United Nations Development Programme

Country: Global
PROJECT DOCUMENT[1]

Project Title: Strengthening climate information and early warning systems in Eastern and Southern Africa for climate resilient development and adaptation to climate change – Global

UNDAF Outcome(s): Outcome 4. Strengthened capacity of developing countries to mainstream climate change adaptation policies into national development plans
UNDP Strategic Plan Environment and Sustainable Development Primary Outcome: Promote Climate Change Adaptation.
UNDP Strategic Plan Secondary Outcome: Other
Executing Entity/Implementing Partner: UNDP

Brief Description

The ability of decision-makers to understand the likely impacts of climate change in the short and long-term is of critical importance when planning strategies for sustainable development. Weather and climate information, based on routinely collected observations and forecast models, allow countries to produce short-term weather forecasts as well as long-term projections of climate change. Combined with information on key vulnerabilities, these forecasts and observations enable the dissemination of warnings of impending disasters, as well as indicating when slow onset climatic shifts may be an impediment to livelihoods and economic growth.

In response to a request for assistance by Least Developed Countries (LDCs), UNDP-GEF has recently designed a programme on Strengthening Climate Information and Early Warning Systems (CI/EWS) for Climate Resilient Development and Adaptation to Climate Change in Africa. The programme comprises of 10 country-led projects in Benin, Burkina Faso, Liberia, Sierra Leone, Sao Tome and Principe, Ethiopia, Uganda, Tanzania, Malawi and Zambia. The focus of each project is to enhance the capacity of each country to monitor and forecast extreme weather, hydrology and climate change as well as make efficient and effective use of hydro-meteorological information for generating early warnings and supporting long-term development plans. These projects have been approved by the LDCF Council and are about to commence implementation in line with UNDP NIM guidelines.

In support of these NIM-implemented country programmes, the purpose of this multi-country support project is to enable each of the countries to cost-effectively draw on technical assistance for strengthening climate information and early warning systems, as well as benefit from regional coordination and sharing of knowledge and experiences. The technical assistance that will be delivered through this project focuses on: meteorological, climate and hydrological observing and forecasting systems, disaster risk management and viable communication systems/processes for disseminating alerts, the use of alternative cost-effective technologies, and engagement with the private sector for the provision of climate services.

This project will be implemented under the DIM modality. The initial duration of this project is four years from 2013 (Dec) to 2017 (Dec).

Programme Period:	2013 - 2017
Atlas Award ID:	00076448
Project ID:	00087832
PIMS #	5322
Start date:	November 2013
End Date	November 2017
Management Arrangements	DIM
PAC Meeting Date	20 Dec 2013

Total resources required	$ 10,000,000
Total allocated resources:	$ 3,460,000
• Regular (GEF/LDCF)	$ 3,460,000
• UNDP	
• Other	

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

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List of Acronyms

ACMAD	African Center for Meteorological Applications and Development
ACPC	African Climate Policy Centre
AGRHYMET	Centre Regional de Formation et d'Application en Agrométéorologie et Hydrologie Opérationnelle
ANPC	National Agency for Civil Protection
ASECNA	Agency for Aviation and Navigation Security in Africa
BCPR	Bureau or Crisis Prevention Recovery
CAP	Consolidated Appeal Process
CCC	Communication pour un Changement de Comportement
CEB	Power Community of Benin
CES	Conseil Économique et Social
CI	Climate Information
CPAP	Country Programme Action Plan
CPD	Country Programme Document
CRHOB	Benin Oceanographic and Fishing Research Center
CSO	Civil Society Organization
DIM	Direct Implementation Modality
DFiD	Department of Internaitonal Development
DNM	National Directorate on Meteorology
DG-Eau	General Directorate on Water
EWS	Early Warning System
EU	European Union
FAO	Food and Agriculture Organization
FEWS	Famine Early Warning Systems
GCOS	Global Climate Observation Systems
GEF	Global Environment Facility
GFDRR	Global Framework for Disaster Risk Reduction
GIZ	Gesellschaftfür Internationale Zusammenarbeit
GTPA	Zonal Agro-meteorological Technical Group
HDI	Human Development Index
ICPAC	International Climate Prediction and Application Centre
IPC	Indice de Perception de la Corruption
JICA	Japan International Cooperation Agency
LDC	Least Developed Countries
LDCF	Least Developed Country Fund
M&E	Monitoring and Evaluation
MAF/CAO	Cadre d'Accélération des OMD
MAEP	Ministère de l'Agriculture, de l'Elevage et de la Peche
MI	Ministère de l'Interior
MDG	Millenium Development Goals
MEHU	Ministère de l'Environnement, de l'Habitat et de l'Urbanisme
NAPA	National Adaptation Programme of Action
NHMS	National Hydrological and Meteorological Services
NGO	Non-Governmental Organization
NGSPR	Agricultural Revival Strategy
NIM	National Implementation Modality
OCHA	Bureau de la Coordination des Affaires Humanitaire
ONASA	National Office for Food Security
PANA	Programme d'Action National d'Adaptation
PAP	Priority Action Programme
PDNA	Post Disaster Needs Assessment

PIB	Produit Intérieur Brut / Gross Domestic Product
PCA	Paquets Minimum d'Activités
PNSR	Programme National du Secteur Rural
PNRCC	Plate-forme Nationale de Réduction des Risques de Catastrophe et d'Adaptation au Changement Climatique (National Platform on Catastrophe Risk Reduction and Adaptation to Climate Change)
PPCR	Pilot Programme for Climate Resilience
PRESAO	Seasonal Precipitation Forecast in West Africa
PRSP	Poverty Reduction Strategy Paper (SCRP en francais)
PUGEMU	Emergency Urban Environment Programme (Projet d'Urgence de Gestion Environnementale en Milieu Urbain)
RGPH	Recensement Général de la Population et de l'Habitat
RRC	Réduction de Risques et Catastrophes
RTA	Retional Technical Advisor
SADC	South African Development Community
SAP	Système d'Alerte Précoce
SCCF	Special Climate Change Fund
SISA	System Intégré System d'Alert
SMART	Standardized Monitoring and Assessment of Relief and Transition
SNSA	Stratégie Nationale de Sécurité Alimentaire
SNU	Système des Nations Unies
UKMO	United Kingdom Meteorological Office
UNDAF	Plan Cadre des Nations Unies pour l'Aide au Développement
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNISDR	United Nations International Strategy for Disaster Reduction
USAID	United States Agency for International Development
WB	World Bank
WFP	World Food Programme
WMO	World Meteorological Organization

1. Situation Analysis

1. In response to a request for assistance by a number of Least Developed Countries (LDCs), UNDP-GEF recently designed a multi-country programme on strengthening Climate Information and Early Warning systems (CI/EWS) for climate resilient development and adaptation to climate change. Ten countries including Benin, Burkina Faso, Liberia, Sierra Leone, Sao Tome and Principe, Ethiopia, Uganda, Tanzania, Malawi and Zambia will receive assistance with financing from the Least Developed Country Fund (LDCF)[2]. The proposals, based on priorities expressed in each country's National Adaptation Programme of Action (NAPA) for addressing CI/EWS priorities, were endorsed by the GEF CEO in September 2013.

2. The CI/EWS initiatives respond to national priorities and actions of the targeted countries to improve their capacity to manage and respond to the uncertainties of climate change. This includes strengthening existing systems to secure, transfer and install critical technologies, as well as supporting climate change-related information to be an integral part of the decision-making processes at the national and local level. The latter encompasses the better use of the local national early warning network to forewarn and respond to extreme climate events as well as compliment long-term planning and management of climate change risks and opportunities.

3. The initiatives are in line with GEF 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"). This programme is also in line with the LDCF/SCCF aim to strengthen adaptive capacity to reduce risks from climate-induced economic losses, successful demonstration, deployment, and transfer of relevant adaptation technology in targeted areas and enhanced enabling environment to support adaptation related technology transfer.

4. During the approval process of the concepts underpinning the multi-country initiative on CI/EWS, LDCF/SCCF council queried the cost-effectiveness and efficiency of having 10 separate projects as opposed to a regional approach[3]. The rationale for a regional approach is founded on the basic premise that weather systems, and indeed climate projections, are not defined by national boundaries. Given limitations in the number of weather, climate and hydrological monitoring stations per country, a regional approach to collecting observations could help improve the use and sharing of data between countries. There are also natural efficiencies and economies of scale in the delivery of technical assistance, and skill building, in addition to benefits of knowledge, information and data sharing between countries. In giving their approval for the projects to be designed, the LDCF/SCCF Council recommended to UNDP to explore the viability of a regional approach that allowed participating countries to maximize on synergies between otherwise distinct projects. This project document is a response to the recommendations made by GEF Council.

2. Design phase of the Multi-Country Programme on CI/EWS in Africa.

5. Each country project in the UNDP-GEF supported multi-country programme has identified a national priority for enhanced Climate Information (CI) and Early Warning Systems (EWS), especially in the context of food security, water resources management, health risk management and terrestrial and coastal ecosystem resilience. In-depth assessments and stakeholder consultations were conducted during the project preparatory phase in each country, and the following barriers were noted as significant impediments to the effective use of CI/EWS for managing and/or responding to climate change risks and opportunities:

[2] UNDP-GEF PIMS #s: 5105 (Benin), 5104 (Burkina Faso), 5095 (Ethiopia), , 4858 (Liberia), 5092 (Malawi), 5103 (Sao Tome and Principe), 5107 (Sierra Leone), 5096 (Tanzania), 5094 (Uganda), and 5091(Zambia)
[3] http://www.thegef.org/gef/meetingdocs/96/48

- *Insufficient weather, climate and hydrological monitoring infrastructure and the capabilities to access such information in a timely manner;*
- *Limited use of satellite and weather/environmental monitoring information;*
- *Long-term sustainability of observational infrastructure and technically skilled human resources are not factored into government budgets;*
- *Challenges in meeting required operation and maintenance costs;*
- *Limited knowledge and capacity to effectively predict future climate events;*
- *Inconsistent use of different information sources across and within country borders;*
- *Monitoring and forecast weather/climate information not used to identify perilous hazards and risks*
- *Insufficient tailoring of weather/climate/hydrological information for decision making in particular sectors and to provide private sector services;*
- *Inability to quickly process information to support the timely dissemination of accurate warnings and advisories;*
- *Standard Operating Procedures for issuing warnings are either not available or not followed;*
- *Monitoring and forecast information available from international and regional centres is not sufficiently utilized.*

6. The above barriers are multi-faceted and encompass underlying technological, institutional, financial, and human resource constraints. In some countries, the unavailability of local meteorological/hydrological measurements is an impediment to the development of useful early warnings/advisories, whereas in others internationally available forecasts and satellite monitoring are currently either under-utilised and/or have limited use for monitoring and forecasting purposes. In nearly all countries the lack of communication and sharing of meteorological, hydrological, environmental and socio-economic data between government institutions, as well as the human and financial resources to maintain and translate these data into useful products/warnings, are critical impediments. The communication channels used for distributing any such data and information to those that need them most is similarly a constraint, as is the financial sustainability of CI/EWS systems.

Country-specific project framework

7. Based on the country consultations over the last 12 months, a project framework with the following outcomes (key results) was validated and subsequently endorsed by GEF/LDCF Council:

1. *Enhanced capacity to monitor and forecast extreme weather, hydrology and climate change;*
2. *Efficient and effective use of hydro-meteorological information for generating early warnings and supporting long-term development plans.*

8. For each of the above outcomes, the associated outputs, in generic terms, include the following (see Annex I for a full list of country-specific outputs as per the UNDP-GEF/LDCF Council approved projects):

Outcome 1: Enhanced capacity to monitor and forecast extreme weather, hydrology and climate change. With associated outputs:

- Procurement, installation and rehabilitation of automatic and manual synoptic, agro-met and climate monitoring stations;
- Procurement, installation and rehabilitation of automatic and manual hydrological monitoring stations, gauges and flow meters;
- Installation and maintenance of communication and IT equipment for receiving data from weather/climate, water level and coastal erosion monitoring stations;
- Strengthened capacity for engineers and technicians to operate & maintain meteorological & hydrological equipment;
- Data archiving servers, software and workstations for forecast production (including data communications with forecast providers), as well as for transferring data between agencies;

- Radiosonde and other equipment for upper air monitoring stations;
- Satellite monitoring and receiving equipment including visualization software, training and access to internationally available weather, climate and environmental products.

Outcome 2: Efficient and effective use of hydro-meteorological information for generating early warnings and supporting long-term development plans. With associated outputs:

- Strengthened capacity to make and use weather and climate forecasts, including accessing training and data from regional and international centers;
- Tailored climate and extreme weather risk advisories that link climate, environmental and socio-economic information on short-term and seasonal timescales, including hazard and vulnerability mapping, and development of flood and drought models/maps;
- Development of multi-agency platforms and Standard Operating Procedures to resolve lack of coordination and data sharing amongst agencies and with other EWS-related initiatives;
- Development of open-access EWS data servers for sharing data cross-sectorally and internationally;
- Building national and local capacity to assimilate climate forecasts/projections and monitoring into existing development planning and disaster management systems;
- Communication channels for issuing warnings are enabled through public/private radio, newspaper, television partnerships and SMS-based technologies, including the development of community/personal feedback mechanisms;
- Rural community capacity to adapt to climate shocks is strengthened by promoting understanding of disaster risk prevention planning and alert signals, and the testing of EWS at pilot sites;
- Develop revenue streams for financing the climate information system through the sale of products/warnings and services to the private sector, and the development of public-private partnerships.

Common requirements across all countries

9. In support of the above outputs, each country will require a number of specialized technical assistance support services, including:

- Capacity development related support on technical and operational aspects related to developing weather and climate forecasts, communication channels and standard operating procedures for EWS;
- Technical support to build skills that will assist public sector staff who are mandated to develop sector-specific information products (e.g. for agriculture and flood management) within countries;
- Developing partnerships with, and services for, the private sector;
- Procuring technologies (weather/climate and hydrological observation and monitoring technologies), whereby countries require support with the procurement process, including advisory support on identification and compiling information on what specifically needs to be procured, including post procurement technical assistance related to installation, maintenance and use;
- Capitalizing on a number of ongoing regional and international efforts that support CI/EWS in Africa including efforts through EU (GeoNetCAST, DevCoCAST, MARS, GMFS), FEWS, IFRC, ICPAC, ACMAD, ACPC, SADC-CMC, AGRHYMET, with financing from both bilateral (e.g. USAID, DFID, JICA, GIZ) and multilateral (e.g. World Bank, GFDRR, FAO, WMO) sources.

10. Whilst the above support will need to be of a high technical standard, there is also a need to facilitate sharing of data, lessons learned, good practices, knowledge and expertise. In this context, a regional approach has clear advantages for the delivery of technical assistance support to all countries supported by UNDP-GEF on CI/EWS.

3. Strategy toward the multi-country technical assistance on CI/EWS

11. The **objective** of this project is to assist countries in the UNDP-GEF LDCF-financed CI/EWS programme to successfully implement all components of their country specific projects. In alignment with the ***outcomes*** of the approved national projects, technical assistance will be delivered in the context of:

1. *Enhanced capacity to monitor and forecast extreme weather, hydrology and climate change*;
2. *Efficient and effective use of hydro-meteorological information for generating early warnings and supporting long-term development plans*.

12. While the country-led need to identify, procure and deploy new observing equipment and technologies is recognized, these investments need to also be grounded on a number of related and interconnected factors. For example, there must be an accompanying understanding of how the data and information generated by these technologies will be directly utilized by those receiving warnings. Consideration must also be given to the cost of installation, maintenance and operation of those technologies from both a financial, technical and administrative point of view. Without addressing these, and a host of other challenges that countries face in the context of existing CI/EWS systems, adding additional equipment/infrastructure is unlikely to yield any long-term sustainable impact.

13. In this context, technical assistance will be provided to each country within the framework of their NIM-led project activities on CI/EWS, to identify the main weaknesses in the use of CI/EWS, appropriate human resource requirements, and plan and deliver relevant technical and training courses. The assistance this project aims to provide will help countries tackle their skill development needs (in the context of managing as well as using equipment), and determining which technologies are appropriate given the local context into which they are to be installed. The need for data that are fit for purpose, as well as exploring and securing financial streams (in partnership with the private sector—especially telecommunications related firms) that will support the sustainable operation and maintenance of the enhanced network, will also be addressed by this project.

14. It will support the sustainable use and maintenance of technology by assisting countries to foster private sector involvement, strengthening technical capacities to manage the flow of data and information within countries (between key institutions and users as well as across countries) and support country-led efforts to make information (i.e. warnings and advisories) as useful as possible to the intended recipients. The project will identify alternative ways of generating information and warnings (e.g. from low cost sources) that may be used by country teams as a stop-gap and/or complimentary measure until national capacities are sufficient to take on the required roles. The project will also support the enhancement and cross-fertilisation of knowledge on CI/EWS within and between countries in the programme.

Outcome 1: Enhanced capacity to monitor and forecast extreme weather, hydrology and climate change

15. Outputs under outcome 1 will support country-led efforts to procure, install and rehabilitate a range of different observing technologies, including manual and automatic weather, climate, hydrological and agro-meteorological stations. As outlined in the country specific project documents, the choice of equipment will be based on several aspects including: design of equipment, state of existing and planned enhancement of supporting infrastructure (e.g. availability of power supplies, telecommunications bandwidth etc.), environmental conditions within which the equipment will be installed, cost of procurement and maintenance, availability of spare parts, familiarity and compatibility with the technology and availability of trained personnel to operate and maintain the equipment. Whilst the National Hydrological and Meteorological Services (NHMS) will lead on and decide on the choice of equipment, based on due diligence checks required as per UNDP-GEF guidelines, and initiate procurement processes (in line with UNDP's NIM guidelines as per each country-specific project document), this project will make available advisory support to each Implementing Partner of the country projects to address the above key issues. In particular, this project will assist each country to acquire and

utilize knowledge to make the most technically and financially robust decisions to achieve this particular outcome in each country context.

16. Given a number of advanced as well as start-up initiatives within the Africa region and at the international level (e.g. led by WB (e.g. PPCR/GFDRR), UNEP, WMO/ Global Framework for Climate Services), it is important that the country-led projects are assisted to coordinate and build on these efforts where possible. For example, in Malawi and Zambia the World Bank and GIZ are installing weather and hydrological monitoring facilities, as well as systems for archiving and data quality control. It is important that LDCF funds are used to strengthen existing observation networks and systems that are compatible with these initiatives (and vice-versa). Besides coordination with other donors, the sharing of information, data and best practices between countries taking part in the overall UNDP-GEF multi-country CI/EWS programme will be promoted through consultations and training. It will contribute towards the preparation of commonly accepted standard operating procedures/guidelines as well as materials on best practices, challenges and opportunities, to implementing successful EWS throughout the countries. As part of these interactions, the sharing of data and information, especially between neighboring countries sharing climate zones or watersheds, will be supported. Additionally, both functional as well as technical skill building will be organized on hydromet network design, operations & maintenance, awareness and knowledge on the use of alternative technologies. This will cover low-cost non-traditional technologies for weather and seasonal forecasting, as well as developing private sector partnerships for alternative revenue generation schemes for the operation and maintenance of these technologies. These activities will be undertaken in collaboration with regional centres of expertise (e.g. ICPAC, ACMAD and AGRHYMET), where possible.

17. The following outputs and activities will contribute to this outcome:

Output 1.1: Key national stakeholders in each country implementing CI/EWS projects are trained on installation, as well as the operation and maintenance of weather, climate and hydrological monitoring and forecasting equipment (including telecommunications and data archiving facilities), ensuring their compatibility with other ongoing initiatives such as those financed by WMO, GFDRR and PPCR and others.

Indicative activities include:

- National level training supportedat local NHMS offices and focused on strategic planning, end-to-end systems engineering and budgeting for future O&M for CI/EWS. Focus of engagement with countries will be to sensitize key stakeholders at the national and sub-national level that any infrastructure that is procured is robust, suits local context (e.g. security, power supply voltage – quality, frequency, constancy, bandwidth), local environment, taking into account maintenance issues (relating to human resource availability/needs, financials and frequency) as well as application of end products;
- Region-based training organized and delivered regarding the use of cutting edge knowledge and expertise on CI/EWS from around the world and other projects working in Africa. The purpose of this is to collectively build on experiences in each country, highlight positive experiences with particular technologies and strengthen national level confidence in working with and maintaining equipment.

18. Modalities such as webinars, and information exchanges with NMHS staff on issues of relevance to their operation and maintenance of CI/EW systems will be used for the above purposes. This includes webinars and information exchanges with external projects and organizations e.g. WMO, GFDRR and PPCR etc.

Output 1.2: Best practices, data and information are shared between countries to enhance country level capabilities to monitor and forecast weather, climate and hydrology, including recommendations and plans of where new equipment can be optimally deployed for regional coverage and scientific advice on how to best use information from other countries/international centres.

Indicative activities include:

- Support and advice on the development of weather forecasting procedures, including the assimilation of surface monitoring data and use of international/regionally available forecast products;
- Support and advice for hydrological forecasting, including the coupling of appropriate hydrological models to weather/seasonal forecast and monitoring data, and the use of extra-national data when available;
- Support and advice for seasonal forecasting of both long and short onset extreme climate events, including links with regional climate outlook fora (SARCOF, GHARCOF and PRESAO) and internationally available data and techniques;
- Advice on the appropriate use of decadal to multi-decadal climate projections (e.g. CMIP3/5), including downscaled model data (statistical and dynamical) e.g. from the CORDEX project;
- Identify and promote data sharing arrangements and standard operating procedures for the sharing, translation, exchange and use of monitoring and forecast data. Other issues discussed in the context of this activity will relate to standardization and representativeness of data generated by CI/EWS systems

19. A variety of approaches will be used to deliver on this output including face to face meetings as well as developing and implementing web and internet-based discussion fora. Where necessary, project funds will be used to develop and disseminate documents and communications on current best practices within the region.

Output 1.3: Technical guidance and training delivered to each participating country on the selection and identification of cost-effective technologies, including the potential cost-benefits of operating and maintaining these technologies.

Indicative activities include:

- Technical advice on the deployment, use, maintenance and upgrading of cost-effective weather/climate and hydrological monitoring and forecasting equipment and systems;
- Assistance with developing budgets and staffing plans as well as identifying potential sources of revenue to cover operations & maintenance of equipment beyond the scope of the initial support provided by the LDCF funds (allocated to this project or the national projects);
  Support and advice with procuring expertize from the private sector, regionally and/or internationally, including strengthening administrative capabilities for procuring specialized technological needs and engineering expertise;
- Technical advice, skills development and awareness raising activities on the use of (including both advantages and limitations) other potential technologies e.g. lightning detection, rain-fade approaches (using mobile phone signals) for monitoring rainfall location and intensity.

Each of the outputs above compliment the deliverables in the following UNDP-GEF CI/EWS related project documents: Benin (PIMS #5105), Burkina Faso (PIMS #5104), Ethiopia (PIMS #5095), Liberia (PIMS #4858), Malawi (PIMS #5092), Sao Tome and Principe (PIMS #5103), Sierra Leone (PIMS #5107), Tanzania (PIMS #5096), Uganda (PIMS #5094), and Zambia (PIMS #5091).

Outcome 2: Efficient and effective use of hydro-meteorological information for generating early warnings and supporting long-term development plans

20. Outputs under Outcome 2 will support each country to make effective use of the hydro-meteorological information from the existing system (which will be strengthened as per outcome 1). LDCF funds will be used to help countries acquire the skills, experience and confidence to generate early warnings of severe weather and climate change that are useful for decision-making (especially at the national/sub-national planning level and household level). This includes the generation of information (at local/regional scales) used to describe current weather (which is important for recognizing the onset of hazardous conditions as they relate to transport, agriculture, water management, urban risk management),

the use of now-casts (short-range forecasts; 0-12 hours), as well as medium (seasonal) and longer-term (inter-annual, multi-decadal) forecasts.

21. A starting point for the successful issuance of warnings and alerts is to have them translated into information that is acted upon by targeted recipients. Recognition will need to prevail that users themselves are not homogeneous nor have homogeneous needs in terms of the information that is generated by the CI/EWS. This requires understanding "what" and "who" is vulnerable in regions where a weather/climate hazard is likely to impact, as well as other socioeconomic pressures that have a bearing on how warnings are received and acted upon. Work under this outcome will therefore assist countries to undertake risk and vulnerability mapping through training, advisory and mentoring support. Countries will also be assisted to understand the information needs of the recipients of climate information and warnings so that value added products can be tailored and presented in ways that enable users to act upon the information (including associated uncertainties). The timely sharing of data generated from the enhanced network is also key if the issuance of warnings is to be acted upon in time. Standard operating procedures and data sharing agreements (for both urgent responses as well as for slow onset events) will need to be in place so that different government departments understand what is required of each for the successful operation of the CI/EWS. Resources will also be used to provide support and advice to project partners of each country initiative on how to successfully communicate warnings via different media, including radio, TV and mobile-phone based services e.g. agricultural advisories[4].

22. Given a variety of ongoing projects and initiatives (e.g. WB (including PPCR), GFDRR, UNEP, WMO and the Global Framework for Climate Services, and others), it is important that the country-led projects are supported to coordinate and build on these efforts where possible. There are also several initiatives in individual countries that could be useful in other countries e.g. use of mobile phones for both distributing agricultural advisories and crowd sourcing information on disasters and ongoing crises. Where possible and useful, the uptake of these technologies will be promoted through technical advice and policy related advocacy to relevant key institutions in the countries. Besides coordination with other donors, the sharing of information, data and best practices between countries taking part in the UNDP-GEF multi-country programme will be promoted. A number of mechanisms will be relied on for this purpose, including region-based and/or web-based discussion fora, as well as developing guidelines and communications materials on best practices, challenges and opportunities to implement successful EWS throughout the countries. As part of these interactions the sharing of data and information, especially between neighboring countries sharing climate zones or watersheds, will be encouraged. Additionally, based on demand from the each country, region-based training will be organized on risk and vulnerability mapping, tailored information and forecasts, successful communication strategies, private sector engagement and revenue generation etc.

23. The below outputs are interlinked and relevant for the outputs under outcome 2 in Benin (PIMS #5105), Burkina Faso (PIMS #5104), Ethiopia (PIMS #5095), Liberia (PIMS #4858), Malawi (PIMS #5092), Sao Tome and Principe (PIMS #5103), Sierra Leone (PIMS #5107), 5096 Tanzania (PIMS #5096), Uganda (PIMS #5094), and Zambia (PIMS #5091).

The following outputs and activities will contribute to this outcome:

Output 2.1: Best practices are shared between countries to enhance country-level capabilities to produce tailored products, warnings and communicate advisories/warnings, including advice on using scientifically robust information from other countries/international centers.

[4] Most countries will be implementing surveys to understand how users make decisions based on weather/climate information, as well as assessing the costs and benefits of the early warning system. Through this outcome support will be provided to digest and analyze the results of these surveys across all countries, providing useful information which can be used when planning future EWS investments.

Indicative activities include:
Technical and functional skills development (including advisory and mentoring support) on:
- assessing and mapping risk and vulnerability as well as assessing costs/benefits of resilience building and longer-term adaptation options;
- integrating climate information into long-term development plans
- developing and generating tailored weather/climate information (including development of SMS-based warnings and advisories) that are useful for decision-making;
- communications, standard operating procedures and mobile services;
- Identifying and promoting data sharing arrangements and standard operating procedures for the generation of climate information products.
- Developing documents and communications on current best practices within the region, successes, benefits as well as obstacles and costs of implementation etc.

Output 2.2: Effective communication and use of climate information and early warnings is supported through developing and testing the uptake of new products and visualization techniques, through multiple-media in collaboration with country-specific teams.

Indicative activities include:
- Assess how climate/weather information is used within local (community) decision frameworks and identify information requirements (regional analysis of country-level data collected through NIM projects), including ground-truth data, tracking impact of communicated information for enabling key decisions to be made, and identifying data-based products that increase the value of NHMS and potentially opens up financial income streams;
- Identify the associated costs and benefits of both receiving and utilizing effective warnings in different socio-economic contexts in Africa (regional analysis of country-level data collected through national projects and building on training provided under Outcome 1);
- Edit, print and publish protocols, handbooks, policy and information briefs, and/or guidelines on climate change adaptation, hydro-meteorological data and early warning systems for sharing with larger development community in Africa and elsewhere.

Output 2.3: Country teams are supported to identify alternative revenue streams, donor funding and public-private partnerships to support the long-term sustainability of infrastructure and services.

Indicative activities include:
- Training on identifying resources required for meeting installation, operation, maintenance and replacement (for routine/non-routine issues) costs;
- Assess and promote commercial operations related to hydro-meteorological services including market research and estimating the cost of developing and implementing a commercial strategy;
- Identify and engage regional- and national-level partners willing to pay for services;
- Provide technical assistance to countries to unleash private capital to support CI/EWS systems in developing countries by identifying and developing measures to reduce legislative and capacity barriers impeding public-private partnerships from forming;
- Support development of agreements between partners and governments.

Efficiency of the project*:*
24. In response to GEF Council's request for a regional approach to support countries on strengthening their CI and EWS systems, the efficiency of this project is grounded on the following:
- Reduced costs from the availability of a pool of technical experts to support all countries, as opposed to hiring equivalent skills for each country. This includes efficiencies gained from avoiding the need to hire and administer independent consultants and other short-term expertize at various times in each country context;
- Efficiencies gained from the availability of dedicated staff to address technical questions, and deliver training, advisory and mentoring support. Specifically training and capacity building for operations and maintenance of the hydromet infrastructure, modeling and forecasting (typically

provided under outcome 1 will benefit from core technical staff that will help design and identify appropriate cost-effective observing networks.

- Advantages in coordinating with regional and international centers and expertise on issues including identification and support for data sharing arrangements between countries – potentially pooling resources and technologies; e.g., sharing numerical weather predictions, radiosonde data, etc.;
- Identifying and facilitating the sharing of common lessons and best practices between countries (South-South Cooperation). Activities can also be coordinated at the regional level, bringing together participants from all countries to encourage knowledge sharing and the development of collective skills. This has several advantages namely: i) promoting the sharing of information and learning between countries; ii) encouraging discussions of best practices i.e. what works, reasons for failure, etc; and iii) increasing the effective pool of skilled resources which each country can draw upon (increasing the potential for future trainings to be conducted by experts within the region). Such activities will need to be closely coordinated with other regional and international partners/centres, e.g. EU, WMO/GFCS, ACMAD, AGRHYMET, ICPAC, World Bank etc.
- Providing technical support to other countries assisted by UNDP-GEF on strengthening CI/EWS systems as/when needed, providing the cost of services is fully covered by the country requesting support.
- Potential measures to mitigate the risk of the lack of political commitment in enhancing political commitment to a certain extent will be adopted, for instance, through effective advocacy, clarifying the accountability of climate services, securing sustained financing including advocating for adequate allocation of budget and investment in the framework of climate financing.
- Technical experts in the fields of meteorology, hydrology, DRR, engagement with the private sector and alternative technologies will be available fulltime and on demand to support countries in their capacity building efforts, in dealing with technical issues and for quality assurance and guidance.

By pooling resources, significant economies of scale will be achieved in providing technical support and backstopping to the participating countries. These include specialists on:

- Meteorology and climate monitoring and forecasting, who will be available to provide technical support, advice and guidance on technology and climate analysis and modelling for local weather forecasting. The technical specialists will provide support to the Govt and UNDP CO on most appropriate technology, deployment; ensure quality of training programs, procurement, quality of data and analysis.
- Hydrology and flood monitoring, modelling and forecasting, who will provide technical support, advice and guidance on, technology and hydrological analysis and modelling. Technical support to help identify appropriate technologies (and low-cost alternatives) and assist national counterparts to ensure these are compatible with the Hydrology Department's modernisation plans. They will also be at hand to assist local staff in the Department with planning and implementing data archiving, communication and quality control systems within the hydrology department.
- Disaster risk reduction who will provide technical support to local NHMS staff on linkages between Early Warning and preparedness, on standard operating procedures (SOPs) and on reaction and communications for disaster management.
- A Specialist on Innovative Alternative Technologies who will provide technical support, advice and guidance on important breakthrough technologies, adaptive technology for tropical and developing countries (for example lightning detectors, or using telecom infrastructure to set up weather stations). This will be critical for Ethiopia to consider in light of limited budgets for Met equipment and also making use of leapfrog technologies.
- A Specialist on Private Sector Engagement who will provide technical guidance and support to the NHMS on developing Public Private Partnerships to advance sustainable revenue generating streams from met products for NHMS.

- These technical support staff will be contracted by UNDP managed regional project and specifically focus on providing direct support to the countries implementing LDCF financed CI/EWS projects. The diverse sets of skills required to provide the necessary technical support to countries would be prohibitively difficult and expensive to procure at an individual country level.
- A further benefit of the multi-country project is that it will actively engage donors and provide the necessary support to countries to further mobilize financial resources to further strengthen national and sub-national CI/EWS initiatives. The intention is to ensure that the current set of LDCF financed projects, is a catalysts for future funding which will further benefit country-level investments and activities. Additional benefits will take the form of improved operational efficiency due to the technical support, and better access to information and different networks from the sharing of lessons from all countries.
- This project involves the procurement of Automated Weather Stations, Hydrology Gauging equipment, as well as computing resources for climate modelling and analysis, meteorological forecasting etc. in several countries. There will be opportunities to pool procurement requests for common items, similar brands and specifications, potentially helping to negotiate lower item and transaction costs. The regional component will also be able to draft common TORs and facilitate contracts with international suppliers.
- This project will build on the work of the AAP project by strengthening the capacities of the national governments further and procuring additional hydromet equipment. Also, if necessary, rehabilitation of non-functioning equipment is part of the country level objectives. Complementary and joint work with the Africa Climate Adaptation Food Security Project and RBA's other regional initiatives is planned in this project.
- For the use of climate information for long term development planning this project will link with ongoing initiatives like the poverty environment initiative, and the NAPs-GSP to support the development of national development plans to promote the use of climate information in national, sectoral and sub-national planning and budgeting processes.

4. Project Results Framework

Applicable SOF (e.g. GEF) Strategic Objective and Programme: Least Developed Countries Fund (LDCF)
Objective 2: Increase adaptive capacity to respond to the impacts of climate change, including variability, at local, national, regional and global level

Applicable SOF (e.g. GEF) Expected Outcomes (relating to the LDCF Results-Based Management Framework):
Outcome 2.1: Increased knowledge and understanding of climate variability and change-induced risks at country level and in targeted vulnerable areas
Outcome 2.2: Strengthened adaptive capacity to reduce risks to climate-induced economic losses

Applicable SOF (e.g. GEF) Outcome Indicators (relating to the LDCF Results-Based Management Framework):

- Relevant risk information disseminated to stakeholders
- Type and no. monitoring systems in place
- % of population covered by climate change risk measures

	Indicator	Baseline	Targets End of Project	Source of verification	Risks and Assumptions
Project Objective[5] *To ensure that all components of the climate monitoring, forecasting and early warning systems in each country participating in the multi-country programme are able to deliver timely information and warnings, utilizing appropriate technologies and scientific knowledge in a sustainable manner*	1. Level and quality of technical support and backstopping provided is adequate and has significantly contributed to the delivery of the multi country programme as measured through the capacity assessment scorecard.	Limited or no technical support and backstopping currently accessible to countries.	Each country has received significant and useful technical support.	Focus group interviews with planning and subject matter specialists who receive assistance from technical staff mobilized by this project Performance surveys of regional staff deployed to assist countries	NHMSs each country recognize the value of technical assistance on the areas of intervention outlined in this project document. Countries request assistance from this initiative Participants of events conducted by the technical staff in this project complete performance evaluations
Outcome 1 *Enhanced capacity to monitor and forecast*	1. Average percentage of national coverage	1. Average percentage of	1. Increase of at least 10% average national coverage of functional	Training programmes feedback forms and	Political commitment to enhance the capacity of the hydro-met institutions

[5] *Objective (Atlas output) monitored quarterly ERBM and annually in APR/PIR*

extreme weather, hydrology and climate change	of weather/climate and hydrological monitoring infrastructure across all countries 2. Average frequency and timeliness of climate-related data availability	national coverage of weather/climate and hydrological monitoring network at the beginning of the project 2. Average frequency of data transmission and collection at the beginning of the project	CI/EWS system 2. Average frequency of data transmission and collection at the end of the project	internal assessments	remains low Unavailability of requisite human resources and data Local IT and telecommunications infrastructure weak e.g. bandwidth and local mobile telecommunications networks do not adequately support CI/EWS systems
Outcome 2 *Efficient and effective use of hydro-meteorological information for generating early warnings and supporting long-term development plans*	1. Percentage of population with access to improved climate information and flood and drought warnings 2. Number of development frameworks that integrate climate information in their formulation	1. Currently low levels of access to improved CI and drought/flood warnings 2. Currently few development frameworks incorporate climate change information	1. Percentage increase in population who have access to improved EWS/CI 2. At least 3 sectoral development frameworks (at national, sub-national and sector level) incorporate analyses of risks based on climate change projections and take into account costs and benefits of adaptation.	Training programme feedback forms and internal assessments National plans and development strategies that have integrated climate information including scenario analysis	Problems related to involvement and co-operation of stakeholders to work cross-sectorally Work progresses in a compartmentalized fashion and there is little integration e.g. government departments refuse to share data and information Non-compliance by primary proponents for the successful implementation of this project Insufficient institutional support and political commitments

5. Total Budget and Workplan

25. The total amount of funding requested by the 10 country-led (NIM) projects, as articulated in the Letters of Endorsement and not including PPG and agency fees is USD 43,630,000 (see Annex 2 for a breakdown of grant and co-financing amounts for each country and output). Of this the total budget set aside for securing region-based support, as part of the multi-country programme, and indicated in the country-specific project documents is USD 3.460,000

Award ID:	00076448	Project ID(s):	00087832
Award Title:	Strengthening climate information and early warning systems in Africa for climate resilient development and adaptation to climate change		
Business Unit:	UNDP1		
Project Title:	Strengthening climate information and early warning systems in Africa for climate resilient development and adaptation to climate change		
PIMS no.	5322		
Implementing Partner (Executing Agency)	UNDP		

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 1:	UNDP	62160	LDCF	61300	Salary and post adjustment cost - IP staff	165500	165500	165500	165500	662000	A
				61200	Salary support costs- support staff	10500	10500	10500	6300	37800	B
				72100	International Consultants	15000	20000	25000	10000	70000	C
				71600	Travel	45000	45000	50000	25625	165625	D
				72100	Contractual Services - C	18750	10000	10000	32750	71500	E
				71400	Contractual Services - I	155000	163500	178500	162875	659875	F

				74200	Audio Visual and Printing Production Costs	5000	10000	10000	14000	39000	G
					Total Outcome 1	**414750**	**424500**	**449500**	**417050**	**1705800**	
OUTCOME 2:	**UNDP**	**62160**	LDCF	61300	Salary and post adjustment cost - IP staff	165430	165430	155570	155570	642000	H
				61200	Salary support costs- support staff	7000	7000	7000	4000	25000	i
				72100	International Consultants	10000	10700	25000	5000	50700	j
				71600	Travel	40000	50000	50000	25625	165625	k
				71400	Contractual Services - I	124000	170500	179000	117875	591375	l
				72100	Contractual Services - C	18750	10000	19000	28750	76500	m
				74200	Audio Visual and Printing Production Costs	4000	6000	10000	10000	30000	n
					Total Outcome 2	**369180**	**419630**	**445570**	**346820**	**1581200**	
Project Management Costs	**UNDP**	**62160**	**LDCF**	74100	Professional services	3000	3000	3000	3000	12000	o
				72400	Communication and Audio Visual Equipment	2000	1000	1000	2000	6000	p
				73100	Rental and Maintenance - Premises	1000	1000	1000	1000	4000	q
				61300	Salary and post adjustment cost - IP staff	9930	9930	9930	6430	36220	r
				61200	Salary support costs- support staff	7640	7640	17500	10000	42780	t

				73500	Reimbursable support costs	16325	15950	18825	20900	72000	u
				Total PMU Costs		**39895**	**38520**	**51255**	**43330**	**173000**	
					PROJECT TOTAL	**823825**	**882650**	**946325**	**807200**	**3460000**	

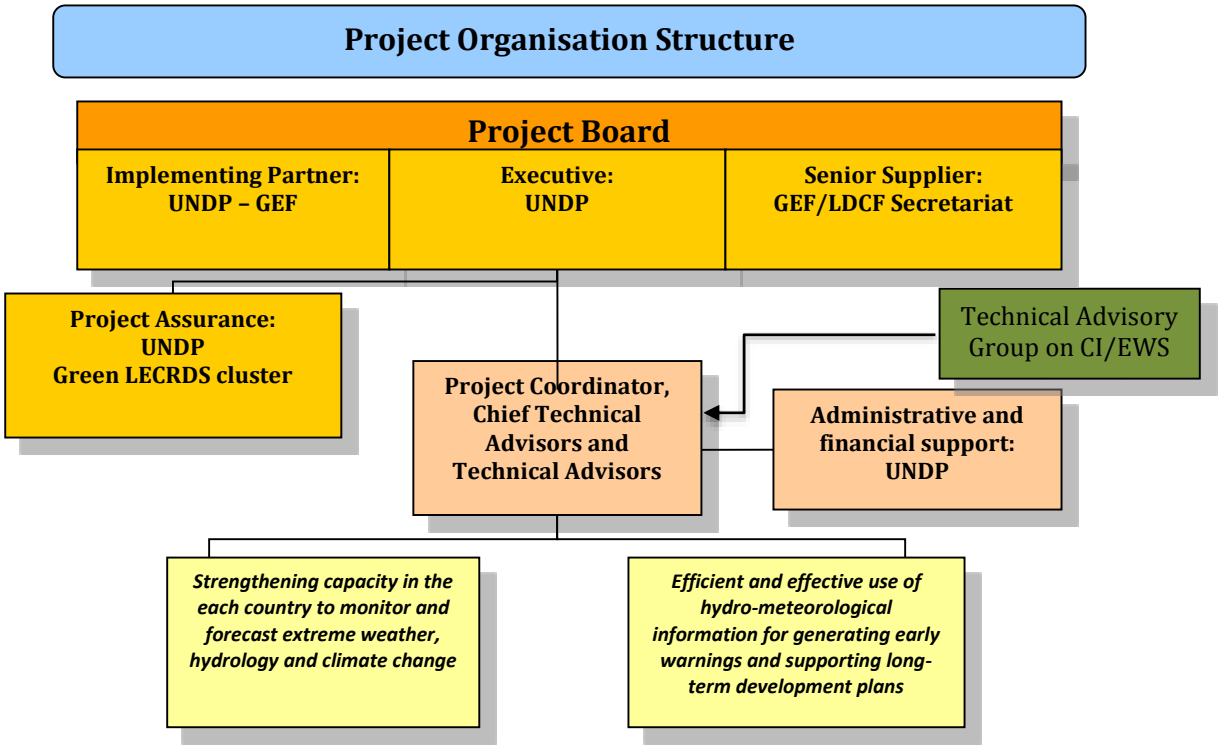
Budget Note	Description of cost item
a	Hiring a programme manager prorated across outcomes (outcome 1 = 49%, outcome 2 = 48%, Project Management = 3 %)
b	This is to cover the cost of an assistant to support the PM and other team members relating to the substantive support provided by this outcome. Prorated at 36% for this outcome.
c	Short term hiring of resource people for conducting training workshops, and for providing expert technical support to all countries, including on themes such as meteorology modeling and forecasting, weather/climate forecasting/predictions, Numerical Weather Prediction and providing guidance on tailoring forecasts for sector-specific services. Hydrology flood forecasting and modeling. Short term hire for training on Automatic Doppler flow meter installation, data transmission and Operation and Maintenance (O&M) training Disaster management, agriculture advisories, flood alerts and notifications, communication protocols and standard operating procedures, risk and vulnerability analyses Training on automatic synoptic and automatic agro-climate stations to assist with weather station installation, data transmission and Operation and Maintenance (O&M) training Cost of an Independent Mid-term evaluation@ $30,000 (prorated across outcomes) Cost of an Independent Terminal evaluation @ $40,000 (prorated across outcomes)
D	Travel to countries by technical experts to provide in-country support for national implementation of hydromet infrastructure (design and operations and maintenance) Travel for in-country support for national implementation of hydromet data management and forecasting (monitoring data management/archiving and quality control, standard operating procedures, weather and seasonal forecasting, hydrological monitoring and forecasting) Travel for in-country support for national implementation (low-cost technologies, budgeting and revenue streams for EWS) Resource people and project staff Attending 8 regional workshops
E	Develop training packages and toolkits for assisting trained meteorologists and hydrologists to build in-house forecasting capacity and enhance collaboration between Met and DRM centres
f	Hiring of technical specialists (Chief Technical Advisors prorated 50% per outcome) for programmatic technical support and: Meteorological and climate observation networks (including O&M), weather and climate forecasting, communication networks and protocols, data management and archiving; Hydrological observation networks (including O&M), flood forecasting, communication networks and protocols, data management systems Disaster risk reduction and SOPs between NHMS and NDMAs. Alternative technologies, low cost options and leapfrog technologies as related to hydrometeorological observing infrastructure
g	Edit, print and publish protocols, handbooks, and/or guidelines regarding observation network quality control and maintenance etc.
h	Hiring a programme manager prorated across outcomes (outcome 1 = 49%, outcome 2 = 48%, Project Management = 3 %)
i	This is to cover the cost of an assistant to support the PM and other team members relating to the substantive support provided by this outcome. Prorated at 20% for this outcome.
j	Mobile communications, private sector engagement, development of tailored products, weather and climate services Specialist technical support for developing disaster, risk and vulnerability databases, SMS/GSM-based servers and implementing novel crowd-sourcing technologies Cost of an Independent Mid-term evaluation@ $30,000 (prorated across outcomes) Cost of an Independent Terminal evaluation @ $40,000 (prorated across outcomes)
k	Travel to countries by technical experts to provide in-country support for national implementation of hydromet infrastructure (design and operations and maintenance) Travel for in-country support for national implementation of hydromet infrastructure (data management, sharing and standard operating procedures) Travel for in-country support for national implementation (private sector engagement, budgeting and revenue streams for EWS) Resource people and project staff Attending 8 regional workshops
l	Hiring of technical specialists (Chief Technical Advisors prorated 50% per outcome) for programmatic technical support on:

	Developing tailored products, including the use of satellite-based technologies and information Risk and vulnerability mapping and identification of areas requiring CI/EWS warnings/advisories Assessing the uptake and use of advisories/warnings and costs-benefits of utilizing the information within decision frameworks Disaster risk reduction and SOPs between NHMS and NDMAs and between NDMAs and communities/local disaster management commitees Alternative technologies, low cost options and leapfrog technologies as related to the communication and dissemination of warnings e.g. use of mobile and radio services Public private partnerships and engagement with the private sector like civil aviation, telecom companies and insurance companies.
m	Contractual services for technical expertise on market research for mobile phone platform for agricultural advisories and flood/extreme weather warnings Develop 'toolboxes', protocols, handbooks, policy and information briefs and/or guidelines on using and responding to hydro-meteorological information and warnings and using climate projections for adaptation planning
n	Edit, print and publish protocols, handbooks, and/or guidelines for communication strategies, decision support and the costs and benefits of utilizing early warnings.
o	Auditing
p	Communication and audiovisual equipment, including internet connection, cell phones
q	Premises rental
r	Hiring a programme manager prorated across outcomes (outcome 1 = 49%, outcome 2 = 48%, Project Management = 3 %)
t	To cover the cost of a assistant to support the PM and other team members with administrative matters relating to the substantive support provided by this project.
u	To cover actual direct costs incurred by UNDP for the provision of execution services towards the project. Recruiting and contract management of Chief Technical Advisors/International Consultants, One Project Manager/IP Staff. One Admin Associate/GS staff. Support to organizing up to 9 regional workshops during the project period, including logistic (venue and services). Support to procurement processes leading to the selection of service providers. Transactional support.

6. Management arrangements

26. This project will be executed by UNDP using the Direct Implementation Modality (DIM). UNDP is the Implementing Partner, responsible for project execution. UNDP will provide services related to recruitment of project staff and consultants, travel, sub-contracting, and payment of vendors in lieu of regional and national workshops that project staff organize and conduct. The direct costs associated with the execution services provided by UNDP will be borne from the Project Management Cost budget line item.

27. Implementation of this project will be carried out under the general guidance of a Project Board (PB) composed of designated senior-level representatives from UNDP-GEF. The PB will be the strategic decision-making body of the project. It will provide overall guidance and direction to the project manager, and also be responsible for making decisions on a consensus basis, when high-level strategic guidance is required, including the approval of major revisions in project strategy or implementation approach. The PB will consist of representation from: (a) UNDP-GEF (Chair); (b) UNDP/BCPR; (c) WMO/GCOS; (d) UN-SPIDER and (e) representatives of 3 UNDP Country Offices participating in the CI/EWS programme (COs represented in the project board will rotate annually with representation of both Anglophone and Francophone countries in any year.)



28. Other relevant stakeholders may participate in meetings as observers as needed, or upon approval by the Board, as Board members.

29. The responsibilities of the PB include to: i) ensure that LDCF resources are committed exclusively to activities that relate to the achievement of the approved project objective and outcomes and in line with approved annual work plans; ii) review and approve the annual work plan for the project; iii) arbitrate significant conflicts within the project; and iv) negotiate a solution to major problems that may arise between the project and external bodies. In order to ensure ultimate accountability for project results, PB decisions will be made in accordance to standards that shall ensure management for

development results, best value for money, fairness, integrity, transparency and effective international competition.

30. The project board will meet once per year. Additional meetings may be called as required by the project manager, in consultation with the UNDP-GEF Task Manager. Board meetings will be organized by the Project Manager (see below), in consultation with the UNDP-GEF RTA providing oversight of this project including the agenda and materials to be discussed and made available to project board members. Travel associated with carrying out PB duties is not funded through this project.

31. *Project Team*: Day-to-day management of project activities will be undertaken by Project Manager (PM). Details of the PM role are outlined in the Terms of Reference for this post (see annex). While the PM's work will be guided by the Project Board, s/he will be supervised by the UNDP-GEF Principle Technical Advisor on Green, Low Emission Climate Resilient Development. Oversight and quality assurance of the work on climate change adaptation, as it relates to this project and the related CI/EWS projects that this initiative supports, will be provided by the UNDP-GEF Senior Technical Advisor on Adaptation.

32. The PM will directly provide, and draw upon expertise from a core team of Chief Technical Advisors (CTAs) to provide, technical support to empower the country teams to implement their national projects on CI/EWS. The PM will draw on administrative support financed by the project and located in the Addis Ababa Regional Service Centre. The CTAs and other project recruits will also be co-located with the UNDP-GEF team located at the RSC in Addis Ababa, as and when necessary.

33. The PM will provide directly, as well as manage and guide a team of CTAs to provide targeted, focused, demand driven support to countries on different aspects of strengthening CI/EWS systems as per the scope of this project document. Given the assistance required by each country the team would need to include the following sets of skills and expertise:

- Meteorological and climate observation networks (including O&M), weather and climate forecasting, communication networks and protocols, data management and archiving;
- Hydrological observation networks (including O&M), flood forecasting, communication networks and protocols, data management systems;
- Disaster management, agricultural advisories and support services to farmers and pastoralists, flood alerts and notifications, communication protocols and standard operating procedures, risk and vulnerability analyses;
- Mobile communications, private sector and community engagement, development of tailored products, weather and climate services.
- Overall coordination of the multi-country programme including fund mobilization for the countries specifically designed to further strengthen CI/EWS.
- Fund raising for the countries supported by UNDP-GEF.

34. The PM (and other project-financed staff) will work on delivering the project outputs by working directly with their project counterparts in each of the countries (as per the country project documents appended to this project document). Support from the PM and the team of CTAs can be requested from either the country-led project teams or recommended by UNDP (CO or UNDP-GEF staff responsible for oversight who determine that such support is necessary based on regular review of implementation progress of the national projects).

35. Inception and quarterly teleconferences will be conducted between the PM (and other members of the project team), country focal points (within the designated IP of each the country projects on CI/EWS and UNDP Country Offices in the countries), and the UNDP-GEF RTA(s) providing oversight to this and other CI/EWS projects in Africa. The purpose of these teleconferences is to regularly share information about implementation progress of the project outputs and activities, alignment of project outputs/activities with the national projects (including their respective implementation progress), trouble shoot, identify lessons and agree on plans of action for outreach and communications.

36. At all times, all project staff hired under this project will ensure that UNDP Country Office focal points are informed of assistance that is to be provided (at both the national and/or regional level) to the project teams located within each Implementing Partner executing the CI/EWS country NIM projects. The PM will coordinate communication between project staff (at the regional and national level) with the UNDP focal point in each Country Office that is providing oversight support to the national project that is part of the multi-country CI/EWS programme financed by the LDCF, keeping the UNDP-GEF RTA regularly updated. The PM will also coordinate closely with UNDP-GEF Region-based Technical Advisors in Addis Ababa and the UNDP-GEF Technical Advisor (Global) on Climate Information Systems.

37. *Technical Advisory Group*: A technical advisory group (TAG), comprising of 4 members drawn from organizations working with weather and climate information/services and EWS in Africa (e.g. Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES; based in Bangkok), UK Met Office, IRI/Earth Institute, International Federation of Red Cross/Red Crescent, South African Met Service, NCAR/UCAR, etc. will be invited to provide technical advice on the approaches and methodologies used by the project team in all capacity building efforts that are delivered to the countries. Additionally regional centers of excellence such as ACMAD and AGRHYMET will also be invited to will be invited to provide technical guidance. The TAG will provide technical guidance to the project team so that the support provided to national teams is anchored on the cutting edge knowledge as well as technological developments on CI/EWS. Costs associated with TAG meetings will be covered by the project in line with UNDP policies and procedures.

38. *Coordination*: The Project will be implemented in synergy with existing LDCF/SCCF/AF, other GEF Trust Fund and donor financed initiatives at the global (e.g. Global Support Programme for National Adaptation Plans), regional (e.g. LDCF financed programme on Other Elements of the LDCF Work Programme) and national/local level (country projects) overseen by the UNDP-GEF unit as well as other units within UNDP. The project will also be implemented in close coordination with other Agency/Donor organization led efforts that are of relevance to CI/EWS initiatives in the target countries and region. New partnerships, where relevant, will be developed with regional and international institutions, in order to promote and advance cross-country knowledge sharing and support country-specific projects.

39. *Project Assurance/Oversight Responsibilities*: UNDP-GEF will provide oversight for this project in line with UNDP's role in the GEF Partnership. UNDP – GEF provides project cycle management services, including on project initiation, monitoring and evaluation, troubleshooting, and reporting to the donor. The project will be overseen (as part of the quality assurance support covered by the GEF IA fee) by a UNDP-GEF Task Manager specifically within the UNDP – GEF Green, Low Emission and Climate Resilient Development Strategies (Green LECRDS) cluster. UNDP-GEF will delegate spending authority to UNDP based on Annual Spending Limits as per the agreed Annual Work Plan. The budget for this project will be set up by UNDP/GEF under UNDP1. UNDP/GEF will approve the budget as cleared by the Project Board, including issuance of ASL. Subsequently, UNDP will be able to spend within the approved spending limits as per the project work-plan and requests made by the PM.

7. Monitoring framework and evaluation

40. Project monitoring and evaluation will be conducted in accordance with established UNDP and GEF procedures and will be undertaken by the project team under the oversight of the UNDP-GEF unit. The Project Results Framework provides performance and impact indicators for project implementation along with their corresponding means of verification. These will form the basis of the project's Monitoring and Evaluation system. The following sections outline the principle components of the Monitoring and Evaluation Plan and indicative cost estimates related to some major M&E milestones.

Project Inception Workshop: A Project Inception Workshop will be held within 3 months of project document signature date with members of the project board and representatives of the project

management teams from each participating country in the project. The Inception Workshop is crucial to building ownership for the project and to plan the first year annual work plan. The Inception Workshop will address a number of key issues including:

i) Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of UNDP staff and project staff *vis à vis* the project.
ii) Discuss the roles, functions, and responsibilities within the project's decision-making, management, assurance and advisory structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff and other project-related structures will be discussed again as needed in order to clarify each party's responsibilities during the project's implementation phase.
iii) Review and agree on the indicators, targets and their means of verification in the Project Results Framework as well as recheck assumptions and risks.
iv) Provide a detailed overview of reporting, M&E requirements, including roles and responsibilities for different M&E functions, with a particular emphasis on the Annual Project Implementation Reviews (PIRs) and related documentation, the Annual Project Review (APR) as well as mid-term and terminal evaluations. The M&E work plan and budget should be agreed upon and scheduled.
v) Discuss financial reporting procedures and obligations, and arrangements for annual audit, including UNDP project related budgetary planning, budget reviews, and mandatory budget rephasings.
vi) Plan and schedule PB meetings. The first PB meeting should be held within the first 12 months following the Inception Workshop.
vii) An Inception Workshop Report is a key reference document and must be prepared and shared with participants to formalise various agreements and plans decided during the inception workshop.

41. *First Annual Work plan*: After the Inception Workshop, the PMU will prepare the project's first Annual Work Plan (AWP), on the basis of the Project Results Framework. This will include reviewing the project's indicators, means of verification, assumptions and risks, imparting additional detail as needed, and on the basis of this exercise finalise the AWP with precise and measurable performance indicators, and in a manner consistent with the expected Outcomes for the project.

42. *Quarterly Reporting*: Progress made shall be monitored by UNDP-GEF. A risk log shall be regularly updated in ATLAS, and no less often than every six months where critical risks have been identified. Quarterly Progress Reports (QPR) will be prepared by the PMU for sharing with the UNDP-GEF (NY).

43. *Annual Reporting:* The APR/PIR is prepared to monitor progress made since project start and in particular for the previous reporting period. The APR/PIR combines UNDP and GEF reporting requirements and is to be completed by the project in the prescribed report format by 1st August of each year. The APR/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).
- Lessons learned/good practices.
- AWP and other expenditure reports
- Risk and adaptive management

44. *Mid-term of project cycle:* A mid-term evaluation will be conducted in line with UNDP-GEF procedures.

45. *End of Project Cycle:* An independent Final Evaluation, as a desk review, will take place three months prior to the final PB meeting, and will be undertaken in accordance with UNDP, and GEF

guidance. The final evaluation will focus on the delivery of the project's results as initially planned. The final evaluation will look at impacts and sustainability of results, including the contribution to capacity development and the achievement of the adaptation alternative proposed by this project document. The Terms of Reference for this evaluation will be prepared based on guidance from the UNDP RCU, Addis. The Final Evaluation will provide recommendations for follow-up activities that require a management response which should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Centre. During the last three months, the project team will prepare the Project Terminal Report. This comprehensive report will summarise 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.

46. *Audit Clause:* The project will be subject to standard DIM audit procedure as per UNDP financial regulations, rules and audit policies.

Table: M&E Budget of the project (for UNDP administered project)

Type of M&E activity	**Responsible Parties**	**Budget US$** *Excluding project team staff time*	**Time frame**
Inception Workshop and Report	Project Manager, CTAs, Programme Associate	8,000	Within first 2 months of project start up
Measurement of Means of Verification for Project Progress on *output and implementation*	Project Manager/Project team	None	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	Project manager and team, UNDP. UNDP-GEF RTA	None	Annually
Periodic status/ progress reports	Project manager and team	None	Quarterly
Mid-term Evaluation	▪ Project manager and team ▪ External Consultants (i.e. evaluation team)	Indicative cost: 15,000	At the mid-point of project implementation.
Final Evaluation	Project manager and team, ▪ External Consultants (evaluation team)	17,000	At least three months before the end of project implementation
Project Terminal Report	Project manager and team	20,000	At least three months before the end of the project
Audit	Project manager and team	Indicative cost per year: 3,000	Yearly
Visits to field sites	Project Manager	50, 000	Yearly
TOTAL indicative COST		US$ 120,000	

8. Legal Context

47. This project forms part of an overall programmatic framework under which several separate associated country level activities will be implemented. When assistance and support services are provided from this Project to the associated country level activities, this document shall be the "Project

Document" instrument referred to in: (i) the respective signed SBAAs for the specific countries; or (ii) in the Supplemental Provisions attached to the Project Document in cases where the recipient country has not signed an SBAA with UNDP, attached hereto and forming an integral part hereof

48. This project will be implemented by UNDP in accordance with its financial regulations, rules, practices and procedures.

49. To ensure its responsibility for the safety and security of the UNDP personnel and property, UNDP 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 UNDP's security, and the full implementation of the security plan.

50. The UNDP shall 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.

9. Annexes

Annex 1: TORs – For Project Manager

UNITED NATIONS DEVELOPMENT PROGRAMME
JOB DESCRIPTION

I. Position Information	
Job Code Title: Project Manager Position Number: 00077064 Department: BDP/EEG/UNDP-GEF Reports to: Principal Policy and Technical Advisor - Green Low Emission Climate Resilient Development Strategies Position Type: MPF Position Status: Non-Rotational	Current Grade: Proposed Grade: P6 Approved Grade: Position Classified by: Classification Approved by:

II. Organizational Context

UNDP Environment and Energy Group (EEG) is based in UNDP's Bureau of Development Policy and is responsible for providing leadership and technical support to delivery of the Environment and Sustainable Development pillar of UNDP's Strategic Plan. Its main focus is on helping countries develop the capacity to fully incorporate environmental sustainability into development at national and local, but also global and regional, levels. The principal areas of work are in environmental mainstreaming, environmental finance, adaptation to climate change, and local governance of resources, including energy.

With its technical focus, the Environment and Energy Group (EEG) is organized into substantive technical teams with a Principal or Senior Technical Advisor (PTA/STA) being the team leader within each area. Each team leader supports and guides a team of Regional Technical Advisors (RTAs) and Regional Technical Specialists (RTSs). As well as being a member of a technical team, each RTA/RTS is also a member of a regional team, which consists of RTAs/RTSs from all technical teams working together under the leadership of a Regional Practice or Team Leader. The regional teams are based in regional service centres from where they primarily support UNDP's country offices and partners in the region, but are also called upon to provide support globally as necessary.

In this context, UNDP is looking for a Project Manager who will be responsible for the implementation, management and quality assurance of the regional component of the of the Weather and Climate Observation Networks (WCON) and Early Warning Systems (EWS) for Development (WCON-EWS) Project in Africa (and other regions), ensuring solid technical quality of deliverables as well as financial and operational management. The Project Manager will report to the Principal Technical Advisor of the Green, Low Emission and Climate Resilient Development Strategies (Green LECRDS) team, and will oversee the work of international and national consultants. The Project Manager will also work closely with

EEG colleagues in the country offices and other project staff.

The Project Manager will be based in New York and is expected to have extensive and sound management and experience in climate early warning systems and/or related programmes at the global level. S/he will advise the Principal Technical Advisor of Green LECRDS on ways the programme can be integrated into national planning and management of climate risk systems, and linking the project to other key initiatives in Africa and other regions.

III. Functions / Key Results Expected

The Project Manager will provide highly specialized technical leadership and administrative supervision in the management of the $44m portfolio of UNDP-GEF EWS projects funded by the LDCF and approved in 2012.

Within the framework of the UNDP-GEF Weather and Climate Observation Networks (WCON) and Early Warning Systems (EWS) for Development (WCON-EWS) Project Document and the overall guidance of PTA for Green LECRDS, the Project Manager is responsible for the overall management, planning, and implementation of the regional component of the Project. S/he will:

- Provide strategic and high level technical and policy guidance on establishing national systems for integrating climate information generated from WCON-EWS to create sustainable weather and climate information services and manage risks from extreme weather events
- Ensure strategic coordination of the national WCON-EWS projects with other ongoing/planned LDCF, SCCF, AF projects at the regional and national level Ensure high profile is maintained for the UNDP-GEF supported projects on WCON-EWS, especially through international forums such as the UNFCCC COPs, in consultation with and coordination with UNDP-GEF management
- Define a detailed work plan for the regional Project components, prepare and keep track of deliverables, timelines and budgets, and oversee the administrative and operational components of the project to ensure the effective use of all project resources (assets, people, funds) in line with UNDP regulations and rules
- In coordination with STA-Adaptation the context of the regional component of the EWS project, implement and leverage partnerships with relevant agencies, donors, IGOs, NGOs, in-house groups, the private sector, and other relevant parties to maximise UNDP-GEF Programme impacts
- Ensure Programme linkages with key regional initiatives, e.g., the Global Climate Observing System (GCOS), NEPAD
- In coordination with STA-Adaptation and in the context of the regional component of the EWS project, pro-actively liaise with bilateral donors and UN Partner agencies to identify and secure co-financing for the Project.

1. Project Management

- Project accountability through the preparation of detailed monitoring and evaluation reports which include regular performance monitoring and evaluation of the project using a participatory approach with partners/participants and are robust enough to meet demanding standards of quality set by government and donors. Regularly share information on progress of implementation and any challenges and emerging issues with the UNDP-GEF PTA and STA and development partners, to support rapid resolution of any such challenges. Meet the administrative, managerial and financial reporting requirements of UNDP and development partners, as stipulated in the project documents.
- In the context of the regional component of the EWS project, provide strategic advice and direct input to facilitate successful project implementation through the establishment of productive working relationships with key partners and stakeholders, articulation of detailed work plans, formulation of operational procedures, and development and implementation of a strategy to mobilize funding for needed additional human resources to complement the $44 million in resources currently available for EWS in Africa, and mobilize an additional $12 million of resources for complimentary EWS projects to ensure the effective use of all project resources (assets, people, funds) in line with UNDP regulations and rules.
- Responsible for the supervision of the project staff in the regional component

Key result: The Projects are successfully implemented in a timely manner and within budget, with outputs of a high quality.

2. Overall Project Guidance

- Provide leadership and specialized technical direction to the Projects including:
- Provide technical and policy guidance on establishing national systems for integrating climate information generated from WCON-EWS to create sustainable weather and climate information services and manage risks from extreme weather events;
- Ensure coordination of the above mentioned national WCON-EWS projects with other on-going/planned LDCF, SCCF, AF projects at the regional and national level by coordinating closely with UNDP-GEF staff supporting oversight of adaptation programmes

Key result: The Programme becomes a leader in demonstrating how to integrate WCON-EWS information into national planning and management of climate risks in key sectors.

3. International Leadership and Coordination

- Expand the profile for the UNDP-GEF supported projects on WCON-EWS including, e.g., through their promotion to strengthen the implementation of the UNFCCC during high level events.
- In the context of the regional component of the EWS project, cultivate strong cooperative partnerships with relevant agencies, donors, IGOs, NGOs, in-house groups, the private sector, and other relevant parties to maximise UNDP-GEF Programme impacts.
- Expand programme linkages with key regional initiatives, e.g., the Global Climate Observing System (GCOS), NEPAD
- In the context of the regional component of the EWS project, pro-actively liaise with donors and UN Partner agencies to identify and pursue new opportunities for the Project.
- Provide strategic guidance to the PTA to support and facilitate new strategic partnerships, and help initiate new areas of collaboration

Key result: The Project is successfully linked to other key initiatives being undertaken in Africa and other regions to increase overall impacts

IV. Impact of Results

The results of the work of the Project Manager (PM) impact the standing and reputation of UNDP in all participating countries. Overall, the PM will seek to enhance the relations and credibility of UNDP with governments, civil societies, and donors in the area of climate change, and specifically, climate observation networks - early warning systems. The PM will ensure the efficiency and delivery of outputs and ensure high profile is maintained for the UNDP-GEF supported projects. The PM makes recommendations to the Principal Technical Advisor, particularly technical and policy guidance on establishing national systems for integrating climate information generated from WCON-EWS to create sustainable weather and climate information services. The PM also pro-actively liaises with donors and UN Partner agencies to identify and pursue new opportunities for the Project. The PM promotes good cooperation and coordination among programme and operations staff and between the Country Offices and Government counterparts.

V. Competencies

Corporate

- Demonstrates integrity and fairness, by modeling the UN/UNDP's values and ethical standards
- Promotes the vision, mission and strategic goals of UNDP
- Displays cultural, gender, religion, race, nationality and age sensitivity and adaptability

Functional/Technical:

- Demonstrates familiarity with national and international programmes for WCON-EWS and requirements for their successful operation and financial sustainability
- Familiarity with evolving technologies and services for support of WCON-EWS in developing countries
- Proven ability to translate practice principles into effective policy and programme interventions in the field
- Proven ability to link knowledge to UN/UNDP global policies, treaties, processes and development assistance frameworks
- Strong analytical, negotiation and communication skills, including ability to communicate with high level decision makers, to produce high quality advisory reports and knowledge products, and to effectively represent the organization

Leadership and Management Skills:

- Demonstrated ability to think strategically and to provide credible leadership
- Innovative approaches/experience on global development issues
- Strong managerial/leadership experience and decision-making skills with proven track record of mature judgments
- Ability to conceptualize and convey strategic vision from the spectrum of development experience; Knowledge and expertise/recognized expert in practice area
- Demonstrated well developed people management and organizational management skills including ability to hire, train and manage teams
- Strong resource mobilization and partnering skills and ability to accept accountability for management of large volume of financial resources
- Substantive knowledge and understanding of development cooperation with the ability to support the practice architecture of UNDP and inter-disciplinary issues
- Demonstrated strong networking skills
- Promotes knowledge management and a learning environment through leadership and personal example
- Seeks and applies knowledge, information and best practices from within and outside of UNDP.

VI. Recruitment Qualifications	
Education:	Masters degree or higher in science, environment, energy, economics, or other closely related field
Experience:	• A minimum of 15 years relevant work experience including climate change related projects • Extensive experience in Africa and/or Asia; work with Small Island Developing States (SIDS) is desirable • Experience and knowledge of climate change finance and adaptation project development and implementation with professional credibility • Demonstrated leadership and management experience, including ability to oversee international staff and organise the work of a large, high-profile project • Extensive experience in working and collaborating with governments on policy issues. • Knowledge of UNDP administration and financial procedures an advantage • Strong interpersonal and communication skills; commitment to team work and to working across disciplines
Language Requirements:	• Excellent knowledge of English, including writing, presentation, and communication skills • Fluency in French is an asset

VII. Signatures - Post Description Certification		
Incumbent *(if applicable)* Name	Signature	Date
Supervisor Name / Title Stephen Gold, Principal Technical Advisor-Green LECRDS, BDP/EEG/UNDP-GEF	Signature	Date
Chief Division/Section Name / Title Adriana Dinu, UNDP/GEF Officer-in-Charge, and Deputy Executive Coordinator, BDP/EEG	Signature	Date

Annex 2: TORs for Technical Officers

Chief Technical Advisor – Meteorology and climate monitoring and forecasting

The meteorological and climate specialist will support the countries participating in the multi-country initiative and will provide technical backstopping to the countries on the identification, procurement and rehabilitation of automated and manual weather stations, including appropriate data logging and communication equipment, advisory support on the operations and maintenance of equipment, (and access to associated technologies), as well as in developing weather and seasonal forecasts, including conducting training on weather and climate modelling techniques. The specialist will provide advice and technical assistance when required by countries, as well as contributing to regional training workshops, development of materials for training and knowledge management, as well as engagement with external projects and organisations undertaking similar work e.g. WMO, World Bank, UKMO etc.
The meteorological and climate specialist will undertake the following duties:

- Provide advisory support to country teams on the utilization of the most cost-effective and appropriate technologies for monitoring and forecasting weather and climate;
- Support the countries with technical advice on the equipment and infrastructure that is to be rehabilitated/procured as per the GEF Council approved project document;
- Conduct regional/national trainings to support the use of meteorological observing equipment (weather stations, upper air monitoring, satellite technology), their operation and maintenance, and developing weather and seasonal climate forecasts;
- Support country teams to validate a meteorological equipment procurement plan based on the set aside LDCF-funds, including necessary training for the operation & maintenance of equipment;
- In collaboration with country teams assess the existing procedures and mechanisms in the country for the deployment of meteorological equipment and the communication of data to central archiving facilities;
- Advise and provide technical support on available visualization software for generating weather and climate forecasts including the potential for satellite data and new technologies to be used for monitoring weather and climate;
- Work with the teams to ensure that data reporting is timely and sufficient quality control procedures are in place and help develop standard operating procedures where necessary;
- Support countries to access international data to support forecast production;
- Develop communication materials to share best practices and knowledge between project countries and with external projects and organisations;
- Collaborate with country teams and other CTA's to ensure that data is shared with national organisations that require meteorological/climate data for warnings or developing sector-specific products.

The specialist will work under direct supervision of the CI/EWS project manager and in close collaboration with the UNDP-GEF Regional Technical Advisor (based on Addis Ababa) overseeing the projects, the UNDP Country Office in each country and the national Implementation Partner (IP), as identified in each project document.

Chief Technical Advisor – Hydrological monitoring and forecasting

The hydrological specialist will support the countries participating in the multi-country programme in their procurement and rehabilitation of automated and manual hydrological stations and monitoring equipment, establishing appropriate data logging and communications, the operation and maintenance of equipment and developing flood monitoring and forecast warning products, in line with previously identified requirements. The specialist will provide advice and technical assistance when required by countries, as well as contributing to regional training workshops, development of materials for training and knowledge management, and engagement with external projects and organisations undertaking similar work e.g. GIZ, World Bank etc. Where potentially lower-cost alternative approaches to data collection or forecast production exist, or the operation and maintenance of equipment is a concern, the specialist will provide advice (including the associated benefits and limitations) to country teams, as well as encouraging the sharing of knowledge and data between countries (especially those sharing watersheds).

In close collaboration with the project manager, other CTA's and the Regional Technical Advisor (Addis Ababa), each UNDP Country Office and the IP, the specialist will undertake the following duties:

- Support country teams to formulate a hydrological equipment procurement plan based on the set aside LDCF-funds, including necessary training for the operation & maintenance of equipment;
- In collaboration with country teams assess the existing procedures and mechanisms in the country for the deployment of hydrological equipment and the communication of data to central archiving facilities;
- Work with the teams to ensure that hydrological data reporting is timely and sufficient quality control procedures are in place and help develop standard operating procedures where necessary;
- Support country teams to identify and utilize the most cost-effective and appropriate technologies for hydrological monitoring and forecasting;
- Advise on the appropriate hydrological modeling software to be used, based on available data;
- Support country teams to conceptualize and develop catchment hydrological models when needed;
- Produce flood risk modeling and mapping guidance document and provide training to national staff in flood prevention measures based on best practices;
- Work with country teams to undertake hydrological studies in support of the design and implementation of flood forecasting models (using appropriate industry-standard software or bespoke software);
- Conduct regional trainings to support the use of hydrological observing equipment (hydrometric and water-level stations, flowmeters, satellite technology), their operation and maintenance, and developing hydrological forecasts;
- Develop communication materials to share best practices and knowledge between project countries and with external projects and organisations;
- Collaborate with country teams and other CTA's to ensure that hydrologically relevant data (including rainfall) is shared with national organisations that require these data for warnings or developing sector-specific products.

The specialist will work under direct supervision of the CI/EWS project manager and in close collaboration with the UNDP-GEF Regional Technical Advisor (based on Addis Ababa) overseeing the 10 projects, the UNDP Country Office in each country and the national Implementation Partner (IP), as identified in each project document.

Chief Technical Advisor –Disaster Risk Management/Disaster Risk Reduction

The DRM/DRR specialist will support the countries participating in the multi-country programme to ensure that weather and climate information is integrated into existing disaster risk management products and activities, and to support the generation and use of new products and information in line with previously identified requirements. The specialist will provide advice and technical assistance when required by countries, as well as contributing to regional training workshops, development of materials for training and knowledge management, and engagement with external projects and organisations undertaking similar work e.g. GIZ, World Bank, GFDRR, BCPR etc. Where experience and evidence from other countries suggest alternative and effective means of using weather/climate information for DRM/DRR, the specialist will provide advice (including the associated benefits and limitations) to country teams, as well as encouraging the sharing of knowledge, experience and data between countries.

In close collaboration with the project manager, other CTA's and the Regional Technical Advisor (Addis Ababa), each UNDP Country Office and the IP, the specialist will support each of the 10 country teams implementing their respective LDCF financed CI/EWS project to undertake the following duties:

- Assess with key stakeholders the requirements for weather/climate related information products for effective DRM/DRR, as per the GEF Council approved project document;
- Support country teams to formulate plans to effectively utilize weather/climate information for DRM/DRR based on the set aside LDCF-funds, including necessary training to enable the production of warning/advisory products in key sectors;
- In collaboration with country teams assess and suggest improvements to existing procedures and mechanisms for the collection of data related existing disasters and vulnerable areas so that such information can better inform policy responses;
- Support country teams with advisory support to strengthen existing systems to generate warnings/advisories in time (including the transfer of data from Meteorological and Hydrological departments), developing protocols to put quality control procedures in place and support the development of other standard operating procedures where necessary;
- Advise the country teams on the selection of appropriate databases and software platforms to be used for combining and recording of meteorological/hydrological information, as well as vulnerability assessments and field reports;
- Support country teams to conceptualize and develop information on vulnerabilities to weather/climate related disasters/slow onset impacts;
- Encourage and advice on the collection of data related to Loss & Damage in key sectors;
- Identify appropriate guidance documentation on risk and vulnerability assessments, and provide training to national staff on methods for risk and vulnerability assessments when needed;
- Conduct regional/national trainings to support the use of risk and vulnerability analyses, development of standard operating procedures, collection of field data, the use of low-cost technologies (e.g. mobile phones) and the development of tailored advisories/warnings for key sectors;
- Contribute towards the development of communication materials on CCA/DRR specific issues emerging from the LDCF financed portfolio of projects to share best practices and knowledge between project countries and with external projects and organisations.

The specialist will work under direct supervision of the CI/EWS project manager and in close collaboration with the UNDP-GEF Regional Technical Advisor (based on Addis Ababa) overseeing the 10 projects, the UNDP Country Office in each country and the national Implementation Partner (IP), as identified in each project document.

Chief Technical Advisor – Alternative Technologies

The Chief Technical Advisor – Alternative Technologies will support countries on issues relating to alternative low cost technology for generating policy relevant climate information and early-warning systems (i.e. 'leap frog' innovative technologies). The alternative technology specialist will provide technical backstopping in the identification, procurement and installation of new and innovative weather observing technology, establishing appropriate data logging and communication equipment, and advisory support on the operations and maintenance implications of the equipment. The specialist will provide advice and technical assistance when required by countries, as well as design and contribute towards the conduct of regional/national training workshops, development of materials for training and knowledge management, as well as engagement with external projects and organisations undertaking similar work e.g. WMO, World Bank, UKMO etc.

In close collaboration with the project manager, other CTA's and the Regional Technical Advisor (Addis Ababa), each UNDP Country Office and the IP, the specialist will undertake the following duties:

- Advise and provide technical support on available alternative and innovative technology for monitoring and forecasting weather and climate over different time scales (now-casts to long-term projections);
- Support country teams to identify and utilize the most cost-effective and appropriate technologies for monitoring and forecasting weather and climate;
- Design and conduct regional/national trainings to support the use of alternative technology observing equipment (lightning sensors, rain-fade technologies, and satellite technology), their operation and maintenance, and developing weather and seasonal climate forecasts;
- Support the countries with technical advice on the equipment that is to be rehabilitated/procured as per the GEF Council approved project document;
- Support country teams to validate an alternative technology equipment procurement plan based on the set aside LDCF-funds, including necessary training for the operation & maintenance of equipment;
- In collaboration with country teams assess the existing procedures and mechanisms in the country for the deployment of alternative technology and the communication of data to central archiving facilities;
- Develop communication materials to share best practices and knowledge between project countries and with external projects and organisations;
- Collaborate with country teams and other CTA's to ensure that data is shared with national organisations that require meteorological/climate data for warnings or developing sector-specific products.

The specialist will work under direct supervision of the CI/EWS project manager and in close collaboration with the UNDP-GEF Regional Technical Advisor (based on Addis Ababa) overseeing the 10 projects, the UNDP Country Office in each country and the national Implementation Partner (IP), as identified in each project document.

Chief Technical Advisor – Private Sector Development

The Chief Technical Advisor – Private Sector Development will provide technical advice and support to countries on the latest approaches and strategies to engage the private sector and develop public private partnerships in the context of Climate Information and Early Warning Information and Technologies. He/she will guide country teams on building partnerships with the private sector like telecom companies, insurance companies and civil aviation in order to establish effective and sustainable funding streams that can be used for the maintenance of CI/EWS related infrastructure.

In close collaboration with the project manager, other CTA's and the Regional Technical Advisor (Addis Ababa), each UNDP Country Office and the IP, the specialist will support each of the country teams implementing their respective LDCF financed CI/EWS project to undertake the following duties:

- Support country teams to engage with the public and private sector to identify needs for weather and climate in each country as basis for revenue generating services;
- Support country teams to engage with the private sector, including mobile/cellular phone companies, to help develop public/private partnerships for both the operation and maintenance of the EWS and the sale of climate information/services;
- Support country teams to leverage private sector finance and infrastructure that can support the deployment of weather observing technology as well as its operations and maintenance;
- Support country teams and work with key government departments to develop business plans, based on identified revenue streams, to support the operations and maintenance of the climate information/EWS in the future;
- Guide country teams to design contracts and agreements between the NHMSs and the private sector to ensure win-win solutions are found;
- Conduct regional/national trainings to support country teams to effectively engage with appropriate private sector collaborators.

The specialist will work under direct supervision of the CI/EWS project manager and in close collaboration with the UNDP-GEF Regional Technical Advisor (based on Addis Ababa) overseeing the 10 projects, the UNDP Country Office in each country and the national Implementation Partner (IP), as identified in each project document.

Annex 3: Grouped outputs per country

COUNTRY	COMPONENT	OUTCOME	OUTPUT .1	OUTPUT .2	OUTPUT .3	OUTPUT .4	OUTPUT .5	OUTPUT .6	OUTPUT .7
Benin	Transfer of technologies for climate and environmental monitoring infrastructure	1. Enhanced capacity of national hydro-meteorological services (DNM/DG-Eau) and coastal monitoring institutions (CRHOB) to monitor extreme weather and climate change (droughts, floods, strong winds, coastal erosion, seal level rise)	1.1 Procurement and installation or rehabilitation of 30 water level monitoring stations with telemetry, 40 automatic rain gauges at hydrological stations and 1 automatic Doppler flow meter with data transmission capabilities and data processing and storage facilities to feed hydrological models . (INV: US$ 832,000)	1.2 Procurement / installation of 3 automatic agro-climate stations, 2 synoptic stations and 25 automatic rain gauges and rehabilitation of 6 synoptic stations and 20 agro-climate stations, all stations/gauges equipped with telemetry and improved data transmission/processing/storage facilities. (INV: US$ 1,227,000)	1.3 Acquisition of maintenance, communication and data collection/treatment equipment (Differential Global Position System Monitoring, Acoustic Doppler Current and Velocity Profilers) for water level and coast erosion monitoring by CRHOB (INV: US$ 309,000)	1.4 Training for DNM (4 engineers / 4 technicians), DG-Eau (2 engineers / 3 technicians) and CRHOB (2 researchers / 2 technicians) on information collection, data storage/analysis, operation and maintenance (O&M) and maintenance/monitoring principles including development of Standard Operating Procedures (SOPs) for equipment and capacity reinforcement for long-term budgeting. (TA: US$ 246,000			
	Climate information integrated into development plans and early warning systems	2. Efficient and effective use of hydro-meteorological, coastal and environmental information for making early and seasonal warnings which feed into long-term development	2.1 DNM/ASECNA and DG-Eau technical capacity to make and use climate forecasts (on hourly, daily and seasonal timescales) is strengthened by training 4 forecasters / 4	2.2 Tailored agricultural and extreme weather risk advisories that link climate, environmental and socio-economic information on short-term and seasonal timescales are developed to	2.3 Development of a multi-agency platform to enhance cooperation (CIMS) and to resolve lack of coordination and data sharing amongst agencies and with EWS-related initiatives (TA: US$ 97,000)	2.4 Development of an open-access EWS data portal for sharing data cross-sectorally, including facilitating internet access and mobile phone services with a Public Private Partnership (PPP) and transferring data into the Global	2.5 Reinforcement of operational and technical capacities within ANPC, PNRCC and DGE to assimilate forecasts and monitoring into existing development	2.6 Communication channels and standard procedures for issuing warnings by ANPC, DGE and NGOs/CSOs are enabled through public/private partnerships with	2.7 Rural community capacity to adapt to climate shocks is strengthened by supporting NGOs/CSOs to promote understanding of alert signals and disaster risk prevention planning and gauge the

		plans	technicians through national, regional and international knowledge sharing. (The Government will assist with recruitment and will mandate that trained personnel must remain working within their respective institution for at least 5 years after training. Training of personnel will occur on national and regional levels.) (INV/TA: US$ 213,000)	support end-user needs, including research development of a mobile-phone based advisory platform. (TA: US$ 150,000)		Telecommunication System. (INV: US$ 116,000)	planning, PRSPs (SCRP, PAP, NGSPR, PDCs), the National Environmental Management Plan (PNDC-GEM) and disaster risk prevention strategies, including support for local and regional collaborations.(TA : US$ 235,000)	radio, newspaper, television and mobile phone services including the development of a feedback mechanism via toll-free numbers, SMS, contact with local EWS focal points and field analysis on the utility of early warning advisories and warnings.(INV: US$ 265,000)	receipt of alerts in a gender disaggregated survey. (TA: US$ 120,000)
Burkina Faso	Transfer of technologies for climate and environmental monitoring infrastructure	1. Enhanced capacity of national hydro-meteorological services (DGM/DGRE) and environmental institutions (DCIME) to monitor extreme weather and climate change (droughts, floods, strong winds)	1.1 Procurement and installation of 100 water level monitors to be placed on 11 manual, hydrological stations and 8 acoustic Doppler flow meters (ADCP) for the National Hydrological Service (DGRE). All equipment will include data transmission/processing/storage facilities which will feed into hydrological forecasting models. (INV: US$ 817,600)	1.2 Procurement and installation of 40 automatic climate stations, 10 automatic synoptic stations with telemetry and 100 rain gauges for the National Weather Service (DGM), including improved data transmission/processing/storage facilities. (INV: US$ 1,069,200)	1.3 Rehabilitation of the radar in Ouagadougou including acquisition of spare parts and knowledge sharing to build self-sufficiency within SAAGA to be able to undertake radar operation and maintenance. (INV: US$ 105,500)	1.4 Radiosonde equipment for ASECNA to provide one more sounding at midnight (in addition to at noon) to generate vertical, atmospheric profile information to feed weather forecasts according to WMO standards. (INV: US$ 236,000	1.5 Equipment for improved satellite imaging and data visualization for the Departmental Division on the Understanding of Environmental Information and Monitoring (DCIME). (INV: US$ 230,400)	1.6 Training for DGM (4 engineers / 4 technicians) and DGRE (3 engineers) on equipment data communication/treatment, operation and maintenance (O&M) and maintenance/monitoring principles including development of Standard Operating Procedures (SOPs) for equipment and capacity reinforcement for long-term budgeting.(TA: US$ 156,000)	

	Climate information integrated into development plans and early warning systems	2. Efficient and effective use of hydro-meteorological and environmental information for making early warnings and seasonal forecasts which feed into long-term development plans	2.1 DGM, DGRE and DCIME capacity to make and use climate forecasts (on hourly, daily and seasonal timescales) is strengthened by training 7 engineers and 4 specialized technicians, updating the National Water Information System Plan (SNIEau) and promoting national and regional knowledge sharing. (The Government will assist with recruitment and will mandate that trained personnel must remain working within their respective institution for at least 10 years after training. Training of personnel will occur on national and regional levels.) (INV/TA: US$ 241,000)	2.2 Tailored agricultural and extreme weather risk advisories that link climate, environmental and socio-economic information on short-term and seasonal timescales are developed to support end-user needs and to promote sustainable financing mechanisms, including research development of a mobile-phone based advisory platform. (TA: US$ 154,000)	2.3 Development of a multi-agency platform to enhance cooperation (CIMS) and to resolve lack of coordination and data sharing amongst agencies and with EWS-related initiatives. (TA: US$ 87,300)	2.4 Development of an open-access EWS data portal for sharing data cross-sectorally, including facilitating internet access and mobile phone services with a Public Private Partnership (PPP) and transferring data into the Global Telecommunication System. (INV: US$ 85,000)	2.5 Capacities for CONASUR and DCIME to conduct field inspection/validation assimilate forecasts and monitoring into existing development planning, PRSPs (SCADD and PEI) and the National Multi-risk Plan are built through local and regional collaborations and support from the Multi-agency Synergy Committee (CIMS). (TA: US$ 199,000)	2.6 Communication channels and standard procedures for issuing warnings by CONASUR, SIG, NGOs/CSOs are enabled through public/private partnerships with radio, newspaper, television and mobile phone services including the development of a feedback mechanism via toll-free numbers, SMS and contact with local EWS focal points and field analysis on the utility of early warning advisories and warnings. (INV: US$ 291,000)	2.7 Rural community capacity to adapt to climate shocks is strengthened by promoting understanding of alert signals and disaster risk prevention planning and gauging the receipt of alerts in a gender disaggregated survey. (TA: US$ 138,000)
Ethiopia	Transfer of technologies for climate and environmental monitoring infrastructure.	Enhanced capacity of the National Meteorological Agency and the Hydrology and Water Quality Department to monitor extreme weather and climate change.	1.1 10 hydrological monitoring stations installed and 50 rehabilitated with telemetry, archiving and data processing facilities.(INV: US$ 479,300)	1.2 40 automated meteorological monitoring stations installed, 200 rehabilitated with telemetry, archiving and data processing facilities and 5 calibration units procured. (INV: US$	1.3 One upper air monitoring station installed and operating.(INV: US$ 330,000)	1.4 Satellite monitoring equipment to receive real time (AMESD) climate and environmental information installed and rehabilitated. (INV: US$ 210,000	1.5 Training of at least 20 technical trainers to maintain and repair equipment, computer infrastructure and telecommunications, including cost-effective technologies to		

				1,851,600)			interface with existing equipment/software. (TA: US$ 465,200)		
	Transfer of technologies for climate and environmental monitoring infrastructure.	2.1 NMAs capacity to make and use climate forecasts (on daily to seasonal basis) is strengthened by training at least 5 lead forecasters 5 hydrology engineers for in house capacity building.(TA: US$ 278,000)	2.2 Tailored sector-specific early warning products – agromet and food security advisories, flood warning…etc - based on identified user needs that link climate and environmental information with current vulnerability assessments are developed. (INV: US$ 380,000)	2.3 National capacity for assimilating forecasts and monitoring (from NMA and HWQD) into existing DRMFS and the Growth and Transformational Plan is built, including coordination with systems and warnings developed by other initiatives.(TA: US$ 360,000)	2.4 Communication channels (e.g. radio, newspapers, SMS, television etc) and Standard Operating Procedures for issuing warnings through both governmental (woreda.net) and civil society are enabled.(INV: US$ 179,800)	2.5 Plan for sustainable financing for the operation and maintenance of the installed EWS developed and implemented, including public and private financing options.(TA: US$ 136,100)			
Liberia	Improve the climate monitoring network, database archives, access to satellite environmental products and ability to issue forecasts.	Increased capacity of hydro-meteorological services and associated networks to monitor and predict extreme weather, climate-related hazards and climate trends.	1.1 Procurement and installation of 11 AWSs and 6 automatic hydrometric stations, including all associated infrastructure, in critical areas across the country, and rehabilitation of 1 automatic and 1 manual meteorological monitoring station, including communications and centralised archiving technologies. (INV: US$ 578,974)	1.2 Technical capacities of staff in Meteorology Department developed to produce standard and customized weather and climate forecasts and packaging meteorological data and information into a suitable format for user agencies and local community end-users. (TA: US$ 1,109,240)	1.3 Weather and climate forecasting systems enabled through procuring and installing required equipment (data servers, computational nodes, visualisation software and suitable bandwidth communications technology, GTS, SYNERGIE and SADIS), and through integrating of satellite observations for monitoring and assessing the changing state of the environment and the impact of current and future climate on key environmental	1.4 Staff in MLME, MoA, NDRC, EPA, MoH, LMA, NPA and MoPEA trained to use information from meteorological, hydro-meteorological and satellite monitoring equipment to tailor forecasts for climate-related hazards specific to the respective sectors (TA: US$ 186,558)			

					variables. (INV: US$ 858,228)				
	Establishment of an early warning system for the dissemination and communication of extreme weather warnings, seasonal outlooks and increased risks due to climate change.	Efficient and effective use of tailored climate, environmental and socio-economic data to produce appropriate information which can be communicated to government entities and communities to enable informed decision-making.	2.1 Systems and communication with the NDRC are developed to use hydrological, weather, climate and environmental monitoring data and existing vulnerability assessments to identify areas of high vulnerability to climate change. (TA/INV: US$ 899,894)	2.2 Communication channels, SOPs and legal mandates developed for disseminating climate information and issuing warnings through government institutions and NGOs. (TA/INV: US$ 861,949)	2.3 Two applications – agricultural and coastal – of the EWS implemented and tested for their effectiveness. (INV/TA: US$ 770,157)				
	Strengthening of institutional capacities to develop policies and strategies that take climate change risks into account.	Increased awareness in government, private sector and local communities of the major risks associated with climate change, and use of available information when formulating development policies and strategies	3.1 Regional climate change scenarios developed for Liberia and used to enable the identification of 'hotspots' where climate change is expected to have severe biophysical and socio-economic impacts. (TA: US$ 418,471)	3.2 Adaptation options (including EWS-related options) developed for the most vulnerable sectors and local communities based on the identified climate change 'hotspots'. (TA: US$ 200,492)	3.3 A system established for inter-ministerial dialogue on incorporating climate change considerations into government policies and strategies. (TA: US$ 300,473)	3.4 Engagement of the private sector to develop paid-for meteorological and hydrological services, including a mechanism for discussing public and private financing for supporting the generation of climate information and early warnings. (TA: US$ 230,564)			

Malawi	Transfer of technologies for climate and environmental monitoring infrastructure.	Enhanced capacity of the Department of Climate Change and Meteorological Services (DCCMS) and Department of Water Resources (DWR) to monitor and forecast extreme weather, hydrology and climate change.	1.1 10 Automatic Hydrological Stations (AHSs) installed in 7 disaster prone districts, namely Karonga, Salima, Nkhota-kota, Rumphi, Nkhata-bay, Dedza and Phalombe and 50 hydrological monitoring stations rehabilitated in key rivers in catchment areas – excluding the districts covered by the SRBI.	1.2 25 automatic, 18 manual and 53 rainfall logging stations rehabilitated and 20 Automatic Weather Stations (AWS) installed to cover blind spots in the existing observation network in the eastern parts of Malawi, Lake Malawi and lakeshore areas including drought and flood prone priority districts, namely Karonga, Salima, Nkhota-kota, Rumphi, Nkhata-bay, Dedza and Phalombe ¬– excluding districts covered by the SRBMP and IFRM.	1.3Weather and climate forecasting facilities upgraded, including building on current and planned upgrades to DCCMS and DWR's data and information management systems under the SRBMP and IFRMS and operationalizing collaboration arrangements and procedures for drought and severe weather monitoring and forecasting between DWR and DCCMS. (INV: US$ 317,625)	1.4 Capacity developed for operating and maintaining observation networks and related infrastructure including training 7 meteorological and 6 hydrological technicians, 2 communications operators and system administrators, 25 weather observers and 25 gauge readers, raising local community awareness and developing an O&M toolbox including refresher courses.	1.5 Tailored drought, flood and severe weather forecasts and alerts produced – with a focus on agricultural stress and Mwera winds over Lake Malawi – by training 8 meteorological and 3 hydrological forecasters to build in-house capacity.		
	Climate information integrated into development plans and early warning systems.	Efficient and effective use of hydro-meteorological and environmental information for early warnings and long-term development plans.	2.1 Weather and climate information and alerts – including drought, flood and severe weather warnings, integrated cost-benefit analyses and hazard and vulnerability maps – made accessible to decision makers in DoDMA/OPC, MoAFS, MoLGRD, private sector, civil society, development partners and communities.	2.2 Weather and climate information mainstreamed into the operationalization of relevant national sector policies, annual budgets and local development plans including the National Disaster Risk Management Policy and District Development Plans in priority drought and flood prone districts – excluding districts covered by SRBMP and IFRM.	2.3 Governmental and non-governmental communication channels and procedures for issuing forecasts and warnings are reviewed and strengthened – including standardising SOPs, alert dissemination systems using a range of successful dissemination approaches and developing a national weather and climate information and early warning system communication and coordination strategy	2.4 Improved enabling environment for development of sustainable revenue streams for DCCMS through the provision of climate services and products.			

					- at a national and local level in 7 priority districts.				
Sierra Leone	Transfer of technologies for climate and environmental monitoring infrastructure.	Enhanced capacity of the Sierra Leone Meteorological Department of (SLMD) and Directorate for Water Resource (DWR) to monitor extreme weather and produce sector tailored weather forecastingclimate change.	Output 1.1: 12 river gauges, 2 water level (limnimetric scale), 6 groundwater data logger, 2 signal counter rotations for hydrological monitoring are installed in partnership with SLMD to complement watershed management networks of Guma Valley, Bumbuna Watershed and The Ministry of Water Resources (MWR). (The Ministry of Water Resources (MWR))(INV: US$ 970,820)	Output 1.2: 38 rainfall gauges, 8 synoptic, 8 climatological automatic weather stations, WMO standard, are installed to support the establishment of an integrated weather monitoring network. (Sierra Leone Meteorological Department-SLMD)(INV: US$ 1,085,730)	Output 1.3:Forecasting meteorological tools, software, infrastructure facilities and specialised training are made available to run SYNERGIE, SADIS & AMESD systems to strengthen the capacity of SLMD to produce improved and sector tailored weather forecasts. (Sierra Leone Meteorological Department-SLMD)	Output 1.4: A total of 6 Meteorologists, 16 Meteorological Technicians, 4 Forecasting Superintendent Officers 20 Specialist Superintendent Officers are trained to support EWS data handling and forecasting operations. (Sierra Leone Meteorological Department-SLMD and the University of Sierra Leone - Fourah Bay College)	Output 1.5: A Communications network is established for SLMD and ONS-Disaster Management Department to support EWS warning and dissemination mechanism. (ONS-Disaster Management Department and Sierra Leone Meteorological Department-SLMD)		
	Climate information integrated into development plans and early warning systems.	Efficient and effective use of hydro-meteorological information for generating early warnings and support long-term development plans.	Output 2.1.: At least 13 Meteorologists and 6 hydrologists are trained in EWS sector tailored weather and hydrological forecasting techniques and information Packaging.(Sierra Leone Meteorological	Output 2.2.: A multidisciplinary and Inter-institutional Technical Committee (EWS-MITEC) is established to develop SOPs (standard operation procedures) and study/plan/propose integration/delivery of EWS products to	Output 2.3.: A CC-Data Management System (CC-DAMAS) is established to allow systematic storage and mainstreaming of digital information to support decision making in sector planning. (The Sierra Leone Environment Protection Agency).(TA: US$	Output 2.4.: The existing dissemination/response system under the ONS-Disaster Management Department (DMD) is strengthened to support EWS. (ONS-Disaster Management Department and Sierra Leone Meteorological	Output 2.5.: A framework for financial sustainability based on cost-recovery service provision is established at SLMD to support future EWS operations. (Sierra Leone Meteorological Department-	Output 2.6: Community based EWS (CBEWS) network is developed in 3 pilot sites to enhance and test its impact on risk reduction in sectors and population. (ONS-Disaster Management Department and	

			Department-SLMD)(TA: US$ 249,057)	the various identified national end users including community sectors. (ONS-Disaster Management Department)(INV: US$ 258,005)	211,435)	Department-SLMD)(INV: US$ 200,564)	SLMD)	Sierra Leone Meteorological Department-SLMD)	
Sao Tome and Principe	Transfer of technologies for climate and environmental monitoring infrastructure.	Enhanced capacity of the National Institute of Meteorology (NIM) and the Directorate General for Natural Resources and Energy (DGRNE) to monitor extreme weather and produce sector tailored weather forecasting.	1.1 12 Automatic Hydrometeorological stations complete with remote data transmission and archiving and 12 river gauges are installed in São Tomé Island and Principe Island.	1.2 A network of 4 synoptic and 8 climatological automatic weather stations, WMO standard, complete with remote data transmission and archiving are installed and 12 manual WMO standard are rehabilitated to support the establishment of an Early Warning System.	1.3 10 workstations to support, AMESD-SYNERGIE and SADIS systems are installed to strengthen the capacity of São Tomé Airport Forecasting Centre. (INV: US$ 374,075)	1.4 5 Meteorologists, 5 Meteorological Technicians, 4 Forecasting Superintendent Officers 10 Specialist Superintendent Officers are trained to support EWS data handling and forecasting operations. (TA: US$ 329,375)			
	Climate information integrated into development plans and early warning systems.	Efficient and effective use of hydro-meteorological information for generating early warnings and support long-term development plans.	2.1 15 Meteorologists and 6 Hydrologists are trained in tailored Weather Forecasting, Special and Warning Packaging.	2.2 Sector tailored early warning products – based on interagency harmonized agreements and international standards and protocols – are developed and made accessible to Disaster Management structure in STP.	2.3 National capacity and inter-sectoral framework for mainstreaming weather and climate information into national development planning policies, district disaster preparedness and management is built specifically targeting Neves, Santa Catarina, Malanza, Ribeira Afonso and Sundy.	2.4 National (Civil Society and Government) Communication Channels, dissemination and response mechanisms, including “sms” text and pictorial alerts are established.	2.5 A Plan for financial sustainability based on cost-recovery service provision to support future EWS operation and maintenance developed and implemented, including the operationalisation of a public-private platform.		
Tanzania	Transfer of technologies for climate and environmental monitoring infrastructure	1. Enhanced Capacity of TMA and Water Basins to monitor (and forecast) droughts and floods	1.1 36 additional automated stations generate hourly climate data (1,696,900 US$) (INV)	1.2 real time hydrological and river flow data available at Water Basin level in the two districts (88,500 US$) (INV)	1.3. Flood forecasting models, flood forecast management systems and flood risk maps are developed for each major river within the	1.4 Hydrological and climate data collected from various monitoring systems is integrated into a harmonized database that is			

					two project river basin (48,000 US$)(TA)	accessible to all sectoral users (281,000 US$) (TA)			
	Climate information integrated into development plans and early warning systems	2. Efficient and effective use of hydro-meteorological information for making early warnings and long-term development plans.	2.1 Standard Operating Procedures for droughts and floods specifying EW codes, communications channels, roles and responsibilities and emergency procedures (252,000 US$) (TA)	2.3 One EWS simulation and adaptation planning exercise deployed in each districts generates lessons learned for upscaling and replicating (242,000 US$) (TA)	2.5 Lessons learned and recommendations on replication, including costs and benefits of EWS are available (55,000 US$) (TA)	2.6 Climate Change and Climate Hazards included in local development plans and land use plans in Liwale and Meru districts (75,000 $) (TA)	2.7 A plan for the sustainable financing for the operation and maintenance hydro-met network is developed and nationally approved (281,500 US$) (TA)		
Uganda	Transfer of technologies for climate and environmental monitoring infrastructure.	Enhanced capacity of the Department of Meteorology (DoM) and Department of Water Resource Management (DWRM) to monitor and forecast extreme weather, hydrology and climate change.	1.1 16 Automatic Water Level Stations (AWLSs) installed and 40 manual hydro-meteorology stations and 5 AWLSs rehabilitated in the Victoria, Kyoga, Albert and Upper Nile Water Management Zones (WMZs.).	1.2 25 Automatic Weather Stations (AWS) installed and 32 manual (12 synoptic, 10 agro-meteorological and 10 hydro-meteorological) and 32 AWSs rehabilitated in priority districts.	1.3Weather and climate forecasting facilities upgraded including an integrated hydro-meteorological data management and information system and an online web platform for operationalizing collaboration arrangements and procedures between DWRM and DoM. (INV: US$ 274,075)	1.4 Capacity developed for operating and maintaining observation networks and related infrastructure including training 9 meteorological and 10 hydrological trainers and 50 weather observers, raising local community awareness, developing an O&M toolbox, and establishing internal arrangements and procedures between DoM and DWRM. (TA: US$ 229,375)			

	Climate information integrated into development plans and early warning systems.	Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term adaptation.	2.1 Technical capacity of DoM and DWRM is strengthened by training 16 forecasters – including 8 senior and 8 junior – to build in-house capacity for producing standard and customized weather and climate forecasts and packaging hydro-meteorological data and information into a suitable format for user-agencies and local community end-users. (TA: US$ 198,375)	2.2 Tailored weather and climate information (including colour-coded alerts – advisories, watches and warnings – for flood, drought, severe weather and agricultural stresses, integrated cost-benefit analyses and sector-specific risk and vulnerability maps) made accessible to decision makers in government, private sector, civil society, development partners and local communities in the Teso and Mt Elgon sub-region. (INV: US$ 258,005)	2.3 Weather and climate information mainstreamed into national policies, annual workplans and local development including the National Policy for Disaster Preparedness and Management, and district and sub-county development plans in priority districts in the Bukedi, Busoga, Elgon, Teso, Acholi, Karamoja and Lango sub-regions. (TA: US$ 211,435)	2.4 Governmental and non-governmental communication channels and procedures for issuing alerts including advisories, watches and warnings are strengthened at a national and local level including the development of an early warning system dissemination national and local toolbox and mobile-based alert platforms in the Teso and Mt Elgon sub-regions.	2.5 Sustainable financing options – including appropriate government cost recovery arrangements, service level agreements and public-private partnerships – identified, developed and implemented for the operation and maintenance of the installed hydro-meteorological observation, forecasting and early warning system.		
Zambia	Transfer of technologies for climate and environmental monitoring infrastructure.	Enhanced capacity of Zambia Meteorological Department to monitor and forecast extreme weather and climate change.	1.1 28 Automatic Weather Stations procured and installed, and 41 existing manual and automatic monitoring stations rehabilitated.(INV: US$ 1,424,474)	1.2 Weather and climate forecasting systems updated, including the installation of required hardware and software and integration of satellite observations.(INV: US$ 553,065)	1.3Capacity developed for operating and maintaining the climate observation network and related infrastructure including the training of 10 engineers, 10 technicians and local communities to maintain and repair meteorological equipment, computer infrastructure and telecommunications network.(TA: US$ 338,301)	1.4 Technical capacity of ZMD is strengthened to improve the production of standard and customized weather and climate forecasts and packaging meteorological data and information into a suitable format for user agencies and local community end-users. (TA: US$ 258,160)			

	Climate information integrated into development plans and early warning systems.	Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans.	2.1 Tailored, sector-specific weather and climate information made accessible to decision makers in government, private sector, civil society, development partners and local communities.(TA/INV:US$ 358,586)	2.2 National capacity developed for assimilating weather and climate information into existing national policies, development plans and disaster management systems. (TA: US$ 122,389)	2.3 Communication channels and procedures for issuing warnings are enabled at a national level, and implemented at a district level through the development of mobile phone-based alert platforms in the priority districts of Chipata, Gwembe and Sesheke.(INV/TA: US$ 653,326)	2.4 Public-private partnership developed for sustainable financing of the operation and maintenance of the installed meteorological observation network.(TA: US$ 101,699)			