ownership, they must commit land or assets belonging to immediate families.

impediments for participation. Activities under this output will review such practices and explore ways of attracting staff while ensuring that they remain committed to working for hydro-meteorological services in The Gambia.

183. The particular activities that will lead to this output include:

- Develop a 10-year recruitment and retention plan to upgrade skills and capacity for hydro-meteorological services
- Begin negotiations with the University of The Gambia to revise curriculum and align it more closely to hydro-meteorological skills required at national level
- Review current bonding practices which are impediments to training and seek efficient recruitment and retention strategies.
- Incorporate climate change and weather training into certification requirements for extension workers

184. Output 3.3 A cadre of certified hydro-meteorological professionals is established**.** This output addresses a central issue identified in the needs assessment and baseline study: the lack of qualified and certified hydro-meteorological professionals that can support an early warning system and provide reliable and accurate climate data to the population. There are a few concerns at hand: (1) the lack of certified staff means that they are often not eligible for international/regional trainings that would otherwise upgrade their skills; (2) the skill level is not optimum for making full use of equipment, analysis and dissemination of climate data; (3) much of the staff has acquired skills from a learning-by-doing approach without necessarily having the prerequisite baseline knowledge that would support them in being more analytical with climate data. The activities that would lead to this output will foster capacity within the country. This project will build the capacity of the The Water Resources Training School so that it is not be limited to providing entry level training without the possibility having future follow-up classes to enhance students' credentials.

185. Strengthening the Water Resources Training School (students belong to the Ministry), will also provide long-term educational benefit and will allow training students nationally, for some courses, without relying on expensive international programmes or travel. It will also strengthen the met services' autonomy and attract students that cannot pursue their education abroad. Strengthening the School will also enhance national meteorological capacity for the long-term. The skills of existing staff will also be bolstered so that they are prepared to operate an effective EWS and optimally use the data generated through investments under the LDCF project.

186. Activities under this output are about creating and sustaining the core competencies that are required to have an effective EWS. These will be enhanced through regional learning sessions, peer workshops, and accessibility to certification and training.

187. Activities delivering this output include:

- Providing a forecasting course to meteorologists
- Upgrading the Water Resources Training School to deliver the basic-intermediate requisite skills for entry-mid level meteorologists
- Certifying middle-level Technicians (WMO Class III) at the Water Resources Training school.
- Providing Meteorologists and Hydrologists with WMO Class I training (PhD, MSC, BSC in AGRHYMET, UK, Nigeria and Nairobi)

- Providing Senior Level Technicians with WMO Class II training (Nairobi/Lagos (Met.) and Barbados (Hydrology))
- Providing Middle-level Technicians with WMO Class III training
- Providing Entry Level Technicians with WMO Class IV training at the Water Resources Training School
- Organizing regional study tours for mid-level meteorologists and hydrologists to enhance cooperation regionally and gain training from regional centres.

Outcome 4: Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans (supported by UNEP)

LDCF project grant request: 3,011,200 USD
Co-financing: 9,005,000 USD

Without LDCF intervention (baseline):

188. The baseline situation is such that although the NHMS provides communication products to various sectoral partners and stakeholders, these are not being understood or effectively incorporated in stakeholders' programme of work or planning. The following are weather monitoring and early warning products currently produced by the NMHS in the baseline scenario:

- **Dekadal Early Warning Bulletin:** Disseminates information on expected weather for the next 10 days. This Bulletin is also a 10 days early warning bulletin for food Security in the Gambia produced and published by the multi-disciplinary working group of the AGRHYMET regional programme, including comparison of present data with last year's data;
- **Seasonal Rainfall Outlook:** Disseminates seasonal forecast issued once a year in June, and updated in July/August. The Outlook gives information on onset and cessation of the rainy season and the amount of rain expected. The projection also contains information on the categorization of the rainy season as being normal, below normal or above normal. During consultations, many stakeholders complained that this arrives too late in the season to help people with their agricultural planning.
- **Daily General and Public Weather Forecast Bulletin:** this is prepared every day for broadcast over GRTS TV. It contains information on weather elements for the preceding 24 hours and a forecast of these elements for the next 24 hours. It also contains information on forecast times of sunrise and sunset. The key complaints about this broadcast by stakeholders is that (i) it is not carried out in local languages which means that a significant portion of the population do not understand it; (ii) people, particularly in areas outside of the central Banjul, do not have confidence in the forecast; and (iii) even for people who do understand English, a large number of people do not know how to interpret the forecast.
- **Flight, Route and Aerodrome weather forecast bulletins** for the purpose of aviation. The type and frequency of the forecast depends on the movement of aircrafts and the time of the year.

189. On an irregular basis, hydro-meteorological services produce:

- **Special Weather Bulletins** that are issued as and when certain weather conditions are expected, such storms with strong winds, heavy and high rainfall intensity, sandstorm/dust storm, fog, and thick hazy conditions that reduce horizontal and vertical visibility to a prescribed but dangerous level,

- **User-Specific Weather Bulletins** carry the same urgency, periodicity and information as Special Weather Bulletins but are tailored to specific users such as the Gambia Ports Authority, Fisher folks, Construction Companies, the National Water and Electricity Corporation and many more that spend a lot of time working outdoors

190. Despite the production of these products, consultations with stakeholders have revealed four main critiques: (1) the material is too technical to be understood and used; (2) the content is not tailored enough to be useful; (3) Weather-related products arrive too late to be useful. This is especially the case of the seasonal outlook on rains—it often arrives once farmers have already planted thereby reducing its usability in guiding farmers; (4) the content is not reliable.

191. Communication challenges have also been noted at the local level. In addition to the four critiques above, current concerns expressed by communities are:

- Specific locations are not identified when providing weather information. Forecasts are not sufficiently downscaled.
- Often the information provided is too brief and filled with jargon.
- The daily forecast is always carried out in English and not understood by the majority of the population.
- Forecasts appear on television and most of the local population does not have access to this technology or have problems of electricity which limits its use.
- Forecasts have not been explained at the local level

192. In the baseline scenario, the contact between media/media related institutions and the NMHS has disorganized. Often, the national website is not updated frequently enough for those users with internet connectivity to access. It has also been difficult for media representatives to obtain climate and weather information, particularly of warnings and advisories on impending weather with potential for disasters, due to limited staff and capacity at NHMS. Currently there are also no protocols whereby hydrological and meteorological Officers stationed in the field regularly update media institutions. Often media communicators are unaware of hydromet staff and offices in their Regions, and hydromet staff have no training to liaise information to media outlets. This creates a communication gap in the transmitting of information.[30] Trainings are scheduled under the first phase of the project with the media and are commencing at this time.

193. Many of the institutions work with or need to work with climate information delivery services for their respective target beneficiaries. For instance, the Department of Agriculture provides extension to farmers, Fisheries Department provides support to fisher folk, Forestry Department provides services to Forest Park and forest users, GCAA plans and guides aircraft movements and airport operations, NDMA prepares people against disasters by giving them timely warnings and provide relief and rehabilitation to victims of the disasters. Media houses and community radio stations require weather and climate information for their listeners and readers. NGOs, Regional Agricultural units, Education Units, construction & public works operations, health institutions, forest communities, international agencies (e.g. FAO, WFP, Red Cross), and fire services are just some of the end-users that require sector-relevant climate information. All these stakeholder institutions require weather and climate services for fulfilment of their mandates, but currently do not receive information in the form needed to do so.

[30] Ngum & Sock (2012).

194. Weather and climate information is currently being aired free of charge for the public interest by GRTS and funded by the Elton group on television. There is however the desire expressed by the institution for the service to be paid for if it is to take the form of a stand-alone permanent programme. One major issue is that the majority of the Gambian population does not have access to watching television programmes due to lack electricity supply in their villages/communities. Most of those who receive weather forecasts in the regions do so from Radio Gambia.

195. Some of the weather forecasts and climate advisories are wrapped into other programming which may suppress some of the relevance (e.g. North Bank Community Radio which has an agricultural programme, with weather and climate change as a sub-theme). Others are not very accurate, such as Capital FM, where the forecast merely gives temperature ranges and some regional weather conditions. The Farafenni Community Radio runs a programme on disaster prevention and management in collaboration with the National Disaster Management Agency (NDMA) and all the rest of the community radio stations, which have a huge following and access to the local level, have no programs or activities relating to the weather and climate change.

196. The telecommunications company GAMCEL does at time send out warning during climate-related crises. These are carried out free of charge. However, GAMCEL's text messages on weather and climate are in English and therefore accessible mainly to literate people with GAMCEL phone lines. The text messages provided by GAMCEL are fairly irregular and point to the fact that there is no consistency or real criteria by which the crises have been identified. There are three other major cell phone carriers and these do not send out such warnings.

197. The first phase of the EW project, the LDCF funded CCEWS1, has begun to lay the groundwork for data collection and sharing of environmental information. The project has initiated training for field data collectors and participating MDFTs and local communities on the type of socio-economic data and information required, the importance of such data, and procedures for collection for issuing early warnings and adaptation advice. It has also sought better communication of the EWS messages for farmers, including of the benefits on the basis of advanced forecasts and alert messages provided by the project and supported by actions to integrate climate risks into sectoral policies such as in agriculture. This first phase will contribute towards reducing the vulnerability of communities living in the project demonstration sites through the application of those recommended adaptation measures. However, this will be happening in a localized manner, rather than on a national scale. The first phase of the LDCF project is only being implemented in the North Bank, Banjul, Kanifeng while the second phase is national and scope and covers all the regions. CCEWS-1 is also collaborating with a FAO-funded intervention to develop a song on climate change to be shared at the local level. This song has been produced and will be used in the first phase project sites. The majority of the rest of the country however is relatively uninformed about climate change. In consultations in two of the pilot sites relatively near the capital, it was made evident that the local communities have not been informed or prepared for climate change.

198. As a result, in the baseline scenario, although villages develop their annual village development plans and have a village development chair, these do not currently integrate climate change or prospective climate-events. Development planning at the local level thus does not incorporate climate considerations.

199. The project preparation phase also revealed that in the baseline scenario ministries are working disparately at the local level. For instance, NDMA has its own contact groups, DWR has its own, sometimes there is overlap and overburdening of local agents, but these are not harmonised or integrated. This can be seen on issues related to natural disaster warning, management and response, but also in the area of agriculture, particularly related to food security alerts.

200. In terms of disaster management, there is very low capacity to respond to disasters. During local consultations it was revealed that although mechanisms are in place for recording and assessing disasters, often these are not responded to. Often times, when villagers are seeking to notify of disasters, or to follow-up on previous reports, they are unable to reach NDMA or the onus is on them to transport themselves to the city of Banjul to report the case. This creates great costs both in terms of expenses and time. Part of the problems on the disaster management end is that aside from the shortage of human capacity, they have limited equipment that can be integrated with an EWS. For instance, they do not have a call recording system which can record the caller, their location and the scope of the disaster.

201. NDMA also do not have an Emergency Notification System (ENS) which are systems which allow an Emergency Call Center and public safety officials to warn people of impending dangers in their area, such as flash floods, wildfires, or sandstorm. These warnings can be planned in advance, for example in flood plains or other known hazard areas, or they can be provided dynamically in response to a currently occurring emergency. There is thus very limited coordination between disaster management and early warnings in the baseline scenario, which are exacerbated by the lack of communication technologies.

202. Without intervention, on the biodiversity front, it is projected that lower average soil moisture will affect the nitrogen up-take of plants and their palatability to grazing animals, and lead to a sharp drop in biomass production under projected natural growing conditions. Long-term loss of ecosystem productivity is likely to adversely affect biodiversity in rangelands, even though soil carbon stocks look likely to increase as a consequence of biomass production failures.[31] Although negative impacts are also projected on wildlife, and behaviours of species have been altering face to climate variability, these are not monitored or examined in light of climate change due to a shortage of equipment and resources.

203. The first phase of the project will be used to collect feedback from the community end-users (farmers and fisher folks) on the usefulness of the messages and advice. The first phase has also sought to raise awareness of the media on climate change and its potential impacts on various facets of livelihoods and commercial activities. The second phase of the project will seek to use accurate data to enrich climate risk assessment and develop targeted early warning messages and weather forecasts.

204. Numerous baseline assessments have been carried out under the scope of CCEWS1 e.g. Consultancy on the Needs Assessments for an Effective Early Warning System in The Gambia; Socio-Economic Consultancy on Designing a Climate and Climate Change Early Warning System for The Gambia through Identification, Collection, Processing and Inclusion of Representative Socio-economic Data for Impacted Communities.

205. There is currently no drought management policy in The Gambia. Drought is a significant problem in The Gambia. In 2011 alone, drought led to a large drop in crop production and a contraction in real GDP.[32] In 2012, drought led to severe food shortages, worsening food prices which

[31] The Gambia's Second National Communication, 2013

[32] IMF: IMF Executive Board Concludes 2013 Article IV Consultation with The Gambia Press Release No. 13/343. Online at

ended up 25% higher than in 2011.[33] It was estimated that in 2011, 42% of the population was going hungry. In a predominantly agricultural society, crop failure can lead to catastrophic outcomes.

With LDCF intervention:

206. This proposed LDCF project builds heavily on the first phase of the UNEP-funded CCEWS 1. The project design is built on the findings of the assessments and field analyses conducted under the preparation of the first project. This LDCF project will also promote learning from the packaging, communication and dissemination of EWS messages to different users and sectors that is currently being piloted in the first phase of the Early Warning NAPA project, as well as learning from the lessons in media training. However, CCEWS activity is limited to only the North Bank Region, Banjul and Kanifeng region of The Gambia, and covers primarily the agriculture and water sectors. Development and operationalization of an effective and sustained early warning system for The Gambia will need to cover all 5 administrative regions and the Greater Banjul Area as well as all major vulnerable economic sectors, which this proposed LDCF project seeks to do. National capacity for assimilating forecasts and mainstreaming them into existing development planning is critical and will be undertaken. Communication channels, strategies and procedures for issuing climate change early warning products will be institutionalized and plans and activities for sustainable financing of the operation and maintenance of the installed EWS will be developed and implemented.

207. The first phase of the project received $930,000 in GEF financing which limits the activities to the North Bank, Banjul, Kanifeng area. For that reason the second phase has been proposed to extend the learning from the first project and construct a national project that can impact all parts of the country, reach the most underserved and vulnerable areas.

208. In addition to the communication products that will disseminate tailored products to stakeholders and local communities, this project will also develop a drought policy where there is none to address the increasing challenges this poses, particular in relation to crop failure and resulting hunger.

209. With LDCF financing, the project will also be able to better integrate disaster management considerations within the early warning activities. As it stands, although there is a positive relationship between NDMA and DWR, both of the entities are operating in silos with parallel activities. To strengthen EWS it will be necessary to strengthen the communicative abilities to of NDMA as well. In particular, strengthening a Computer Aided Dispatch System (CAD) will allow to record critical information coming from calls and support the tracking and responses of first responder units. CAD systems will make available the location of callers and the associated disasters and will be able to automatically record and archive this information for improved knowledge on climate disasters in The Gambia. CAD systems will also facilitate the generation of reports, statistics and analyses which can be used to improve public safety services. This data can be analyzed to identify patterns and develop strategies to more efficiently address and plan for incidents.

210. Similarly an Emergency Notification System (ENS) would support the dissemination of climate alerts. This would allow the designation of particular phone lines in a geographic area which would receive a

http://www.imf.org/external/np/sec/pr/2013/pr13343.htm

[33] Action Aid: Drought in the Gambia as West Africa's Sahel Crisis Spreads. Online at: http://www.actionaid.org/news/drought-gambia-west-africa%E2%80%99s-sahel-crisis-spreads

recorded message of climate disasters are forecasted for those regions; these can be sent out in form of physical calls, texts and even e-mail alerts for those areas that are more connected to the internet.

Outputs and Indicative Activities under Outcome 4 (supported by UNEP)

211. Output 4.1 Targeted climate products are produced for sectoral institutional partners. Activities delivering this output support the creation and tailoring of climate products that are sector-relevant. The goal is that different sectoral stakeholders make use of climate information in a way that is useful to them. This will support various governmental stakeholders to better serve the public and achieve their own goals. This output takes a holistic approach in that it addresses diverse sector interests which have expressed a need for climate information such as agriculture, disaster management, food security and soil conservation, parks and wildlife, environment etc... It also promotes the use of software and applications that can fulfil the needs for climate information and harmonize responses to particular climate events.

212. Food security alerts are also folded into this output. In a country where a significant percentage of the population is undernourished, it is necessary for the country to establish food security alerts and warn populations of possible upcoming hardships. This is particularly important when a natural hazard may destroy foodstuffs, or when crops are maladapted to a variable climate, or when people do not ration ahead of time because they are unaware of upcoming severe climate-events. Food security alerts will help people to plan and respond to such circumstances.

213. Activities under this project also include efforts on the policy and institutional front, in order to ensure that policies are in place to respond to droughts. Also, strengthening the National Disaster Management Platform will ensure harmonisation and coordination among activities from different ministries. As it stands, EW and disaster management have been operating individually—these activities can support coordinated resources and interventions.

214. In particular activities under this output include:

- Develop GIS-based climate related maps and models (GIS application for flood vulnerability, GIS application for drought severity, storm surges, sustained winds, sea-level rise)
- Develop 10-day agro-meteorological and monthly bulletins, seasonal forecasts and crop-climate models, food security bulletins
- Development and revision of agro-met and other hazards' communications SOPs, codes and advisories to make them more user-friendly and relevant to sectoral
- Development of food security alert systems in 14 pilot sites
- Gather and analyze agro-meteorological and crop data to be able to issue food security alerts
- Capacity building of soil scientists with climate science and training of lab equipment to disseminate early warnings
- Develop a Drought Policy and Monitoring Strategy
- Develop clearly-written Standard Operating Procedures (SOPs) in the event of early warnings for disasters
- Harmonize different ministerial standard operating procedures and strengthen the coordinating mechanism (National Disaster Platform)

- Review list of recipients of bulletins and forecasts and ensure key stakeholders are included

215. Output 4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up. Activities delivering this output ensure that not only is climate risk information disseminated widely and targeted to remote and vulnerable communities, but also that there is an uptake of such information at the local level. As such, activities under this output operate at two levels: (1) sensitization and building public awareness and instilling a greater understanding and trust in what forecasts and various climate information mean, but also (2) building capacity at the local level to comprehend such information and apply it at the local level in adaptive responses. This output also focuses on disaster management and ensures that protocols on how to respond to climate-related disasters are widely disseminated, understood and integrated in community planning.

216. Working with decentralized government agents (such as the Multidisciplinary Facilitation teams that are made up of cross-sectoral actors or extension workers) that have the trust of local communities and are aware of the various needs at the local levels, and build their capacities in understanding and interpreting climate risk and knowing how to respond, can help promote uptake of climate information. Sensitizing media can also lead to a more informed and knowledgeable audience when it comes to weather hazards and climate change.

217. Specific activities under this output include:

- Step-down training for MDFTs and Extension staff to disseminate climate information and provide user-relevant climate risk management advice (14 sites)
- Train MDFTs, farmers and other sector end-users to apply/use climate information for enhanced productivity and climate risk management (14 sites)
- Develop guidelines, tools and seasonal calendars to foster a common understanding of climate risks
- Training and monitoring of various end-users in the uptake and applications of climate and climate change early warning information
- Conduct needs assessment for disaster risk management, recovery planning and checklists for preparedness in the face of climate risks.
- Enhance trust in forecasts by engaging extension workers and MDFTs to sensitize local communities on meanings of forecasts and climate risks in pilot sites
- Develop MOU with Media Houses (all media-related stakeholders) and telecommunication services on early warning and disaster-related communication dissemination
- Sensitize media houses on disaster protocols once they have been finalized
- Strengthen contact groups in 14 pilot sites to disseminate early warning information and disaster management protocols

218. Output 4.3 Underserved communities receive early warning messages. Activities under this output are designed to provide access to climate information for a larger percentage of the population, particularly those residing in vulnerable and remote areas that are currently underserved by weather-related messaging. This output also focuses on the end-user, ensuring that EWS is effective by reaching a breadth of local populations. Many of the activities here are focused on using the GRTS as well as community radio stations as a vehicle to reach a larger population. The activities are anchored by the concept of sustainability to ensure that any use of GRTS and community radios is done according to a strategic plan with appropriate long-term and sustainable financing to

use their media services beyond the duration of the project. Using GRTS and community radio will involve public-private partnerships which will be explored and strengthened during project implementation. Thus, financing for communications will be central to the activities listed below to ensure ongoing delivery of EW.

219. Dissemination of information will take several forms. First, broadcasters, media personnel will be trained in the delivery of hydro-meteorological information, alerts and advisories. Second, forecasts and climate data will be translated into local languages which was identified by almost all stakeholders as the most pressing change to be made for effective delivery. Currently the forecast is only conducted in English which limits the use and uptake of this information. Translation will involve partnerships with various governmental players and CBOs to ensure that warnings, advisories, forecasts and other climate information are delivered cost-effectively in local languages.

220. Mobile phones, which were identified during community meetings as an essential tool for reaching people, will also be used to disseminate information. Graphics will be developed to signal level and scope of warning so as to reach non-literate communities.

221. All of these community-based activities will be piloted in the 14 test sites that have been determined during the project preparation phase. The pilot sites all include a contact group that will be used as an entry point for communication. It is a diverse group that is made up of the village head, village development chair, Kanyaleng women (traditional communicators), religious representatives, diverse clan representation and youth and elders.

222. Specific activities under this output include:

- Increase coverage of radio forecasts to underserved regions and radio stations and guarantee national coverage while building sustainability
- Support GRTS in developing a national coverage plan to provide forecast information and identify financing opportunities for long-term sustainability
- Establish public private partnerships for enhancing community radio participation in EW dissemination
- Provide communications training on message development and delivery of early warning messaging in local languages to broadcasters
- Translate weather forecasts into local languages for transmission on a daily basis through TV and community radio, and in early warning advisories
- Use of mobile phone technology for disseminating warnings and collecting data on ongoing disasters and developing MOUs with telecom companies
- Provide early warning, climate change adaptation and disaster risk reduction training to local contact groups in 14 pilot sites
- Create new early warning dissemination mechanisms in pilot sites through contact groups (to be delivered through inter-ministerial approach)
- Mobile alert system: develop a set of graphic messages and codes for early warning and agro-meteorological information
- Engage and support the 14 Community Radios in the 14 Pilot Sites to enable timely reception and dissemination early warning products (forecasts, warnings, advisories, etc.) to communities

223. Output 4.4 Climate change issues are integrated into local development plans in 14 sites. The activities that leads to this output ensure that climate information that is gleaned from improved meteorological services is integrated into local development plans so as to build long-term adaptive capacity and resilience. These activities will initially take place in the 14 pilot sites in all regions of the country. Each selected site has a local development committee which updates its plans for the upcoming year annually. As of now, climate risks, hydro-meteorological data, adaptation, disaster risk management is not included in these village development plans.

224. The activities listed below will help prepare local stakeholders to manage information on climate risk, and plan their responses:

- Generate climate scenarios and climate impacts
- Conduct economic study on impacts of climate change on livelihoods, production and economic activity at local level
- Provide technical support to local development planning teams to integrate climate considerations into long-term planning
- Develop community response plans to climate induced food security threats in 14 pilot sites
- Simulation of National Disaster Contingency Plan in pilot sites
- Develop response plan to floods and mainstream in community development plans
- Incorporate response to floods in National disaster management policy
- Enhance the capacity of the emergency call centre for use by local communities

225. Output 4.5 Enhanced knowledge of climate impacts on biodiversity. The Gambia's biodiversity is central to the country's economy, culture, and environment. In order to have an effective EWS which optimally serves the country, this project integrates biodiversity monitoring. The baseline information on climate change impacts on biodiversity has been scarce. Although wildlife officials describe that migration patterns and behaviours of certain species are changing, these have not been documented systematically in relation to climate change. Nor have wildlife officials been warned of impending climate risks and how to enact policies and practices that may help them respond to climate-related disasters. The activities under this component thus extend early warning to a sector of the economy that is vital to The Gambia:

- Upgrade existing wildlife and biodiversity monitoring sites and establish new sites for observation
- Capacity building on species' monitoring is delivered to Parks & Wildlife Management
- satellite monitoring used to assess habitat/species/forest loss and links made to climate events, hydrological changes by the new meteorological agency in collaboration with Parks & Wildlife Management
- Identifying wildlife/species baseline with current climate scenario in 6 protected areas and 3 other biodiversity hotspots
- Carry out study on climate-species movement/migration as related to climate change
- Climate change mainstreaming into nature-based tourism development plans

226. Output 4.6 Knowledge management structures for effective feedback and incorporation of lessons learned are created. In addition to the monitoring and evaluation, given the communicative aspect of EWS it will be necessary to be continually learning in this project to ensure that climate information is relevant to the people who receive it, and is useful in helping them to adapt to climate risks. Therefore, activities delivering this output will seek to establish effective feedback mechanisms and knowledge management structures to deliver the optimum messaging to reduce people's exposure to risk and threats. This will also help ensure that resources are used most-cost effectively

and that inefficient vehicles are not promoted throughout the project term—rather that the project activities can continually be re-adapted to serve the greatest number of people through the most effective messaging and delivery possible.

227. Specific activities under this output include:

- Assess disseminated climate information to feedback and inform the development of tailored products throughout the project.
- Establish inter-ministerial MOU on sharing results from project implementation
- Identify the type of data that is being collected in central database, assess whether it is providing service to different departments
- Distribute a survey both at midterm and at end of project to assess both efficiency and effectiveness of EW messaging and related climate and disaster management trainings, as well as the accuracy of climate products.

2.5 Key indicators, risks and assumptions

2.5.1 Project Indicators

228. Performance indicators are crucial to measure the impact of the project at the outcome level and to track change during the project implementation period. The outcome indicators in the table below are designed to measure changes in the coverage, impact, and sustainability of the project outcomes. Indicators have been developed to be Specific, Measurable, Achievable, Realistic and Time bound ('SMART') and are indicated in the Project Results Framework.

Indicator	***Time scale and Measurement***
Impact Indicator The key impact indicator for this project is the level of capacity of agencies to monitor, assess, disseminate, and promote uptake of hydro-climate information for early warnings and long-term planning. This indicator will be measured through the use of the standardized Capacity Assessment Scorecard (Annex 1).	Time Frame: By end of Project (annual progress reviews to be conducted) Measured by: Running the capacity scorecard again
Outcome 1 Indicator- Amount of dedicated budget allocated for NMS activities by end of project Baseline: new agency has no budget allocation	Time Frame: By end of project Measured by: annual national budgets and records

Indicator	*Time scale and Measurement*
Indicator- Completion of a comprehensive business plan to support financial sustainability of hydrometeorological services Baseline: New agency does not have a business plan in place to ensure financial sustainability	
Outcome 2	
Indicator- Percentage of national coverage by monitoring network, and percentage of which is covered by an automated network by end of project Baseline: 50% currently covered by monitoring, 5% of which is covered by an automated network.	Time Frame: By end of project Measured by: annual performance reviews
Outcome 3	
Indicator- Number of skilled hydro-meteorological staff recruited and retained by NMS by the end of the project (disaggregated by sex) Baseline: 88 staff of which 12 are female	Time frame: By end of project Measured by: annual payroll records
Outcome 4	
Indicator- Percentage of population with access to improved climate information in pilot sites (disaggregated by gender) Baseline: 5% of population has access to EW in pilot sites	Time frame: By end of project Measured by: Survey

2.5.2 Project Risks

229. Key risks and associated mitigation measures underlying project development were identified during the project preparation stage:

Description of risk	**Risk Category**	**Potential Consequence**	**Level**	**Management Response**	**Risk Mitigation by Output**
Lack of political will to support project	Political	Limited sustainability	Low	The project is the second phase of a project on EWS that has already been initialized and has received political support from various government stakeholders. This project is a result of strong political will; and is capitalizing on the momentum of the first phase of the project. This project is in line with the NAPA, and Vision 2020 and fits with the Gambia's overall broader policy on climate change. This	Output 1.1 Developing a comprehensive business plan in collaboration with public and private partners will ensure a long term strategy and support for such an agency. The process of consultation and identifying sectoral needs, and how the new agency will fulfill them, backed up with hard economic data, will reinforce the political will for this project.

				project is also taking place in parallel to a process that will support the formation of an independent meteorological agency, which demonstrates the current interest in strengthening meteorological services.	4.6 Knowledge management structures for effective feedback and incorporation of lessons learned are created. Given the communicative aspect of EWS, the continual learning in this project to ensure that climate information is relevant to the people who receive it will be shared with stakeholders, thus maintaining political interest while demonstrating outcomes. Activities under this output will seek to deliver the optimum messaging to reduce people's exposure to risk and. Threats—such positive outcomes will assist in maintaining political will.
Lack of coordination among government stakeholders	Political/organizational	Project delays/sustainability issues	Medium	Clear mandates are articulated in the development of the project, and roles and responsibilities will be outlined at the project inception meeting, and have been discussed at the logframe validation meeting. Regular interministerial meetings and consultations will be held to share progress, challenges, roles and responsibilities chaired by the project manager. The key to managing this risk will be ongoing communication, which has been one of the lessons learned from the first phase of the project. Platforms such as the National Climate Committee and the Disaster Management platform will be	2.5 A comprehensive database and data management system is established and centralized This database will help coordinate sectoral activities, order sectoral information and support future government activities and interventions. The joint nature of this activity will support coordination and sharing of knowledge and expertise. Sectoral partners will be contributing and extracting from this joint database to advance their work, leading to enhanced

				specifically used to keep government stakeholders involved and engaged.	collaboration and coordination. 4.1 Targeted climate products are produced for sectoral institutional partners. This will enhance coordination among sectors as communication is enhanced and hydrometeorological services respond to the needs of various sectors. This process will also help clarify what needs institutional partners have.
Unavailability of requisite human resources/lack of skilled human resources	Organizational	Project delays/project failure	Medium	The lack of adequate, skilled human resources has been a major barrier for a satisfactory EWS in the Gambia. The project is addressing this issue by focusing project activities on establishing the basic threshold of skills and personnel for the operation of a successful EWS (See Outcome 3). By targeting the systemic issues around recruiting and maintaining staff, the project is mitigating against the risk of not having qualified staff. Moreover, the various trainings and capacity building initiatives seek to increase the skill and competencies of existing staff.	3.2 A recruitment and retention strategy is developed. This output mitigates this risk by taking a long-term strategic approach. Instead of merely focusing on immediate staffing and training, the activities under this output are geared to developing a plan to ensure competent personnel and skills in the long-run. Activities under this output will be geared not only at the government level, but will explore linkages with the University and colleges. This will involve curriculum development and a sound understanding of the needs well into the future. Activities under this output will also explore incentives to attract qualified personnel to join the civil service. 3.3 A cadre of certified hydro-meteorological professionals is established. The activities under this

					output will mitigate this risk by fostering capacity within the country. For instance, the capacity of the The Water Resources Training School will be strengthened to train national meteorology students with entry level and follow-up training to enhance their credentials.
Inability to communicate effectively with local communities	Strategic	Inadequate use of project products/ limited sustainability	Medium	The project will target this issue by consulting local communities to meet their needs, translate climate products into local languages, use improved communication mediums and allow for recurrent feedback mechanisms so that lessons learned can continuously inform the production of climate products. Contact groups have been designated in pilot sites whose very job will be to report back on success of project activities. These contact groups are very inclusive (different clans, village head, kanyaleng women, youth, religious figures, elders). Numerous consultations have sensitized local communities as to the project goals and activities.	Output 4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up Activities delivering this output ensure that not only is climate risk information disseminated widely and targeted to remote and vulnerable communities, but also that there is an uptake of such information at the local level. This will happen through (1) sensitization and building public awareness and instilling a greater understanding and trust in what forecasts and various climate information mean, but also (2) building capacity at the local level to comprehend such information and apply it at the local level in adaptive responses. Output 4.3 Underserved communities receive early warning messages. Activities under this output are designed to provide access to climate information for a

					larger percentage of the population, particularly those residing in vulnerable and remote areas that are currently underserved by weather-related messaging. This output also focuses on the end-user, ensuring that EWS is effective by reaching a breadth of local populations.
Limited capacity to effectively tackle all project components	Strategic/Organizational	Inadequate completion of project	Medium	The project components have been constructed out of the lessons learned from the first phase of the EWS project as well as based on a needs assessment conducted in The Gambia. The project is incorporating the lessons learned through these two processes, and through consultations during the preparatory phase. The project is thus based on activities that have been deemed possible at the government and local levels. The interdependence of activities among different government actors also ensures that each party brings their comparative advantage to the execution of the activities, making the implementation of the activities possible. It also adds an internal level of accountability; e.g. the GRTS is dependent upon DWR for climate information, and other sectors are dependent upon GRTS for the dissemination of such climate information. Each level requires effective execution of activities in order to fulfill its mandates. In addition, due to the extensive consultations that have been had, government partners have incorporated	Output 4.6 Knowledge management structures for effective feedback and incorporation of lessons learned are created and activities delivering this output will seek to establish effective feedback mechanisms and knowledge management structures to continuously promote learning to deliver EW to reduce people's exposure to risk and threats.

				these activities as part of their own work-planning, which need to be executed for fulfillment of their programme of work. Co-financing commitments also reinforce the desire by the government to execute these activities. Finally, the key impediments to the execution of the activities are the lack of financial and human resources. Outcome 1.1 and 3.2 target these issues on the onset to ensure that there is a strategic plan in place for sustainability and successful implementation. In terms of implementation at the local level, contact groups have been established and activities will be carried out in conjunction with the village development chair and committee which makes project delivery at the local level accountable to specific village planning processes.	
Telecommunication challenges hamper implementation of the project	Strategic	Project investments are not able to be used to their full potential	High	Given the current challenges that the forecast office faces, it is possible that telecommunication challenges pose significant threats to the project. The project will address this by investing in upgraded telecommunications equipment and by including telecommunication partners in the implementation of this project so as to increase their stake. Cost-effective solutions for each particular situation will be used e.g. satellite automatic weather and hydrological stations, where reporting over the mobile telecoms network will be preferred. An MOU will be sought between the government and telecom companies.	Investments in enhanced and reliable telecommunications infrastructure under Output 2.2 Increased availability of real time climate data help mitigate against this risk.

				There are however baseline telecommunications (landline, coverage) problems in the Gambia which go beyond the scope of this project and could impede some aspects of the project. However, all of the 14 pilot sites have access to excellent mobile technology.	
Extreme climate events	Environmental	Disruption of project activities/damage to project infrastructure	Medium	Coordination will be sought with NDMA, MDFTs and other regional organizations to deliver early warning advisories to pilot communities, as well as offer relief and adaptation recommendations for such events. Climate events will serve as a mechanism to deliver on outputs of the project.	Investments in infrastructure under Outputs 2.1 Effective, timely and accurate flood warnings issued; 2.2 Increased availability of real time climate data; 2.3 A marine meteorological station network is operational, should over the duration of the project begin to yield more reliable and accurate climate data that can be used to protect assets and investments under this project.

2.5.3 Assumptions

230. Key assumptions underlying the project design include:

- Participating government ministries, departments , agencies and stakeholders will demonstrate the political will and commitment to execute this project successfully;
- There is basic infrastructure, systems, and government structures in place on which this project can be built.;
- Forecast accuracy will increase through the provision of increased hydro-meteorological data and training;
- The identified equipment and infrastructure are best adapted to contribute to improved capacity observe and forecast severe weather events;

- The relevant ministries, agencies and government stakeholders require the climate information being made available and will utilize them optimally: participating government stakeholders will incorporate the climate information (risks and adaptation strategies) made available through this project to mainstream into their own activities and include in development planning;

- The pilot sites chosen for first phase of implementation are representative of the climate-diversity in The Gambia and are ideally suited for conducting pilot activities;

- Participating communities have displayed a need for this type of climate information and will be fully committed to the project. They will also play their mutually agreed to role, particularly in reporting back during monitoring and evaluation activities, so that they may benefit themselves and activities can be replicated in other communities, while building on lessons learned;

- Regional, municipal and local stakeholders will work in coordination with national level ministries and agencies to execute this project;

- The simulation exercise is conducted without interference from natural or other hazards.

- The government is capable and committed to integrate the SOPs into its regular operations and budgets after the duration of the project;

- The government will be willing to consider a change in regulation and national budgetary frameworks to support the ongoing operations of the monitoring system.

- There is and will continue to be sufficient qualified personnel within the NHMS to handle the new equipment, data transmission/storage/treatment

- The private sector finds incentives and a vested interest in participating in the EWS

2.6 Cost-effectiveness

231. The project will be implemented through government agencies responsible for EWS, climate change adaptation, disaster risk management and multi-sectoral task teams. Drawing expertise from the departments responsible for planning and implementing climate resilience enhancing practices was considered the most cost effective approach.

232. Given the need for resources in The Gambia, every effort has been made to ensure that funds are used most cost-effectively, efficiently and give the greatest value per dollar invested.

233. Alternative approaches were considered for this project but were considered less cost effective. For instance, although a low-level wind alert system was initially part of the project design, it was considered to be less-cost effective in the long-run. After numerous consultations with forecasters and policy-makers, it was deemed that the low level wind alert system would not necessarily yield wind data content needed to issue early warnings. It was also assessed that the installation of automatic weather stations could provide the kinds of information that could be duplicative with a low level wind alert system. Consultations with stakeholders also revealed that there was greater interest in investing in human capital and skills building than merely equipment, which is why some of those resources were diverted to building up the Water Resources Meteorological school to train civil servant meteorologists at a higher rank than it is currently providing.

234. Similarly the upper air system was forgone in this project despite being part of the original proposal. It was deemed that the range of equipment requested in this project can collectively yield the kind of data that can be provided by the upper air station. It was also noted that the development of meteorological services has to happen incrementally ensuring that human skills and capabilities match the equipment being purchased so that investments are not underused. It was felt at this time that the currently requested equipment can be utilized optimally by a staff that is trained in tandem.

235. As mentioned previously, the project will be piloted in 14 sites to assess the effectiveness of early warning dissemination at the local level. Although this may seem like many sites, this is cost-effective in the long run in that sensitization on early warnings will cover a greater geographic expanse. This will reduce the cost of future replication activities. Moreover, by working in all regions, the project is sure to obtain quality feedback from diverse populations living in different climate situations, which will help inform EWS. Such activities will also promote greater community ownership which in the long-run will be greater uptake of project interventions.

236. The design of this project has also been informed by the first phase of the early warning project (2011-2014). The first phase had a limited budget of GEF financing (1,028,000 USD), which did not cover the costs of planned infrastructure at a national level, and was not able to provide the desired training and equipment to meet hydrometeorological needs. The needs assessment which was commissioned by the first phase of the project, informed the activities of this project, namely how to address the financial, equipment and human capacity gaps. In particular, the following needs highlighted in the needs assessment were incorporated into the design of this project:

- A need for the Meteorology Division of the Department of Water Resources to be transformed into a full-fledged Gambia Meteorological Agency with the necessary clauses that will enable it to perform its mandate of advising the Government of The Gambia on policy formulation and implementation relevant to weather, climate and climate change issues that have critical effects on the socioeconomic development of the country.
- Facilitation of commercialization through cost recovery and linkages with government and private institutions to ensure improvement and sustainability of the provision of forecasting and early warning services and provision of information for disaster reduction;
- A need for additional meteorological and hydrological observing and monitoring stations to be installed to improve forecasts and provide the required early warning and advisory services by the meteorological services;
- Need for an establishment of an Instrument Repair Workshop that will be staffed with skilled personnel and stocked with spare parts;
- Improvements in National, Regional and Global Telecommunication Systems at the CFO, Communication and Data Analysis Division (CDAD) at the Headquarters of DWR, GIS Data management and Database system , Meteorological observation networks for Surface, Upper Air and Marine, Remote Sensing Network and Systems
- Need for improved maritime and hydrological observation network
- Provision of more understandable and tailor-made forecasts and information to the following sectors and activities: Agriculture (especially crop production) and Livestock Services, Fisheries and Coastal Settlements, Forestry Sector and forest industry, Water Resources Management, Energy Resources, Transportation (air, road and water, Tourism, Construction, Land use planning, Insurance, Human Health, Disaster risk reduction, Media
- Strengthening of the Water Resources Training School (WRTS) to enable the training of technicians at the WMO Class IV and III levels in the areas of Meteorology and Hydrology and their applications in socio-economic development

- Facilitation of the provision of the necessary training for personnel on application and forecasting of weather and climate at the AGRHYMET Regional Centre, ACMAD, University of Nairobi, FUTA in Nigeria, and the Regional Meteorological Training Centres, (RMTCs) in Egypt, Kenya, Niger and Nigeria.
- Preparation of a comprehensive strategic plan that reviews the current service scheme and structure of both cadres and provides for a carrier development plan and systematic progression opportunities for the retention of trained and skilled staff.

237. Moreover, the second phase extends the investments made in the first phase, to a national level. While the first phase of the project focused around Banjul City and the North River Region, the second phase has pilot sites across the country. The second phase of the project will also build upon the preliminary trainings initiated in the first phase. For instance, while there have been initial climate sensitivity trainings held in the first phase, these will be integrated into village development plans and processes in the second phase and translated into concrete adaptive policy actions. Moreover, while the first phase of the project initiated technical training at the Water Resources Training School, the second phase will enhance the school as a national institution to be able to provide follow up qualifications, and develop a strategy to integrate new recruits into the meteorological services. The first phase was unable to provide capacity building on equipment and technologies that the country does not possess, and the second phase will provide an integrated approach both in terms of providing the equipment and technologies but also on how to use, apply and interpret generated data effectively.

236. In order to ensure that cost-effectiveness is achieved, the following measures will be taken:

1. Coordination with other international projects to ensure harmonisation, coordination and the sharing of resources when applicable.
2. The removal of some of the outputs and activities proposed in the PIF which were not cost-effective investments and did not meet EWS and climate-related urgent and immediate needs as per the NAPA.
3. Emphasizing skills and capacity development so as to ensure that systemic capacities are built and the project is not merely focused on equipment or technical inputs, which over time can become obsolete.
4. Promoting South-South partnerships wherever possible to reduce training costs and promote long-term regional partnerships.
5. Identifying stakeholders that have the basic capacity to carry out interventions and are best suited to do so cost-effectively and sustainably.

2.7 Sustainability

237. Sustainability is a key consideration in the design of this project. Previous barriers to developing an early warning system have been examined closely to determine which issues have prevented the development of an effective EWS in The Gambia. The project will address any such issues that may threaten the sustainability of the project after completion. The project is designed to support the development of an early warning system that can be self-sustaining, establish cost-recovery mechanisms, and have buy-in from various levels of government and communities long after the project has been completed.

238. This project will have strong and durable impacts beyond the project implementation phase as it aims at transferring and rehabilitating hydro-met equipment, building capacities of government staff and leveraging financial support from new partners through payment for climate-related services and information. In particular sustainability will be achieved due to the following:

- *The project outcomes are closely aligned and coordinated with national efforts to promote developmental goals and priorities*. The project is aligned with the framework of Poverty Reduction Strategy Papers (PRSP). In the case of Gambia, the relevant pillar which the project will support is "Improving social protection needs of the poor and vulnerable and Enhancing the capacity and output of the agriculture sector". The project also supports The Gambia's climate change integrated Programme for Accelerated Growth and Employment (PAGE) and supports the five key pillars of (i) accelerating and sustaining economic growth, (ii) improving and modernising infrastructure, (iii) strengthening human capital stock and enhancing access to social services, (iv) improving governance and increasing economic competitiveness and (v) reinforcing social cohesion. The project also complies with The Gambia's NAPA, responding to the urgent needs, and supports the following NAPA objectives: (i) delivering adaptation benefits; (ii) contributing to building local and national adaptive capacities; (iii) creating awareness and build foundations for maximising long-term adaptation benefits. This project also builds upon the investments made in the EWS Phase I project.

- *The project addresses crucial hazards* which threaten economic activity, livelihoods, social and physical infrastructure as well as The Gambia's environment. The project is focused on strengthening the capacity of national and sub-national entities to monitor climate change, generate reliable hydro-meteorological information (including forecasts) and to be able to combine this information with other environmental and socio-economic data to improve evidence-based decision-making for early warning and adaptation responses as well as planning, which would carry on well after the completion of the project.

- *Project activities have been designed to promote cost recovery*. Activities in the project (Component 1 & 2) involve devising a business plan for long-term financing for any new services. The rationale is that establishing sustainable financing is the first step of implementation to ensure long-term sustainability. This is the case for virtually any new services folded into the project e.g: water quality monitoring, biodiversity monitoring, enhancing communications through community radio and GRTS, as well as enhancing the new meteorological agency. In addition, the private sector as well as crown corporations will be approached to make additional funds available for specific interventions; initial conversations have already begun with telecommunication companies. Civil aviation, port authorities, energy companies, telecommunications, tourist and construction companies are all interested stakeholders. In order to realize these financial relationships, it is necessary for the project to articulate what possible arrangements would look like and to specify the types of hydro-meteorological services that can be provided. This is why a cost-recovery plan is embedded in the project as an activity.

- *Economic analyses underpin project activities so as to ensure that sound economic considerations are included in all decision-making.* Cost benefit analyses and cost-recovery plans are built into the activities to ensure that sound fiscal judgment is at the heart of decision-making and that all activities have long-term financial support. This is particularly relevant given The Gambia's recent decreases in international development support from the

European Union and DFID. In order to ensure sustainability is ensured it is necessary to identify all the long-term possibilities of funding which are being conducted through activities under Components 1 & 2, and the potential benefits the project activities will bear so as to secure such funding irrespective of the changing donor climate.

- *Stakeholders have been engaged in planning and design stages, and the prospects of stakeholders to adopt interventions beyond the duration of the project will be maximised.* The project outcomes are closely aligned and coordinated with efforts already underway within Gambia to promote development which is resilient to climate change at the national and local levels. The project is focused on strengthening the capacity of national and sub-national entities to monitor climate change, and generate reliable hydro-meteorological information, including forecasts, and to improve decision-making and planning for early warning and adaptation responses. The proposed project will be implemented at the country level by the lead Ministry (Ministry for Fisheries and Water Resources) mandated to advance climate monitoring including management of climate data in full collaboration with other relevant line Ministries who rely on the information for planning purposes (Disaster Management, Agriculture, Finance, Planning, Health, Environment etc). Sub- national authorities (Provincial and/or District officers, Municipalities, civil society (women and youth associations, NGOs, media, farmers' associations) and the private sector will all also be important stakeholders, as end users and have been engaged in the design of the project.

- *National capacity is fostered in the project*. One of the main challenges facing The Gambia is the lack of *skilled* human resources. Often staff working in hydro-meteorological services do not have prerequisite training or qualifications. A large portion of the staff obtains their credentials through on-the-job experiences that are limited in scope. The project will be unsustainable if competent staff is not able to conduct the various activities required for an effective EWS, or do not have the capacities to analyse complex meteorological data. For that reason, training and capacity building are folded into every aspect of this project. Aside from training associated with the use of various equipment, the project takes a forward thinking perspective by including relevant climate change and weather-related training at the certification level of extension workers, so as to ensure cadre of trained extension workers that have a sound understanding of climate advisories and how these should be responded to. Similarly, the project will promote activities with the University of The Gambia so as to design curricula that will generate hydro-meteorological students that will meet long-term needs of the country. Moreover in-house expertise for repair and maintenance will be fostered to promote self-sufficiency and to ensure long-term use of EWS equipment, technology and infrastructure. MDFTs and other government officials will also receive training on climate change resilience and how best to disseminate information so as to reach the largest amount of beneficiaries. Staff will also receive capacity building in communications while broadcasters and media house will be sensitized on climate-related information, how to deliver it, and how to plan for responses (with collaboration with NDMA). Additional capacity built on operations and maintenance of existing and newly procured hydro-net infrastructure will remain a strong sustainability point well after the project is completed as the project would have created a skilled manpower for NHMS to maintain its equipment. Assuming these officials stay in the public service, this experience will be incorporated into the sub-national planning environments and applied to all equipment and infrastructure beyond the duration of the LDCF project.

- *Improved hydro-meteorological information*: The rehabilitation of existing weather observational equipment and the procurement of new AWS, hydro gauging stations, marine stations, satellite and visualisation software, will allow for weather information to be gathered beyond the duration of the project and feed into the enhanced analysis and modelling capacity set up by the project. The project will use lessons learned from Phase I to feed into the implementation of this project, good practices and lessons learned back into the developing national and sub-national climate planning processes, and add to the experiences of other on-going projects. The improved accuracy of weather forecasts and information will also lead to greater reliability and trust by the public, leading to more long-term use by citizens.

2.8 Replicability

239. A central objective of this project is to build capacity at the national level for improved climate observation to enhance EWS for the purposes of climate change adaptation. As such, the knowledge gleaned, the institutional changes made, the structuring of new organizational mechanisms, the establishment of cost-recovery and cost-sharing practices will serve as demonstrations for other projects and initiatives.

240. As this project is the second phase of developing a viable, sustainable, long-term EWS at the national level, one does not anticipate a third phase, or this project to be replicated in its entirety in the near-to mid-future. However the lessons learned, the good practices, the knowledge transfer and identification of opportunities and challenges will be shared during and after project implementation, and can be replicated within the scope of other interventions. Most notably, as this project will be key in supporting the development of a national meteorological agency, it is anticipated that other activities carried out by this entity will build on the knowledge and experience of the implementation of this LDCF initiative.

241. One of the most relevant contributions of this project which will allow for replication is that of downscaling. The interventions being undertaken in the pilot sites will be replicable on a national level as they will set up the necessary technical and communication infrastructure which will showcase how relevant hydro-meteorological information can be transmitted to the most vulnerable and remote local users. The use of national institutions to do this (DWR, NDMA, NEA, among others) will bolster the capacity of these entities to be able to carry out similar interventions anywhere else in the country. The training of extension workers and MDFTs and the enhanced training of extension workers at the collegiate level, will demonstrate how these entities can be deployed to advise on adaptation actions under particular climate events. The capacity building of hydro-meteorological staff, extension workers and MDFTs will be conducted with an eye to building a pool of experts that are capable of transferring expertise and knowledge to other colleagues and stakeholders at various levels of governance.

242. This project will demonstrate what kind of organizational structures work for the service of communities at the local level. For instance, the contact groups that have been established in the pilot sites include the village head, the village development chair, kanyaleng women's groups (traditional communicators), elders, youth, religious representatives (imam), extension workers as well as local fisher/farmer folk. This is a new form of local organization in dealing with government agencies and this project will demonstrate whether these are good channels by which to communicate through. These contact groups, as soon as the project will be implemented, will be replicated to serve as contact points for other government dissemination activities: namely NDMA and Agriculture.

243. The replication of activities under this project will depend heavily on knowledge management. Knowledge transfer is addressed through inter and intra governmental exchanges; information dissemination at the local level and to the general public; knowledge transfer between national governments and regional and municipal levels; and through international exchanges, particularly with those countries where EWS projects are being implemented for an improved understanding of possible challenges and opportunities. Skill-building is a central tenet of this project as this has been one the greatest barriers in achieving an optimum EWS in The Gambia.

244. At the hydro-meteorological level, the aim is to strengthen the services to the extent that they are able to replicate any activities within this project. The project will thus establish a core network of national hydro-meteorological competencies, effective communication mechanisms, and sustainable financing opportunities which will provide the enabling conditions for downscaling information.

245. Lessons learned during local level adaptation interventions will be shared with community based organizations (CBO) and Non-Government Organizations (NGO), government agencies and Ministries through the media and NCC outreach activities so that they could be replicated elsewhere in the country.

246. At the international level, the Adaptation Leaning Mechanism will serve as a useful platform to share knowledge. There will be ongoing interactions with other countries implementing their EWS to share experiences. Outside of those, there will be close interaction with the governments of Senegal and Niger for purposes of training.

2.9 Stakeholder involvement plan

247. Numerous stakeholders are required to successfully implement this project. Government, regional and local entities and actors will be engaged in the generation of information, its analysis, the dissemination; and uptake of information received. The table below outlines some of the key roles and responsibilities:

Table: Stakeholders to the project

Stakeholders to the project			
Organizations	**Mandate/objective**	**Role in the Project**	**Potential Benefits**
Ministries and Departments			
Ministry of Forestry and Environment	Responsible for the formulation of policy in environment, forestry and wildlife management.	Contribute in the overall project leadership and promote the mainstreaming of climate change into sectoral policies and strategies. It will also be a recipient of tailored advisories and climate messaging and warnings.	Staff of the ministry and its departments will benefit directly from the project's institutional and human resources capacity building activities. In order to mainstream climate change concerns into the national development agenda, particularly in the Environment sector.

Stakeholders to the project			
Organizations	**Mandate/objective**	**Role in the Project**	**Potential Benefits**
Ministry of Fisheries, Water Resources and National Assembly Matters	Responsible for formulating policy and promoting investment in water resources and fisheries as well as coordinates through DWR the implementation of climate change related projects.	Contribute to the overall project leadership and implementation and promote the mainstreaming of climate change in the sectoral policies and management plans especially in the fisheries and water sectors.	The Ministry and its staff will benefit from the project capacity building activities and information derived through the project.
Ministry of Agriculture	Responsible for formulating agricultural policy and promoting investment in agriculture and implementation of agricultural programs. It also coordinates the implementation of project that aids adaptation to climate change.	Mainstream climate change in the agriculture policy; and support the small scale interventions for rural livelihoods improvement.	Improved understanding of potential negative impact of climate change events on national agricultural production
Ministry of Finance and Economic Affairs	Responsible for overall national economic policy and development plans as well as the national budget. Provision of Government contributions to projects and coordination of donor funding	Assist in mainstreaming climate change risks and adaptation into policies at national & local development planning. It provides counterpart funds as government's contributions to the projects.	Improved understanding of potential negative impact of climate change events on national development and economic goals.
Ministry of Works, Communications & Infrastructure	Responsible for the Government's infrastructural policy and development and mainstreaming climate change into infrastructure development	It role in the project is very limited. It is much more a beneficiary than a contributor.	Improved understanding of potential negative impact of climate change events on infrastructure development
Ministry of Regional Administration, Lands & Traditional Rulers	Responsible for regional and local administration and development. Through its technical departments it develops guidelines for urban and land use planning.	Support the mainstreaming of climate change in regional and local area development plans. Sensitize local communities on the benefits weather information and foster a broader collaboration between communities and the NMHS.	Will benefit from the improved understanding of potential negative impact of climate change events on Communities and municipal development
Ministry of Health and Social Welfare	Responsible for overall national health policy and development plans as well as the implementation of programmes and project related to health.	It role in the project is limited and much more a beneficiary than a contributor.	Will benefit immensely from the understanding of the relationship between disease and weather conditions as well as the use of the information derived from the project on planning process for interventions
Ministry of tourism and Culture	Responsible for overall national tourism and	Support the mainstreaming of climate change into the tourism sector and encourages the use	Staff to benefit from sensitization on climate

Stakeholders to the project			
Organizations	**Mandate/objective**	**Role in the Project**	**Potential Benefits**
	culture policies development.	of weather information by the sector.	change and use of weather forecasts
Ministry of Energy	Responsible for overall national energy policies	Support the mainstreaming of climate change into the energy sector and encourages the use of renewable initiatives and weather information	Staff to benefit from capacity building on further understanding climate change issues as well as the use of weather and climate information.
Ministry of Information, Communications and Information Technology	Responsible for national information policies and information technology development	Assist in the dissemination of weather and climate information, particularly in local languages in the national media outlets.	Broader collaboration with the National Meteorological Services
Department of Water Resources (DWR)	Responsible for climate, weather and hydrological information and data; UNFCCC's focal point, responsible for National Communications on CC and host and coordinates the project	Coordinates the implementation of the project and also houses the meteorological and hydrological divisions, which are core bases for the provision of weather and climate information.	Staff to benefit from Capacity development as well as gain institutional support.
Department of Fisheries (Ministry of Fisheries and Water Resources)	Responsible for implementation of national fisheries policy; Promotion of artisanal fisheries and aquaculture; Management of fish landing sites and mainstreaming climate change into the fishery policy.	The design and implementation of climate resilient fisheries including the development of aquaculture; and support for the rehabilitation and protection of fish landing sites against sea-level rise	It is expected to benefit from capacity building and information provided by the project
Department of Forestry	Responsible for the implementation of the forest policy and legislation and the supervision of the community forestry programs	Limited role in the project and is much more a beneficiary than a contributor; use of weather information in monitoring wild fires	It is expected to benefit from a broader understanding of the negative impact climate change in the forestry sector.
Department of Agriculture	Responsible for the implementation of agricultural policies and projects at national, regional and district levels	Contribute in the effective implementation of the project at regional and district levels as it deals directly with farmers	It is expected to benefit from a broader understanding of the negative impact climate change in the agriculture and the use of weather and climate information to enhance productivity
Department of Livestock Services	Responsible for the implementation of Livestock policies and projects at national, regional and district levels	Contribute in the involvement of the project in the Livestock sector at regional and district levels as it deals directly with farmers	It is expected to benefit from the use of weather and climate information to enhance productivity

Stakeholders to the project			
Organizations	**Mandate/objective**	**Role in the Project**	**Potential Benefits**
Department of Community Development	Assist local communities to organize and undertake community development projects in their areas	Support and encourage the involvement of local communities in pilot areas and assist them in integrating climate change in the communal plans	Improved understanding of climate risk reduction issues and the use of weather climate information at community level
Department of Parks and Wildlife Management	Responsible for the administration of national parks and all Protected Areas in collaboration with local communities.	Design and implement climate resilient wetlands management plans; and assist in the implementation of the project in the biodiversity sector	To benefit in the institutional assistance of the project and capacity building
Department of Non formal Education	Responsible for the implementation of non-formal education programmes in the country	Their role is vital in the interpretation of weather forecasts in local languages and aiding local communities understand weather and climate information	It is expected to benefit from the use of weather and climate information to enhance a broader community involvement.
Para-state Agencies			
National Environment Agency	Responsible for promoting and coordinate the implementation of all environmental policies in the country;	Support and encourage the involvement of local communities in pilot areas with the assistance of its regional coordinators; the consideration of climate change issues in environmental planning.	It is expected to benefit from the use of weather and climate information to enhance a broader community consideration of climate change issues in the environment
National Disaster Management Agency (NDMA)	Responsible for disaster management; promotes local and national disaster management plans; coordinates disaster response activities and funding;	Help in mainstreaming climate change into the national and local disaster management plans and strategies.	The Agency will benefit from the information derived from the project and training in climate change related issues
Gambia Ports Authority (GPA)	Responsible for Ports management, monitoring of information on tides and dredging activities. station	Provide information and data on the tides as well as the dredging activities. Also host the marine weather	Staff to benefit from capacity building and information derived from the
Gambia Tourism Authority (GTA)	Responsible for the promotion and development of the tourism industry.	Engage in encouraging the tourism and leisure industry in the use of weather information in their activity planning.	Greater awareness of dynamism of climate change on the coastal zone and improved capacity to mainstream climate changes in tourism development plans.
Gambia Civil Aviation Authorities (GCAA)	Responsible for aviation and the management of the Airport	Biggest user of weather products in aviation; it also host the central forecast office and the equipment it uses.	It will continue to benefit from the use of weather information in its operations
National Agricultural Research Institute	The Institute carries out research on crops, livestock, forestry, fisheries and other natural resources.	May be involved in research activities, linking natural resource management and biodiversity and climate change	Development of staff capacity through the project.

Stakeholders to the project			
Organizations	**Mandate/objective**	**Role in the Project**	**Potential Benefits**
		issues and development of relationships with communities for on-farm action research.	
University of The Gambia	The University provides training at graduate and undergraduate levels in fields including climate change related fields and livelihoods development.	The University may be contracted to carry out some of the training required under the project program.	Staff to benefit from capacity building program of the project
Media: Gambia Radio and Television Services;	Provision of news and information on varies issues of interest to the general public as a way of raising awareness and promoting development	Information dissemination on the project both radio and television; dissemination of impacts of climate change to the general public and sensitization of stakeholders	Increased awareness of impact of climate change on the socioeconomic development and the important role of media in this context
Local Governments of North Bank, Western Coast, Lower River, Central River and Upper River Regions	Responsible for the administration of the areas in their jurisdiction	Contribute to the implementation of the project's activities in the pilot sites and the mainstreaming of climate changes in regional development plans.	Will benefit directly from the project's capacity building activities and products
Non Governmental Organizations, community based organizations and Private sector			
Local Communities- Fishermen, Kanyaleng women's group and farmers organizations as well as Herdsmen Group and Vegetable Growers Group, youth for information dissemination (designated by the contact groups in pilot sites), and Village Development Councils, Community radio stations	Community organizations to promote development at local level. Assist in the mobilization of community efforts for development work.	Mobilize and participate in the design and the implementation of adaptation schemes and use of weather information; vital in building trust between communities and NMHS; information dissemination; providing feedback on climate products, reducing climate risks faced by communities.	Greater awareness of climate change issues and capacity development
NGOs: TANGO, Stay Green, Famers Platform	Delivery of development activities at local and community levels in partnership with donors and local communities and their organizations.	These are organizations that are key in the delivery of early warning messages to farmers and communities, hence their collaboration and cooperation is vital for the project. Also support the implementation of	These organization will benefit from the project capacity building activities

Stakeholders to the project			
Organizations	**Mandate/objective**	**Role in the Project**	**Potential Benefits**
		community training and sensitization in order to increase the climate resilience of communities.	
Gambia Hotel Association	Organizes the stakeholders in the hotel industry to promote the industry; and encourage good practice among members.	Participation in increasing awareness of climate change risks among their membership and provide a forum for interaction between the project and the hoteliers.	Increased awareness of impact of climate change hazards on the industry and sensitization to develop adaptation measures.
International Agencies			
UNDP	Works to eradicate poverty; Supports the elaboration of national strategies and policies in the area of climate change adaptation; Supports technical capacity building (Institutional, Financial and Human); Coordinates and supervise the implementation of UNEP and GEF funded projects	Executing Agency for the Project	Increased Inter-agency cooperation in mobilizing funds for the Gambia in quest to reduce vulnerability to climate change.
GEF, UNEP	International Donor Agencies on climate change and environmental related projects	Donors to the project	Increased Inter-agency cooperation in mobilizing funds for the Gambia in quest to reduce vulnerability to climate change

Key Government Stakeholders

248. The following government stakeholders have an important role in the implementation of the project and are also beneficiaries to the project in that they will tailored advisories, communication messages and based on their value added and basic abilities, capacity building and skills development.

- Ministry of Fisheries and Water Resources;
- Ministry of Environment and Parks and Wildlife Management;
- Ministry of Agriculture;
- Ministry of Lands and Regional Government;
- Ministry of Finance and Economic Affairs;
- Ministry of Health and Social Welfare.

249. The Ministry of Fisheries and Water Resources is responsible for the coordination and implementation of the project, whilst the Ministry of Environment and Parks and Wildlife

Management is responsible at policy level and represents the project in Cabinet. There are also biodiversity-related monitoring activities that will be carried out by the Ministry of Environment and Parks and Wildlife Management, and this ministry will take part in inter-ministerial coordination in administering project activities.

250. The Ministry of Agriculture and its line technical departments (Department of Agriculture and Department of Planning Service) are key stakeholders for success of the project as they are both users and providers of information. The extension staff will play a key role in disseminating early warning and climate information, and will receive climate and communications training. The ministry will also be included in activities related to early warnings on food security.

251. The Ministry of Lands and Regional Government is responsible for regional administration and development and has a direct responsibility over the pilot project sites. The Ministry of Finance and Economic Affairs is the Government's Agency that is responsible for coordinating bilateral and multilateral donor assistances and formulating and streamlining government's short and long terms development plans into which climate change issues are integrated; progress and expenditures will be reported to this Ministry. The Ministry of Health and Social Welfare is a potential user of information, considering the relation between diseases and weather—they have not been implicated in the first part of the budget, but will receive tailored climate products.

Technical Departments

252. The Departments of Water Resources which will host the project and the Department of Fisheries are technical arms of the Ministry of Fisheries and Water Resources. The Departments of Water Resources has two Divisions (Meteorology and Hydrology) which are very essential to the project, in fact the core basis for the provision of weather and climate related information. Each of this Division has a Network of ten stations across the country. The Department of Fisheries also has agents and representatives in fish landing sites along the coast and in-land who work directly with fisher folks.

253. The two technical departments under the Ministry of Agriculture which are key to the project are the Department of Agriculture (Extension) and the Department Planning Service Unit (Statistics). These two combined, have extension agents working at Regional, District and village levels across the country. The two could be potentially useful in the implementation of the project with regard to the dissemination of early warning messages/alerts as well as farmer sensitization on weather and climate issues.

254. The five regional offices plus the two municipalities under the Ministry of Lands and Regional Governments deal with communities both at rural and urban levels and are, therefore key in the understanding and delivery of early warning information to these communities as well as getting feedbacks to the project for improvement.

Para-state Agencies

- National Environment Agency (NEA)
- National Disaster Management Agency (NDMA)
- Gambia Radio and Television (GRTS)
- Gambia Civil Aviation Authority (GCAA)
- Gambia Ports Authority (GPA)

255. The National Environment Agency is the Focal Point for both GEF and UNEP, it has to endorse all PIFs under these two agencies. It is both a provider of environmental information and user of early warning information and most importantly has a GIS Unit that is vital for publication of information, particularly providing maps for vulnerable and affecting areas for intervention, thus making it a partner and a key stakeholder.

256. National Disaster Management Agency (NDMA) is responsible for disaster management and risk reduction and coordination of disaster response activities. It has regional coordinators in all the 7 regions and the two municipalities. The NDMA is one of the main users of climate information in its planning activities and will be engaged for Component 2 activities in dissemination and response. It will also play a key role in the National Disaster Platform which will coordinate joint disaster management and early warning activities.

257. The Gambia Radio and Television (GRTS), is vital for broadcasting weather and climate information to the general public and also in the sensitization of weather and climate information to communities. It has the potential of reaching the citizens of the

258. Gambia Civil Aviation Authority (GCAA) is currently the biggest consumer of weather information through aviation. It also houses the central forecast office which provides both aviation and public weather forecasts and the biggest potential customer for the future meteorological agency. Likewise, the Gambia Ports Authority (GPA) is a user and provider of marine information and equally houses the automatic marine weather station.

Civil Society Organizations (NGOs, CBOs)

- ✓ Community Radio Stations
- ✓ Kanyaleng Women's Groups
- ✓ TANGO
- ✓ Stay Green
- ✓ Famers Platform

259. These organizations are key in the delivery of early warning messages to farmers and communities, hence their collaboration and cooperation is vital for the project.

The Private Sector

260. The private sector is not as engaged as it can and should be. Following consultations with the Chamber of Commerce, it is clear that many industries are interested in receiving accurate weather and climate data for their work. The engagement is at a preliminary level, and the National Chamber of Commerce has highlighted that the governmental stakeholders in the project would have to elaborate a very clear vision how public-private partnerships are to take effect. They also require a clearer picture of what climate information/services can be provided to the private sector.

261. The activities will thus focus on how to develop public-private partnerships, particularly with telecommunication companies (Gamcel is already providing some early warnings, but the two other major mobile phone carriers are not); radio stations; transportation; health; energy; and tourist facilities. The National Tourism Board did participate in the inception workshop and is interested in being included in future discussions. The establishment of a new agency offers the ideal opportunity

to engage these partners and identify what services can be provided to them and what role they can have to finance and disseminate early warnings and climate information.

3 PROJECT RESULTS FRAMEWORK

This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD: COUNTRY PROGRAMME / UNDAF OUTCOME #3: Environmental sustainability and disaster risk reduction systems and services in place					
Country Programme Outcome Indicators: CP Outcome 2: Sustainable livelihood security enhanced for the disadvantaged groups through the promotion of income diversification opportunities and better management of environmental resources					
Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one): 1. Mainstreaming environment and energy OR 2. Catalyzing environmental finance OR 3. Promote climate change adaptation OR 4. Expanding access to environmental and energy services for the poor.					
Applicable SOF (e..g GEF) Strategic Objective and Program: CCA-2 Increase adaptive capacity to respond to the impacts of climate change, including variability, at local, national, regional and global level; CCA-3 Promote transfer and adoption of adaptation technology					
Applicable SOF (e.g. GEF) Expected Outcomes: Strengthened adaptive capacity to reduce risks to climate-induced economic losses; and Successful demonstration, deployment, and transfer of relevant adaptation technology in targeted area					
Applicable SOF (e.g .GEF) Outcome Indicators: 1.1.1 No. of adaptation actions implemented according to planning frameworks (NAPA, CAS, UNDAF, PRSP, disaster risk reduction strategies, government development plans, and other), Output 2.2.1 Adaptive capacity of national early warning networks strengthened to rapidly respond to extreme weather events; Output 3.1.1: Relevant adaptation technology transferred to targeted groups; Output 3.2.1: Skills increased for relevant individuals in transfer of adaptation technology					
	Indicator	Baseline	Targets End of Project	Source of verification	Risks and Assumptions
Project Objective: To strengthen the climate monitoring capabilities, early warning systems and available information for responding to climate shocks and planning adaptation to climate change in Gambia.	Level of capacity of agencies to monitor, assess and disseminate hydro-climate information for early warnings and long-term planning	60/135 points	115/135 points	Capacity Assessment Scorecard	The assumptions are that: The GoTG has sufficient capacity to implement its financing plan **and** it is sufficient to ensure long-term operational costs of the upgraded NHMS; Other drivers of capacity such as institutional and legal frameworks are supportive and addressed through baseline or parallel interventions.
Outcome 1 The Gambia National Meteorological Services is supported in its transition to becoming a financially sustainable Meteorological Agency (UNEP)	Amount of dedicated budget allocated for NMS activities by end of project Completion of business plan to support financial sustainability of hydrometeorological services	There is currently no dedicated budget for the new agency. NHMS is currently under the Department of Water Resources in the Ministry of Fisheries and Water Resources and does not have an independent and dedicated budget, rather it filters through the umbrella ministry New hydrometeorological agency does not have a business plan in place to ensure financial sustainability	A dedicated, predictable sufficient budget is allocated to NHMS activities to deliver timely and effective early warnings by end of project	annual national budgets and records	The assumption is that there is the political will to establish an independent, fully functional hydro-meteorological agency. There is always the risk that the establishment of the new agency may go through some political and economic snags and that its establishment will be slower than the implementation of the project. This risk is mitigated however by coordinating with the cofinancing partners that are involved in supporting the development of the agency. This is also mitigated by the

					fact that the Department of Water Resources is a key actor in helping establish the agency and is also the principal ministry to be implementing this project. This will ensure alignment of activities. Developing a comprehensive business plan will also support NHMS in identifying exactly what services it can provide, for what price and to which clients, with what targets—this will help mitigate against economic challenges and sustainability issues.
Outcome 2 Hydrological/meteorological infrastructure is installed for optimal performance of national hydro-met monitoring system	Percentage of national coverage by monitoring network by end of project and percent of coverage by an automated network	(50% is covered by a monitoring system at present, 0% of which is automated	At least 50% national coverage of which 100% is an automated network	Annual performance reviews	There is the risk that all the equipment is not installed in a timely fashion, or that there are lags between training, calibration and operation. To mitigate this risk, the project will make purchases in the first year and piggyback the purchases and installation with the ACPC project which has already undergone the process of identifying the specific type of equipment. The same equipment will be procured to harmonise and coordinate the projects, and to ensure that trainings under the LDCF project are relevant to the ACPC initiative.
Outcome 3 A critical mass of skilled human resources is able to operate the Gambia Early Warning System and perform long-term climate planning beyond the pilot project	Number of skilled hydro-meteorological staff recruited and retained by NMS by the end of the project (disaggregated by sex)	92 staff of which 12 are women	NMS is able to recruit 15 staff per year and retain 80% of them by end of project (of which 50% are women)	payroll records	There is the risk that some of the lengthier training may last past the duration of the project. In order to mitigate against this risk, staggered trainings will take place to ensure that new employees come in at different phases of the project. There is also the risk that some employees that receive upgraded certification may seek work in other countries. One of the activities of the project is therefore to review bonding practices and ensure that positive incentives are provided to those being trained to remain within the new agency. Although it may appear as though the targeted amount of women is

					considerably high compared to the baseline, it is essential to note that a significant proportion of women have recently enrolled in the Water Resources Training School thereby making the target achievable.
Outcome 4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	Percentage of population with access to improved climate information in pilot sites (disaggregated by gender) Population in pilot sites: **Kanifing Municipal Council KMC)** - Eboutown, 23,621 - Dippakunda, 17,912 **Banjul City Council (BCC)** - Soldier Town Ward,1,710 - Crab Island Ward, 2,770 **West Coast Region (WCR)** - Tanji, 15,636 - Kanlaji, 1,690 **Lower River Region (LRR)** - Kwinela *(Sansanhkono and Nya Kunda),* 2,266 - Jappineh *(Marikoto and Tembeto),* 2,540 **North Bank Region (NBR)** - Ker Ardo, 1,115 - Salikene2,957 **Central River Region (CRR)** - Kuntaur *(Wharf Town and Fulla Kunda),* 2,297 - Bansang 9,442 **Upper River Region (URR)** - Dasilameh Mandika, 816 - Diguiri 3,800	Local team is currently obtaining this information	At least 75% more people have access to early warnings and climate information by end of project in pilot sites (disaggregated by gender)	survey	There is the assumption that the contact groups assigned in the pilot sites (composed of village head/chief, village development chairs, kanyaleng women's groups, elders, youth, and representative of different clan) will be able to successfully survey and monitor the progress achieved in the villages.

4 TOTAL BUDGET AND WORKPLAN

UNEP BUDGET

APPENDIX 1 - RECONCILIATION BETWEEN GEF ACTIVITY BASED BUDGET AND UNEP BUDGET LINE (GEF FUNDS ONLY US$)														
Project title: Strengthening climate services and early warning systems in the Gambia for climate resilient development and adaptation to climate change – 2nd Phase of the GOTG/GEF/UNEP LDCF NAPA Early Warning Project														
Project number: UNEP ID: 00901														
Project executing partner: Department of Water									Project implementation period: 2014-2017					
			Expenditure by project component/activity (provide description)						*Insert actual year					
From:	**2014**		Add additional components/activities as required						Add additional years as required					
To:	**2017**			Outcome 1	Outcome 3	Outcome 4	Project Management	Total	Expenditure by calendar year					
									2014	2015	2016	2017	**Total**	
UNEP Budget Line														
	11	**PERSONNEL COMPONENT**												
		1101	Project coordinator				140,000	**140,000**	35,000	35,000	35,000	35,000	**140,000**	1
		1102	Drivers				60,850	**60,850**	15,850	15,000	15,000	15,000	**60,850**	2
		1199	**Sub-total**	**-**	**-**	**-**	**200,850**	**200,850**	**50,850**	**50,000**	**50,000**	**50,000**	**200,850**	
	12	**Consultants**												a
		1201	National Climate and Development Specialist	12,000	12,000	48,000		**72,000**	18,000	18,000	18,000	18,000	**72,000**	3
		1202	NC- economist (Market analysis for climate services)	24,000				**24,000**	24,000	-	-	-	**24,000**	4
		1203	IC-meteorology management specialist	30,000				**30,000**	30,000	-	-	-	**30,000**	5
		1204	International Consultant-CTA	30,000	30,000	36,000		**96,000**	9,000	69,000	9,000	9,000	**96,000**	6
		1206	NC - Climate Services Specialist	6,000				**6,000**	6,000	-	-	-	**6,000**	7
		1207	NC- Met HR consultant		24,000			**24,000**	-	-	24,000	-	**24,000**	8
		1208	NC- agromet specialist		36,000			**36,000**	-	18,000	18,000	-	**36,000**	9
		1209	IC-GIS and climate modelling specialist			6,000		**6,000**	-	-	6,000	-	**6,000**	10

		1210	NC-Communications			26,250		**26,250**	7,500	6,250	6,250	6,250	**26,250**	11
		1211	NC- Rural Communication expert			45,000		**45,000**	-	45,000	-	-	**45,000**	12
		1212	NC-Communications Expert			36,000		**36,000**	-	-	36,000	-	**36,000**	13
		1212	NC- Communications experts			35,250		**35,250**	9,000	8,750	8,750	8,750	**35,250**	14
		1213	NC- food security climate change			108,000		**108,000**	24,000	36,000	36,000	12,000	**108,000**	15
		1215	IC for Drought Policy and Strategy			24,000		**24,000**	-	-	24,000	-	**24,000**	16
		1216	NC- disaster management			27,000		**27,000**	-	18,000	9,000	-	**27,000**	17
		1217	NC- needs assessment disaster management			42,000		**42,000**	18,000	-	-	24,000	**42,000**	18
		1218	NC-Disaster management			12,000		**12,000**	-	12,000	-	-	**12,000**	19
		1219	NC – Applied/Agricultural Meteorologist			50,400		**50,400**	16,800	16,800	16,800	-	**50,400**	20
		1220	NC- Media communications expert			32,400		**32,400**	-	26,400	6,000	-	**32,400**	21
		1221	NC- Communications expert			48,000		**48,000**	-	24,000	-	24,000	**48,000**	22
		1222	NC-Economist /telecommunications			32,400		**32,400**	26,400	6,000	-	-	**32,400**	23
		1223	IC- development economist			27,000		**27,000**	18,000	9,000	-	-	**27,000**	24
		1224	NC-Development Economist			54,000		**54,000**	-	18,000	36,000	-	**54,000**	25
		1225	NC- economic planning and development			144,000		**144,000**	-	48,000	48,000	48,000	**144,000**	26
		1226	NC- food security climate change			144,000		**144,000**	-	48,000	48,000	48,000	**144,000**	27
		1227	NC- biodiversity monitoring			24,000		**24,000**	-	12,000	12,000	-	**24,000**	28
		1228	NC-Indigenous Biodiversity and climate change expert			48,000		**48,000**	24,000	24,000	-	-	**48,000**	29
		1229	NC- biodiversity and climate change expert			108,000		**108,000**	54,000	18,000	18,000	18,000	**108,000**	30
		1230	IC - ISO instructor		184,000			**184,000**	-	96,000	48,000	40,000	**184,000**	31
		1231	IC - National Metorologist Trainer		258,000			**258,000**	60,000	78,000	60,000	60,000	**258,000**	32
		1232	IC - National Metorologist Trainer		258,000			**258,000**	60,000	78,000	60,000	60,000	**258,000**	33
		1233	NC - National Metorologist Trainer		60,000			**60,000**	60,000	-	-	-	**60,000**	34
		1234	NC - National Metorologist Trainer		48,000			**48,000**	12,000	12,000	12,000	12,000	**48,000**	35

		1235	NC - agricultural economist			30,000		**30,000**	7,500	7,500	7,500	7,500	**30,000**	36
		1236	IC - Emergency Call Center Operations Specialist			30,000		**30,000**	-	30,000	-	-	**30,000**	37
		1299	**Sub-total**	**102,000**	**910,000**	**1,217,700**	**-**	**2,229,700**	**484,200**	**782,700**	**567,300**	**395,500**	**2,229,700**	
	13	**Administrative Support**												
		1301	Finance manager/Office Coordinator				40,000	**40,000**	10,000	10,000	10,000	10,000	**40,000**	40
		1302	M&E officer				32,000	**32,000**	8,000	8,000	8,000	8,000	**32,000**	2b
		1399	**Sub-total**	**0**	**0**	**0**	**72000**	**72000**	**18000**	**18000**	**18000**	**18000**	**72000**	
	1600	**Travel on official business**												
		1601	Travel/accomodations		40,000			**40,000**	10,000	10,000	10,000	10,000	**40,000**	41
		1602	transportation costs of MDFTs and extension staff to local areas			21,000		**21,000**	3,000	6,000	6,000	6,000	**21,000**	50
		1603	transport costs			6,000		**6,000**	-	2,000	2,000	2,000	**6,000**	51
		1604	Study tour to Nigeria Emergency call Center			10,000		**10,000**	-	10,000	-	-	**10,000**	52
		1900	**Sub-total**	**-**	**40,000**	**37,000**	**-**	**77,000**	**13,000**	**28,000**	**18,000**	**18,000**	**77,000**	
	1999 Component Total			**102,000**	**950,000**	**1,254,700**	**272,850**	**2,579,550**	**566,050**	**878,700**	**653,300**	**481,500**	**2,579,550**	
	20	**SUB-CONTRACT COMPONENT**												
	21	**Sub-contracts (MOUs/LOAs for cooperating agencies)**												
		2101	Sub-contract with DoA			31,500		**31,500**	8,750	8,750	7,000	7,000	**31,500**	54
		2199	**Sub-total**	**-**	**-**	**31,500**	**-**	**31,500**	**8,750**	**8,750**	**7,000**	**7,000**	**31,500**	
	23	**Sub-contracts (for commercial purposes)**												
		2301	Sub-contract for graphic EWS desgisn			60,000		**60,000**	20,000	20,000	10,000	10,000	**60,000**	55
		2302	Sub-contract website creation			10,000		**10,000**	4,000	2,000	2,000	2,000	**10,000**	56
		2399	**Sub-total**	**-**	**-**	**70,000**	**-**	**70,000**	**24,000**	**22,000**	**12,000**	**12,000**	**70,000**	
	2999 Component Total			**-**	**-**	**101,500**	**-**	**101,500**	**32,750**	**30,750**	**19,000**	**19,000**	**101,500**	
	30	**TRAINING COMPONENT**												
		3300	**Meetings and Workshops**											
		3201	Meetings and workshops (cost-recovery policy)	5,000				**5,000**	5,000	-	-	-	**5,000**	57
		3202	Meetings and workshops (use of airwaves)	5,200				**5,200**	5,200	-	-	-	**5,200**	58

		3203	meetings and workshops for organizational change		20,000			**20,000**	5,000	5,000	5,000	5,000	**20,000**	59
		3204	Workshops and meetings with University of The Gambia		20,000			**20,000**	-	-	10,000	10,000	**20,000**	60
		3205	meetings and workshops on revised EW codes			30,000		**30,000**	10,000	10,000	5,000	5,000	**30,000**	70
		3206	Drought Strategy Meetings			20,000		**20,000**	-	-	20,000	-	**20,000**	71
		3207	EWS dissemination mechanism workshop			4,000		**4,000**	1,000	1,000	1,000	1,000	**4,000**	72
		3208	Natl Disaster Platform meetings			20,000		**20,000**	5,000	5,000	5,000	5,000	**20,000**	73
		3209	workshops and meetings (feedback)			8,000		**8,000**	2,000	2,000	2,000	2,000	**8,000**	74
		3210	meetings and workshops (Upscaling)			10,000		**10,000**	-	-	-	10,000	**10,000**	75
		3210	Initial Forecasting Course (Meteorology) in Kenya/Nigeria/UK		120,000			**120,000**	-	60,000	60,000	-	**120,000**	53
		3211	Project Steering Committee Meetings				20,000	**20,000**	5,000	5,000	5,000	5,000	**20,000**	76
		3299	**Sub-Total**	**10,200**	**160,000**	**92,000**	**20,000**	**282,200**	**38,200**	**88,000**	**113,000**	**43,000**	**282,200**	
		3200	**GROUP TRAININGS**											
		3301	Communications training			30,000		**30,000**	-	15,000	-	15,000	**30,000**	61
		3301	GIS training workshop			40,000		**40,000**	-	-	40,000	-	**40,000**	63
		3302	training of trainers on dissemination of climate information			195,000		**195,000**	15,000	60,000	60,000	60,000	**195,000**	64
		3303	training on uptake and application of climate EWS			60,000		**60,000**	15,000	15,000	15,000	15,000	**60,000**	65
		3304	workshop costs			40,000		**40,000**	10,000	10,000	10,000	10,000	**40,000**	66
		3305	training climate theatre groups			45,000		**45,000**	10,000	15,000	10,000	10,000	**45,000**	67
		3306	training on software, data mgmt.			30,000		**30,000**	15,000	-	15,000	-	**30,000**	68
		3307	biodiversity monitoring training costs			12,000		**12,000**	-	7,000	2,500	2,500	**12,000**	69
		3308	training (extension staff on crop monitoring and climate change)			40,000		**40,000**	-	40,000	-	-	**40,000**	
		3309	training (MDFTs on food security & EW)			40,000		**40,000**	-	40,000	-	-	**40,000**	
		3310	Peer training materials and workshop costs			20,000		**20,000**	5,000	5,000	5,000	5,000	**20,000**	70

		3310	Workshop - training of MDFTs			90,000		**90,000**	-	30,000	60,000	-	**90,000**	
		3311	extension staff training workshop			25,000		**25,000**	-	-	25,000	-	**25,000**	71
		3312	training of staff on emergency call center operation			50,000		**50,000**	-	50,000	-	-	**50,000**	72
		3313	biodiversity database training			10,000		**10,000**	10,000	-	-	-	**10,000**	73
		3399	**Sub-Total**	**-**	**-**	**727,000**	**-**	**727,000**	**80,000**	**287,000**	**242,500**	**117,500**	**727,000**	74
		3999	**Component total**	**10,200**	**160,000**	**819,000**	**20,000**	**1,009,200**	**118,200**	**375,000**	**355,500**	**160,500**	**1,009,200**	
	40	**EQUIPMENT AND PREMISES COMPONENT**												
		4100	**Expendable equipment**											
		4101	GIS software upgrade			10,000		**10,000**	-	-	10,000	-	**10,000**	
		4102	Air time			112,000		**112,000**	28,000	28,000	28,000	28,000	**112,000**	75
		4103	spare parts and instruments		70,000			**70,000**	20,000	50,000	-	-	**70,000**	77
		4104	soil testing lab equipment			30,000		**30,000**	-	15,000	15,000	-	**30,000**	81
		4105	biodiveristy database software			4,000		**4,000**	4,000	-	-	-	**4,000**	82
		4106	educational materials for local EWS training			12,000		**12,000**	3,000	3,000	3,000	3,000	**12,000**	83
		4107	binoculars (5)			5,000		**5,000**	5,000	-	-	-	**5,000**	89
		4108	mobile phones (35)			6,000		**6,000**	6,000	-	-	-	**6,000**	92
		4109	vehicle maintenance		11750			**11,750**	2,931	2,940	2,940	2,940	**11,750**	
		4199	**Sub-Total**	**-**	**81,750**	**179,000**	**-**	**260,750**	**68,931**	**98,940**	**58,940**	**33,940**	**260,750**	
		4200	**Non-expendable equipment**											
		4201	work stations, technologies, educational materials		300,000			**300,000**	150,000	150,000	-	-	**300,000**	83
		4202	Vehicle		80,000			**80,000**	80,000	-	-	-	**80,000**	84
		4203	GIS equipment and land change modeller			20,000		**20,000**	20,000	-	-	-	**20,000**	85
		4204	PA system			30,000		**30,000**	-	10,000	10,000	10,000	**30,000**	86
		4205	Operating equipment for local radios			151,000		**151,000**	25,000	42,000	42,000	42,000	**151,000**	87
		4206	Two Radio transmitters of 2 Kilo Watts			40,000		**40,000**	40,000	-	-	-	**40,000**	88
		4207	Four studio transmitter links system for GRTS Radio			80,000		**80,000**	40,000	-	40,000	-	**80,000**	90
		4208	emergency phone lines			10,000		**10,000**	10,000	-	-	-	**10,000**	91

		4209	Emergency notification system			60,000		**60,000**	15,000	15,000	15,000	15,000	**60,000**	93
		4210	phone lines			8,000		**8,000**	2,000	2,000	2,000	2,000	**8,000**	94
		4211	biodiversity monitoring equipment (wire, incubation sites)			15,000		**15,000**	-	15,000	-	-	**15,000**	95
		4212	simulation operation equipment			36,000		**36,000**	-	12,000	12,000	12,000	**36,000**	96
		4213	Computer aided dispatch system (CAD)			35,000		**35,000**	15,000	10,000	5,000	5,000	**35,000**	97
		4214	GPS for wildlife tracking			20,000		**20,000**	5,000	5,000	5,000	5,000	**20,000**	98
		4215	digital cameras (2)			7,000		**7,000**	-	7,000	-	-	**7,000**	99
		4299	Sub-Total	**-**	**380,000**	**512,000**	**-**	**892,000**	**402,000**	**268,000**	**131,000**	**91,000**	**892,000**	100
		4999	Component total	**-**	**461,750**	**691,000**	**-**	**1,152,750**	**470,931**	**366,940**	**189,940**	**124,940**	**1,152,750**	
	50	**MISCELLANEOUS COMPONENT**												
		5300	**Sundry**											
		5301	Translation costs			20,000		**20,000**	5,000	5,000	5,000	5,000	**20,000**	101
		5302	Translation costs			48,000		**48,000**	12,000	12,000	12,000	12,000	**48,000**	102
		5303	Printing			12,000		**12,000**	3,000	3,000	3,000	3,000	**12,000**	103
		5304	printing and publication			20,000		**20,000**	5,000	5,000	5,000	5,000	**20,000**	104
		5305	data acquisition costs			15,000		**15,000**	-	5,000	5,000	5,000	**15,000**	105
		5306	Translation costs			30,000		**30,000**	-	10,000	10,000	10,000	**30,000**	106
		5399	Sub-total	**-**	**-**	**145,000**	**-**	**145,000**	**25,000**	**40,000**	**40,000**	**40,000**	**145,000**	
		5500	**Evaluation**											
		5501	Audit				12,000	**12,000**	3,000	3,000	3,000	3,000	**12,000**	107
		5599	**Sub-Total**	**-**	**-**	**-**	**12,000**	**12,000**	**3,000**	**3,000**	**3,000**	**3,000**	**12,000**	
		5999	**Component total**	**-**	**-**	**145,000**	**12,000**	**157,000**	**28,000**	**43,000**	**43,000**	**43,000**	**157,000**	
		Grant Total		**112,200**	**1,571,750**	**3,011,200**	**304,850**	**5,000,000**	**1,215,931**	**1,694,390**	**1,260,740**	**828,940**	**5,000,000**	

UNDP BUDGET:

Award no:	00071313
Project ID	00084862
Business Unit:	GMB10
Project Title:	Strengthening climate services and early warning systems in the Gambia for climate resilient development and adaptation to climate change – 2nd Phas
PIMS no:	5156
Implementing Partner (Executing Agency)	Department of Water Resources, Ministry of Fisheries and Water Resources

SOF (e.g. GEF) Outcome/Atlas Activity	Responsible Party/ Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Total (USD)	See Budget Note:
Outcome 2	DWR	62160	LDCF	**71200**	**International Consultants**	6,000	154,000	103,000	100,000	363,000	A
				71300	**National Consultants**	41,000	61,500	25,500	4,500	132,500	B
				71400	**Contractual services**	75,000	75,000	75,000	75,000	300,000	B1
				72100	**Contractual Services - Companies**	50,000	40,000	-	-	90,000	C
				72200	**equipment and furniture**	621,100	741,000	93,500	-	1,455,600	D
				72300	**materials and goods**	15,000	-	-	-	15,000	E
				74200	**Audio Visual&Print Prod Costs**	-	10,000	6,000	10,000	26,000	F
				75700	**Trainings, workshops and Conferences**	10,000	316,000	61,000	85,900	472,900	G
					total outcome 2	923,100	1,442,500	289,000	200,400	2,855,000	
Project Management				72100	International Consultants		35,000		55,000	90,000	H
				71300	Local Consultant	10,000	10,000	10,000	10,000	40,000	I
				74100	Professional services	3,500	3,500	3,500	4,500	15,000	J
					Total Project management	13,000	49,000	14,000	69,000	145,000	
					Total	936,100	1,491,500	303,000	269,400	3,000,000	

Totals by agency:

Agency	Year 1	Year 2	Year 3	Year 4

UNDP	936,100	1,491,500	303,000	269,400
UNEP	1,210,055	1,694,390	1,390,265	705,290

Budget Notes

A	for local training on management, use and operations of Automatic Hydrological Stations and analysis of data generated.; Provide maintenance and repair on existing Satelite receiving and visualization system; Consultant to support the training on maintenance and repair of AWS; Expert to provide training to 10 persons (2 per shift) for interpretation of NWP, management, operation and data analysis of content generated from visualisation softwares; Annual costs of lightning detection forecasting, data storage and internet-based software applications; International Consultant to provide technical assistance towards cliamte model downscaling
B	National Consultant to assist in the development of a database on climate and hydrological data and to Build interconnected network between stations using a database with integrated analytical functioms; National Expert to provide support and training on operation and management of ballon stations; National expert to Upgrade telecommunications equipment for internal MET service communications and real time data transmission, and design communication protocols; Expert on analysis of wave and tide data; National Experts on Water quality analysis for performing water quality testing;national Expert to develop a long-term cost recovery plan and financing strategy for water quality monitoring; National Expert to support Capacity building on data management and analysis.
B 1	Cost of region-based technical assistance to the Implementing Partner for outcome 1 of this project from a pool of project-based chief technical advisors (hydrological and meteorological specialists assisting weather, climate and hydrological observation systems and forecasting) supporting this and other EWS projects in the UNDP-GEF/LDCF supported multi-country initiative on EWS/CI. *Note: that the full cost of the Technical Support is covered by all 10 projects participating in the GEF/LDCF financed EWS multi-country initiative*. This budget will be managed separately
C	Sub-contreact for the rehabilitation of hydrological stations;sub-contract with engineering firm for the installation of marine stations;Sub-contract for development of comprehensive environmental/climate information system
D	Hydrological stations;Construction materials (fencing);computers, workstations and office equipment;servers, telecom equipment;12 rain gauges;12 automatic rain recorders;GPS;computers;telecom equipment;weather stations (installation, software, calibration) (7);pilot ballon equipment;computer (4) with drives for storage;visualisation software;back-up toolkit (SADIS);upgraded satelite receiver operating systems;Conventional meteorological measuring instruments;lightning detection sensors and computer equipment;Video recorder (12.3megapixels CMOS sensor HD);audio/video mixer;communication equipment for media;5 Workstations;Digital Scan Converter;external display system;2 tide marine stations (installation, calibration, archiving, marine analytics software;buoy marine station ;base station software;Accoustic Wave and Current Profiler;oceanography and marine met training for 5 personnel;spectrophotometer;gas chromatography;auto clave;incubators, distillery and sterilization ;Water sampling boat;climate database software;climate software;computer (2);
E	acquisition of flood forecasting software for the Hydrology Division in the DWR
F	Printing costs for the development of annual flood risk maps for vulnerable areas and sensitize targeted communities ; Printing costs for the annual report on water quatlity; Costs of printing the climate atlas
G	Workshop for training of trainers on flood management, flood risk prevention and flood risk assessment; Costs of peer training on flood forecasting, modelling and management; loacl workshops on flood risks, flood management and flood damage prevention;Training of 15 Hydrology Staff on management, use and operations of Automatic Hydrological Stations and analysis of data generated.;costs of a peer training workshop on management , use and operation of automatic hydrological stations for local training on management, use and operations of Automatic Hydrological Stations and analysis of data generated.;Training for technicians on the maintenance and repair of AWS;cost of Training 20 staff members on management, use, and operations of automatic weather stations, and on analysis of data generated;Peer training costs on the management, use and operations of automatic weather stations;Workshop costs of training on operation of ballon stations;Costs of attending specialized training on satelite meteorology;Costs required to conduct peer training workshop with those accredited with specialized Geostationary and Polar orbiting Satellite training ;Cost of training to 10 persons (2 per shift) for interpretation of NWP, management, operation and data analysis of content generated from visualisation softwares;Training workshops on use and application of marine data;Cost of training on use and analysis of wave and tide data;Peer training workshop on core aspects of oceanagraphy and marine met training to 5 marine met personnel;Training for existing staff towards accredication on water quality testing;Peer training workshops on water quality training;Training on climate model downscaling;Cosst of meetings to Develop appropriate procedures and strategies for centralizing data and providing services to users;Training for staff on lightning detection equipment operation, data use, software applicatiomns
H	Cost of conducting Mid-term Evaluation; Cost of conducting final evaluation and audit
I	Finance manager/Office Coordinator costs for 4 years (national hire)
J	Costs of Annual Audit

5 MANAGEMENT ARRANGEMENTS

262. The project will be implemented according to the National Implementation Modality. The UNDP and UNEP will be the GEF Implementing Agency. DWR will act as Implementing Partner for this project. Project finances will pass through the Ministry of Finance to ensure national accountability through the normal government procedures and according to UNDP rules and regulations. There will be coordination with the regional component of the ten other projects on EWS developed through UNDP-GEF support in Africa. The Gambia will benefit from the technical support that is in place, as well as from the lessons learned. Enhanced regional coordination will facilitate sharing of experiences, access to best practices in the region and sharing of resources in cases where hydrometeorological training can be provided jointly.

263. The Project Board/Steering Committee will be chaired by DWR. DWR will be responsible for the implementation of the project, monitoring day-to-day operations, and accountability on financial flows, and be responsible for policy guidance in the virtue of its mandate for policy development and coordination of environment and climate change issues in the country. Other ministries and agencies (DOA, NEA, GRTS, NDMA, Parks and Wildlife) will act as Responsible Partners (RP) for specific components of the project as specified in the sections above. Responsible Partners are members of the project who are responsible for delivering some activities and outputs under the project. Participating Members are members who benefit from the project's activities and who can help provide oversight and guidance to the project overall.

264. The Project Steering Committee will be comprised of the following partners:

a. DWR (Chair)
b. DOA (Responsible Partner)
c. NDMA (Responsible Partner)
d. NEA (Responsible Partner)
e. GRTS (Responsible Partner)
f. Parks & Wildlife (Responsible Partner)
g. Finance (Participating Member)
h. Fisheries (Participating member)
i. Local Governments & Lands (Participating Member)
j. Tourism & Culture (Participating Member)
k. Works, Construction & Infrastructure (Participating Member)
l. UNDP/UNEP (Project Assurance)

265. **The Project Board/Project Steering Committee (PSC)** is responsible for making management decisions for a project in particular when guidance is required by the Project Manager. The Project Board plays a critical role in project monitoring and evaluations by quality assuring these processes and products, and using evaluations for performance improvement, accountability and learning. It ensures that required resources are committed and arbitrates on any conflicts within the project or negotiates a solution to any problems with external bodies. In addition, it approves the appointment and responsibilities of the Project Manager and any

delegation of its Project Assurance responsibilities. The PSC also approves annual workplans, reviews annual or other periodic reports, financial reports, and makes decisions on any adjustments to the project strategy. Based on the approved Annual Work Plan, the Project Board can also consider and approve the quarterly plans (if applicable) and also approve any essential deviations from the original plans.

266. In order to ensure UNDP and UNEP's ultimate accountability for the project results, Project Board decisions will be made in accordance to standards that shall ensure management for development results, best value money, fairness, integrity, transparency and effective international competition. In case consensus cannot be reached within the Board, the final decision shall rest with the UNDP/UNEP Project Manager.

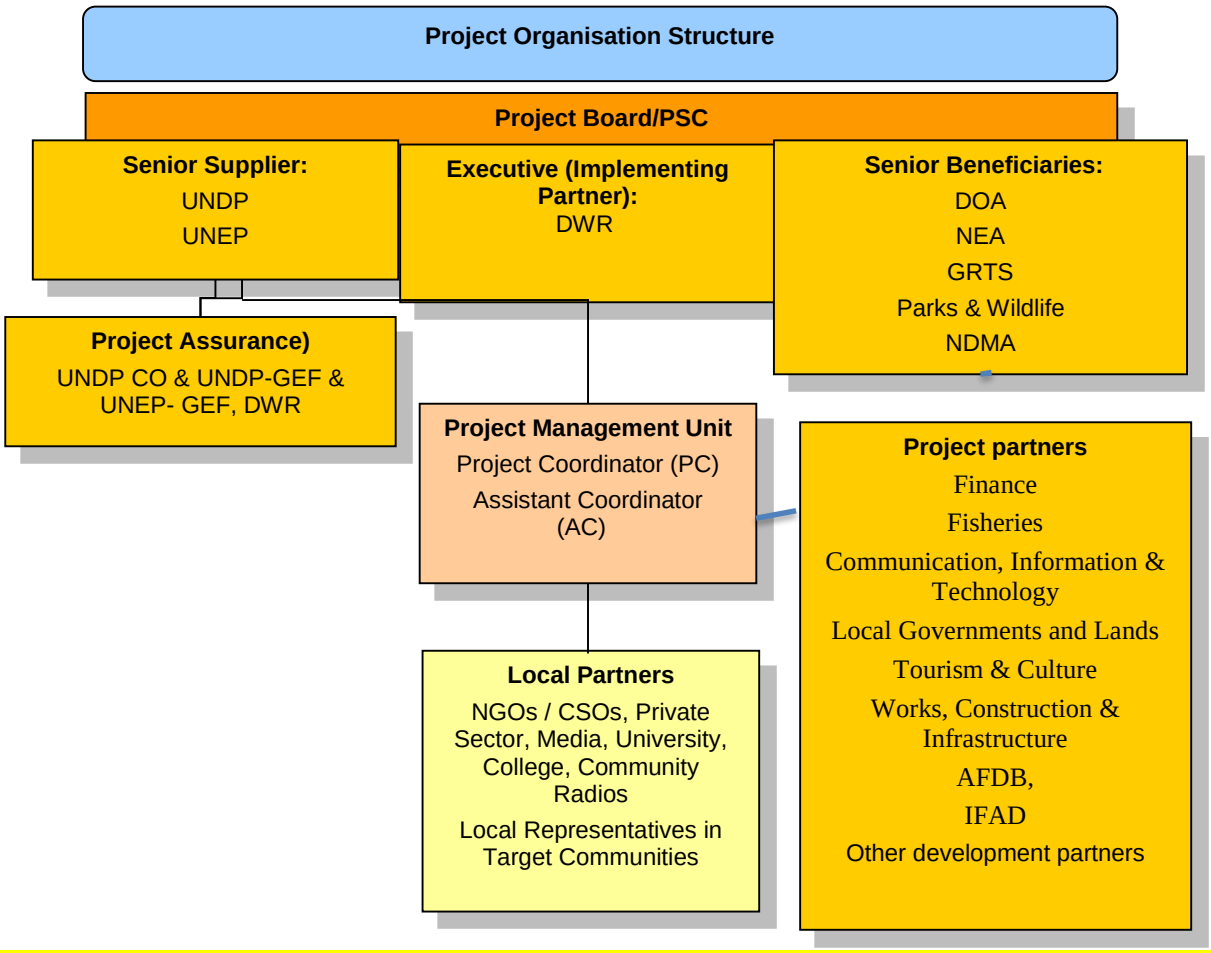
267. Potential members of the Project Board will be reviewed and recommended for approval during the PAC meeting. Representatives of other stakeholders can be included in the Board as appropriate. The Board contains three distinct roles (see figure below), including:

a. An Executive: individual representing the project ownership to chair the group
b. Senior Supplier: individual or group representing the interests of the parties concerned, which provide funding for specific cost sharing projects and/or technical expertise to the project. The Senior Supplier's primary function within the Board is to provide guidance regarding the technical feasibility of the project. (e.g. Representative of the Implementing Partner and/or UNDP)
c. Senior Beneficiary: individual or group of individuals representing the interests of those who will ultimately benefit from the project. The Senior Beneficiary's primary function within the Board is to ensure the realization of project results from the perspective of project beneficiaries. (e.g. Representative of the Government or Civil Society).
d. The Project Assurance role supports the Project Board Executive by carrying out objective and independent project oversight and monitoring functions. The Project Manager and Project Assurance roles should never be held by the same individual for the same project. (e.g. A UNDP Staff member typically holds the Project Assurance role).

268. The project will be managed through Project Coordination Unit housed within the PMO-DMD. The PCU will be comprised of a Project Coordinator (PC) and an Assistant Project Coordinator (APC) who will function under the supervision of the PMO-DMD and the project steering committee. The Project Coordinator will be expected to dedicate 60% of their time to technical issues and support, and 40% of their time to project management and coordination, whereas the assistant coordinator will be expected to dedicate 100% of their time to project management issues, including financial management, procurement, logistical support and coordination. The terms of reference are provided in Annex 8.4.

269. **Project Coordinator**: The Project Coordinator has the authority to run the project on a day-to-day basis on behalf of the Implementing Partner within the constraints laid down by the Board. The Project Coordinator's prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost. The terms of reference for the project coordinator are included in Annex 8.4.

270. As per discussions with the GEF Secretariat, this initiative is part of a multi-country set of NIM projects supported by UNDP-GEF.



As per discussions with the GEF Secretariat, and the UNDP CO in the Gambia, this initiative is part of a multi-country set of NIM projects supported by UNDP-GEF. In response to LDCF/SCCF Council requirement that a regional component would be included to enhance coordination, increase cost effectiveness and, most importantly, benefit from a regional network of technologies, a cohort of technical advisors and a project manager will be recruited to support each of the national level project teams. In particular they will support countries to develop robust adaptation plans and provide technical advice, training and support for accessing, processing and disseminating data for early warning and national/sectoral planning related purposes on a systematic basis. The cost of these project staff has been

prorated across all country project budgets and recruitment of these posts will be undertaken by UNDP-GEF (HQ) in coordination with all UNDP Country Offices.

6 MONITORING FRAMEWORK AND EVALUATION

272. The project is accompanied by an effective and resourced M&E framework, that will enable ongoing adaptive management of the project ensuring that lessons are learnt, management decisions are taken based on relevant and up-to-date information, that the appropriate feedback channels are used to integrate new information, and that regular progress reports are available for concerned parties.

273. The project M&E plan is consistent with the GEF Monitoring and Evaluation policy. The Project Results Framework includes SMART indicators for each expected outcome as well as mid-term and end-of-project targets. These indicators along with the key deliverables and benchmarks are to be developed in some more detail and fine-tuned during the inception phase of the project and will be the main tools for assessing project implementation progress and whether project results are being achieved.

274. The M&E plan will be reviewed and revised as necessary during the project inception workshop to ensure project stakeholders understand their roles and responsibilities vis-à-vis project monitoring and evaluation. Given the scope of the project, its breadth of activities and geographic coverage, a Monitoring & Evaluation project staff will be assigned to monitor successes and challenges in the 14 pilot sites, as well as at the national institutional level. This will allow ongoing feedback and the possibility of adjusting project outputs to meet the adaptation needs of the end-users.

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

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

277. A Project Inception Workshop will be held within the first 2 months of project start with those with assigned roles in the project organization structure, UNEP task manager and UNDP country office and where appropriate/feasible regional technical policy and program advisors as well as other key stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan.

278. In particular, the **Inception Workshop** will involve the following:

- Supporting all partners and stakeholders to fully understand and take ownership of the project.

- Detailing the roles, support services and complementary responsibilities of UNDP & UNEP vis-à-vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed as needed.
- Based on the project results framework, reviewing and seeking agreement on the indicators, targets and their means of verification, and rechecking assumptions and risks.
- Providing a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget will be agreed and scheduled.
- Discussing financial reporting procedures and obligations, and arrangements for annual audit.
- Planning and scheduling project committee meetings. The first project steering committee meeting should be held within the first 10 months following the inception workshop.

279. An Inception Workshop Report will be one of the main outputs from the inception workshop meeting. This is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting. Progress made shall be monitored in the UNDP and UNEP systems.

280. **Project Implementation Reports (PIR)**: This key report is prepared to monitor progress made since project start. The PIR combines UNEP, UNDP and GEF reporting requirements. The PIR includes, but is not limited to, reporting on the following:

- Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative)
- Project outputs delivered per project outcome (annual).
- Lesson learned/good practice.
- AWP and other expenditure reports.
- Risk and adaptive management
- Portfolio level indicators (i.e. GEF focal area tracking tools) are used by most focal areas on an annual basis as well.
- ATLAS QPR

281. **Periodic Monitoring through site visits:** Relevant staff from UNEP will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress on the activities for which UNEP is responsible. Similarly, UNDP staff will conduct site visits for activities for which it is responsible. Other members of the Project Steering Committee may also join these visits. A Field Visit Report/BTOR will be prepared by both agencies by one month after the visit to the project team and Project Steering Committee members.

282. **Mid-term of project cycle:** The project will undergo an independent **Mid-Term Evaluation** at the mid-point of project implementation. The Mid-Term Evaluation will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be jointly prepared by UNDP & UNEP. The management response and the evaluation will be uploaded to UNDP

and UNEP corporate systems. The relevant SOF (GEF) Focal Area Tracking Tools, as well as data for ATLAS will be completed during the mid-term evaluation cycle. The LDFC/SCCF AMAT will also be completed during the mid-term evaluation cycle.

283. **End of Project:** An independent **Final Evaluation** will take place three months prior to the final Project Committee meeting and will be undertaken in accordance with UNDP, UNEP and GEF guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared jointly by UNDP & UNEP. The Terminal Evaluation will also provide recommendations for follow-up activities and requires a management response. The relevant GEF Focal Area Tracking Tools will also be completed during the final evaluation. The LDFC/SCCF AMAT will also be completed during the terminal evaluation cycle. The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response, which should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Center (ERC).

284. During the last three months, the project team will prepare the **Project Terminal Report.** This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

285. The **tracking tools** will be validated/updated at inception, mid-term and at the end of the project and will be made available to the GEF Secretariat along with the project PIR report. As mentioned above the mid-term and terminal evaluation will verify the information of the tracking tool.

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

287**. Audit:** Project will be audited in accordance with UNEP & UNDP Financial Regulations and Rules and applicable audit policies.

288. ***Monitoring & Evaluation Intervals***

Quarterly:

- Project Steering Committee meetings
- Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform and by the UNEP task manager.

- Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS for UNDP. Risks become critical when the impact and probability are high. Note that for UNDP/GEF projects, all financial risks associated with financial instruments such as revolving funds, microfinance schemes, or capitalization of ESCOs are automatically classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical). Based on the information recorded in Atlas, a Project Progress Reports (PPR) can be generated in the Executive Snapshot. Other ATLAS logs will be used to monitor issues, lessons learned. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

Annually

- Annual Project Review/Project Implementation Reports (APR/PIR) Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative)

Learning and knowledge sharing:

289. Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums.

290. The project will identify and participate, as relevant and appropriate, in scientific, policy based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects.

Type of M&E activity	**Responsible Parties**	**Budget US$** *Excluding project team staff time*	**Time frame**
Inception Workshop and Report	Project Director, Project Coordinator	Indicative cost: 10,000	Within first two months of project start up
Measurement of Means of Verification of project results.	M&E Officer, UNDP & UNEP task managers	To be finalized in Inception Phase and Workshop.	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on *output and implementation*	Oversight by Project Coordinator, M&E Officer	To be determined as part of the Annual Work Plan's preparation.	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	Project Coordinator	None	Annually
Periodic status/ progress reports	Project coordinator and project management team	None	Quarterly

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project team staff time*	Time frame
Mid-term Review	Project Coordinator, M&E Officer, UNDP & UNEP task officers and External Consultants (i.e. evaluation team)	Indicative cost: 30,000	At the mid-point of project implementation.
Terminal Evaluation	Project coordinator, M& E Officer, UNDP & UNEP task managers and external consultants (i.e. evaluation team)	Indicative cost : 30,000	At least three months before the end of project implementation
Audit	Project Director UNDP, UNEP	Indicative cost per year: 3,000 (12,000 total)	Yearly
Visits to field sites	Project Coordinator	For GEF supported projects, paid from IA fees and operational budget	Yearly for UNDP
TOTAL indicative COST Excluding project team staff time and UNDP & UNEP staff and travel expenses		US$ 82,000 (+/- 5% of total GEF budget)	

7 LEGAL CONTEXT

This document together with the CPAP signed by the Government and UNDP which is incorporated by reference constitute together a Project Document as referred to in the SBAA [or other appropriate governing agreement] and all CPAP provisions apply to this document.

Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner.

The implementing partner shall:

a) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;

b) assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

8 ANNEXES

8.1 Annex I- Capacity Scorecard

The scorecard is arranged according to functional capacities for agencies to both monitor and forecast climate-related hazard information, share and package such information with relevant agencies, disseminate both warnings and advisories based on such information and provide appropriate legal and procedural frameworks.

The scoring can be adapted and locally defined. The standard scale is:

1. No evidence of capacity
2. Anecdotal evidence of capacity
3. Partially developed capacity
4. Widespread, but not comprehensive capacity
5. Fully developed capacity

CAPACITY OF AGENCIES TO PRODUCE INFORMATION							
Capacity Indicator	Baseline: Level of Existing Capacity					Target level of Capacity in the project timeframe	Priority of Capacity (h/m/l)
	1	2	3	4	5		
Capacity to service the observational infrastructure e.g. hydrological and meteorological stations, radar, upper air monitoring, satellite technology etc.	X					4	H
Capacity to generate weather/climate forecasts e.g. Numerical weather prediction (1-7 days), seasonal forecasts etc.				X		5	H
Capacity to utilize internationally and regionally available monitoring and forecast products			X			5	M
Capacity to send local observations to international centres			X			4	M
Capacity to record and use national/local observations for monitoring current meteorological and hydrological hazards in a timely manner			X			5	H
Capacity to record and use national/local observations to forecast future meteorological and hydrological hazards in a timely manner			X			5	H
Capacity to utilise satellite information for climate and environmental monitoring.			X			4	H
Capacity to form partnerships with key stakeholders to ensure effective delivery of agricultural/hydrological support services		X				4	H
Capacity to be able to monitor the cost of operations and maintenance of current equipment			X			4	L
Capacity to assess and understand key stakeholder's needs for climate information		X				5	H
Capacity to enable a free flow of information (e.g. generate, and provide access to data and information to partners and other users)			X			4	M
Capacity to plan cost recovery mechanisms		X				4	H
Capacity to sell products to the private sector		X				4	H

CAPACITY OF AGENCIES TO PACKAGE INFORMATION							
Capacity Indicator	Baseline: Level of Existing Capacity					Target level of Capacity in the project timeframe	Priority of Capacity (h/m/l)
	1	2	3	4	5		
Capacity to fully understand impacts of climate variability and change on food security (e.g. on fisheries , crop production, livestock, etc)		X				5	H
Capacity to fully understand impacts of climate variability and change on water resources and flooding (e.g. dam management and flood risk modelling)	X					5	H
Capacity to combine climate monitoring and forecast information with current agricultural assessments to provide agriculturally specific advisories		X				5	H
Capacity to combine climate monitoring and forecast information with current hydrological assessments to provide hydrologically specific advisories		X				5	H
Capacity to partner with national government structures and academic institutions to develop tailored, sectorally specific information and packaged products	X					4	M
Capacity to feed climate information into policy briefs and long-term strategies			X			4	M
Capacity to analyze relevant climate data/information for policy strategies such as agricultural production, infrastructure development, credit, insurance and marketing	X					4	M
Capacity to feed climate information, forecasts and tailored information to disaster risk management agencies and frameworks		X				5	H
Capacity of disaster risk management agencies to assess information in a timely manner		X				5	H

CAPACITY OF AGENCIES TO DISSEMINATE INFORMATION							
Capacity Indicator	Baseline: Level of Existing Capacity					Target level of Capacity in the project timeframe	Priority of Capacity (h/m/l)
	1	2	3	4	5		
Capacity to disseminate warnings and advisories in local languages	X					4	H
Capacity to disseminate warnings and advisories related to existing indigenous practices and technologies.	X					4	H
Capacity to disseminate alerts in a wide range of media (e.g., privileged telephone communication systems, CB radios, SMS alerts etc.)			X			5	H
Capacity for district and community focal points to understand the content of warnings and advisories		X				4	H
Capacity to establish and sustain mechanisms to raise awareness on the impacts of climate shocks and long-term change		X				4	H
Capacity to coordinate with government agencies to respond to warnings		X				5	H
Capacity to coordinate with CSOs to respond to warnings	X					4	H
Capacity to disseminate warnings and advisories to the district level or community focal points			X			5	H
Capacity of local populations to understand climate change and it's long term effects		X				4	H
Capacity to receive feedback on the usefulness of alerts from affected communities	X					4	H

CAPACITY OF LEGISLATIVE AND GOVERNANCE FRAMEWORK							
Capacity Indicator	Baseline: Level of Existing Capacity					Target level of Capacity in the project timeframe	Priority of Capacity (h/m/l)
	1	2	3	4	5		
Capacity for national coordination of emergency response activities			X			4	H
Capacity of standard operating procedures to guide the production, dissemination and response to warnings		X				4	H
Capacity of legislative system to mandate designated authorities e.g. which authority will disseminate warnings, which will produce warnings etc.		X				4	M
Capacity of multiple agencies to contribute to the issuing of warnings through national structures e.g. disaster management committees etc.		X				4	H

8.2 Risk Analysis

Description of risk	Risk Category	Potential Consequence	Level	Management Response	Risk Mitigation by Output	owner
Lack of political will to support project	Political	Limited sustainability	Low	The project is the second phase of a project on EWS that has already been initialized and has received political support from various government stakeholders. This project is a result of strong political will; and is capitalizing on the momentum of the first phase of the project. This project is in line with the NAPA, and Vision 2020 and fits with the Gambia's overall broader policy on climate change. This project is also taking place in parallel to a process that will support the formation of an independent meteorological agency, which demonstrates the current interest in strengthening meteorological services.	Output 1.1 Developing a comprehensive business plan in collaboration with public and private partners will ensure a long term strategy and support for such an agency. The process of consultation and identifying sectoral needs, and how the new agency will fulfill them, backed up with hard economic data, will reinforce the political will for this project. 4.6 Knowledge management structures for effective feedback and incorporation of lessons learned are created. Given the communicative aspect of EWS, the continual learning in this project to ensure that climate information is relevant to the people who receive it will be shared with stakeholders, thus maintaining political interest while	UNEP

					demonstrating outcomes. Activities under this output will seek to deliver the optimum messaging to reduce people's exposure to risk and. Threats—such positive outcomes will assist in maintaining political will.	
Lack of financial sustainability for hydrometeorological services	Financial/organizational	Sustainability issues	Medium/Low	This risk will be mitigated by the creation of a business plan, public private partnership, costing out services and identifying key clients.	1.1 will establish a comprehensive business plan aimed at ensuring financial sustainability	UNEP
Lack of coordination among government stakeholders	Political/organizational	Project delays/sustainability issues	Medium	Clear mandates are articulated in the development of the project, and roles and responsibilities will be outlined at the project inception meeting, and have been discussed at the logframe validation meeting. Regular interministerial meetings and consultations will be held to share progress, challenges, roles and responsibilities chaired by the project manager. The key to managing this risk will be ongoing communication, which has been one of the lessons learned from the first phase of the project. Platforms such as the National Climate Committee and the Disaster Management platform will be specifically used to keep government stakeholders involved and engaged.	2.5 A comprehensive database and data management system is established and centralized This database will help coordinate sectoral activities, order sectoral information and support future government activities and interventions. The joint nature of this activity will support coordination and sharing of knowledge and expertise. Sectoral partners will be contributing and extracting from this joint database to	UNDP

					advance their work, leading to enhanced collaboration and coordination. 4.1 Targeted climate products are produced for sectoral institutional partners. This will enhance coordination among sectors as communication is enhanced and hydrometeorological services respond to the needs of various sectors. This process will also help clarify what needs institutional partners have.	
Unavailability of requisite human resources/lack of skilled human resources	Organizational	Project delays/project failure	Medium	The lack of adequate, skilled human resources has been a major barrier for a satisfactory EWS in the Gambia. The project is addressing this issue by focusing project activities on establishing the basic threshold of skills and personnel for the operation of a successful EWS (See Outcome 3). By targeting the systemic issues around recruiting and maintaining staff, the project is mitigating against the risk of not having qualified staff. Moreover, the various trainings and capacity building initiatives seek to increase the skill and competencies of existing staff.	3.2 A recruitment and retention strategy is developed. This output mitigates this risk by taking a long-term strategic approach. Instead of merely focusing on immediate staffing and training, the activities under this output are geared to developing a plan to ensure competent personnel and skills in the long-run. Activities under this output will be geared not only at the government level, but will explore linkages	UNEP

					with the University and colleges. This will involve curriculum development and a sound understanding of the needs well into the future. Activities under this output will also explore incentives to attract qualified personnel to join the civil service. 3.3 A cadre of certified hydro-meteorological professionals is established. The activities under this output will mitigate this risk by fostering capacity within the country. For instance, the capacity of the The Water Resources Training School will be strengthened to train national meteorology students with entry level and follow-up training to enhance their credentials.	
Inability to communicate effectively with local communities	Strategic	Inadequate use of project products/ limited sustainability	Medium	The project will target this issue by consulting local communities to meet their needs, translate climate products into local languages, use improved communication mediums and allow for recurrent feedback mechanisms so that lessons learned can continuously inform the production of climate products. Contact groups have	Output 4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up. Activities delivering this output ensure that not only is climate risk information	UNEP

				been designated in pilot sites whose very job will be to report back on success of project activities. These contact groups are very inclusive (different clans, village head, kanyaleng women, youth, religious figures, elders). Numerous consultations have sensitized local communities as to the project goals and activities.	disseminated widely and targeted to remote and vulnerable communities, but also that there is an uptake of such information at the local level. This will happen through (1) sensitization and building public awareness and instilling a greater understanding and trust in what forecasts and various climate information mean, but also (2) building capacity at the local level to comprehend such information and apply it at the local level in adaptive responses. Output 4.3 Underserved communities receive early warning messages. Activities under this output are designed to provide access to climate information for a larger percentage of the population, particularly those residing in vulnerable and remote areas that are currently underserved by weather-related messaging. This output also focuses on the end-user, ensuring that EWS	

					is effective by reaching a breadth of local populations.	
Limited capacity to effectively tackle all project components	Strategic/Organizational	Inadequate completion of project	Medium	The project components have been constructed out of the lessons learned from the first phase of the EWS project as well as based on a needs assessment conducted in The Gambia. The project is incorporating the lessons learned through these two processes, and through consultations during the preparatory phase. The project is thus based on activities that have been deemed possible at the government and local levels.	Output 4.6 Knowledge management structures for effective feedback and incorporation of lessons learned are created and activities delivering this output will seek to establish effective feedback mechanisms and knowledge management structures to continuously promote learning to deliver EW to reduce people's exposure to risk and threats.	UNEP
Telecommunication challenges hamper implementation of the project	Strategic	Project investments are not able to be used to their full potential	High	Given the current challenges that the forecast office faces, it is possible that telecommunication challenges pose significant threats to the project. The project will address this by investing in upgraded telecommunications equipment and by including telecommunication partners in the implementation of this project so as to increase their stake. Cost-effective solutions for each particular situation will be used e.g. satellite automatic weather and hydrological stations, where reporting over the mobile telecoms network will be preferred. An MOU will be sought between the government and telecom	Investments in enhanced and reliable telecommunications infrastructure under Output 2.2 Increased availability of real time climate data help mitigate against this risk.	UNDP

				companies. There are however baseline telecommunications (landline, coverage) problems in the Gambia which go beyond the scope of this project and could impede some aspects of the project. However, all of the 14 pilot sites have access to excellent mobile technology.		
Extreme climate events	Environmental	Disruption of project activities/damage to project infrastructure	Medium	Coordination will be sought with NDMA, MDFTs and other regional organizations to deliver early warning advisories to pilot communities, as well as offer relief and adaptation recommendations for such events. Climate events will serve as a mechanism to deliver on outputs of the project.	Investments in infrastructure under Outputs 2.1 Effective, timely and accurate flood warnings issued; 2.2 Increased availability of real time climate data; 2.3 A marine meteorological station network is operational, should over the duration of the project begin to yield more reliable and accurate climate data that can be used to protect assets and investments under this project.	UNDP

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8.4 Terms of Reference

Project Steering Committee (PSC)

Composition and its Membership

Composition of the Project Steering Committee (PSC) shall be multi-disciplinary and multi-stakeholder and in this regard the membership shall be drawn from the following broad categories:

i. Representatives of the Ministry of Fisheries and Water Resources, Ministry of Environment and Parks and Wildlife, Ministry of Finance and Economic Affairs, Ministry of Agriculture and Department of Water Resources, as implementing institution;
ii. Representative(s) of the Local Government Authorities representing the interests of project beneficiaries;
iii. Representatives of Academia
iv. Representative of the Women's Bureau serving the interests of Gender;
v. Representative of Youth Groups serving the interest of youths;
vi. Representative(s) of Civil Society Organizations;
vii. Representative(s) of the private sector in Gambia; and
viii. Focal Points of GEF and the Multilateral Environment Agreements (NEA, DoF, DoPWM);
ix. Representative(s) of UNDP and UNEP as GEF implementing agencies of the Project;

Roles and responsibilities of the Project Steering Committee (PSC) include

- Ensure that the project gives value for money and cost-effective and is focused on achieving its objectives and delivering outputs that will contribute to higher level outcomes.
- Ensure that there is a coherent project organizational structure and logical set of plans;
- Provide oversight and supervision of project implementation at a strategic level
- Ensure that risks are being tracked and mitigated as effectively as possible
- Ensure that the achievements of project results are realized based on the expectations of and from the perspective of project beneficiaries;
- Provide guidance regarding the technical feasibility of the project and that accountability is assured to meet the required fiduciary oversight.
- Promote and maintain focus on the expected project output(s)
- Prioritize and contribute beneficiaries' opinions on Project Steering Committee decisions on whether to implement recommendations on proposed changes
- Ensure the expected output(s) and related activities of the project are well defined
- Monitors progress against targets and the outputs and ensure progress remains consistent from the beneficiary perspective
- Review and approve the Project Work Plan covering activity definition, quality criteria, targets and indicators and the monitoring and evaluation plan and strategy;
- Agree on Project Manager's responsibilities, as well as the responsibilities of the other members of the Project Management team;
- Address project issues as raised by the National Project Coordinator in the Progress Report;
- Provide guidance and agree on possible countermeasures/management actions to address specific risks;
- Conduct regular meetings to review the Project Quarterly Progress Report and provide direction and recommendations to ensure that the agreed deliverables are produced satisfactorily according to plans.
- Review Financial Report prior to submission and certification by the GEF Implementing Agencies (UNDP and UNEP);
- Appraise the Project Annual Review Report, make recommendations for the next AWP;
- Review and approve end project report and make recommendations for follow-on actions;
- Assess and decide on project changes through revisions;
- Assure that all Project deliverables have been produced satisfactorily;
- Review and approve the Final Project Review Report, including Lessons-learned;

The National Project Director (NPD)

The NPD will be responsible for:

- Overseeing overall project implementation on regular basis;
- Provide financial oversight of project implementation;
- Ensure that the project objective and outcomes are achieved;
- Ensure that the National Project Coordinator provides timely and effective reporting on project progress (technically and financially) to the Project Steering Committee; and
- Coordinate and ensure the flow of results and knowledge from the project to the Project Steering Committee and Project Partners.

National Project Coordinator (NPC)

- Ensure that all project stakeholders concerned are fully informed about the project;
- Ensure that all preparatory activities, including training for project staff and provision of logistic supports are carried out on a timely basis;
- Ensure that funds are made available to the project;
- Ensure that Project Quarterly Progress and Financial Reports are prepared and submitted on time, and according to standards in terms of format and content quality;
- Provide direction and guidance to project team(s) and responsible party(ies);
- Liaise with the Project Steering Committee to assure the overall direction and integrity of the project;
- Identify and obtain any support and advice required for the management, planning and control of the project;
- Plan the activities of the project and monitor progress against the initial quality criteria.
- Mobilize goods and services to initiative activities, including drafting TORs and work specifications;
- Ensure monitoring events as determined in the Monitoring & Evaluation Plan and Strategy which is prepared and updated by the M&E Officer;
- Manage requests for the provision of financial resources by the GEF Implementing Agencies (UNDP and UNEP), using advance of funds, direct payments, or reimbursements;
- Monitor financial resources and accounting to ensure accuracy and reliability of financial reports;
- Manage and monitor the project risks as initially identified in the Project Brief appraised by the LPAC, submit new risks to the Project Steering Committee for consideration and decision on possible actions if required; update the status of these risks by maintaining the Project Risks Log;
- Prepare the Project Quarterly Progress Report (progress against planned activities, update on Risks and Issues, expenditures) and submit the report to the Project Steering Committee and Project Assurance;
- Prepare the Annual Review Report, and submit to the Project Steering Committee for review and prepare and adjust the Quarterly Plans and the Annual Work Plan (AWP) for the following year, taking fully into consideration the review results;
- Prepare Final Project Review Reports to be submitted to the Project Steering Committee;
- Identify follow-on actions and submit them for consideration to the Project Steering Committee;
- Manage the transfer of project deliverables, documents, files, equipment and materials to national beneficiaries;
- Comply and cooperate with the GEF Implementing Agencies in commissioning and conducting project evaluation as and when required; and

- Prepare final Financial Report for signature by UNDP and UNEP.

Climate Change and Development Expert (CCDE)

The Climate Change Adaptation Expert will report to the National Project Coordinator and his/her responsibilities shall include:

- Consolidation of the gains of the First Phase of the GOTG/UNEP/LDCF Climate Change Early Warning Project and other climate change projects and programmes in initiating the process of mainstreaming climate change into the development process of The Gambia;
- Engagement and utilization of National Media Agents, Multidisciplinary Facilitation Teams (MDFTs) and Focal Points at the 14 Pilot Project Sites to receive and disseminate climate change early warning information, raise awareness on climate change and its potential impacts on various facets of livelihoods, sensitize decision makers on required climate change adaptation options and on mainstreaming climate change into various sector policies and development programmes;
- Review the process of the development of the National Climate Policy of The Gambia and use lessons learnt and best practices gained during the process to provide support for achieving the goal of mainstreaming climate change into the development process of The Gambia;
- In consultation with national stakeholders, particularly the public sector, review and analyze national development and sectoral policy documents, integrate climate change into the documents and provide recommendations for mainstreaming of climate change into relevant regulations, policies and strategies;
- Creation of a Consultative Forum with major private sector partners to, among other things, develop proactive adaptation options and rally support for climate change integration into national planning and budgeting system;
- Establishment of a data coordination network for Early Warning Systems and climate monitoring through inter-ministerial coordination mechanism;
- Development of policy briefs and organization of bi-annual workshops and dialogue sessions for senior policy makers to sensitize them on the outputs and recommendations for specific policy changes due to integration of climate change;
- Creation of a National Climate Change Adaptation Coordination Mechanism that brings together the National Meteorological and Hydrological Services (NMHS) which operate the early warning systems and the National Disaster Management Agency (NDMA), international organizations, and non-governmental organizations that implement national decentralized systems for carrying out all phases of disaster management;
- Provision of support for the institutionalization of the linkages between Climate Change Early Warning and Disaster Management in The Gambia through the established Climate Change Adaptation Coordination Mechanism;
- Development of site-specific adaptation plans in consultation with concerned implementation partners focusing on participatory approach for climate change adaptation at community level, paying particular attention to gender-sensitive livelihood diversification and on assessing early warning needs to safeguard alternative livelihood investments against extreme climate events.

- Application of his/her knowledge on community-based adaptation to climate change and working closely with decentralized and local government structures and research organizations involved in the development of site-specific adaptation plans; and
- Communicate these plans to each agency that will be responsible for its implementation and support the implementation process.

Chief Technical Adviser (CTA)

- Provide technical advices
- Review technical reports
- Monitor technical activities carried out by responsible parties

Support Staff of the Project Management Unit (PMU):

Project support staff will provide project administration, management and technical support to the National Project Coordinator as required by the needs of the day-to-day operations. The Department of Water Resources will provide office space for the PMU and a excellent working environment that will ensure project implementation proceeds smoothly through effective work plans and efficient administrative arrangements that meet donor requirements.

The PMU will be composed of the following core support staff.

1. The **Accounting Officer** will assist in the financial management tasks under the responsibility of the National Project Coordinator, including information on the transfer and conversion of funds at the Bank, verification of financial entries in the IFMIS Accounting Software at the Department of Treasury under the Ministry of Finance and Economic Affairs (MoFEA), timely payments of contractual fees and procurements, and provision of support in the use of IFMIS for financial monitoring and reporting on project financial flows
2. The **Administration Assistant** will set up and maintain project files, collect and archive project related data and information; establish document control procedures; administer Project Steering Committee and National Climate Committee meetings; compile, copy and distribute all project reports (Consultancies, workshops, training sessions, etc.)
3. **Motor vehicle Drivers** will be hired for the duration of project implementation. Two drivers and a vehicle will be stationed at the Banjul International Airport to service the Water Resources Training School (WRTS) and the Central Forecast Office and to specifically transport students to and from the WRTS, transport staff of the CFO who operate a 24-hour shift and also deliver weather forecasts at the Gambia Radio and Television Services (GRTS) in Fajara which is about 15 Kilometers from the Airport Office. Two drivers and **a** vehicle will be posted at the Bansang Regional Hydrological Station at about 300Kms from the Department of Water Resources in Banjul for use by staff in water level, river discharge, salinity, surface water runoff data collection and monitoring of hydrological events and provision of hydrological warnings and advice to cover two-thirds of the country. A driver and a vehicle will be allocated to the Hydrology Division for monitoring and data collection in the other third of the country. A driver and **a vehicle** will be allocated to the Water Quality Division of the Department of Water Resources for monthly water quality monitoring and data collection covering more than 200 groundwater monitoring points country-wide. The Division also conducts ad-hoc monitoring during disasters related to flooding. A driver and a vehicle will be allocated to the Meteorology Division for monthly

monitoring and data collection during the dry season and 10-day monitoring and data collection during the wet season covering 10 meteorological stations and about 40 rainfall measuring sites country-wide. Finally, a driver and a vehicle will be allocated to the PMU for day-to-day management of the project and for use by the CTA, CCDE and M&E Officer for field operations when needed.

8.5 Stakeholder Involvement Plan

Stakeholder consultation has been a key feature in the design of this LDCF Proposal, and stakeholders have been involved in identifying and prioritizing the proposed intervention activities. Consultations have included stakeholders from national, regional and local levels of government as well as NGOs, private sector, local communities and interest groups. . Details of the stakeholder engagement during the PPG Phase were provided in Section 2.3 above. On-going public consultation at all levels has been recognized as critical for successful implementation. This section outlines some of the key consultation principles and processes at a strategic level that will need to be translated into practical action during the project implementation. It provides guidance based on the initial stakeholder analysis, conducted as part of the project preparation process, and the consultations so far. This can be used to define exact activities that will form part of a communications and consultation strategy developed during the inception period of implementation.

Objectives

The stakeholder consultation during project implementation will be expected to support all outcomes. Overall, the objective of the consultation plan is to provide a framework to guide and promote two way engagements between the key Project Beneficiaries (DWR, DOA ,MOA, NDMA, NEA, GRTS, Parks & Wildlife and local communities) and the end-users with whom the project will engage and directly impact upon.

It is proposed that several more specific objectives for consultation are adopted:

1. To ensure that the general vision and strategy of the project and its expected outcomes is shared and understood by all concerned stakeholders;
2. To engage key stakeholders in planning, implementing and monitoring of specific interventions;
3. To ensure consistent, supportive and effective communication (information, documentation, sharing, lessons learned and feedback) processes with and among key beneficiaries as well as the wider public including in particular, vulnerable communities.
4. To gather support for project outcomes and mobilize influence to ensure long term strategic support from national and international partners for the continuation, upscaling and replication of project results.

In delivering these objectives, there are a number of simple qualitative considerations that need to be taken into account when planning engagement processes and what they should be seeking to achieve:

- Identify constraints and solutions: As a two way engagement, the consultation process should be used as an opportunity to identify with stakeholders possible constraints to or with the project's implementation and to work with the stakeholders in finding sustainable solutions.
- Managing expectations: The LDCF investment is relatively minor, compared to the adaptation demands facing the country. It will be important that consultations take due consideration to manage expectations of stakeholders and stakeholder groups.

- Partnerships for co-financing: The LDCF seeks to add value to its investments by building on existing and parallel projects that represent co-financing; consultations should consider opportunities for partnerships that will leverage co-financing into innovative approaches or technologies that may improve efficiencies and enhance impact.

Stakeholders

Stakeholders include a range of types of groups, all with their own interests and concerns. They have different roles to play in the project and the Table below indicates key stakeholders and their possible roles.

Activities planned during implementation and evaluation

During implementation, the communication and consultation process can be divided into three main phases, being:

Phase 1 –the **mobilization** phase in the first year of the project. The fine details of the activities and implementation structures will be designed, partnerships for action will be forged and stakeholder engagement will focus around these design processes.

Phase 2 – represents the main **implementation** phase where investments will be made on the ground in the target areas and stakeholder consultation about engagement will focus on output oriented action.

Phase 3 – represents the **completion** of the project and the plans for scale-up and long-term sustainability of the LDCF investments. Consultation will focus on learning, bringing experience together and looking at processes for continued post-project impact.

Phase I – Developing a strategy and action plan

At mobilization, a simple communications strategy should be developed. Key principles to be considered in the development of the strategy include:

Who? Implementers need to understand the stakeholders well – their needs, the impacts of interventions on each stakeholder group, the opportunities for contribution/engagement, and their power/influence. Whilst, as part of the project preparation, a stakeholder analysis was carried out, during this phase this should be reviewed as stakeholders should be seen as dynamic. The stakeholders that may be involved in or affected by the project are multiple, diverse; so an effective stakeholder identification process will be an important contributor to identifying key factors for success and risks to mitigate.

***Gender**: In engagement with the project implementation, it will be important to consider the different ways that the early warning products and climate information are easily accessed, understood and used by both women and men. The project implementers will need to consider how these two groups access information and interpret it and get feedback through consultation process in selected areas of implementation.

Why? Implementers need be clear about the purpose of the consultation process as so that the right stakeholders make the right inputs to the planned activities. During Phase I, the **Project Manager** with support from the main partners will seek to ecure the support and commitment of key stakeholders required for project implementation.

Implementers should make key stakeholders aware of the plan and its intended activities and outcomes and make clear their role and scope for contributing to project decisions and activities.

What? In planning stakeholder involvement, the strategy should make as much use of existing mechanisms (institutions and process) as possible, avoiding establishing project oriented structures.

Types of consultation mechanisms:

- Preparation meetings with NGOs/CSOs to be implicated in alert communication and in the simulation exercise;
- Initial consultation meetings in target regions;
- Information briefings for government and co-financing institutions;
- Development of public awareness messages on EWS and the utility of climate services for private sector representatives

Phase II - Consultation through implementation

Once implementation begins, public consultations should become more of an ongoing exchange of information, and there are two main purposes for the various mechanisms outlined under Phase I:

- to gather information from beneficiaries and stakeholders about the impact and effectiveness of the planned adaptation packages (efficient and reliable EWS) to support adaptive management; and
- to provide interested government and donor stakeholders and the general public with information about the progress and impact of the project as it is implemented.

The first purpose relates to engagement for effective implementation and monitoring, whilst the latter is more concerned with information dissemination, 'public relations' and expectation management. Good public relations will also help encourage collaboration with respect to the objective of the LDCF project.

Phase III - Project completion and scale up promotion

This will be a process of ensuring completion, hand-over and long-term sustainability of the LDCF investment. Consultation will focus on bringing experience together, sharing key lessons learnt (through the UNDP ALM and other forums) and looking at processes for promoting scale up of this project in order to have efficient and reliable EWS in the country.

Identified stakeholders in section 2.3 will be indirect and direct beneficiaries of all activities under the project. The following table however highlights which stakeholders will be involved in achieving which outputs and outcomes through their active engagement in project activities. The table thus captures the participation of stakeholders more than being beneficiaries.

Stakeholders	Outcomes Stakeholders will be involved in	Outputs Stakeholders will be involved with
National Government Institutions		
Ministry of Fisheries, Water Resources and National Assembly Matters	1 The Gambia National Meteorological Services is supported in its transition to becoming a financially sustainable Meteorological Agency 2 Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by recent needs assessment reports in the Gambia 3 A critical mass of skilled human resources is able to operate the Gambia Early Warning System and perform medium and long-term adaptation planning beyond the project 4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	1.4 A comprehensive business plan for deployment of effective hydro-met service developed 2.1 Effective, timely and accurate flood warnings issued 2.2 Increased availability of real time climate data 2.3 A marine meteorological station network is operational 2.4 The water quality monitoring system is upgraded 2.5 A comprehensive data base and data management system is established and centralized 3.1 A cadre of certified maintenance and repair technicians exists within the NHMS 3.2 A recruitment and retention strategy is developed 3.3 A cadre of certified hydromet professionals is established 4.1 Targeted climate products are produced for sectoral institutional partners 4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up 4.3 Underserved communities receive early warning messages 4.4 Climate change issues are integrated into local development plans in 14 sites 4.5 Knowledge, data and information on climate impacts on local biodiversity is available 4.6 Knowledge management structures for effective feedback and incorporation of lessons learned are created
Ministry of Forestry and Environment & National Environment Agency	2 Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by	2.5 A comprehensive data base and data management system is established and centralized 4.1 Targeted climate products are produced for sectoral institutional partners

Stakeholders	Outcomes Stakeholders will be involved in	Outputs Stakeholders will be involved with
	recent needs assessment reports in the Gambia 4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up 4.5 Knowledge, data and information on climate impacts on local biodiversity is available
Ministry of Agriculture	2 Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by recent needs assessment reports in the Gambia 4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	2.5 A comprehensive data base and data management system is established and centralized 4.1 Targeted climate products are produced for sectoral institutional partners 4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up 4.3 Underserved communities receive early warning messages 4.4 Climate change issues are integrated into local development plans in 14 sites 4.6 Knowledge management structures for effective feedback and incorporation of lessons learned are created
National Disaster Management Agency (NDMA)	2 Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by recent needs assessment reports in the Gambia 4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	2.5 A comprehensive data base and data management system is established and centralized 4.1 Targeted climate products are produced for sectoral institutional partners 4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up. 4.3 Underserved communities receive early warning messages 4.4 Climate change issues are integrated into local development plans in 14 sites 4.6 Knowledge management structures for effective feedback and incorporation of lessons learned are created

Stakeholders	Outcomes Stakeholders will be involved in	Outputs Stakeholders will be involved with
Department of Parks and Wildlife Management	2 Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by recent needs assessment reports in the Gambia 4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	2.5 A comprehensive data base and data management system is established and centralized 4.5 Knowledge, data and information on climate impacts on local biodiversity is available 4.6 Knowledge management structures for effective feedback and incorporation of lessons learned are created
Ministry of Works, Communications & Infrastructure	2 Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by recent needs assessment reports in the Gambia 4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	2.1 Effective, timely and accurate flood warnings issued 2.2 Increased availability of real time climate data 4.3 Underserved communities receive early warning messages
Ministry of Local Governments and Lands	4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up 4.3 Underserved communities receive early warning messages 4.4 Climate change issues are integrated into local development plans in 14 sites
Ministry of Finance and Economic Affairs	1 The Gambia National Meteorological Services is supported in its transition to becoming a financially sustainable Meteorological Agency 3 A critical mass of skilled human resources is able to operate the Gambia Early Warning System and perform medium and long-term adaptation planning beyond the project	1.5 A comprehensive business plan for deployment of effective hydro-met service developed 3.3 A cadre of certified hydromet professionals is established

Stakeholders	Outcomes Stakeholders will be involved in	Outputs Stakeholders will be involved with
Ministry of tourism and Culture	2 Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by recent needs assessment reports in the Gambia 4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	2.4 The water quality monitoring system is upgraded 4.5 Knowledge, data and information on climate impacts on local biodiversity is available
Department of Community Development	4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up 4.3 Underserved communities receive early warning messages 4.4 Climate change issues are integrated into local development plans in 14 sites
Gambia Radio and Television Services	4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.1 Targeted climate products are produced for sectoral institutional partners 4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up 4.3 Underserved communities receive early warning messages
Crown Corporations		
Gambia Ports Authority (GPA)	2 Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by recent needs assessment reports in the Gambia 4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	2.3 A marine meteorological station network is operational 4.1 Targeted climate products are produced for sectoral institutional partners

Stakeholders	Outcomes Stakeholders will be involved in	Outputs Stakeholders will be involved with
Gambia Civil Aviation Authorities (GCAA)	2 Hydro-meteorological infrastructure is upgraded / installed and maintained that will cover the full needs for 'optimal performance of EWS' as identified by recent needs assessment reports in the Gambia 4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	2.2 Increased availability of real time climate data 4.1 Targeted climate products are produced for sectoral institutional partners
Regional and Local Governments		
Local Regional Governments of NBR, BCC, KMC, WCR, LRR, CRR, URR,	4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up. 4.3 Underserved communities receive early warning messages
Academic institutions and Research Institutes		
University of The Gambia	3 A critical mass of skilled human resources is able to operate the Gambia Early Warning System and perform medium and long-term adaptation planning beyond the project	3.2 A recruitment and retention strategy is developed 3.3 A cadre of certified hydromet professionals is established
Gambia college: training of extension staff	3 A critical mass of skilled human resources is able to operate the Gambia Early Warning System and perform medium and long-term adaptation planning beyond the project	3.2 A recruitment and retention strategy is developed 3.3 A cadre of certified hydromet professionals is established
Local Communities, NGOs and Community-based organizations		
Local Communities-Fishermen, Kanyaleng women's groups, farmer organizations, Herdsmen Group and Vegetable Growers Group, youth for	4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up. 4.3 Underserved communities receive early warning messages 4.4 Climate change issues are integrated into local development plans in 14 sites

Stakeholders	Outcomes Stakeholders will be involved in	Outputs Stakeholders will be involved with
information dissemination (designated by the contact groups in pilot sites)		
Village Development Councils	4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.4 Climate change issues are integrated into local development plans in 14 sites
Community radio stations	4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.3 Underserved communities receive early warning messages
NGOs: TANGO, Stay Green, Famers Platform	4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.2 Early warnings and climate change risk information in 14 sites disseminated and taken up 4.3 Underserved communities receive early warning messages
Private Sector		
Telecommunications	4 Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans	4.3 Underserved communities receive early warning messages
Energy, Construction, Hotels, Transport	1 The Gambia National Meteorological Services is supported in its transition to becoming a financially sustainable Meteorological Agency	1.1 A comprehensive business plan for deployment of effective hydro-met service developed

8.6 Community Consultation Report

Community consultation Report

1. Introduction

These consultations are within the current PPG for the climate change early warning phase II project. Phase I was piloted with a limited coverage (two regions (NBR, WCR) & two municipalities (BCC,KMC)), whilst Phase II has a country wide coverage. Two sites per region across the country and the selection criteria were agreed during the inception workshop. In consultations with Regional Governors and Municipal Administrators 14 sites (figure 1) were selected according to the recommended criteria.

The objective of the trek was to visit these sites, inform the relevant authorities in these sites of the project and what it meant, together with them discuss the requirements and selection of contact persons for effective implementation in the sites.

The consultations started from the 3rd to 8th and continued on the 14th and 19th July 2013. It was composed of three, Mr. Bubu P. Jallow head of the mission, Mr. Alpha Jallow secretary and in-charge of logistics and Mr. Sarjo Njie the driver.

2. Methodology

The 14 sites were selected based on the five criteria below:

(1) High human risk (mortality/disease outbreak)
(2) Vulnerable to frequent and/or severe climate-related events;
(3) Economically and socially significant: a source of livelihoods and food security
(4) Underserved by current forecasting messaging
(5) Environmentally vulnerable

In the five Regions and the two Municipalities, authorities were asked to identify two sites that best suites the five criteria for use in the project pilot. The consultations were conducted in the form of group discussions with questions and responses from both sides.

3. Visited Pilot Sites

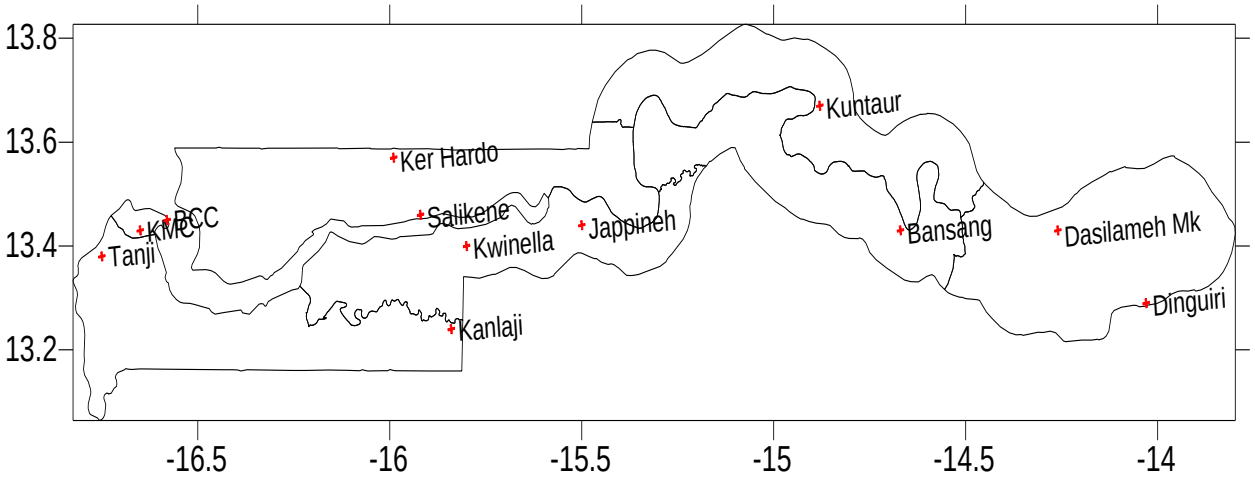

Figure 1: location of the pilot sites

3.1 Ndingri village Upper River Region (URR)

Figure1: Cross section of the gathering at Ngingri Village

Date: 4th July 2013

Present were:
The Deputy Governor URR
The Head of the Village
The Village Development Committee (VDC) Chair
Women representatives
Youth representatives
The Regional Disaster Coordination
The Regional Health Officer
The Regional Meteorological Officer

3.2 Dasilameh village Upper River Region (URR)

Figure2: Cross section of the gathering at Dasilameh Village

Date: 4th July 2013
Present were:
The Head of the Village
The Village Development Committee (VDC) Chair
Women representatives
Youth representatives
The Regional Disaster Coordination
The Regional Health Representative
The Regional Meteorological Officer

2.3 Bansang Town Central River Region (CRR)

Figure3: Cross section of the gathering at Bansang Town

Date: 5th July 2013

Present were:
The Head of the Village
The Deputy Governor CRR
The Village Development Committee representatives
Women representatives
Youth representatives
The Regional Disaster Coordination
The Regional Meteorological Officer

2.4 Kuntaur Town Central River Region (CRR)

Date: 5th July 2013
Present were:
The Head of the Village
The Deputy Governor CRR
The Village Development Committee representatives
Women representatives
Youth representatives
The Regional Disaster Coordination
The Regional Meteorological Officer

2.5 Salikene Village North Bank Region

Figure 4: Cross section of the gathering at Salikene village

Date: 5th July 2013
Present were:
The Head of the Village
The Governor's Representative NBR
The Village Development Committee VDC Chair
The Imam of the Village
Women representatives
Youth representatives
The Regional Disaster Coordination
The Regional Meteorological Officer

2.6 Kerr Ardo Village North Bank Region

Figure 5: Cross section of the gathering at Kerr Ardo village

Date: 5th July 2013
Present were:
The Head of the Village
The Governor's Representative NBR
The Village Development Committee (VDC) Chair
Women representatives
Youth representatives
The Regional Disaster Coordination
The Regional Meteorological Officer

2.7 Japenni Village Lower River Region (LRR)

Figure 6: Cross section of the gathering at Japenni village

Date: 6th July 2013
Present were:
The Heads of the two Villages
The Chief of the District
The Deputy Governor LRR
The Village Development Committee (VDC) Chair
Women representatives
Youth representatives
Elder's Council representatives
The Regional Disaster Coordination
The Regional Meteorological Officer

2.8 Kwinela village Lower River Region (LRR)

Figure 7: Cross section of the gathering at Kwinela village

Date: 6th July 2013
Present were:
The Heads of the two Villages
The Chief of the District
The Deputy Governor LRR
The Village Development Committee (VDC) Chair
Women representatives
Youth representatives
Elder's Council representatives
The Regional Disaster Coordination
The Regional Meteorological Officer

2.9 Kanlagi village West Coast Region (WCR)

Figure 8: Cross section of the gathering at Kanlagi village

Date: 6th July 2013
Present were:
The Head of the Village
Elder's Council representatives
The Village Development Committee (VDC) Chair
Women representatives
Youth representatives

2.10 Tangi West Coast Region (WCR)

Figure 9: Cross section of the gathering at Tanji village

Date: 8th July 2013
Present were:
The Head of the Village
The Deputy Governor WCR
The Village Development Committee (VDC) Chair
Women representatives
Youth representatives
Elder's Council Chair
Traditional communicators representative
Fisher folk representative
Representative Department of Water Resources (DWR) at Governor's Office (WCR)
Regional Disaster Coordinator

2.11 Dippa Kunda Kanifing Municipal Council (KMC)

Figure 10: Cross section of the gathering at Dippa Kunda

Date: 8th July 2013
Present were:
The Head of the Village
The Ward Council
Community Development Officer (KMC)
Women representatives
Youth representatives
Elder's Council representative
Disaster coordinating Officer
Ward representatives

2.12 Ebou Town Kanifing Municipal Council (KMC) (Serre Kunda)

Date: 8th July 2013
Present were:
The Head of the Village
The Ward Council
Community Development Officer (KMC)
Women representatives
Youth representatives
Elder's Council representative
Disaster coordinating Officer
Ward representatives

2.13 Crab Island Ward Banjul City Council (BCC)

Date: 14th July 2013
Present were:
The Deputy Mayor (Ward Council)
Women representatives

Youth representatives
Elder's Council representatives
Ward representatives

2.14 Soldier Town Ward Banjul City Council (BCC)

Date: 19th July 2013
Present were:
The Ward Council
Women representatives
Youth representatives
Elder's Council representatives
Ward representatives

3 Discussions

The discussions were chaired by Regional Disaster Coordinators at regional levels and by Ward Councils in the municipalities. All discussions began with prayers followed by welcoming remarks either by Village Heads, the District Chiefs or the Ward Councillor.

Mr. Bubu Jallow in his introductory remarks in all the 14 venues, informed the gathering the purpose of the visit, the rationale behind the project, how the sites became selected and what is expected from them. He informed the participants that the main activities of the project is to provide climate information in the form of early warning messages/alerts, daily weather forecasts and seasonal outlooks to safeguard lives and properties and enhance agricultural production. That climate information such as temperature variations, rainfall patterns and wind strengths are essential and important elements in our daily activities. He further informed them that climate is an important element of our lives as it has an influence on most of our activities including rural duelers who depend on agriculture for much of their livelihoods, hence the need for its information reaching them.

However, he emphasized that current information is very technical and mainly in English and hence the need to consult with them to identify ways of getting the information in languages they can understand. That the information is not meant only for officers, but should also reach farmers, fishermen and cattle owners. In responding, most emphasized the important of climate and weather information as it is expected contribute to save guard lives and properties. A particular example was cited at Ndingri village with the current rain gauge installed in the village which helps them make a choice when to saw ground or not and requested for more of its kind. A similar example was also cited in Salikene on the use of the seasonal outlooks. At Tanji village, the Head of the fishermen informed the team that he is a user of weather information to advise his folks. He gave a particular example was last year when he received warning from a Senegalese radio monitored in Tanji that a rough sea waters is expected. He advised his fishermen not go to sea but contrarily, in Senegal some fishermen lost their lives and properties for not adhering to the warning. He re-iterated the importance of providing the weather information and its relevance to their activities.

Meanwhile, what was unanimously requested in all the sites visited is training and sensitization on weather and climate, as the information can only be effective and useful when it is trusted, which emphatically depend on the level of knowledge and understanding of those it is intended to benefit.

Finally, Mr. Jallow emphasized that any person selected as a contact person should be dedicated to the task and should prioritize public interest before personal one and over all be prepared to contribute effectively to the success of the project.

4 Required needs for dissemination of climate Change Early Warning Messages as identified by local communities

The table below recapitulates the requirements for disseminating weather and climate information, the contacts persons and their telephone numbers

Table 1: Needs and contact persons of pilot sites

#	Pilot site	Community raised needs for communication (for information only)	Contact persons	Telephone	Best GSM
1	Ndingri	• Motor bike • Mobile Public Address (PA) system • Training &sensitization on weather & climate • Mobile phones • Preferred Radio stations (GRST FM, UNIQUE FM) in 3 main languages (Mandinka, Fula, Sarahuleh)	Chaddou Fofana Alh. Ebrima Sumareh Hadja Mama Touray Samasa Hadja Chama Sumareh	7223152 7336947 9771952 9250408	Africel Comium GAMCEL
2	Dasilameh	• Motor bike/Bicycle • Mobile Public Address (PA) system • Training &sensitization on weather & climate • Mobile phones • Traditional communicators	Manjang Jawla Seedy Suso Kajali Barrow Mariama Sillah	9098385 9823421 7674659 9788782	Africel Gamcel

		• Preferred Radio stations (Basse GRST FM) in 3n main languages (Mandinka, Fula, Sarahuleh)			
3	Bansang	• Motor bike/Bicycle • Mobile Public Address (PA) system • Training &sensitization on weather & climate • Mobile phones + lines • Preferred Radio stations (Bansang FM, Basse GRST FM**)** in 4 main languages(English Mandinka, Fula, Sarahuleh)	Niamu Touray Alieu Badou Jallow Tunko Fatty Mama Jawara	9266255/7895596 7238249/9181755 6163866 7002109	Africel Comium GAMCEL
4	Kuntaur	• Motor bike/Bicycle • Mobile Public Address (PA) system • Training &sensitization on weather & climate • Mobile phones + lines • Preferred Radio stations (Brikamaba) in 3 main languages(Mandinka, Fula, Sarahuleh)	Aunty Rohey Ceesay Ebrima Bah Maimuna Barry Pa Boy sillah	6231160/3113253 6810683 7220356 6338560	
5	Salikene	• Motor bike/Bicycle • Mobile Public Address (PA) system • Training &sensitization on weather & climate • Mobile phones + lines	Momodou B. Dibba Ba Saikou Kanteh Lamin Seck Sisay Ebrima Jawneh Zakara Touray	9903101 9330221 9036434 9825855 9810735	GAMCEL

		• Radio Cassette Player • Rain Boot & Coat • Radio (Kerewan FM, Preferred Radio stations (GRST FM) in 3 main languages(Mandinka, Fula, Sarahuleh)	Fodaymano Trawalley Buba Kebba Fofana Njobodi Fatty Buba Touray Malamin Daffeh Buba Karanba Fatty	9809834 9821472 9127166 9060363 9330221 9330221	
6	Kerr Ardo	• Motor bike/Bicycle • Mobile Public Address (PA) system • Training &sensitization on weather & climate • Mobile phones + lines • Traditional Communicators • Rain Boot & Coat • Preferred Radio stations (Kerewan FM), in 3 main languages(Mandinka, Fula, Wolof)	Momodou Sowe Pa Mady Jallow Sohna Ceesay Matty Sey Omie Bah		
7	Japenni	• Motor bike/Bicycle • Mobile Public Address (PA) system • Training &sensitization on weather & climate • Mobile phones + lines • Traditional Communicators • Rain Boot & Coat • Preferred Radio stations (Soma FM & Farafenni FM), in 3 main	Lamin Dampha (FP) Kebba Fatty Alhagie Jas Yarboe Bundow Kebbeh Fatou Sanneh		

		languages(Mandinka, Fula, Sarahuleh)			
8	Kwinela	• Motor bike/Bicycle • Mobile Public Address (PA) system • Training &sensitization on weather & climate • Mobile phones + lines • Traditional Communicators • Preferred Radio stations (Soma FM, Farafenni FM, Africel FM**)**, in 2 main languages(Mandinka, Fula)	Demba Darboe (FP) Mustapha Sabally Demba Sanyang Seyfo Nakoto Demba M. Sanyang		Africel Comium GAMCEL QCEL
9	Kanlagi	• Motor bike/Bicycle • Mobile Public Address (PA) system • Training &sensitization on weather & climate • Mobile phones + lines • Traditional Communicators • Data card for internet • Rain gauges • Note books • Office building • Identification cards • Preferred Radio stations (Capital FM, Bwiam FM, GRSTS FM), in 3 main languages(Mandinka, Fula, Jola)	Enssa Nyassi Sainy K.K. Sanyang Famara Colley Sainabou Gaye Kumba Barry	6117467 3720583 6317891 6206396 7846030	Africel Comium QCEL

10	Tangi	• Motor bike/Bicycle • Mobile Public Address (PA) system • Training &sensitization on weather & climate • Mobile phones + lines • Traditional Communicators • Preferred Radio stations (STAR FM), in 3 main languages(Mandinka, Fula, Wolof)	Dembo Bojang Lama Jallow Sidou Darboe Siaka Kolley Mamadou Bah Sama Samateh Babucarr Sanneh Pa Saikou Kujabi Muhamadou Jamamnka Ousman Jallow Fanma Jadama Abou Kumba Njie	7790320 9851255 7005517 7537774 7823919 7650607 7039446 3505418 9987720 7083246 7776690	Africel GAMCEL
11	Dippa Kunda (Serre Kunda)	• Mobile Public Address (PA) system • Training &sensitization on weather & climate • Mobile phones + lines • Preferred Radio stations (GRTS FM, CAPITAL FM, Africell, Unique FM, West Coast 1& 2, STAR FM) in 4 main languages(English, Mandinka, Fula, Wolof)	Amie Gissey Ebrima Kieta Mamma Jallow George Camara Yama Sanneh Tasia Ceesay Buba Drammeh Fatou Sarr Babou Jonga Kaddy Sanneh Ramou Mbaye Mariama Susso Hassum Camara Yusupha Sowe Mam Binta Keita Musa Jobe Nyima Gomez	 758029 7201423 9718060 7785124 7543074 9924088 9914106 9922269 9804706 7737568 9174439 9991775 3711094 7157608 7734394	

12	Ebou Town (Serre Kunda)	• Mobile Public Address (PA) system • Training &sensitization on weather & climate • Mobile phones + lines • Text to customers by GSM Companies • Posters and pamphlets • Preferred Radio stations (GRTS, STAR, Capital) in 4 main languages (English Mandinka, Fula, Wolof)	Kebba Ceesay Ousman Jassey Lamin Mbenga Anjness Gomez Fatou Faye Jim Nyass Haddy Gisseh Joko Colley Iso Camara Abou MB Sanneh Sait Jallow Haddy Jagne Abou Balajo Modou Narr Secka Kebba Low Haddy Bass	9242323 9922216 9923168 7337500 3410233 7806552 9928516 7059840 7777430 7067426 982363 3565883 7745335 7713956 7364837 9988096	
13	Crab Island Ward (Banjul)	• Mobile Public Address (PA) system • Training &sensitization on weather & climate • Mobile phones + lines • Text to customers by GSM Companies • Preferred Radio stations FMs (Capital, SEN FM) 4 main languages(English Mandinka, Fula, Wolof)	Baboucarr Sisiho (PF) Sangareh Janko Satou Sawaneh Fatou Ngom Balaba Camara Ousman Marong Ebrima Dibba	9928996 9847388 7248825 9881683 9915771 9223136 3541761	Africel Comium GAMCEL QCEL
14	Soldier Town (Banjul)	• Mobile Public Address (PA) system	John Fullah Alhagie Dodou Njie	9912550/2 248769	Africel Comium GAMCEL

		• Training &sensitization on weather & climate • Mobile phones + lines • Text to customers by GSM Companies • Posters and pamphlets • Bell • T-Shirts • Message book • Traditional Communicators • Preferred Radio stations (Capital FM, SEN FM) 4 main languages(English Mandinka, Fula, Wolof	Baboucarr Mbaye Low Jainaba Jammeh Fatou Sakeni Ida Ngom Corr Pa Ablie Joof Nyimma Jammeh Omar Jammeh Tunko Jammeh	9946477/3650176 7770303 9916954 9982535 7412326 7237915 9930927 7770303 9198489/7721549	QCEL

8.7 Policymakers Consultation Report

Bilateral consultations with Policy Makers by PPG Consultants		
Institution	**Officials met**	**Issues discussed**
UNDP Country Office	**Abdou Touray,** *Programme Officer* **Mamadi Ndow,** *Programme Officer*	1. Information on other projects related to climate change, for example a. Enhance resilience of vulnerable communities and coastal areas to the impacts of CC project (8.9 million dollars) (PPG completed) b. The Gambia protected areas networks and community livelihood project (3.9 million dollars) (PIF level)

Department of Agriculture(DOA)	**Falalo Touray,** *(Deputy Director General)*	1. Confirmed good collaboration with DWR, 2. Weather and climate information comes from DWR, 3. Needed real short term information, 4. Needed capacity building to interpret climate information' 5. The institution is well prepared for drought in terms of technical advice varieties but not for excessive rainfall (2012), 6. The need to strengthen the regional meteorological stations to be able to store their data for region use, 7. The Technical advisory Committees at regional level could be used for EWS dissemination, 8. FAO has trained extension workers on Risk Management for further step down training at District level.
FAO Country Office of The Gambia	**Saidu Jallow** *(Former head of Agricultural communication Unit)* **Essa Khan** *(Former head of the National Disaster Management Agency: NDMA)*	1. IDB mission to support EWS in the Gambia, 2. Climate change affects livelihoods and cause hazards, 3. The WFP Bulletin, an early warning tool but confined to WPF only, 4. Other early warning tools from DWR use by the NDMA in their planning and preparedness are: The Daily Weather Forecast, the 10-day Bulletin and Seasonal Forecast, 5. EWS communications should be well coordinated and transmitted on time, 6. Linking climate science with agronomic practices to enhance production, 7. Delivery of climate information be included the formal extension work plan.
Gambia Chambers of Commerce and Industry (GCCI)	**Almamy Taal,** *(Chief Executive Officer)*	1. Private sector participation was over sighted by Government, 2. Public private partnership (PPP) is essential under a new work frame where Government will take the lead,

		3. EWS will need private sector capital investment that is affordable to the public.
Stay Green Foundation, NGO	**Baboucarr Mbaye,** *(Head of NGO)*	1. A member of the National Climate change Committee (NCC) since its inception, 2. Produce more than 3,000 nursery plants annually for farmer planting, 3. Engaged with more than farmer communities, 4. Does disseminate weather and climate information to farmers in local languages, 5. Needs capacity to interpret climate information (very technical) into local languages.
North Bank Region (NBR)	**Lamin Queen Jammeh,** *(Governor of the Region)*	1. Confirmed receiving the EWS information from DWR, 2. The need to strengthen the Multi-Disciplinary Facilitating Teams (MDFTs) and TACs to be able to deliver EWS information directly to community levels, 3. The need for training of Trainers on weather and climate, 4. The need to set up district development centres with opportunities to employ youths and deviate them from activities that are unfriendly to the environment.
National Disaster Management Agency (NDMA)	**Mbassy Sanneh** *(Admin Assistant)* **Fatou Sowe Jaiteh** *(Finance Assistant)*	1. The Agency has a coordinator in each of the 7 regions in the country with disaster coordination committees and work with the MDFTs, 2. Do receive the EWS information and share it the regional coordinators, 3. Do also receive the Meningitis alert from the African Centre for Meteorology And Development (ACMAD), 4. That the information is sometimes very technical and need to be simplified for sharing purposes and therefore needed training for their coordinators, 5. Need to exploit the possibilities of cooperating with the national GSM operators and local radios for quick message deliveries.

Central Forecast Office (Airport)	**Tijani Bojang** *(Deputy Head of Forecast Office)* **Kebba Jawo** *(Forecast Office Studio Manager and Head of Water Resources Training School)*	1. Need to strengthen observations stations, 2. the Current automatic weather station installed at the Airport can only provide wind and pressure information, 3. Automatic stations installed in-country would help in the monitoring and provision of reliable data for enhanced forecasting, 4. That the forecast unit will be able to provide advance information on approaching storms and the wind conditions, but will a device/mechanism in place for faster communication to users without relying on the daily forecast segment broadcast over the TV.
Kanifing Municipal Council (KMC)	**Mustapha Njie** *(CEO)* **Binta Sey Jadama** *(NDMA Focal Point)* **Fatou Jibba** *(NCC member)*	1. The Council had identified hot spot with regard to climate related risks 2. The Council is not receiving directly EWS information from DWR, but instead get it from the TV, 3. Need to include region aspects (probabilities) in the seasonal prediction, 4. Sensitization of the general public on weather and climate is necessary in order to build trust on information, 5. A system for rapid message delivery is vital for the EWS, 6. MDFTs are train on dissemination weather forecasts at grass root level.
National Environment Agency (NEA)	**Momodou Sarr** *(Executive Director);* **Alieu Nyang** *(Manager, Research and Development);* **Momodou J. Suwareh** *(Senior Programme Officer, Coastal and Marine Environment);*	1. Climate change should be integrated into policy; 2. Need to re-install the Air pollution monitoring equipment and the mechanism for analyzing it at national level, 3. Need to exploit the use of indigenous knowledge in climate and environmental prediction, 4. Need to optimize the GIS Unit and to enable the production of maps of relevant climate information for early warning of disasters,

	Dodou Trawalley *(Senior Programme Officer, GIS/EIS Unit)* **Ajie Binta Kinteh,** *(Senior Programme Officer, Environment Education and Communication);* **Aji Awa Kaira,** *(Programme Officer, GIS/EIS Unit).*	5. That information on tides, waves and currents is necessary for coastal monitoring, 6. Need to use weather and climate information in the tourism sector, 7. Need to have water quality information around the Ports and swamps around Banjul for species monitoring, 8. That the Gambia is commended for sharing weather and climate information by the Abidjan Convention; 9. Build closer ties with and tap the expertise of the Environment Education Unit for the development and communication of Media Material on climate change early warning; and 10. Enhance the capacity of the GIS/EIS and the Environment Education Units to effectively support and participate in the Climate Change Early Warning System of The Gambia.
Extension, Education and Communication (EEC) Unit, Department of Agriculture, Abuko	**Alhagie Musa Dampha** *(Deputy Director, Communication, Extension and Education);* **Abdoulie Bojang** *(Senior Agricultural Officer);* **Ebrima Janko Jawo** *(Senior Agricultural Officer);* **Dembo Dibba** *(Agricultural Officer);* **Marie Sambou** *(Principal Agricultural Officer).*	1. The EEC Unit is the Extension Services arm of the Department of Agriculture; 2. Most of the Extension Agents of the MDFTs in the Districts and Regions are from Agriculture and are trained at the College of Agriculture; 3. All of the Extension Agents in North Bank Region, BCC, KMC and the West Coast Region have participated in the Climate Change Early Warning Capacity Building Workshops; 4. It will be prudent to develop a climate change training programme and conduct the training in conjunction with the Extension Services Training Programme at the College of Agriculture; 5. It was agreed that the EEC Unit should submit a proposal for the development of the Climate Change Training Programme for Agriculture Extension Agents at the College of Agriculture and submit to the Project Management Unit of CCEWS; and

		6. It was also agreed that the EEC Unit should submit to PMU of CCEWS the capacity enhancement needs (materials and training) including costs required for its sustained participation in climate change early warning system of The Gambia.
Water Quality Laboratory, Abuko	**Foday Conteh** *(Principal Scientific Officer);* **Lamin Jabang** *(Laboratory Technician);* **Ansumana Ceesay** *(Scientific Officer);* **Neneh Touray** *(Scientific Officer);* **Badou Saine** *(Laboratory Technician);* **Yaya Trawally** *(Laboratory Technician);* **Kumba Mballow** *(Laboratory Field Assistant);* **Adama Sosseh** *(Laboratory Field Assistant);* **Aji Awa Njie** *(Data Entry Clerk);* and **Assie Jallow** *(Laboratory Field Assistant).*	1. The Water Quality Laboratory (WQL) of the Department of Water Resources is the National Laboratory for the chemical, physical and biological monitoring and analysis of surface and groundwater resources of the country; 2. WQL is also called up to analysis and report on water pollution during environmental disasters; 3. WQL collaborates with the National Environment Agency in analysis of air quality; 4. The Hotels and Tourist Resorts engage the WQL in the monitoring of waters in swimming pools and this is sustained through contributions to the operations of the Laboratory; 5. The effective participation of the WQL in the Gambia Early Warning System will be constrained by the inadequacy in trained personnel and laboratory materials; 6. Currently, most of the laboratory analysis is carried out by personnel that have not been trained to the required level despite long years of service at the WQL. Lack of training is due to lack of entry requirements in high schools of learning and also lack of funding; 7. It was agreed that Management of the WQL should submit to PMU of CCEWS the capacity enhancement needs (materials and training) including costs required for its sustained participation in climate change early warning system of The Gambia
Department of Parks and Wilflife	**Momodou Lamin Gassama** *(Director)*;	1. The Department of Parks and Wildlife Management is mandated to manage (including monitoring) Parks and Wildlife and Biodiversity of the country;

Management, Abuko		2. DPWM has 15 biodiversity monitoring sites and species monitored are Sitatunga, Hippopotamus, Crocodile (slender snouted and dwarf), Marine turtle, Flamingo, Savile bustard, West African Manatee and Dolphins and whales; 3. Inadequate human and institutional capacity is a constraint in regular monitoring and reporting; 4. Management of the Department was requested to submit to the Project Management Unit a costed proposal containing human and equipment needs for effective and sustained participation in the Gambia Early Warning System
St. Mary University in Nova Scotia, Canada	**Cathy Conrad,**	1. St. Mary's University in Nova Scotia, Canada is a key partner in the procurement of laboratory materials and a potential partner on capacity building of the Laboratory; 2. It was suggested and agreed the Management of the Department of Water Resources and Project Management Unit should work with St. Mary's University to work out ways of training the matured staff of the Laboratory; 3. St. Mary's University has proposed and submitted a Training Programme for matured students at the WQL and management of the Department of Water Resources is studying the programme for eventual adoption. The proposed training will be conducted in The Gambia by staff from Canada.
Earth Networks, USA Company with Headquarters in Washington, DC	**Darvidof**	1. Foundational Infrastructure for Early Warning Systems 2. Produces Severe Weather Maps for Lightning Flashes Per Km2 Per Year 3. Earth Networks serves governments, enterprises and public particularly NMHS, Emergency Management, Agriculture, Electrical Utilities and Aviation; 4. The company provides advanced solutions for delivering critical weather and climate information to various levels

		of government and millions of people via mobile platforms; End-to-end Early Warning Systems consisting of sensor, data, model, alerting, and content delivery layers and Accurate, reliable and automated severe weather alerts – comparable to those produced by a world-leading NHMS but enabled at a fraction of the cost 5. Its installations include a Network of Integrated compact automated weather and lightning sensors on mobile communications towers, rooftops and in other secure locations; 6. Metadata handling system ensures data quality control checks and sensor operability to deliver the highest quality data at lowest maintenance cost. 7. Total Lightning Detection Enables Severe Weather Forecasting, National scale total lightning detection at high efficiencies is critical for earlier identification, tracking & forecasting of dangerous weather, including: Severe thunderstorms, High winds, Hail storms, Microbursts and wind shear, Tornadoes, Tropical cyclone intensification and Cloud-to-ground lightning 8. Integrated weather and lightning information enables Nowcasting and Alerting (DTAs and PulseRad), Forecasting on various timescales and Specialized follow-on programs on Climate, Floods, Droughts, Ag, etc. 9. Integrating Surface Observations with PulseRad and Satellite for Drought/Flood Monitoring, Forecasting and Early Warning 10. Information and Alerting systems includes Automated and manual alert delivery to decision-makers and the general public 11. Automated alert types include: current weather observations, lightning, flooding, DTAs and severe weather alerting, hourly forecast information 12. Advantages of Regional Lightning Detection include Reduction in number of stations deployed, Reduction of

		ongoing maintenance, More program resources allocated to forecasting, alerting, and training, Extended coverage of incoming storms, Added network redundancy for improved uptime and Promotion of regional cooperation and climate resilience 13. Coverage in Africa includes Botswana, Congo, Cape Verde, Egypt, Ethiopia, Ivory Coast, Kenya, Madagascar, Malawi, Morocco, Namibia, South Africa, Togo and Zambia.

8.8 Meteorological Staff List and Current Training

* staff highlighted in green is female

METEOROLOGICAL STAFF LIST AS AT DECEMBER 2012

PRESENT POST HELD	GRADE	QUALIFICATION ACADEMIC	PROFESSION	PRESENT STATION	POSTED TO
PRINCIPAL MET.	10	BSc, MSc	Meteorologist	BANJUL	BANJUL
SNR. MET.	9	BSc, PM	Meteorologist	BANJUL	BANJUL
MET. OFFICER I	8	BSc, PM	Meteorologist	SECONDEMENT	SECONDEMENT
MET. OFFICER I	8	BSc, MSc	Meteorologist	CLIMATE	CLIMATE
MET. OFFICER I	8	BSc	Meteorologist	YUNDUM	YUNDUM
MET. OFFICER I	7	BSc	Meteorologist	YUNDUM	YUNDUM
MET. OFFICER II	7	Higher Diploma	SNR MET TECH	YUNDUM	YUNDUM
MET. OFFICER II	7	Higher Diploma	SNR MET TECH	YUNDUM	YUNDUM
CADET MET.	7	BSc (Physics)		YUNDUM	YUNDUM

MET. OFFICER II	7	Higher Diploma	SNR MET TECH	YUNDUM	YUNDUM
MET. SUPT.	7	Diploma	ENT. LVL. MET. TECH	BANJUL	BANJUL
MET. SUPT.	7	Higher Diploma	MID. MET. TECH.	YUNDUM	YUNDUM
MET. ASSISTANT I	6	BSc, PM	Meteorologist	BANJUL	BANJUL
MET. ASSISTANT I	6	Higher Diploma	MID. MET. TECH.	YUNDUM	YUNDUM
MET. ASSISTANT I	6	Higher Diploma	MID. MET. TECH.	CLIMATE	CLIMATE
MET. ASSISTANT I	6	Higher Diploma	MID. MET. TECH.	KEREWAN	KEREWAN
MET. ASSISTANT I	6	Higher Diploma	MID. MET. TECH.	BASSE	BASSE
MET. ASSISTANT I	6	Diploma	ENT. LVL. MET. TECH	YUNDUM	YUNDUM
MET. ASSISTANT I	6	Diploma	ENT. LVL. MET. TECH	SIBANOR	SIBANOR
MET. ASSISTANT II	6	Diploma	ENT. LVL. MET. TECH	JENOI	JENOI
MET. ASSISTANT II	6	Diploma	ENT. LVL. MET. TECH	YUNDUM	YUNDUM
MET. ASSISTANT II	6	Diploma	ENT. LVL. MET. TECH	YUNDUM	YUNDUM
MET. ASSISTANT II	6	Diploma	ENT. LVL. MET. TECH	YUNDUM	YUNDUM
MET. ASSISTANT II	4	Diploma	ENT. LVL. MET. TECH	YUNDUM	SARESOFI
MET. ASSISTANT II	4	Diploma	ENT. LVL. MET. TECH	JANJANBUREH	JANJANBUREH
MET. ASSISTANT II	4	Diploma	ENT. LVL. MET. TECH	YUNDUM	YUNDUM

MET. ASSISTANT II	4	Diploma	ENT. LVL. MET. TECH	BANJUL	BANJUL
MET. ASSISTANT II	4	Diploma	ENT. LVL. MET. TECH	JANBANJELLY	YUNDUM
MET. ASSISTANT II	4	Diploma	ENT. LVL. MET. TECH	SIBANOR	SIBANOR
MET. ASSISTANT II	4	Diploma	ENT. LVL. MET. TECH	KAUR	KAUR
MET. ASSISTANT II	4	Diploma	ENT. LVL. MET. TECH	CLIMATE	CLIMATE
MET. ASSISTANT II	4	Diploma	ENT. LVL. MET. TECH	BANJUL	BANJUL
MET. ASSISTANT II	4	Diploma	ENT. LVL. MET. TECH	YUNDUM	YUNDUM
MET. ASSISTANT II	4	Diploma	ENT. LVL. MET. TECH	YUNDUM	YUNDUM

PRESENT POST HELD	**GRADE**	**QUALIFICATION ACADEMIC**	**PROFESSION**	**PRESENT STATION**	**POSTED TO**
MET. ASSISTANT II	4	Sec. Tech	CLASS	YUNDUM	YUNDUM
MET. ASSISTANT II	4	Sec. Tech	ENT. LVL. MET. TECH	CLIMATE	CLIMATE
MET. ASSISTANT III	2	S.S.S.L.C	ENT. LVL. MET. TECH	FATOTO	FATOTO

MET. ASSISTANT III	2	Sec. Tech	Trainee	SAPU	YALLAL
MET. ASSISTANT III	2	Sec. Tech	Trainee	YUNDUM	YUNDUM
MET. ASSISTANT III	2	Sec. Tech	Trainee	BASSE	BASSE
MET. ASSISTANT III	2	Sec. Tech	ENT. LVL. MET. TECH	YUNDUM	YUNDUM
MET. ASSISTANT III	2	Sec. Tech	ENT. LVL. MET. TECH	YUNDUM	YUNDUM
MET. ASSISTANT III	2	Sec. Tech	Trainee	YUNDUM	YUNDUM
MET. ASSISTANT III	2	Sec. Tech	ENT. LVL. MET. TECH	YUNDUM	YUNDUM
MET. ASSISTANT III	2	O-Levels	ENT. LVL. MET. TECH	YUNDUM	YUNDUM
MET. ASSISTANT III	2	Sec. Tech	ENT. LVL. MET. TECH	YUNDUM	YUNDUM
MET. ASSISTANT III	2	Sec. Tech	ENT. LVL. MET. TECH	SIBANOR	SIBANOR
MET. ASSISTANT III	2	WASSCE	Trainee	Study leave	Study leave
MET. ASST. TRAINEE	1	Sec. Tech	Trainee	JANJANBUREH	JANJANBUREH
MET. ASST. TRAINEE	1	Sec. Tech	Trainee	JENOI	JENOI
MET. ASST. TRAINEE	1	Sec. Tech	Trainee	YUNDUM	YUNDUM
MET. ASST. TRAINEE	1	Sec. Tech	Trainee	YUNDUM	YUNDUM

MET. ASST. TRAINEE	2	Sec. Tech	ENT. LVL. MET. TECH	YUNDUM	YUNDUM
MET. ASST. TRAINEE	1	SSSLC	ENT. LVL. MET. TECH	JENOI	JENOI
MET. ASST. TRAINEE	1	WASSCE	Trainee	YUNDUM	YUNDUM
MET. ASST. TRAINEE	1	WASS	ENT. LVL. MET. TECH	YUNDUM	YUNDUM
MET. ASST. TRAINEE	1	WASSCE	Trainee	FATOTO	FATOTO
MET. ASST. TRAINEE	1		Trainee	YUNDUM	YUNDUM
MET. ASST. TRAINEE	1	WASSCE	Trainee		
MET. ASST. TRAINEE	1		Trainee	KEREWAN	KEREWAN
MET. ASST. TRAINEE	2	WASSCE	Trainee	BASSE	BASSE
MET. ASST. TRAINEE	1	WASSCE	Trainee	YUNDUM	YUNDUM
MET. ASST. TRAINEE	DP	WASSCE	Trainee	CLIMAT	CLIMAT
MET. ASST. TRAINEE	DP	WASSCE	Trainee	CLIMAT	CLIMAT
MET. ASST. TRAINEE	DP	WASSCE	Trainee	YUNDUM	YUNDUM
MET. ASST. TRAINEE	DP		Trainee	CLIMAT	CLIMAT
MET. ASST. TRAINEE	DP	WASSCE	Trainee	BANJUL	BANJUL
MET. ASST. TRAINEE	DP	WASSCE	Trainee	YUNDUM	YUNDUM
MET. ASST. TRAINEE	DP	WASSCE	Trainee	YUNDUM	YUNDUM
MET. ASST. TRAINEE	DP	WASSCE	Trainee	BASSE	BASSE
MET. ASST. TRAINEE	DP	WASSCE	Trainee	JANJANBUREH	JANJANBUREH

SUPPORT STAFF

PRESENT POST HELD	GRADE	QUALIFICATION ACADEMIC	PROFESSION	PRESENT STATION	POSTED TO
MESSENGER	1	Non-Academic	Unskilled Staff	YUNDUM	YUNDUM
MESSENGER	1	Non-Academic	Unskilled Staff	YUNDUM	YUNDUM
WATCHMAN	1	Non-Academic	Unskilled Staff	JENOI	
WATCHMAN	1	Non-Academic	Unskilled Staff	FATOTO	FATOTO
WATCHMAN	1	Non-Academic	Unskilled Staff	KUNTAUR	KUNTAUR
WATCHMAN	1	Non-Academic	Unskilled Staff	SAPU	SAPU
WATCHMAN	1	Non-Academic	Unskilled Staff	YUNDUM	YUNDUM
WATCHMAN	DP	Non-Academic	Unskilled Staff	BASSE	BASSE
WATCHMAN	1	Non-Academic	Unskilled Staff	JANJANBUREH	JANJANBUREH
WATCHMAN	DP	Non-AcademicUnskilled Staff		KEREWAN	KEREWAN
WATCHMAN	DP	Non-Academic	Unskilled Staff	KARANTABA	KARANTABA
CARETAKER	DP	Non-Academic	Unskilled Staff	BASSE	BASSE
CARETAKER	DP	Non-Academic	Unskilled Staff	KEREWAN	KEREWAN
MESSENGER	DP	Non-AcademicUnskilled Staff		YUNDUM	YUNDUM
CARETAKER	DP	Non-AcademicUnskilled Staff		JANJANBUREH	JANJANBUREH
STN LABOURER	DP	Non-Academic	Unskilled Staff	KUNTAUR	KUNTAUR

CARETAKER	DP	Non-Academic	Unskilled Staff	JENOI	JENOI
CARETAKER	DP	Non-Academic	Unskilled Staff	SIBANOR	SIBANOR
WATCHMAN	DP	Non-Academic	Unskilled Staff	SIBANOR	SIBANOR
CARETAKER	DP	Non-Academic	Unskilled Staff	FATOTO	FATOTO
CARETAKER	DP	Non-Academic	Unskilled Staff	YALLAL	YALLAL
WATCHMAN	DP	Non-Academic	Unskilled Staff	YALLAL	YALLAL
WATCHMAN	DP	Non-Academic	Unskilled Staff	KAUR	KAUR
CARETAKER	DP	Non-Academic	Unskilled Staff	SARE SOFFIE	SARE SOFFIE
WATCHMAN	DP	Non-Academic	Unskilled Staff	SARE SOFFIE	SARE SOFFIE
WATCHMAN	DP	Non-Academic	Unskilled Staff	JANBANJELLI	JANBANJELLI
CARETAKER	DP	Non-Academic	Unskilled Staff	JANBANJELLI	JANBANJELLI
CARETAKER	DP	Non-Academic	Unskilled Staff	KAUR	KAUR
CARETAKER	DP	Non-Academic	Unskilled Staff	SAPU	SAPU
WATCHMAN	DP	Non-Academic	Unskilled Staff	BANJUL	BANJUL
CARETAKER	DP	Non-Academic	Unskilled Staff	BANJUL	BANJUL

8.9 Sectoral Needs Identified in Survey

A survey was distributed to all government ministries and key institutional stakeholders to assess current needs relative to EWS and to identify how institutions currently receive information and whether it is effective in its transmission. The survey also asked institutional partners to identify strategic equipment and training that could help attenuate some of the barriers, and identify the costs of such investments. Obviously, not all suggestions and needs can be responded to within the scope of this project. Only the most strategic, cost – effective and likely to have a positive long-term impact of EWS were eventually incorporated in the project design. However, the exercise allowed to connect with sectoral partners and get a sense of what they view as relevant as part of EWS. This exercise required numerous bilateral follow-ups and an elaboration of what the project components and outcomes are. The feedback from the ministries that responded is posted below:

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STAKEHOLDER NEEDS – CCEWS PHASE II

DEPARTMENT OF WATER RESOURCES

National Meteorological and Hydrological Services (NMHS)

Meteorology Division

Rational List of Activities, Equipment, Tool, Infrastructure and Human Resources Requirement of Meteorology Division					
List of Activities	**Required Equipment and Tools (quantity and Cost in Bracket**	**Required Infrastructure (Quantity and Cost in Bracket)**	**Required Human Resources and Training (quantity and cist in Bracket)**	**Total Cost**	**Potential National of International Suppliers**
1.1.1.1:					
	SSB Radios (25);	Main NMA Headquarters and			

	Solar panels (200 watts/ panels) 12 volts (25;) 40 Amps three phase charge controllers (25); Sets of dry cell solar batteries 400 amps /set (25); Solar wires (200 metres); Coaxial cable lighting protector and accessories (25); Broadband antenna dipole 150watts and 2-22mHz (25); RF cable 30 meters RG-8 cable with connector (25); Mast kits tilt base, guy lines installation hardware spare part. (15 meters); Spare parts kits for support (5); CDMA set broadband internet connector at forecast office plus server and accessories (1); Routers for signal amplification (2)	4 Regional Offices, (USD1,000,000)			
1.2.1.1: Procure and install:					
(a) Five (5) AWS330	AWS330 (5); 195,000 +Installation and Training 38,000		• PhD Degree - (2;) • MSc Degree – (5;) • BSc Degree – (9); • CLASS II-Senior Level Technician (SLT) – (12), Cost USD 109,200 • CLASS III-Middle Level		

			Technician (MLT)- (20, UDS 174,000 • CLASS IV- Entry Level Technician (ELT)- (30; USD 9020		
(b) Conventional	Sheathed Pattern Maximum Thermometers range -10 to +65^{O}C M106202 (25,USD 2050) Calibration Certificate for Sheathed Pattern Maximum Thermometers (25) Sheathed Pattern Minimum Thermometers -25 + 50^{O}C M106204 (25, USD2500) Calibration Certificate for Sheathed Pattern Minimum Thermometers (25) Sheathed Pattern Ordinary Thermometers -20 to 550C (40, USD 1200) Calibration Certificate for Sheathed Pattern Ordinary Thermometers (40) Barograph Instrument Display pattern M110010 (3, USD 3,600) Calibration Certificate for Barograph Digital Barometer (PTB330 A1AAHHHCGB0A0B) (3, USD 10,800)				

	Calibration Certificate PTB330 (3, USD 810) Kew Pattern Barometer (3, USD 7,800) Calibration Certificate for Kew Pattern Barometer Fortin Barometer M101002 (2, USD 4,800) Calibration Certificate for Fortin Barometer				
(c) A Low Level Wind shear Alert System (LLWAS)	LLWAS (1; USD 516,000)				
1.2.2.2: Procure and install the required equipment and operate the stations	Helium or hydrogen compressed gas tank with regulator and hand operated valve. (10), Balloons, fillers and weights Theodolite and accessories (10),				
1.2.3.2: Procure and install the required equipment at marine station					
	MAW410 (3, USD				
	3 Tide Station w/\met. Sensors			182,500	
	1 Bouy Station w/ Met Se3nsors			201,933	
	1 Spares			81,402	
	1 Base station software configuration			10,000	
	1 Engineering services			337,500	
	1 Shipping			56,000	
TOTAL				**869,286**	

Hydrology Division

Rational List of Activities, Equipment, Tool, Infrastructure and Human Resources Requirement of Hydrology Division					
List of Activities	Required Equipment and Tools (quantity and Cost in Bracket	Required Infrastructure (Quantity and Cost in Bracket)	Required Human Resources and Training (quantity and cist in Bracket)	Total Cost	Potential National of International Suppliers
Hydrological data generation, analysis, transmission, verification & storage	a) Five Water level Recorder with Data Loggers (3001 LTC level logger Junior) b) One Water level Recorder with Data Loggers build in (EC, pH, TDS)	Six Recorder housing	-	-	Tel:(905) 873-2255 (800) 661-2023 Fax☹905) 873 1992 Email:instruments@solinst.com Website: www.solinst.com
Construction /rehabilitation of staff quarters/office and perimeter fencing of the Bansang Hydrology campus.		Office, staff quarters and fencing.	-	(-	DWR Contractors
Monitoring of River Flow, profile, TDS.					
Monitoring of Saline limit	Salinometer (HI 98312 Portable EC/TDS/pH) waterproof tester	-	-	-	Tel:(905) 873-2255 (800) 661-2023 Fax☹905) 873 1992 Email:instruments@solinst.com

					Website: www.solinst.com
Training/Capacity building of staff of National Hydrological Services	-	-	-Class III middle Level Technicians(3) -Class II Senior Technicians (2) -Hydrological Instrument Technicians (3) -BSc Engineering Level (2) -MSC Hydrologists (3)		UTG, Overseas

Water Quality Division

Rational List of Activities, Equipment, Tool, Infrastructure and Human Resources Requirement of Water Quality Division

List of Activities	Required Equipment and Tools (Quantity and Cost in Bracket)	Required Infrastructure (Quantity and Cost in Bracket)	Require Human Resources and Training (Quantity and Cost in Bracket)	Total Cost	Potential National or International Supplies
Water Quality Analyses (both ground and surface)	HACH Spectro photometer DR 5000 and 2/10ml bottle and 3/25ml bottle (1 spectrophotometer) (1 equipment , US $7,000)	Dark Room (1 US$ 2,000)	Training and Installation (US$1,000)	US $10,000	HACH Company
9 WATER QUALITY ASSESSMENT	Gas chromatography (US $12,000)	Dark Room (1 US$ 3,000)	Training and Installation (US$3,000)	US $18,000	Fisher Scientific
Routine activity 1 (sterilization)	9.1 Auto clave 9.2 (US $ 3,000)	Microbiology lab		US $3,000	Fisher Scientific
Routine activity 2 (incubation)	Incubator (3 incubators US $1,000 = (US$3,000)	Microbiology lab		US $3,000	HACH
Routine activity 3 (Distillation)	Distillatory (1 US $ 2,500)	Water Chemistry Lab			HACH

		(US $ 1,000) for installation			
Routine activity 4 (sterilization)	Oven 0 to 250^{O}C (2 ovens US $2,500.00 each = US $5,000)	Wash Room (US $ 500.00)		US $5,500	*9.2.1 Gellenkamp, Uk*
Routine activity 5 (chlorination)	45 kg drum of_Calcium Hypo chlorite (5 US $ 350 per drum = US $ 1,750	Renovation of the_store US $ 1,000	Operational cost USD 5000	US $_2750.00	SASCO Kairaba Avenue, Serre Kunda
Microbiological analyses or assessment of water	Microscopes (2 microscopes each US $1,100 = US$2,200	Microbiology Training US $ 500			Fisher Scientific
Water Chemistry and Microbiological assessment			3 staff for BSc in water Chemistry with UTG US $1,000pa x 3 people x 4 years =USD 12,000	US$12,000	University of the Gambia ??????????
Water Chemistry and Microbiological assessment			2 staff for MSc in microbiology and environmental science overseas US $50,000 x 2 people x 2 years =USD 200,000	US $200,000	Overseas
Water Quality Assessment (Analytical Procedures)			Diploma 4 staff x US $2,000 =USD 8000		Ghana
Data entry and analyses	2 Desk Top Computers with all the necessary accessories USD 2000 for two		**9.3**	9.4 US $2,000	**9.5**
Data entry and analyses	2 lap tops each US $500.00 =US 1000		**9.6**	9.7 US $1,000	**9.8**
Data entry and analyses	Giant Printer US $5,000		**9.9**	9.10 US $5,000	**9.11**
Data entry and analyses	1 Giant photocopier US $5,000		**9.12**	**9.13** US $5,000	**9.14**
			9.15 Grand Total = US $282,450		**9.16**

COMMUNICATION OF EARLY WARNING INFORMATION

Gambia Radio and Television Services (GRTS)

RATIONAL List of Activities, Equipment, Tools, Infrastructure and Human Resources requirements for The Gambia Radio and Television Services (GRTS) for the coordination, implementation, monitoring and evaluation of Multi-media interventions on the 2nd Phase of The Strengthening of The Gambia's Climate Change Early Warning Systems Project, in their capacity as the Lead Institution of The Cross-cutting Group of the National Climate Committee (NCC)					
List of Activities	***Required Equipment and Tools (Quantity and Cost in Bracket)***	***Required Infrastructure (Quantity and Cost in Bracket)***	***Require Human Resources and Training (Quantity and Cost in Bracket***	***Total Cost***	***Potential National or International Suppliers***
1. Purchase two Radio Transmitters to enable National Coverage by GRTS Radio. Purchase Four Studio Transmitter Links Systems (STLS) for GRTS Radio	Two Radio transmitters of 2 Kilo Watts each-DB Electronica, Sielco or Elenos (@ £16,000.00 each) Four Studio Transmitter Links Systems (STLS) (@ £7000.00 each)	-	-	£32,000.00 £28,000.00	Italian Companies Italian Companies
2. Purchase Two 500 Watts Radio Transmitters for Soma and Brikama Ba Community Radio Stations	Two 500 Watts Radio Transmitters (@£4,000.00 each			£8,000.00	Italian Companies
3. Purchase one Toyota Pick-up for treks	One Toyota Pick-up @£50,000.00			£50,000.00	Toyota Company in Japan
4. Purchase of a TV Camera and MDV Tapes for field recordings for GRTS	TV Camera (1 Sony DVCam Camera in Flight case: S/N 0040491@ £9675.00 = £9675.00	- -	- -	£9675.00 £600.00	HHB Company UK

	MDV Tapes (300 tapes @ £2.00 = £600.00)				
5.Purchase of Digital Radio recorders for GRTS radio and three Community radios	Mini Disc Radio recorders: Marantz PMD500 Professional Solid State Recorders (6 recorders @ £655.00 each =£3930.00) Blank Mini Discs: TDK (1000 blanks @ £1.00 each = £1000)	-	-	£3930.00 £1000	HHB Company UK
6. Train three TV producers on climate change science and interpreting weather forecasts for broadcast.	Transport and fuel for visits to weather stations and forecasting offices (£243.00)	Training Hall, Visual Aids and Catering (£3560.00)	3 days training and a day's field visit: honoraria for resources persons and participants (£1860.00)	£5663.00	
7. Train fourteen Radio producers on climate change science and interpreting weather forecasts for broadcast.	-do-	-do-	-do-	-	
8. Train Three print media personnel on climate change science and interpreting broadcasts for print.	-do-	-do-	-do-	-	
9. Support Radio and TV trekking Staff with night allowances, a vehicle and fuel as	Transport and fuel for visits to weather stations and forecasting offices	vehicle and fuel x ten treks in project period, two treks annually(£2430.00)	DSA for trekking staff x number of treks (£5582.00)	£8012.00	

and when necessary.					
10. Provide financial and logistical support for the production of TV and radio programmes including seven Community radio stations as well as articles in three news papers and print media visual aids (200 posters and 100 leaflets) for a five-year period.	Transport and fuel for visits to seven community radio stations and forecasting offices	Vehicle and fuel x two visits per year to community radio stations and forecasting offices: ten in all in project period. (£2430.00) Production cost for live TV and Radio phone-ins, panel discussions, spots, drama and theatre performances as well as articles in three news papers and print media visual aids (200 posters and 100 leaflets). (£63256.00)	DSA for trekking staff and resource persons x ten treks (£5582 for treks)	£8012.00 £63256.00	
11. Provide financial and logistical support for the establishment of Television Viewer Groups and Radio Listening Groups in specific locations in the country and for their orientation, training and moderation.	Purchase of 3 TV and 10 Radio monitors for groups ten Radio Listening Groups and three Television Viewer groups (£1396.00)	vehicle and fuel x five treks (£243.00)	DSA for trekking staff and resource persons x number of treks and trainings sessions (£ 1215.00)	£2854.00	
12. Provide financial and logistical support for the training of Traditional Communicators on		vehicle and fuel x five treks (£243.00)	DSA for trekking staff and resource persons x five treks and trainings sessions (£ 1215.00)	£1458.00	

popular theatre performances of Early Warning messages and Climate Change.		seed money support to groups to start village theatre performances (£931.00)		£931.00	
13. Provide financial and logistical support for message development, pre-testing and broadcast air time cost of specific Early Warning messages.	20 participants x 4 days	Training Hall and catering for 20 pe0ple x 4 days(£651.00)	3 days training and a day's field trek: honoraria for resources persons and participants (£ 1982.00) Air time cost on TV and 8 radio stations weekly for five years (£13674.00)	£2633.00 £13674.00	
14. Provide logistical and financial support for the development and distribution of print media on Early Warning messages (posters, leaflets).	20 participants x 4 days	Training Hall and catering for 20 pe0ple x 4 days(£651.00)	3 days training and a day's field trek: honoraria for resources persons and participants (£1982.00)	£2633.00	
15. Monitoring and evaluation of all media interventions.	Development and duplication of 100 survey questionnaires and conducting In-depth individual Interviews and Focus Group Discussions (£150.00)	To be carried out by the National Network of Communicators on Climate Change (NNCCC)	Trek to administer survey questionnaires (fuel, vehicle and DSA for 5 people) for 3 days(£531.00)	£681.00	
16. Coordination of all media interventions and stationary for five years.	Purchase of stationary (note books, markers, flipcharts, sketching paper,	To be carried out by the National Network of Communicators on	Fuel for coordination of all media interventions and	£7000.00	

	banner pieces of cloth, cost of internet and mobile communication, supply of multimedia material to webmaster) (£6000.00)	Climate Change (NNCCC)	activities for five years (£1000.00)		
Grand Total: Two hundred and fifty thousand and twelve pounds sterling only				**£250,012.00**	

DEPARTMENT OF PARKS AND WILDLIFE MANAGEMENT

Rational List of Activities, Equipment, Tools, Infrastructure and Human Resources requirements of your Office					
List of Activities	Required Equipment and Tools (Quantity and Cost in Bracket)	Required Infrastructure (Quantity and Cost in Brackets)	Required Human Resources and Training	Total Cost	Potential National or International Suppliers
Building an Effective Implementation Partnership			(2 Consultation and awareness raising meetings @ **$ 25,000**) (consultancy on training material development and testing **$ 15,000**) (sharing of Early warning system experiences and capacity Building on species monitoring **$17,000** for 20 people), Study tour to sub-region **$45,000** for 5 people @ 5days)	**$102,000**	
Capacity building programme on species taxonomy, survey	(18 Plant pressing materials $ 1,500)		(Annual training workshops (3) on the early warning system process: for 25 people@ **$45,000**) (Overview, Setting criteria and selection of species nationwide: **$5,000**) (Establishment of seed banks, seedling and nurseries management, observatory and database development: **$100,000**) (Train 10 staff for the management of the observatory @ **$5,000**) (Train 35 staff on the establishment of seed bank and nurseries @ **$ 15,000)**	**$ 215,200**	

			(Train 35 DPWM staff on taxonomy, species identification collection, labeling and storage at the observatory **$ 8,700),** A local Training Institution (MWT) will be contracted to carry out specified technical duties including preparation, organizing and giving training courses, preparation and adaptation of training materials @ **$ 35,000** for a period of 18 months		
Intervention in PA's and Biodiversity hotspots monitoring Process for field staff	3 Toyota pickups **$ 100,000**), 2 station wagons $ **120,000** 15 motorbikes **$ 75,000**, 1 video camera **$ 600**, SPSS software $ **20,000** 5 Desktop computer s and 5 laptop @ **$15,000** salinometer **$1500** 35 field guides **$ 1,500** 8 rain gauge **$ 15,000** 8 thermometer **$500**, Newsletter @ 2 publications per year for 3 years **$ 15,000**		(Establishment of species and habitats baseline in 6 PAs and 3 other biodiversity hotspots by 35 personnel @ **$ 45,000)** (quarterly periodic field monitoring exercise by 35 personnel for 3 years @ **$ 250,000)** (data processing, interpretation and storage by 5 personnel @ **$ 12,000)** (standard operation Procedures in handling change **$ 15,000)** (feedbacks and reporting **$ 15,000)** **(**supervisory technical services, 2 missions per year by 2 DPWM senior personnel for 2 weeks **@ $25,000**), (Advisory technical services 2 missions per year by NARI, WABSA, MWT For 2 weeks **@ $28,000**), (several duty travels within the country by focal point office **@ 35,000**)	**$ 808,000**	CFAO Shiben Madi Osamotors (vehicle& Bikes) Sonko Jeleng Ent. Pass Trading (furniture &computer) Bon Jack (newsletter)
Building required infrastructures	20 shelves wooden $10,000, (chain linked, poles and cement for fencing nurseries in 6 PAs and digging of 2 wells **$ 12,000**), (18 watering can, 4 horse pipes, 6 hand shovel, 30 dozens polythen bags **$ 500**), (5 table and 10 chair **$ 800**), (600 preservation bottles **$ 500**),	contract for the construction of 6 seed banks **$15,000**	(prepare specifications and bill of quantities and ToR's **$1,500)** (Develop training materials **$ 6,500)**	**$46,800**	Building Contractor: Taba Ni Sita Sunu Kerr Sulayman s.s. Jammeh (Garden materials)

General operating expenses	Communication, Stationary Fuel, General operating cost **@ $ 45,000**			**$45,000**	
Grand Total				**$ 1,217,000**	

NATIONALENVIRONMENT AGENCY

List of activities, equipment, tools, infrastructure & human resources requirements for NEA's participation in the CCEWS Project

#	activity category	activity element	required equipment, tools etc. & costs	required human resources training & cost	total cost	potential of nat'l & intern'l suppliers
1	Training on environment and climate change for stakeholders	1. Climate change scenario & future conditions mapping to help define adaptation/resilience options 2. Climate change vulnerability assessment and risk mapping 3. Stream flow change modeling	• 2[1] units of Apple 27" iMac – comes with in-built climate data assessment software packages (D85,000/ unit) • 1 unit 17"MacBook Pro (laptop) (D82,500/ unit)	capacity exists at NEA to offer all trainings (training rates to be based on NEA guidelines); downscaled climate data freely available on-line; it is hope that long-term river discharge records will be available from DWR for stream flow modeling	~US$7.500 (equipment only)	local suppliers available
2	Application of GIS[2]	1. Provision of decision support materials like vulnerability maps, charts, report etc. 2. Training of stakeholders on vulnerability	• two desktop PCs to allow for multi-personnel training (D29,000/ unit)	Capacity exists at NEA to offer trainings; fairly good *digital terrain model (~30m)* is freely available	US$16, 500 • ~US$1700 for two PCs • ~US$14,000 for mapping software • ~US$800 (5% contingency on total cost;	• national suppliers available for the PCs • LCM is produced and distributed by *Clarks*

[1] 2 units will be entirely dedicated to climate change assessments and will allow training to be offered to at least 4 people at one time; indicated cost based on pro-forma invoices

		mapping (including sea level rise assessments) with GIS-based applications	• software: ○ two *land change modeler (LCM)* general licenses (USD 795/lic) ○ ArcGIS 9.3.1 (Editor) single-use license (one lic at) ○ ArcGIS 9.3.1 Spatial Analyst extension (one lic at USD3000)	online; it is hope bathymetric data for SLR assessment will be available nationally	all payments are bank transfers	*University, USA* • SAMBUS Co Ltd., Ghana is W/Africa distributor of ArcGIS products
3	Effective data storage and sharing	1. Revival of MoUs between NEA and its designated five data centres	an arranged meeting of heads of the institutions* to agree on modalities (cost of coffee & biscuits ~GMD3,000)		**~US$100** for the proposed meeting	all indications are nationally available
		2. Establishment of a *national spatial data infrastructure* (NSDI)	The NEA to convene a meeting of all national data providers (beyond) the five centres) and make a presentation	A national consultant will be needed for the NSDI needs and setup assessment (national	**~US$1,200**	all indications are nationally available

			concept; GBoS should be contacted to present on *GamInfo* for the possibility of turning it into an NSDI (~GMD30,000 to 40,000 to cover food & transport refunds for a small meeting that can be hosted at NEA's documentation centre);	rates)		
4	Ambient air quality monitoring	Revival of NEA's air quality monitoring systems in Kanifing Municipality	Details of equipment can be supplied on request	Will require hire of consultant from supplier for the installation, reading, interpretation and maintenance of equipment (not sure if national capacity exists to offer such training therefore international consultation fees anticipated and this can be enquired)	**US$40,845** for equipment only (5% increment added to original 1997 cost of US$38,900)	Mouchel Consulting Ltd, UK that advised the installation of the monitoring equipment in late 1990s can still be contacted
5	Vehicle		Details of	Will require	~US$14,870 for	Mouchel

			request	from supplier for the installation, reading, interpretation and maintenance of equipment (not sure if national capacity exists to offer such training therefore international consultation fees anticipated and this can be enquired)	to original 1997 cost of US$14,160)	advised the NEA on such equipment can still be contacted for advise

* ***Dept. of Water Resources;*** *Dept. of Lands & Surveys;* ***Dept. of Planning;*** *GBoS;* ***SWMU***

MINISTRY OF AGRICULTURE

1. COST

1.1. Capacity Building For Extension Workers

1. Honorarium

Resource Persons – 4 × 4 days × D1000.00/day	D 16, 000.00
Facilitators – 2 × 4 days × D1000.00/day	D 8, 000.00

Participants – 120 × 2 days × D650.00/day		D156, 000.00
Drivers – 5 × 4 days × D650.00/day		D 13, 000.00
	Sub-total	***D 193, 000.00***

2. Food

11 officers and drivers × 4 days × D300.00/day	D 13, 200.00	
120 participants × 2 days × D300.00/day		D 72, 000.00
	Sub-total	***D 85, 200.00***

3. Accommodation

11 officers and drivers × 4 days × D250.00/day	D 11, 000.00	
120 participants × 2 days × D250.00/day		D 60, 000.00
	Sub-total	***D 71, 000.00***

4. Hiring of Hall

4 days × D500.00/day	D 2, 000.00

5. Training Materials D 7, 000.00

6. Fuel for Generator

40 litres × 4 days × D50.00/litre		D 8, 000.00
	TOTAL	**D366, 200.00**
(Three Hundred and Sixty-six Thousand, Two Hundred Dalasi Only)		

1.2. Sensitisation of Local Government Authorities

1. Allowance

4 Officers × 6 days × D800.00/day D 19, 200.00

1 Driver × 6 days × D650.00/day D 3, 900.00

2. Food

4 Officers and 1 driver × 6 days × D250.00/day D 7, 500.00

60 local government authorities × 1 day × D250.00/day D 15, 000.00

3. Accommodation
4. Officers and 1 driver × 6 days × D250.00/day D 7, 500.00

4. Fuel

200 litres × D50.00/litre D 10, 000.00

5. Ferry Crossing D 900.00

TOTAL D 64, 000.00

(Sixty-four Thousand Dalasi Only)

1.3. COST SUMMARY

Training of Extension Workers D366, 200.00

Sensitisation of local Government Authorities D 64, 000.00

GRAND TOTAL **D430, 200.00**

(Four Hundred and Thirty Thousand, Two Hundred Dalasi Only)

N^0	**Item**	**Quantity**	**Supplier**
1	Professional Short gun microphone	1	Cool breeze International
2	Professional tripod	1	"
3	Professional video camera	1	"
4	Lighting equipment with accessories	1	"
5	Digital camera	2	"
6	DVD cassettes	100	"
7	Public Address System	2	"
8	VHS to DVD recorder	1	"
9	Tape recorder with external microphone	2	"
10	RISO print master	1	Ventures
11	Desktop computers (with printers)	3	"

12	Laptop computers	5	"
13	Coloured photocopier and cartridges	1	"
14	Glossy paper	50 rims	"
15	UPS	5	"
16	Power point projector	1	"
17	Flip chart stand	2	"
18	Flip chart pad	10	"
19	Vehicle	1	CFAO
20	Telephone line (land phone)	2	GAMTEL
21	Data cards (with 1 year payment)	5	Qcell

SECTOR :) Department of Forestry

A: Weather information related

1. Do weather events or changes in weather patterns affects your activities

   [***x]*** YES [ ] NO

2. If impending weather events are known to you, would you do differently?

   [x] yes, [ ] no

3. If weather information is fundamental to your activities, how often would you like to receiving it

Daily

4. Indicate events when the information was useful or relevant to you

Rainfall (Rainy Season- Planting season
Dry Season (to know the direction and speed of winds-Fire season

5. By which means (TV, Radio, telephone, e-mail, bulletin etc) would you like to receive it

E-mail, Tv, and Radio

6. Are you familiar with weather information (daily weather forecast, Bulletin, Seasonal forecast) issued by National Meteorological Hydrological Services (NMHS)at DWR

Yes daily weather forecast on TV

7. Please specify your needs as a user in terms of weather information which could help/improve on your sector activities in terms planning and preparedness

Monitoring bushfires (wind velocity, temperatures)

Tree planting (Rainfall Pattern)

8. Within the context of the early warning system project for climate change, what information can you provide

Biophysical information (bushfires, reforestation activities)

9. On what time scale?

Dekadal and annual (National Forest Assessment)

10. Could you provide or facilitate the provision indigenous knowledge in weather and seasonal forecast both for short term and long term.

If extension staff are trained, we can provide or facilitate the provision of indigenous knowledge on weather and seasonal forecast.

B: Specific Sector needs in order to participate effectively in the early warning project phase II

11. What are your sector's needs to participate effectively in the Early Warning Project phase II in terms of training for capacity building, equipment/instruments.

    a. Provide a comprehensive but rational list of the quantity and cost of equipment/instruments, and addresses and contacts of suppliers both at the national and international levels
    b. Provide a comprehensive but rational list of human resources requirements of your institution for effective and sustainable participation in the Gambia climate change early warning system. Include names and addresses (including websites) Educational Institutions that offer the training required by your institution

Training of 20 extension staff
Mobility 7 motor bikes
Rain gauges in all Forest Stations
Computer sets (Laptop)-

SECTOR : (indicate user type) Ministry of Health, Social Welfare and National Assembly Matters

A: Weather information related

12. Do weather events or changes in weather patterns affects your activities

[**x**] YES [ ] NO

13. If impending weather events are known to you, would you do differently?

[x] yes, [ ] no

14. If weather information is fundamental to your activities, how often would you like to receiving it

Daily

15. Indicate events when the information was useful or relevant to you

Beginning of the rainy season

16. By which means (TV, Radio, telephone, e-mail, bulletin etc) would you like to receive it

TV, email, Radio

17. Are you familiar with weather information (daily weather forecast, Bulletin, Seasonal forecast) issued by National Meteorological Hydrological Services (NMHS)at DWR

Yes

18. Please specify your needs as a user in terms of weather information which could help/improve on your sector activities in terms planning and preparedness

Lap top with wireless facility, Printer

19. Within the context of the early warning system project for climate change, what information can you provide

Disease outbreaks

20. On what time scale?

On weekly basis

21. Could you provide or facilitate the provision indigenous knowledge in weather and seasonal forecast both for short term and long term.

No

B: Specific Sector needs in order to participate effectively in the early warning project phase II

22. What are your sector's needs to participate effectively in the Early Warning Project phase II in terms of training for capacity building, equipment/instruments.
    c. Provide a comprehensive but rational list of the quantity and cost of equipment/instruments, and addresses and contacts of suppliers both at the national and international levels

d. Provide a comprehensive but rational list of human resources requirements of your institution for effective and sustainable participation in the Gambia climate change early warning system. Include names and addresses (including websites) Educational Institutions that offer the training required by your institution

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Item	Quantity	Cost	Supplier
Lap top	3	D30,000.00	Sonko Jilleng Enterprise
Printer	1	D15.000	___do_____
Photocopier	1	D45,000	_____do_____

B.

Training on early warning

Training on climate change

NB: Any suitable training institution in the Sub-region.

EARLY WARNING: DISASTER RISK REDUCTION AND CLIMATE CHANGE ADAPTATION

Background

The inaugural meeting of the Gambian National Platform for Disaster Risk Reduction and Climate Change Adaptation which was formally launched in March 2011 by Her Excellency, The Vice President and Minister of Women Affairs who was then the Chairperson of The Gambia Disaster Management Governing Council.

2. National Platform established is a requirement by UNISDR and ECOWAS to serve as entry point for Disaster Risk Reduction and coordination mechanism at Global, Regional, Sub Regional and National level in the implementation of the Hyogo Framework for Action and The ECOWAS guidelines to build community resilience to disasters and a culture of safety at community level. Therefore, to have an active and a functional National Platform and become the best in the sub-region, the following needs to be considered on the way forward:

3. Secretariat Development

- Office vehicle
- Computers, Laptops
- Printers, Stationeries
- Photocopier, internet, furniture
- Operational funds, etc

4. Simulation of The National Contingency Plan (this will help test the Response Plan in real life floods).

Emergency Call Center Systems: The NDMA Model

5. In place of the basic telephone, police or fire radio, and pencil-and-paper record systems Emergency Call Centers now use computer-based systems which can dramatically improve First Responder response times and public safety in general.

6. Three common systems in a modern Emergency Call Center are Call Recording Systems, Computer Aided Dispatch ("CAD") systems, and Emergency Notification Systems ("ENS").

CALL RECORDING SYSTEMS

7. A Call Recording system will make audio recordings of all calls to an emergency numbers or call line (e.g 911 or 112) handled by the Emergency Call Center. The most modern recording systems record the calls digitally on hard disk, indexing them by time, call taker position (extension) and to the CAD system, and automatically backing up the calls onto CDs/DVDs, tape or other archival media. Because the calls are recorded digitally on hard disk, they can be quickly accessed by First Responders for completion of reports or by others who need access to the call audio.

COMPUTER AIDED DISPATCH SYSTEMS

8. A CAD system is the heart of a modern Emergency Communications Center (and may serve multiple Centers serving a Region, for example). Early and basic CAD systems replaced note card systems for keeping track of available First Responders and units, and recording critical information from calls. CAD system are also typically connected with the Center's emergency number phone system so that they will display the caller location as provided by the emergency call line or number Network on the call taker's data screen, and may also display the location on a map or aerial photo on the call takers map screen. (CAD Systems may include up to **4 monitors for each call taker**, who will also have an additional monitor for the computer controlling the First Responder radio systems.) The CAD system will also display for the call taker or dispatcher 911 or 112 call history for the caller's location, caution notes for the officers, information regarding hazardous chemicals stored at or in the vicinity of an incident location (particularly important for fire or certain public health incidents), and other useful information.

9. The most modern CAD systems integrate **Automatic Vehicle Location ("AVL") systems and "mobile CAD" running** on **portable computers** ("Mobile Data Terminals" or "MDTs") installed in First Responder Vehicles. The CAD system will track the availability and location of First Responder units, the training of the First Responders assigned to those units, and the equipment on those units. When an emergency call comes in the CAD system identifies existing calls to which the call may be related based upon location. After the call taker enters a code for the type of incident, the CAD system recommends the response agency or units to be dispatched (or automatically dispatches the units) based upon availability, location, call-type, training of the First Responders assigned to the unit and equipment on the unit. Where a police or fire service's policy is to send two or more units or different types of units to a specific type of incident, the CAD system will recommend or automatically dispatch the number of units required.

10. In recommending units by location, some CAD systems will make their recommendations not by physical proximity, but by estimated drive-time taking into account road closures, train crossing schedules, and even current traffic volumes using real-time traffic volume monitors. The CAD systems will then display on the First Responder's MDT the quickest route to the incident, as commercial GPS systems do. First Responders may update their status, or obtain information which they used to have to wait for a dispatcher to provide.

11. Fire fighters en route to a fire can access information on their MDTs, including hydrant locations, premises information including pre-plans for fighting fires at the location (which many fire services develop for commercial buildings), and premises (and nearby premises) hazard information. Some Mobile CAD systems include utilities to help an incident commander coordinate the actions of multiple units responding to a major incident.

12. Modern CAD systems will also constantly monitor the status of emergency responders. Not only do CAD systems allow First Responders to respond more quickly to emergencies and be better prepared when they arrive on scene, the record keeping and analysis functions they provide are a valuable resource. They allow First Responders to complete reports more quickly and accurately based upon the real-time recording of incident data, and to be back in service sooner.

13. CAD systems also facilitate the generation of reports, statistics and analyses which can be used to improve public safety services. CAD systems retain data regarding the numbers, types and locations of calls, crimes, accidents, fires, incidents by date and time of day, etc. This data can be analyzed to identify patterns and develop strategies to more efficiently address, or even prevent, crime accidents and other incidents.

RADIO SYSTEMS

14. Current radio systems are controlled with a computer interface, as with a computer monitor and mouse rather than a radio with switches and knobs. This makes implementing features and assigning users to groups much more convenient.

15. The deployment of mobile data terminals (laptop computers in First Responder vehicles, or "MDTs") which are interconnected with the CAD system by radio data links, provides significant efficiencies, particularly where Automatic Vehicle Location ("AVL") is utilized. For example, such systems permit First Responders to efficiently update their status with dispatchers, and dispatchers to quickly dispatch First Responders without tying up voice channels. First Responders can even be automatically dispatched by the CAD system as soon as the call-taker enters the call-type code into the CAD system, based on call-type, the location of the incident reported by the emergency call number/line System, First Responder location, First Responder training and equipment on the First Responder unit. The deployment of interconnected MDTs also allows First Responders to retrieve information relating to their call or stop through the CAD system, again without having to wait for or tie up a dispatcher. Routine messages can also be transmitted by text message and held in queue on First Responder's MDT's for the First Responder to review when he or she has time, rather than interrupting current operation with a voice message.

EMERGENCY NOTIFICATION SYSTEMS

16. Emergency Notification Systems ("ENS") are systems which allow an Emergency Call Center and public safety officials to warn people of impending dangers in their area, such as flash floods, wildfires, or sandstorm. These warnings can be planned in advance, for example in flood plains or other known hazard areas, or they can be provided dynamically in response to a currently occurring emergency.

17. The basic ENS "reverses" the 911 or 112 call process. Instead of identifying the location of a caller (the phone the caller is using), the ENS identifies all phones (traditional wireline phones) in a designated geographic area. The ENS service then places calls to those phones, and plays a recorded message. In most if not all current ENS systems, the person using the notification service can define the area to be called by specifying and address or intersection and a radius, by applying a geometric shape to a map displayed on a computer and adjusting the size of the shape designating the area to be called, or by using a mouse and drawing "freehand" the boundaries of the area to be called on the computer map display.

18. Some ENS systems allow residents to register additional numbers and addresses, such as wireless (cell phone) numbers, fax numbers, text message addresses, and e-mail addresses, to which ENS messages should be sent. The message may be recorded by the public safety officer activating the ENS System, and the recording will be replayed when each call is answered. With some systems, the public safety officer types the message, and the ENS system to use text-to-voice computer program to read the message to those receiving the message by phone. This method is used where the ENS system will also send the message to fax machines, text message and e-mail addresses, and TTY numbers for the hearing impaired.

19. ENS systems or services generally use systems located in diverse areas of the country, protected by backup power systems, and use diverse networks to send the outgoing messages. They have variable call rates to avoid overwhelming the capacity of local telephone switches.

SETTING UP OR UPDATING EMERGENCY CALL CENTERS WILL SAVE LIVES

20. It is strongly believed that setting up or updating Emergency Call Centers will result in First Responders being dispatched and arriving on scene sooner and better prepared, and will save lives. ENS Systems which warn people to take shelter in event of a disaster, to evacuate in event of a flood, sandstorm or wildfire, or to take other action when other emergencies occur, will save lives.

Note:

- For the effectiveness of the communication system, it is important that there is an interface between the country's (The Gambia) communication service provider (s) and the NDMA's proposed Call Centre.
- Staff of the proposed Emergency Call Centre must be trained appropriately
- Dedicated Emergency Call Number/Line (e.g 911, 112 or any appropriate 3 digit number as the case may be)
- Toll free lines should be made available for emergencies situations
- Perhaps The NEMA, Nigeria Emergency Call Centre Model may be adopted by the NDMA

SOME CRITICAL EQUIPMENT NEEDED IN THE EMERGENCY CALL CENTRE

- **Computers**
- **Monitors**
- **Servers**
- **Mobile/fix phones**
- **Radios**
- **Back-up Power Systems**
- **Internet Network systems (communications and internet facilities)**

OPERATIONAL SYSTEMS

- **Call Recording Systems**
- **Computer Aided Dispatch ("CAD") systems**
- **Emergency Notification Systems ("ENS").**

OTHER OPERATIONAL REQUIREMENTS

- **Manpower (to operate the systems)**
- **Furniture**
- **Cooling System (AC & Fan)**
- **Funds**

Annex 9: UNDP Environmental and Social Screening Template (see attached)