REQUEST FOR CEO ENDORSEMENT
PROJECT TYPE: Full-sized Project
TYPE OF TRUST FUND:LDCF

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PART I: PROJECT INFORMATION

Project Title: Strengthening climate information and early warning systems in Tanzania for climate resilient development and adaptation to climate change			
Country(ies):	Tanzania	GEF Project ID:[1]	4991
GEF Agency(ies):	UNDP(select)(select)	GEF Agency Project ID:	5096
Other Executing Partner(s):	Prime Minister's Office - DMD	Submission Date:	July 23, 2013
GEF Focal Area (s):	Climate Change	Project Duration(Months)	48
Name of Parent Program (if applicable): ➢ For SFM/REDD+ ☐ ➢ For SGP ☐	n/a	Agency Fee ($):	400,000

A. FOCAL AREA STRATEGY FRAMEWORK[2]

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Grant Amount ($)	Co-financing ($)
CCA-2(select)	**Outcome 2.1** Increased knowledge and understanding of climate variability and change-induced risks at country level and in targeted vulnerable areas	**Output 2.1.2** Systems in place to disseminate timely risk information	LDCF	2,114,400	20,930,000
CCA-2(select)	**Outcome 2.2** Strengthened adaptive capacity to reduce risks to climate-induced economic losses.	**Output 2.2.2** Targeted population groups covered by adequate risk reduction measures	LDCF	1,705,600	1,985,000
Project Management Cost			LDCF	180,000	250,000
Total project costs				4,000,000	23,165,000

B. PROJECT FRAMEWORK

Project Objective: To strengthen the climate monitoring capabilities, early warning systems and available information for responding to climate shocks and planning adaptation to climate change in Tanzania.

Project Component	Grant Type	Expected Outcomes	Expected Outputs	Trust Fund	Grant Amount ($)	Confirmed Co-financing ($)
A. Transfer of technologies for climate and environmental monitoring infrastructure	TA/INV	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	LDCF	2,114,400	20,930,000

[1]Project ID number will be assigned by GEFSEC.
[2] Refer to the Focal Area/LDCF/SCCF Results Framework when completing Table A.

			and river flow data available at Water Basin level in the two districts (88,500 US$) (INV) 1.3. Flood forecasting models, flood forecast management systems and flood risk maps are developed for each major river within the two project river basin (48,000 US$)(TA) 1.4 Hydrological and climate data collected from various monitoring systems is integrated into a harmonized database that is accessible to all sectoral users (281,000 US$) (TA)			
B. Climate information integrated into development plans and early warning systems	TA/INV	2. Efficient and effective use of hydro-meteorological information for making early warnings and long-term development plans.	2.1 Standard Operating Procedures for droughts and floods specifying EW codes, communications channels, roles and responsibilities and emergency procedures (252,000 US$) (TA) 2.2 An operational emergency operations unit that coordinates EW emission and DR activities for the country, based on SOPs (429,600 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) 2.4 a crowd-sourced hazard feedback and agricultural planning platform is installed (370,500 US$) (INV) 2.5 Lessons learned and	LDCF	1,705,600	1,985,000

			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)			
Subtotal					3,820,000	22,915,000
Project management Cost (PMC)					180,000	250,000
Total project costs					4,000,000	23,165,000

C. SOURCES OF CONFIRMED COFINANCING FOR THE PROJECT BY SOURCE AND BY NAME ($)

Please include letters confirming cofinancing for the project with this form

Sources of Co-financing	**Name of Co-financier (source)**	**Type of Co-financing**	**Co-financing Amount** ($)
National Government	Prime Minister's Office – DMD	Grant	1,380,000
National Government	Tanzania Meteorological Agency	Grant	20,575,000
National Government	Ministry of Water	Grant	610,000
Multilateral Agency	UNDP	Grant	600,000
Total Co-financing			23,165,000

D. TRUST FUND RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY1

GEF Agency	**Type of Trust Fund**	**Focal Area**	**Country Name/ Global**	**(in $)**		
				Grant Amount (a)	**Agency Fee** (b)[2]	**Total** c=a+b
UNDP	LDCF	Climate change adaptation	Tanzania	4,000,000	400,000	4,400,000
Total Grant Resources				4,000,000	400,000	4,400,000

[1] In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table. PMC amount from Table B should be included proportionately to the focal area amount in this table.

2 Indicate fees related to this project.

E. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:

Component	**Grant Amount ($)**	**Co-financing ($)**	**Project Total ($)**
International Consultants	160,000	0	160,000
National/Local Consultants	701,000	0	701,000

F. DOES THE PROJECT INCLUDE A "NON-GRANT" INSTRUMENT?No

(If non-grant instruments are used, provide in Annex D an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF/NPIF Trust Fund).

PART II: PROJECT JUSTIFICATION

A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN OF THE ORIGINAL PIF[3]

There are a few modifications to the PIF's original design. Under Component 1, a number of outputs were revised, to take into account the results of the baseline assessment that showed that many of the intended activities had already been delivered under other initiatives. This project therefore focuses on the acquisition of hydrological and climate monitoring equipment according to the most urgent gaps highlighted by the Tanzania Meteorological Agency and the Ministry of Water. The installation of radar and upper air stations was foregone due to high costs and low cost efficiency, as well as due to the fact that a new radar was already under installation in the country. New outputs were added to build capacity on flood forecasting, as well as on data sharing among the various users.

Under Component 2, the new outputs are also more aligned with the current needs of the country with regards to the integration of climate change into long-term planning at local level, as well as with the need to demonstrate local benefits of the early warning system. The project now includes a simulation of the EWS, and builds on ongoing policy initiatives to develop standard operating procedures, streamline communications channels, and ensure benefits for local populations.

There have been no changes to the outcomes of the project, but the distribution of costs between the components was adjusted to reflect real costs and updated needs. Co-financing amounts were also revised and adjusted to reflect the project's additional benefits and anchoring to national baseline development projects. Total financing remains unchanged, as per the table below:

Component	Original LDCF Financing	Updated LDCF financing	Original co-financing	Updated co-financing
1	2,710,000	2,114,400	2,750,000	20,930,000
2	1,100,000	1,705,600	16,115,586	1,985,000
Project management	190,000	180,000	239,000	250,000
Total	4,000,000	4,000,000	19,104,586	23,165,000

A.1 National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAS, NAPs, NBSAPs, national communications, TNAs, NCSA, NIPs, PRSPs, NPFE, Biennial Update Reports, etc.

1. This project makes a direct contribution to addressing the 2006 NAPA Priorities in the water and health sectors (Priority 6, develop an early warning system for drought and flood) and in the human settlements area (priority 7, "Establish a Disaster planning framework"). The project also falls within the framework of the Expanded NAPA of 2009, where early warning systems for droughts and floods are also mentioned as priorities in the short-, medium- and long-term for the agriculture sector, and as a cross-cutting priority.
2. In addition, this project also contributes to addressing issues highlighted in the recently launched 2013 National Climate Change Strategy, which aims to put in place a better institutional arrangement to adequately address and change. The goal of the strategy is to enable Tanzania to effectively and that climate change and to participate in global efforts to mitigate climate change with a view to achieving sustainable development, in line with the five-year national development plan, the Development Vision 2025, as well as national sectoral policies.
3. The project also contributes to ensuring the sustainability of national development goals, including those expressed in the National Strategy for Growth and Reduction of Poverty I and II (MKUKUTA I &II). MKUKUTA II advocates for food security and climate change adaptation and mitigation.

[3] For questions A.1 –A.7 in Part II, if there are no changes since PIF and if not specifically requested in the review sheet at PIF stage, then no need to respond, please enter "NA" after the respective question

4. The project is in line with the Tanzania Five Year Development Plan 2011/2012 – 2015/2016 that highlights five core priorities to unleash Tanzania's latent growth potentials. Most of the core priorities in the plan are climate change vulnerable sectors (agriculture, tourism), and the plan further highlights the need to enhance coordination and knowledge on climate change issues.

A.2. GEF focal area and/or fund(s) strategies, eligibility criteria and priorities.

No change from the PIF. See section 2 of the Project Document for additional detail.

A.3 The GEF Agency's comparative advantage:

No change from the PIF. See section 2.3.4 for additional detail.

A.4. The baseline project and the problem that it seeks to address:

There has been no significant change in the barriers this project seeks to address. See section 1.3 of the Project Document for additional detail.

In order to demonstrate the anchoring of this LDCF Grant to national priorities and baseline programmes, the project is now designed to provide additional adaptation funding to the following national baseline programmes:

- The ongoing Tanzania Meteorological Agency's hydro-climate monitoring programme, and its 5-year Plan.
- The ongoing Ministry of Water and Water Basin Authorities hydrological monitoring programmes under the Water Sector Development Programme.
- The Ministry of Agriculture's current programming on crop and rainfall monitoring for food security.
- The Prime Minister's Office's current programming in the framework of disaster risk management, including the revision of the Disaster Management Policy and Act and efforts to develop a national and district-level Emergency Preparedness Plans.

Baseline projects and co-financing is therefore as below:

Sources of Co-financing	**Name of Co-financier(s)**	**Purpose**	**Amount ($, over duration of project)**
Government of Tanzania	Tanzania Meteorological Agency	- Ensures current operations and maintenance of the climate monitoring system; - Delivers weather forecasts, climate forecasts, climate models and early warnings - Acts as the main climate data provider for all sectoral clients - Collects and conserves climate data	20,575,000
Government of Tanzania	*Prime Minister's Office – Disaster Management Department*	- Establishes the institutional legal and regulatory framework for disaster management - Manages and coordinates DRM and Disaster Response - Establishes and implements the Tanzania Emergency Preparedness and Response Plan - Coordinates with local disaster management authorities, district councils and communities on disaster risk reduction and relief - Emits Standard Operating Procedures and guidelines - Emits Early Warnings	1,380,000

Government of Tanzania	*Ministry of Water/ Water Basin Boards*	- Monitors, mobilizes and manages water resources in the country - Works with local communities to effectively manage water - Undertakes infrastructural works to mobilize, manage and conserve water - Undertakes river and surface water monitoring and flood response	610,000
Implementing Agency	*UNDP*	- Support the GoT's work on Disaster Risk Reduction through financing and technical support - Support the GoT's development agenda through funding and technical support - Implement Disaster management Project	600,000
Total Co-financing			**23,165,000**

The project will also make use of relevant baseline capacity created by projects such as the Africa Adaptation Programme, the Disaster Management Project (UNDP), and other connected projects and programmes. See section 2.3 of the Project Document for additional details.

A. 5. Incremental /Additional cost reasoning*: describe the incremental (GEF Trust Fund/NPIF) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF/NPIF financing and the associated global environmental benefits (GEF Trust Fund) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project:*

Outcome 1: Enhanced Capacity of TMA and Water Basins to monitor (and forecast) droughts and floods
Without LDCF/SCCF Intervention (baseline):

This project builds on – and addresses key gaps in - the current baseline of operations of the Tanzania Meteorological Agency in terms of climate monitoring, weather prediction and forecasting, as well as on the work of Water Basin Authorities in terms of flood monitoring and mitigation. The TMA performs regular climate monitoring services, including rainfall and other climate parameters through a network of manual and automatic stations. At the moment, the percentage of the country that is covered by the operational climate monitoring system is estimated at 50% (mostly manual stations), and the percentage covered by an automated network is estimated at 30[4]%.

Transmission and global exchange of weather data in TMA occurs along three levels of communication links, namely transmission from observation stations to collecting zonal offices then from zonal offices to Central Forecasting Office (CFO) and from CFO to the Regional Telecommunication Hub Nairobi, Kenya. ICT technology is deployed at CFO for data flow and access from TRANSMET to forecasting tools (Synergie), from RETIMs to TRANSMET through Local Area Network (LAN). TMA uses telephones, Single Side Band radios (SSB's), Mobile phones, Internet and e-mail, VSAT Telecommunication System for data transmission and acquisition.

The TMA has drought and seasonal forecasting skills and benefits from skilled staff and a well staffed forecasting office (361 people including network operations personnel). While staff are already available and well-trained, the tools to deliver an efficient and functioning monitoring and forecasting system are missing: servers and computing power have been noted during project preparation activities as one key limitation to the development of computerized forecasts, and the prevalence of manual stations in the network results in slow data flows. TMA currently runs two Numerical Weather Prediction (NWP) models; the Weather Forecasting and Research (WRF) model and the High Resolution

[4]These figures are estimated based on data received during project preparation and compiled using various sources, including the TMA's database of existing stations, the MoW's list of stations, and the TMA's proposed 5 year plan.

Model (HRM). Due to limited computing resources, TMA generates short-range forecasts with a low horizontal resolution to minimize model run time. As a result, the TMA is relatively well placed for predicting slow-onset weather events and seasonal forecasts, but lagging behind in terms of now-casting and early warning. .

Current annual baseline costs of operating the TMA and its network are 10.8 billion TZS (approx. 6.7 million USD). The TMA's Five Year Plan for Enhancement of Meteorological Services for Sustainable Socio-economic Development in Tanzania (2010-2015) foresees an additional 35 million US$ overfiveyearstoenhancetheservices and infrastructure of the TMA. Of this amount, only 15% has been funded to date.

TMA and the other ministries maintain all weather/climate data on paper archives and accesses them manually when specific requests are made or when specific models require this information. The TMA also operates and maintains the network (in accordance with available finances) of synoptic and rainfall stations across the country. It performs weather forecasting and issues daily, dekadal and seasonal bulletins, using a combination of manual and digital plotting and numerical forecasting.

For hydrological monitoring, the WBA each maintain, according to their resources, a network of rainfall gauges and river gauges that are read manually by station monitors (semi-volunteer observers). Data is sometimes transmitted to the TMA using paper formats or, where possible, SMS systems, and – in the case of registered automatic weather stations – through the telecommunication system. However the data cannot be recovered from the TMA once uploaded, as there is no shared database. There is currently no flood forecasting or early warning capacity in the MoW or within the WBA, in particular in the Ruvuma and Pangani Basins where the two project districts are located.

Where manual stations exist, river level data is read manually every two hours, but the information is transmitted according to the observers' capacity and means (by SMS, telephone, mail). The current budget is estimated at around 100,000,000 TZS (60,000 USD) for maintaining EW networks annually. In the Ministry at central level there are 50 staff employed in the EW related sections; WBAs are independently staffed with 30 to 50 professionals each depending on the size of the basin. The Ministry of Water also administers the Water Sector Development Programme, a 2,8 billion USD initiative (WSDP, 2006-2025). The programme aims at addressing shortfalls in urban and rural water supply infrastructure, to improve water resource management primarily through upgrading the country's nine Basin Water Offices, and to strengthen the sector institutions and their capacities. Under the WSDP, the MoW and various WBAs have acquired or rehabilitated 60 meteorological stations that are currently under MoW administration. Plans are underway to share the data from these stations with the TMA.

The Ministry of Agriculture, whose mandate is to use the meteorological data to produce forecasts on food security, cannot currently deliver its functions for lack of data. Where it once maintained a parallel network of rainfall stations using SMS transmission, these have been out of operation since 2009 due to a lack of funds to cover the recurring costs. The MoA has recently acquired a satellite receiving station that it uses to track rainfall data in relation to crop growth information it receives from the extension services. Regarding human capacity, the Ministry houses one agrometerologist, one agronomist, one agroeconomist and one agrostatistician and the Crop Monitoring Department is comprised of 1 person. There is no designated officer for communications with the district agricultural officers in case of warning. Communications with the districts occurs using regular mail, telephone or fax. At district level, staff is generally not well versed in the interpretation of climate data, relying excessively on products and information provided by the center.

Estimated total baseline funding that this project builds on under Outcome 1 is USD 20,930,000 over 4 years, based on estimated annual costs of ongoing programming by the Tanzanian government through TMA and MoW.

With LDCF/SCCF Intervention (adaptation alternative)

Output 1.1 will invest in the acquisition and installation of additional weather/climate monitoring equipment under the responsibility of the TMA This equipment will enable the organization to more accurately monitor the current weather/climate and to increase the accuracy of short-term (daily) and long-term (seasonal, decadal and climate change) forecasts, as well as warnings and alerts. Through LDCF funding the TMA will acquire a total of 36 AWS with agro-meteorological sensors to be installed in and around the two project districts as a matter of priority, and then deployed nationally according to TMA's deployment plan and list of priority sites, where no station currently exists, and in coordination with other Ministries to ensure there is no duplication of equipment (See Annex 2 for preliminary list of TMA sites). In order to support this expansion of the network, the project will also support training for 6 TMA engineers and instrument specialists in the operation, calibration and repair of new stations and maintenance of the telecommunications network.

Output 1.2 will invest in the acquisition of hydrological monitoring equipment under the responsibility of the WBAs in Ruvuma and Pangani. LDCF funding will be used to acquire 20 hydrological monitoring stations, 20 automated river staff gauges and 20 automated rainfall gauges for local flood monitoring and forecasting, which will all be deployed in the two basins targeted by the project according to needs and specifications expressed in each Basin's Hydrographic Design. This monitoring equipment will be used to collect and generate real time data that will be available locally and transmitted to the TMA simultaneously.

Output 1.3 will further support the development of flood forecasting in the Ruvuma and Pangani basins, including the sub-catchment piloting areas. The LDCF funding will be used to acquire flood forecasting software and computing facilities (servers and workstations), and to enable the WBAs to develop flood forecasting models and flood risk maps using available climate and hydrological data, including updated data coming in from the new monitoring stations acquired in Output 1.2 above. The types of forecast models to be developed will be determined during the inception phase. The Water Basins will be enabled to perform various tasks using flood management software, including: real-time local flood forecasting based on hydrological and precipitation data (rainfall-runoff models, or hydrological models), development of GIS-based flood risk maps and models using varied parameters to optimize decision making, better management of hydraulic structures (e.g. dams), and environmental monitoring. Models will use the available historical climate and hydrological data for the districts and the basins that is currently kept on paper in various sites in TMA and within the Water Basins. Linkages will also be explored with the WMO initiative on Flash Flood Forecasting for SADC.

Output 1.4 will address the existing gaps in data coordination and data sharing by working with all climate and hydrological data users and producers to develop a shared platform for data sharing. Funding will be used to establish, through a working group comprised of TMA, MoW, MoA and DMD, and Water Basin Boards, an integrated database of climate/hydro information that can be accessed by sectoral users in real time. Access and cost recovery protocols will also be developed around this shared platform. The database will be maintained by TMA and managed through the working group. Access by other sectoral users will be made available through online portals. Existing data concerning the two project districts, currently available only on paper, will be digitized through a systematic document management system, input into the database, and other digitally available data will be migrated into the shared platform.

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

Without LDCF/SCCF Intervention (baseline)

This project builds on ongoing baseline programming led by the Prime Minister's Office (Disaster Management Department) to review existing legal frameworks and to develop Emergency Preparedness Plans at national and district levels. This process is also supported by UNDP's ongoing programming in Disaster Risk Reduction, as well as the

work of many partners who work on disaster relief and risk management at local level including WFP, UNICEF, UNFPA, TRCS, World Vision, Care and Plan International. The Disaster Management Department (DMD) is responsible for coordinating all disaster management issues in the country including disaster relief operations and preparedness measures. The DMD receives initial notification or warning of disaster from multiple sources, chiefly from the TMA (concerning climate-based or weather-based warnings) or from local sources (concerning occurrences of disaster). Once a notification is received, the DMD convenes the National Disaster Management Committee (NDMC) who informs the Prime Minster, who then informs the President of the United Republic of Tanzania accordingly. Following a disaster, the DMD coordinates relief efforts.

The Disaster Management Department is manned with 12 technical staffs of which three are managers, and 6 additional support staff. These technical staffs have been drawn from different fields. None of the staff members have had formal training on disaster management but they have attended short courses. The DMD annual budget is TZS 700 million (433,300 USD). The Disaster Relief Fund (which stood at 4.9 million USD in 2013) can be expended upon the authorization of the Tanzania Disaster Relief Commission (TANDREC), while the department expenditure depends on cash flow. Additional resources in the amount of 511,915 USD were mobilized by the DMD in 2012-2013 through development partners, including UNDP.

The DMD is currently leading a nation-wide effort to revise the Disaster Management Policy Framework. This includes developing a new Disaster Management Act which is due to be approved in 2013, and which proposes a number of changes to current institutional structures, including granting full autonomous Agency status to the DMD. In parallel, the DMD has developed the Tanzania Emergency and Preparedness Plan (TEPRP, 2013) that describes various disaster situations and planning assumptions, operational concepts, response and recovery actions, organizational and other assignments of responsibilities to the departments and government agencies tasked with local response efforts.

The TEPRP does not yet contain a comprehensive set of Standard Operating Procedures that highlight each partner's roles and responsibilities, the types of early warning messages, appropriate responses, resources and communication pathways to reach local communities. This lack of SOPs and the gaps in procedures means that the government and local partners must each time deal with disasters in an ad hoc manner. There is no harmonized definition of hazards and triggers, and communication of hazards does not follow established channels and codes of conduct. Most importantly, local community participation in early warnings is still ignored. This means that opportunities for bottom-up early warning, using crowd-sourcing technologies for example, are not currently taken into consideration. As a result, local communities remain highly vulnerable to increased variability and frequency of extreme weather.

In addition, the country has no 24-hour emergency unit that can receive EW information and transmit accordingly. There is a 24-hour emergency operations unit in Dar es Salaam, but its coverage is limited. At the moment the creation of a national unit remains a plan in the TEPRP and the Draft Disaster Management Act and it is unlikely to be fully operational in the short-term. As a result, EW information transmitted by the TMA sometimes has to wait until regular business hours for the DMD to be able to launch emergency procedures.

There has been little thinking at national level on the costs and benefits of maintaining an appropriate weather/climate/hydrological monitoring and early warning system. Insufficient funds provided for maintenance and equipment upgrading places undue burdens on the current infrastructure and maintenance staff, and as a result, the monitoring system is under-performing and obsolete. At the moment, TMA only recovers a small portion of its costs by selling data to particular clients (an approximate figure of 60,000 US$ per year from private clients has been reported by TMA, but there is no available list of customers). There is much untapped potential, particularly with the large public-private partnerships being launched by the government in different sectors, including agriculture (for example Southern Agricultural Growth Corridor - SAGCOT).

Furthermore, there is no clear telecommunications regulation governing the use of airwaves, frequencies and networks during emergencies, which creates additional costs for the monitoring system, and which has resulted in each ministry separately entering into individual and sometimes costly agreements with telecommunications operators.

At the local level, as part of the TEPRP efforts, emergency preparedness plans are under development in selected districts, including the Liwale and Meru districts. However, local development planning frameworks (e.g. District Strategic Development Plans or District Budget Plans), including land use plans, do not yet take into full consideration the possible impacts of climate change and of increased climate-induced hazards. In the absence of flood risk mapping, many people continue to build and cultivate in flood-prone areas, and long-term economic development planning at local level continues to be jeopardized by climate variability and climate hazards. While drought forecasts are available at regional level from the TMA, these are not well translated into agricultural guidance for local land users, who practice agriculture-as-usual even in cases of rainfall failures, often leading to aggravated food insecurity.

Finally, a number of other development partners are also supporting the GoT in its efforts to enhance disaster preparedness as well as through disaster relief support. Tanzania Red Cross coordinates the distribution of disaster relief assistance in areas struck by disaster. World Vision works with local communities to develop food security, including through training of smallholder producers in improved farming methods, water management, and the dissemination of basic sanitation services.

This project builds on a baseline of USD 1,985,000 comprised of the ongoing operations of the DMD regarding early warnings (including UNDP support), Ministry of Water (regarding flood monitoring), as well as the UNDP's support to the DMD through its disaster risk reduction programming.

With LDCF/SCCF Intervention (adaptation alternative)

Output 2.1 will establish effective communications channels and procedures for issuing early warnings through both government and non-governmental channels. A set of Standard Operating Procedures for climate hazards will be developed and operationalized with the participation of all relevant stakeholders in the DRM community, under the leadership of the PMO-DMD. These SOPs will be based on the revised TEPRP and will include the following elements:

- A set of EW triggers and codes for their rapid communication
- A set of established communication pathways between TMA, DMD and other partners at local and national level
- A set of procedures for using public airwaves and telecommunications mechanisms for emitting EW bulletins
- A set of procedures for each Ministry highlighting their roles and responsibilities in each scenario or for each category of EW
- A mechanism for relaying the warnings to the district and ward-level disaster management committees
- A mechanism for feedback from local communities during and after EW, including for reporting on small-scale events such as land slides, damages and losses.

Output 2.2 will support the establishment of the 24-hour emergency operations unit (EOU) within PMO-DMD. This will include a feasibility study that will cover location options, long-term financing, institutional arrangements, and other managerial considerations. LDCF funding will be used to cover the costs for staff for the duration of the project and telecommunications equipment. After the end of the project, the PMO-DMD will integrate these costs into its regular budget. The purpose of this activity is to demonstrate the benefit and increased effectiveness of having an

operational 24-hour operations unit that can help avoid losses through the dissemination of real-time warnings and early recovery planning.

Under **output 2.3**, this operations center will become the focal point for launching a simulation of the EWS in the two pilot districts, using the newly developed SOPs when available. Working with disaster management committees at district and ward level, the project will develop disaster scenarios and run a hazard simulation exercise with local communities. Each district will work with one disaster scenario representing a given climate hazard (in this case, a flood or a major drought), and run a single simulation exercise which is expected to last 1-2 months.

Output 2.4 will support the deployment of a crowd-sourced disaster management platform whereby local communities will be provided with telecommunications means (either simple smart phones or tablets) to upload real-time disaster and vulnerability information (including coping capacity, socio-economic data, evaluation routes, stocks and reserves). This system will be combined with an SMS-based system for transmission of relevant agro-meteorological information, that will be designed to be usable by all users, and targeted specifically to smallholders, with gender-specific messaging as needed. It is expected that this system will provide information to the Emergency Operations Unit, while enabling the local communities to anticipate, plan and address hazards and climate variability locally. This will be supplemented by training for local media, CBOs, gender-based organizations and other NGOs active in the project regions on dissemination and interpretation of EW and climate information. The volunteers mentioned above will receive training on the use of the platform and will be required to act as information relays within their groups or community. The project will monitor the efficiency of the platform, in conjunction with the extension service, as a tool for delivering agro-meteorological information.

Through **output 2.5**, LDCF funding will support the extraction of concrete lessons learned. This will involve gathering local data on productivity, livelihoods, infrastructure assets, and providing a baseline assessment of economic productivity in the targeted district. This data will then be used during the simulation exercises in output 2.3 to project potential economic and social losses from the fictional hazard, using short, mid-and long-term economic models and prediction approaches, as well as direct and indirect losses incurred. This data will then be extrapolated to assist in developing lessons on the long-term economic benefits of operationalizing an EWS and recommendations on the future expansion of the EWS.

To support the resilience of long-term planning, under **output 2.6**, the project will support, through work with the local authorities, Basin authorities, ward and district councils, the integration of climate information, climate scenarios and flood risk mapping (Output 1.3) into the local development planning processes, in particular land use planning and local development plans Meru and Liwale districts. This will include identifying information on local vulnerability, and integrating climate information and other data into the planning processes for district budget plans and district strategic development plans, according to their planning cycles. This process will use observed trends in climate, data on the potential economic losses in the short, medium and long-term produced in the output 2.5, as well as socio-economic projections, to recommend changes to the local development plans and budgets. These changes could include: changes in land use planning and urbanization plans, revised budget allocations to address emerging vulnerabilities, revised economic growth production, or new investments in infrastructure. Changes to the local development plans and budgets will be incorporated by the District Councils, during normal planning cycles, with technical assistance from the project.

Finally, the LDCF funding will support through **Output 2.7**, the development of a comprehensive sustainability and exit strategy. This will include working with the Tanzania Telecommunications Regulation Agency to address any shortcomings in the way telecommunications providers interact with government partners in terms of transmitting weather/climate data and early warnings. The expected end result will be that all private operators will be engaged and, if necessary, legislated (either by law or through enforceable licensing agreements) to provide services for the early warning system, including for accessing the crowd-sourced disaster management platform. Recommendations to the

government on upscaling of the EWS, on long-term financing for the hydro-climatic monitoring network, and for long-term maintenance of the Emergency Operations Unit, based on assessments of economic costs and benefits and lessons learned from the project, will also be made at the end of the project period. The project will also support the development of a private-sector engagement platform within the TMA, which will seek to increase the revenue generated from data services. This will include a special brief on financing issues for focusing on the annual costs of maintenance to be sourced from the national budget, cost recovery mechanisms and data sharing protocols.

A.7. Coordination with other relevant GEF financed initiatives

One of the strategic principles that will influence the implementation of this project are the links and synergies with the other similar projects (in Benin, Burkina Faso, Ethiopia, Liberia, Malawi, Sierra Leone, São Tomé & Príncipe, Tanzania, Uganda and Zambia) implemented through UNDP and funded through the LDCF. These 10 projects were designed simultaneously and as such, synergies have been and will continue to be explored among them. Common indicators have been included in the projects in order to facilitate aggregate results reporting and to allow comparisons between countries. Opportunities for joint activity delivery (training and knowledge sharing) will be explored and facilitated through UNDP and through a set of common services, including technical support and administrative assistance (see section B.3). Example activities that could be organised on a multi-country basis include:

a. Activity 1.3.1 Acquire flood forecasting software, tools and methodologies through training.

b. Activity 1.4.1: Rescue, digitize and archive relevant available historical data from all ministries.

c. Activity 2.3.4: Field visits and stakeholder consultations to understand how users of early warning advisories and warnings use the information for managing climate and weather related risks and how their decision frameworks affect the interpretation of advisories and warnings

d. Activity 2.5.3: Analyse economic costs and benefits of an early warning system at local level, including data on economic losses avoided from the simulation exercise.

e. Activity 2.5.4: Develop a lessons learned report including methods for replication and extrapolation of the socioeconomic benefits of EWS.

Opportunities for South-South cooperation and multi-country exchanges will also be pursued, including joint trainings and the production of knowledge products and guidelines that can benefit all countries supported through these LDCF-financed initiatives.

B. ADDITIONAL INFORMATION NOT ADDRESSED AT PIF STAGE:

B.1 Describe how the stakeholders will be engaged in project implementation.

The main stakeholders that have been and will continue to be participating in this project are as follows:

The Vice Presidents' Office VPO is the focal point for multilateral environmental agreements (MEAs) that Tanzania is party to. VPO will play a lead role in engaging with UNFCCC initiatives in Tanzania and reporting back to the conference of parties. The project will make use of the coordination capacity of VPO particularly in relation to the Adaptation Fund, the Green Climate Fund, the Climate Investment Funds, the Climate Technology Centers & Networks and any other instruments that may be useful to the project and ensuring alignment with initiatives and policy development under their mandates. In addition, the VPO is responsible for coordinating and tracking all climate-change related initiatives in the country. The VPO will assume the executing role for the project and therefore play an active role in the project through the Project Steering Committee and by providing advice on policy coordination, in particular initiatives under this

project designed to integrate climate change into development planning, for which it has some previous experience. The VPO will also be called upon to participate in the development of the long-term financing strategy for the hydro-climate monitoring network, including through partnerships and outreach with the private sector.

Disaster Management Department-Prime Minister's Office.The DMD is responsible for coordinating all disaster management response issues in the country including disaster relief operations and preparedness measures. The DMD receives initial notification or warning of disaster from multiple sources, chiefly from the TMA (concerning climate-based or weather-based warnings) or from local sources (concerning occurrences of disaster). The DMD will be the lead implementing partner for this project, will house the project management unit and will coordinate activities with all other stakeholders.

Tanzania Meteorological Agency, Ministry of Communication. Tanzania Meteorological Authority is the autonomous entity in charge of providing weather, climate services and warnings for the safety of life and property to the general public and to various users including aviation, marine, agriculture and food security, water resources, disaster management, health and construction industry, with its mission to provide quality, reliable and cost effective meteorological services to stakeholders expectations thereby contributing to the protection of life and property, environment and national poverty eradication goal. The TMA will be one of the main implementing partners and beneficiaries of the project, including through the acquisition, installation and operation of the new equipment. The TMA will also house and administer the shared climate database.

Crop Development department Irrigation department, Ministry of Agriculture. The departments use climate and hydrological information to ensure having current/future food and water security in the country, and they need timely accurate and reliable information necessary for decision making. The focus for the ministry's work is therefore combining climate information with crop information (rate of growth, flowering) to provide an overall forecast of the food situation. Using satellite data and the shared database established by the project, the MoA will be able to access real-time rainfall data that will enable it to deliver better crop production advice to local farmers. The MoA will also lead in the development of agro-meteorological advice that will be transmitted through the crowd-sourcing platform.

Ministry of Livestock and Fisheries Development. The Ministry has the mandate of overall management and development of livestock and Fisheries resources for sustainable achievement of the Millennium Development Goals, National Strategy for Growth and Reduction of Poverty, Improved Livelihood of Livestock and Fisheries Dependent Communities, Food Safety & Security without compromising animal welfare and environmental conservation. The Ministry will be invited to participate in the project through the shared database, particularly in terms of accessing rainfall data that can be of use for rangeland management, and will be invited to participate in the development of agro-meteorological advice for livestock managers in the project districts, in cooperation with MoA.

Water Resources Division, Ministry of Water.To mobilize and manage water resources in the country. The MoW will work with WBAs to map out flood prone areas and whenever required and in collaboration with other agencies issue early warning related to flood forecasting and early warning (FFEW). The MoW will work with the Water Basin Authorities to deliver activities related to flood risk mapping and early warning in the project.

Pangani Water Basin and Ruvuma Water Basin Authorities - Ministry of Water. Water Basin Boards and authorities (WBAs) are mandated to undertake water management with full stakeholder participation at local level. The WBAs will be lead actors in this project including through acquisition, installation and operation of hydrological monitoring equipment, training and mapping out flood risks; coordination of data collection with TMA; and in the deployment of the early warning system in their respective areas;

Tanzania Communications Regulatory Authority (TCRA), Ministry of Communication, Science and Technology. The TCRA has the mandate to regulate the communications and broadcasting sectors in Tanzania. The TCRA will be called upon to assist in developing a clear policy on agreements with the mobile providers on the use of frequencies, airtime and airwaves for early warning system. The TCRA is also expected to take part in the discussions on the long-term financing of the climate monitoring system through cost recovery.

Local Disaster management Committees, Municipal District Council. District Councils (DCs) are the local government authorities. Disaster Management Committees (DMC) exist at district and ward level. The DMCs and DCs will be the main local partner for this project and they will coordinate the deployment of the simulation exercise, participate in the development of SOPs and codes, assist in the collection of socio-economic data, and oversee the deployment of the EWS at local level.

Local communities in the two selected pilot project areas will participate in the deployment of the EWS at local level, testing of the flow of information, crowd-sourcing and on the integration of climate information into local level development planning. These will be the ultimate beneficiaries of the project in the country. Local community groups, such as Water User Groups, women's groups, producer associations, cooperatives and other groups will be drawn upon to assist in the mobilization of local land users and to gather feedback on the project. Volunteers representing each group and major socio-economic sectors will be selected following consultations led by the District Councils, as participants in the crowd-sourcing platform. These volunteers will receive agro-meteorological information directly through devices to be provided by the project, and will be required to help disseminate the information to the members of their groups and communities. They will also be required to participate in the simulation exercise by uploading hazard and damage information through the crowd-sourcing mechanism.

During the project development two consultative stakeholder workshops were conducted, as well as local consultations with the Water Basins, district council offices, and communities. These workshops brought together a number of stakeholders those that have expressed interest and willingness to continue to be involved in the implementation of the project. This includes the government departments, ministries and the independent Departments and Agencies, UN organizations as well, as local NGOs. A report of the project preparation phase is available in Annex 4, and the involvement matrix in the table 3 below provides an overview of how stakeholders were included in the project design.

A Stakeholder involvement plan has been created to provide a framework to guide interaction between implementing partners and the key stakeholders, particularly end-users to validate project progress. Details of the Stakeholder Involvement Plan are indicated in Annex 5 of the Project Document.

B.2 Describe the socioeconomic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund/NPIF) or adaptation benefits (LDCF/SCCF):

This project will provide broad economic and social benefits to Tanzania by providing the means to avoid losses from increased climate variability and climate extremes due to climate change. Because it will also strengthen the overall

framework and infrastructure for climate monitoring, the project will provide benefits for the agriculture sector in Tanzania, enabling better planning in the short, medium and long-term. It is expected that this project will also provide benefits related to the management of water, which is already a key constraint some parts of Tanzania, by enabling better predictive management of droughts and floods. The project is a direct contribution to MDG 7 on environmental sustainability and MDG 1 on reduction of poverty and hunger.

National benefits expected from this project will include reduced losses incurred by the national economy from droughts and floods. For example the study on Economic Impacts of Climate Change in Tanzania (2010) estimates that additional costs incurred from climate change could reach 2% of GDP annually by 2030, whereas the costs of a single severe drought event have been shown to reach 1% of GDP. Losses in the agriculture sector alone may be as high as 35% (yield decreases) by 2050[5]. Energy constraints due to droughts are also estimated to lead to high costs and reduced availability, as hydro-electricity generates 55% of the country's energy. The costs of floods are harder to estimate, but encompass losses of life and property, productive land and assets, health, with longer times of recovery during heavy rain periods. Better anticipation of severe events, stronger preparedness and more rigorous land use planning, informed by accurate weather, climate and hydrological forecasts and predictions, can reduce these losses in the short and long-term.

Short-term national benefits from this project will also include increased cost-savings from automation of the hydro-climate observing system, as well as cost savings and efficiencies from increased coordination and data sharing among the main stakeholders.

At the local level, this project expects to deploy an effective early warning system in two districts that are already highly vulnerable to climate variability. These two districts are comprised of mainly rural areas, where the proportion of poor and extremely poor is already high. Both districts have experienced repeated losses from droughts and floods over the past years. An effective EWS will provide direct benefits to these two areas in terms of avoided losses.

At the local level early warnings and climate hazard mapping, disseminated correctly and acted on appropriately, can provide economic benefits through reducing losses of agricultural produce, infrastructure (roads and bridges) and disruption to peoples livelihoods. This has further benefits on people's health and wellbeing. Communities are expected to benefit from this project through the deployment of the early warning system for both droughts and floods, which will reduce the losses to agriculture from climate hazards, e.g. losses of land during severe rainfall events or floods, and yield decreases during drought periods. Communities will also benefit from the availability of reliable climate data on which to base land-use planning decisions, as well as its use for flood forecasting and risk mapping. The project will also estimate the economic costs and benefits of the early warning system, to assess where, when and under what circumstances it is economically feasible to upscale the monitoring and services that are provided.

The project design integrates gender considerations in a Tanzanian context. Specifically, given their particular roles in agriculture, and the large number of female-headed households in project sites, the project intends to ensure that women play an adequate part in the early warning system, that they benefit from climate information that is relevant to them and their roles, and that the information is presented and transmitted in a way that is accessible to them, considering their specific constraints. In addition, the project will ensure that all training and capacity development opportunities are made available equally to women and men, and equal numbers of participants in meetings, committees, trainings and seminars will be sought during implementation.

B.3. Explain how cost-effectiveness is reflected in the project design:

[5] URT, UK Aid, Economic Impacts of Climate Change in Tanzania (2010).

A number of alternative options were considered for this project that proved to be less cost effective. The first option was to purchase a greater number of higher-end climate stations for deployment throughout the country. As data flows are one of the main constraints faced by the EWS, the argument was that increased data could go a long way to removing key barriers to EWS effectiveness. However, it was decided that coordination among the existing stations and data flows that are being administered by the key Ministries provided a clear option for cost savings, therefore limiting the purchase of new equipment to the minimum and their installation to priority sites to fill major gaps in coverage was deemed more cost-effective.

Another alternative to rainfall measuring stations would have been to invest in radar installation that would cover larger portions of the territory, as originally foreseen in the PIF. This option was not retained because of high costs (upwards of 1 million US$ per radar, not including maintenance and operation costs which are high) and because it was felt that automated weather stations could be equipped with a maximal number of sensors to serve multiple sectoral needs (including agro-meteorology) and can more easily be distributed over a wider region. Tanzania has acquired through separate funding two radar stations, one of which is already in operation in Dar es Salaam and the other that should be installed shortly in Mwanza.

The maintenance of "volunteer" station monitors and rainfall observers was also considered as a means to continue involving local communities in the climate observation network and to ensure continued data flows. However, it was felt that the recurring costs (12$ per person per trimester on an ongoing basis, or an estimated 98,000 US$ annually for the existing manual rainfall stations alone) exceeded the benefit in terms of data and placed the system at risk. In the current project design, the costs of station monitors can be converted to cover the costs of maintenance for the infrastructure (where it replaces current manual stations), as a means to realize some savings for the government.

Repairs to the SMS-based data transmission system used by the Ministry of Agriculture's Crop Departmentfor rainfall data transmission were also considered but were not retained as part of the project strategy for various reasons: first, the costs of the SMS system are high and the Ministry has not had the means to cover them internally to date, with no evidence that this situation would change in the near future. Second, they involve continued payments to station monitors, whose quality and timeliness of data varies (see above). Under the current design, automation and shared data appeared as more cost effective means to ensure that all users could access relevant and timely data.

From a flood prevention perspective, an option could have been to perform river-level monitoring only on selected major rivers and tributaries. This option was not retained because flooding has been shown to occur even from smaller water bodies, particularly in light of expected increases in precipitation during the rainy season. Full, Basin wide hydrological monitoring is the preferred option by MoW to reduce vulnerability to flood and to increase the knowledge on the water resources for more resilient management. It could have been possible also to limit project interventions to the development of a system whereby existing data transmitted to TMA would simultaneously be transmitted to the WBAs for EW purposes. However, on its own, this option would have left some areas already at risk of flooding uncovered by the EWS due to a lack of equipment.

Regarding flood risk mapping, the project could have opted to perform flood risk mapping for only the two districts concerned by the project. This option was not retained since the applicability of the software and training will assist the Water Basins in performing the functions for the whole basin and sub-basins depending on data availability. Furthermore, it was felt that Water Basins would deliver more comprehensive flood assessments if the models could be calibrated to the whole basin. For cost reasons, it was however decided not to extend the initiative to all 9 basins.

In order to enhance the data coordination among stakeholders, the project could have opted for a different strategy. For example, it was considered that each of the main stakeholders could sell its data to the others. However, this approach was not pursued as this would raise problems of recurring costs and was deemed an unsustainable solution. In this alternative, the Crop department in the Ministry of Agriculture in particular would lose out since it has not the means to purchase data annually. Additionally, this would raise issues of data validation, data quality and harmonization. It was also not possible to digitize and migrate all available historical data into the database for reasons of high costs. It was estimated by the TMA that the costs of digitizing all of its available paper records would cost over 1 million US$, costs that would increase if one had to reconcile, harmonize and perform quality control on data from other ministries as well. It was decided to start by demonstrating the effectiveness and usefulness of the database around the two districts in the project, and to seek future financing opportunities from other partners who had shown an interest (e.g. DFID, Finland).

To address the various policy weaknesses in the system, the project could also have opted to wait until the Government of Tanzania set up its Emergency Operations Unit following approval of the TEPRP and the new DM Act. This option was not retained because of the need to demonstrate benefits of an EWS in the short term (e.g. during the project). It was also decided not to rely on Government funding to recruit the staff of the EOU during the project because of delays in recruiting project staff, and because it was felt that a demonstration of effectiveness would assist the government in making a sustainable long-term decision on staffing and funding of the EOU.

It was also suggested that the project could function operating with the current Standard Operating Procedures, adapted on a case-by-case basis. This option was not retained because it was the wish of the Tanzanian Government to further formalize working procedures in Disaster Management. Current operations have also been shown to lead to mis-directions, lack of coordination and duplication of efforts, leading to higher costs of DRM and Disaster response. A suggestion to develop only partial SOPs, that would not include EW codes or graphic messages for local users, but that would focus on the roles and responsibilities of ministries and government agencies, was also not retained. It was felt that one of the reasons for which the EWS was not fully efficient was that it failed to adequately reach local users. Therefore, while the activity could be less expensive, it would not be effective in addressing the target population.

Similarly, it would have been possible to use the crowd-sourcing platform only for hazard information. This option was not retained because of the need to maximize the usefulness of the medium to the local users. The transmission of clear, easy to understand, agro-meteorological information will create an incentive for users to continue using the platform, thereby making its use more cost-efficient and potentially leveraging additional benefits for agricultural extension.

In terms of engaging the private sector, the project design could have opted to engage mobile phone operators on a voluntary basis, rather than using a regulatory approach. This option was not retained because it was felt that the voluntary approach, which is currently being used in an ad hoc manner, has led to high and climbing telecommunications costs for the EWS and the hydro-climate network, and because the approach provides no long-term certainty of service.

This LDCF project is not a standalone project; it is part of a wider multi-country programme that will implement similar initiatives on climate information and Early Warning Systems in at least 10 countries in Africa (including Benin, Burkina Faso, Ethiopia, Liberia, Malawi, Sierra Leone, São Tomé & Príncipe, Tanzania, Uganda and Zambia). Synergies between these projects will be used to enhance the cost-effective hiring of specialized technical staff, coordination of data and information (including inter-country sharing where feasible), training (operations & maintenance of equipment; forecasting techniques; tailored advisories and warnings), and effective use of communications and standard operating procedures.

Surveying the technical support needs for each country a set of common specialized technical staff were identified, each with particular skills related to the development of hydroclimatic observing systems, the effective design and implementation of standard operating procedures and tailored warnings/advisories, as well as the communication of advisories/warnings. Hiring 3-4 full-time technical staff, which can provide the needed support for all countries, will be more cost effective than hiring the same staff as consultants for each country and all projects will benefit from the diverse technical support that will be provided. Further benefits include time saved on HR procurement procedures (e.g. for hiring, advertising etc.) and the ability to compare and standardize support across countries where possible. UNDP will directly undertake the recruitment for all project staff who will support all countries in this multi-country programme.

Training and capacity building for operations and maintenance of the hydromet infrastructure and for modeling and forecasting (Outputs 1.1, 1.3, and 1.4) can also be done at a 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 be closely coordinated with other regional and international partners/centres e.g. WMO/GFCS, ACMAD, ICPAC etc.

Regional support will also be used to help strengthen the development of standard operating procedures (both the procedures themselves and their legal basis), for the issuing and communication of warnings/advisories (Output 2.1 and 2.2), where possible incorporating warnings issued by neighbouring countries e.g. in the case of shared watersheds. Where private sector engagement (Output 2.4 and 2.7) includes multi-national corporations, regional support will assist engaging head offices in multiple countries, increasing the total effective services being offered and hence bargaining position of each government. In the case of mobile (cellular) communications (which may be used for both disseminating alerts and the collection of data used to generate alerts), the regional support programme will leverage collective negotiations for data services, as well as engaging with corporate social responsibility programmes to enhance services where possible

In addition, the project will explore the possibility of joining with some or all countries for the delivery of the following activities, which could be combined for further cost savings:

f. Activity 1.3.1 Acquire flood forecasting software, tools and methodologies through training. This activity could be delivered through regional training with other countries who have similar priorities and use similar products.

g. Activity 1.4.1: Rescue, digitize and archive relevant available historical data from all ministries. This activity could be delivered nationally but through a combined contracting approach to reduce costs;

h. Activity 2.5.1: Analyse economic costs and benefits of an early warning system at local level, including data on economic losses avoided from the simulation exercise. This activity could be delivered alongside other countries to benefit from best available knowledge and promote comparative assessments.

i. Activity 2.5.2: Develop a lessons learned report including methods for replication and extrapolation of the socioeconomic benefits of EWS. This activity could also be delivered on a regional basis, particularly in terms of the analysis of the socio-economic benefits of EWS. This would provide the activity with increased international policy leveraging power, and could potentially reduce costs

C. DESCRIBE THE BUDGETED M &E PLAN:

The project will be monitored through the following M& E activities. The M& E budget is provided in the table below.

A **Project Indicator Baseline study** will be launched immediately upon project inception.

A **Project Inception Workshop** will be held within the first 2 months of project start with those with assigned roles in the project organization structure, UNDP country office and where appropriate/feasible regional technical policy and programme advisors as well as other stakeholders.

Progress made shall be monitored in the **UNDP Enhanced Results Based Managment Platform**.

Based on the initial risk analysis submitted, the **risk log** shall be regularly updated in ATLAS.

Based on the information recorded in Atlas, a **Project Progress Reports (PPR)** can be generated in the Executive Snapshot.

Other **ATLAS logs** can be used to monitor issues, lessons learned etc...

Annual Project Review/Project Implementation Reports (APR/PIR) will be prepared to monitor progress made since project start and in particular for the previous reporting period (30 June to 1 July).

UNDP CO and the UNDP RCU will conduct **visits to project sites** based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the Project Board may also join these visits. A Field Visit Report/BTOR will be prepared by the CO and UNDP RCU and will be circulated no less than one month after the visit to the project team and Project Board members.

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

The relevant **GEF Tracking Tools** will also be completed during the mid-term evaluation cycle.

An independent **Final Evaluation** will take place three months prior to the final Project Board meeting and will be undertaken in accordance with UNDP and SOF (e.g. GEF) guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals.

The relevant SOF (e.g GEF) Focal Area Tracking Tools will also be completed during the final evaluation.

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

Results from the project will be disseminated within and beyond the project intervention zone through existing **information sharing networks** and forums. The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects.

Additional information is included in section 6 of the project document.

M& E workplan and budget

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project team staff time*	Time frame
Inception Workshop and Report	▪ Project Manager ▪ UNDP CO, UNDP CCA	Indicative cost: 5,000	Within first two months of project start up
Measurement of Means of Verification for Project Progress on *output and implementation*	▪ Oversight by Project Manager ▪ Project team	To be determined as part of the Annual Work Plan's preparation.	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	▪ Project manager and team ▪ UNDP CO ▪ UNDP RTA ▪ UNDP EEG	None	Annually
Periodic status/ progress reports	▪ Project manager and team	None	Quarterly
Mid-term Evaluation	▪ Project manager and team ▪ UNDP CO ▪ UNDP RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost: 15,000	At the mid-point of project implementation.
Final Evaluation	▪ Project manager and team, ▪ UNDP CO ▪ UNDP RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost: 30,000	At least three months before the end of project implementation
Project Terminal Report	▪ Project manager and team ▪ UNDP CO ▪ Local consultant	0	At least three months before the end of the project
Audit	▪ UNDP CO ▪ Project manager and team	Indicative cost per year: 3,000	Yearly
Visits to field sites	▪ UNDP CO ▪ UNDP RCU (as appropriate) ▪ Government representatives	For GEF supported projects, paid from IA fees and operational budget	Yearly
TOTAL indicative COST Excluding project team staff time and UNDP staff and travel expenses		US$ 57,000	

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. Record of Endorsement of GEF Operational Focal Point(s) on Behalf of the Government(s):(Please attach theOperational Focal Point endorsement letter(s) with this form. For SGP, use this OFP endorsement letter).

NAME	POSITION	MINISTRY	DATE*(MM/dd/yyyy)*
Dr. Eric Ningu	Director of Environment	VICE PRESIDENT'S OFFICE	04/20/2012

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for CEO endorsement/approval of project.

Agency Coordinator, Agency Name	**Signature**	**Date** ***(Month, day, year)***	**Project Contact Person**	**Telephone**	**Email Address**
Adriana Dinu Office-in-Charge, and Deputy Executive Coordinator, UNDP/GEF		July 23, 2013	Mark Tadross Technical advisor, Gr-LECRDS	+27216502884	mark.tadross@undp.org

ANNEX A: PROJECT RESULTS FRAMEWORK

This project will contribute to achieving the following UNDAP outcomes:

- Communities have access to improved credible emergency information to enable early action (Outcome 2, Emergency Preparedness and Response)
- Prime Minister's Office (PMO) and Chief Minister's Office –Disaster Management Departments (DMDs) effectively lead Emergency Preparedness and Response (ERP) with focus areas most susceptible to disasters
- Key MDAs and LGAs integrate climate change adaptation and mitigation in their strategies and plans

UNDAP Key Actions: TA and FA to MDAs and LGAs to mainstream Climate Change Adaptation (CCA) in their development strategies;
Capacity Building for PMO-DMD related to effective disaster management coordination

Primary applicable Key Environment and Sustainable Development Key Result Area
Promote climate change adaptation

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

LDCF Expected Outcomes:
Outcome 2.1: Increased knowledge and understanding of climate variability and change-induced threats at country level and in targeted vulnerable areas;
Outcome 2.2: Strengthened adaptive capacity to reduce risks to climate-induced economic losses

LDCF Outcome Indicators:

- 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[6] **(equivalent to output in ATLAS)** To strengthen the climate monitoring capabilities, early warning systems and available information for responding to climate shocks and planning adaptation to climate change in	Level of capacity of agencies to monitor, assess and disseminate hydro-climate information for early warnings and long-term planning	The aggregate average level of capacity as per the Capacity Assessment Score is measured at 2.24 at the start of project.	The aggregate average Capacity Assessment Score at end of project is 3.5	Capacity Assessment Scorecard	

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

Tanzania.					
Outcome 1[7] 1. Enhanced Capacity of TMA and Water Basins to monitor (and forecast) droughts and floods.	% of national coverage by climate monitoring system	50% of the territory is covered by some form of monitoring, but only 30% by AWS.	75% of national territory is covered by an automated network	TMA database of network stations, MoW	Risks - There is a risk that the increased data flows will pose additional demands on the forecasting office which it may not be able to meet within current resources. - There is a risk that TMA cannot mobilize sufficient government financing to continue monitoring and to cover recurring O&M costs - There is a risk that the project cannot improve the current coordination between EWS agencies and with EWS-related initiatives to improve the ability to work cross-sectorally - There is a risk that natural disasters could damage infrastructure (particularly floods) - There is a risk that data sharing is hindered by lack of coordination / willingness of agencies to share data or by technical constraints (e.g., bandwidth issues or local mobile telecommunication networks) - There is a risk that digitization of climate records supported by the project will be insufficient to reliably increase historical data availability **Assumptions** Data collected on river levels will be transmitted directly to the concerned Basin for early warning, simultaneously to transmission to TMA.
	Frequency of data transmission and reception of current weather and river levels in TMA and the WBAs	River stations are read manually every 2 hours during rainfall but transmitted at various frequencies depending on the observer's capacity, automatic river gauges transmit every 30 minutes. TMA network operates at various frequencies, with most rapid transmission being hourly from AWS and slowest being daily manual	Data from river stations received in WBAs and TMA every 30 minutes; Data from automatic weather stations received by TMA on an hourly basis and from manual stations on a daily basis	TMA, MoW, WBAs	

[7] *All outcomes monitored annually in the APR/PIR. It is highly recommended not to have more than 4 outcomes.*

		readings transmitted on a weekly basis.			-Telecommunication systems used for data transmission from manual and automated stations will be robust enough to withstand increased data flows - Forecast accuracy will increase through the provision of increased amounts of data in real time. - Available forecasting tools and methods are adequate to emit accurate short, medium-term, and seasonal forecasts - All relevant ministries can access the shared database and continue to have adequate capacity for interpreting and using climate data for their own constituencies. - The TMA and WBAs have enough regular and predictable financing to support monitoring operations and will consider recurring O&M costs for new infrastructure in government budget lines because of the usefulness of the EWS will be demonstrated
Outcome 2. Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans.	% of population with access to climate information and improved flood and drought warnings % of which are women	0 people in the project sites have access to improved climate information, drought or early warnings.	At least 70% of residents in the targeted areas benefit from improved climate information, drought or early warnings	Site surveys, reports on the implementation of the EWS simulation, crowd-sourced information	**Risks** - There is a risk that users could not be reached during the EWS simulation exercises due to lack of telecommunication infrastructure and inadequate roads. - There is a risk that environmental or climate hazards will impede the deployment of the EWS simulation. - There is a risk that the government will not be able to mobilize sufficient resources to continue operating the Emergency Operations Unit after the project. - There is a risk that the government cannot finalize a change in regulation and national
	Type of development planning framework informed by climate information in Meru and Liwale Districts	TAFSIP, MKUKUTA II, and other high level frameworks include climate	local land use plans and development plans in Meru and Liwale include climate change risk information	Local land use plans, local development plans, district council	

		change and mitigating measures but no plans at local level		documents	budgetary frameworks to support the operations of the EWS and monitoring system - There is a risk that the private sector will resist changes in the regulatory environment governing their access to climate data **Assumptions** - Local users and communities are reachable and committed to participating in the EWS simulation exercises - The simulation exercise is conducted without interference from natural or other hazards. - The government is capable and committed to integrate the SOPs and the Emergency Operations Unit into its regular operations and budgets after the duration of the project. - The government will be willing to consider a change in regulation and national budgetary frameworks to support the ongoing operations of the monitoring system. - There is sufficient political support and capacity within the EWS agencies for successful execution and implementation of the project - There is and will continue to be sufficient qualified personnel within the NHMS to handle the new equipment, data transmission/storage/treatment - The private sector finds incentives and a vested interest in participating in the EWS

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

United States Government Comments	
Comments	Responses
Include detailed activities related to production of climate/hydrological information, communications and sustaining this work and retaining expertise, particularly under component 2.	Activities related to production of climate and hydrological information are now included in the project for Tanzania. For example, the project will work with two Water Basin Authorities and the Ministry of Water to strengthen flood forecasting, flood risk management and flood risk mapping in 2 basins. The project will also include activities designed to deliver through a SMS/crowd-sourcing platform, agro-meteorological information to users and extension services. The project is based on the use of existing expertise and capacity and trainees will be expected to pass on their skills to ensure that expertise is transferred and not lost.
Maintain close relationships and establish partnerships with relevant organizations working on climate and hydrometeorological services in the project region and make use of lessons learned from related efforts. This will strengthen capacity and connectivity within the broader region.	The project has learned from ongoing regional and national projects and has worked to develop partnerships during the project design phase. This has included discussions with the ACPC ClimDev, WHO and UK Met, as well as governments of Finland, who have expressed an interest in projects in the region and in Tanzania. While these have not resulted in the mobilization of additional activities or support yet, it is expected that this coordination will continue through UNDP CO during project implementation, in the hopes of leveraging additional support for any remaining gaps ths project could not address. The TMA is well connected to regional and international meteorological partnerships, including through the WMO and Global Observation systems.
Describe how the project will ensure that the production of information is driven by the needs of the users and delivered through appropriate user-friendly channels	The project is based on a series of local consultations where land users and communities were interviewed to discuss their vulnerabilities and needs, as well as documented vulnerability studies conducted by other partners in rural areas of Tanzania. In Component 2, the project will test the delivery of an EWS and climate services by working with the local disaster management committees to ensure that early warning information is delivered to users in a timely manner. This will include an EW simulation to test the best communications channels. The crowd-sourcing platform will also equip users with easy to use and easy to understand EW codes, mobile phones that can send and receive EW information, as well as radio and other community-based information dissemination mechanisms.
Include clear explanations of how local communities and women will be involved in shaping the project and describe how the project will benefit vulnerable populations and individuals.	Consultations during the preparation phase involved all vulnerable stakeholders, including women, and has ensured that specific vulnerable groups will be explicitly involved in the development of EW codes, Standard Operating Procedures, as well as in the testing of the EWS during the simulation foreseen in Component 2.
Activities related to data stewardship should be expanded to include a plan for data sharing throughout the region and globally.	Component 1, Output 1.4 consists of an activity specifically designed to strengthen data coordination, data sharing and data conservation, which has been seen as a challenge in Tanzania. This includes migrating all available digital data into a shared platform that will be housed in TMA but accessible through online access to all sectoral ministries. It also includes gradually digitizing historical records that are only available on paper (starting with data available for the 2 project districts). Data sharing protocols, cost recovery and data services will be established through a data management taskforce comprised of all major users and providers of agro-hydro-climate data in the country.
Clearly articulate the sectors that will benefit from the project, and include considerations of the adaptation priorities and needs of local communities.	In Tanzania the sectors that will benefit directly from the project are the Water and Agriculture sectors, since they will be beneficiaries of project activities and capacity strengthening. However, indirect benefits from the successful operation of the EWS will include tourism, infrastructure and land use planning (through Component 2 mainstreaming efforts). Direct community benefits are as highlighted in section 2, will include providing enhanced EW to approximately 70% of residents in both targeted districts (76,015 people in Liwale and 271,906 inMeru), at least 50% of which are women.
General comments on PIFs	
Given the similarity between all the PIFs, it is recommended to develop one regional PIF OR conduct more in-depth analysis of	The activities of this project have been tailored to address the gaps and needs of the TMA, the MoW and the MoA in order to enable them to provide timely and accurate hydro-climate services in relation to the anticipated increase in severe droughts and

gaps and needs for each country.	floods under climate change. These gaps and needs were identified in consultation with all partners, as well as NGOs and community based organizations, through 2 multi-sectoral consultation workshops and 1 set of local consultations. Consultations were attended by all relevant ministries and directorates as well as bilateral and multilateral development partners. Please see the details of stakeholder involvement and the report of the project preparation phase in Annexes 4 and 5.
Long term data records require sustainability and therefore need more detail for output 2.5 (sustainable financing) and how it will overcome barriers.	In Tanzania, this output (now 2.7) will be used to mobilize support for ongoing financing of climate monitoring services through the development of a comprehensive strategy for resource mobilization that will include national budgets, private sector contributions (leveraged through regulatory approaches), cost recovery mechanisms. These have not yet been fully explored in TZ and it is expected that the project will assist in mobilizing added resources for the O&M of the infrastructure as well as historical data.
Ensure that integration of hydro-met system, satellite, gauges and radars is considered. Radars are expensive to install and maintain and can exceed national budgets .	In TZ, 2 radars already exist; this project will not fund additional ones. However the project will also work to integrate all elements of the existing system that are being managed by various ministries through the use of a shared database which will integrate all incoming climate and hydrological data (from the new automated stations), as well as digitized historical records for the 2 project districts (as a first phase of digitization). The database will be housed by TMA and provide access to all sectoral users, primarily MoW and MoA. Data sharing protocols, data query and analysis functions will be developed during the implementation phase through a data coordination taskforce.
Projects will be challenged by a lack of IT infrastructure (bandwidth, etc.) to collect, analyse, exchange and archive data.	This is being addressed in TZ through the provision of IT infrastructure where it is needed (mainly water basins and TMA). Currently TMA has sufficient access to bandwidth, internet and telecommunications to ensure adequate access to outside data, regional information and satellite data. Both TMA and MoW have a satellite receiving station which are operational. Additional servers are being provided, namely for the hosting and access to the shared hydro-climate database, and in the Water Basins (along with telecommunications equipment) to ensure adequate channels are available for data transmission from the local level to the central level. A small number of computers or workstations are to be procured by the project to allow for flood forecasting and flood modeling.
There is a lack of workstations to make forecasts, access global products for downscaling etc.	
There is a lack of private capital to support the large costs of modernisation.	Exploration of linkages with the private sector will occur through output 2.7, although for now TZ has preferred to focus on the national budget for funding for public services. Opportunities for other sources of funding through the public sector would be mobilized through a cost-recovery policy, which is not clear at the moment, and which would allow TMA to recover costs of data services to some ministries. Opportunities for other sources of funding through the private sector could include: insurance companies, tourism sector and operators, large agriculture enterprises, mobile phone operators, transport companies.
Specific details on which hazards are important and where should be included.	This is addressed in the section 1of the project document. In Tanzania, the project focuses on addressing floods and droughts. The project will operate in districts that are prone to both, and that have seen incidences of both hazards during recent years. In Meru the project intervenes in Four (4) different wards for the deployment of the EWS: Nkoarisambu ward (flooding), King'ori ward (drought) and Makiba and Mbuguni wards (both droughts and floods). In Liwale 93% of income comes from rainfed crop agriculture, and is therefore highly dependent on climate. The divisions that have been selected for the project are Kibutuka division, that is mostly affected by drought, and Makata division as a representative of the areas affected by floods (see also section 2 on project strategy)
More analyses of climate needs to be included in determining where hydromet stations should be located.	A needs analysis for the whole country was conducted by TMA as a basis for its 5 year plan, as well as by the Water Basins (through hydrographic basin design and strategic plans) and the project is basing its interventions on these analyses. Specific siting studies will be completed by TMA prior to installation of stations, however the stations will be installed in the project areas (around Meru and Liwlale districts) as a priority, and then from there using the priority list of sites provided by the TMA in Annex 2.
To ensure that the appropriate climate observations are recorded and applied, the	

following considerations should be included:	
Clear descriptions of the types of observations that are required and how they will feed into an EWS appropriately.	In Tanzania we are focusing on weather parameters and in particular rainfall. Automated weather stations will measure temperature, rainfall, soil moisture, evapotranspiration and pressure variables on the surface or in the case of wind, 2 or 10 m above the surface each hour. In terms of river flow monitoring, the project will install staff gauges and automated rain gauges around rivers to monitor rainfall and water levels. Hydrological monitoring stations will also be installed to detect flooding risk, which will transmit information automatically to both the WBAs and TMA on an half-hourly basis.
Provide data to world climatic data centres.	This is already being done in TZ through the GTS. The project does not foresee improving on this situation as this was not felt to be a major need in Tanzania
Clearly distinguish between weather and climate observations and how they are used.	In TZ weather information is used in immediate forecasting whereas climate information is used for long-term forecasting and scenario building. The information provided through the new automated stations will be used to enhance the resolution and accuracy of seasonal forecasts, drought forecasts, as well as early warnings in case of severe rainfall events, and in particular accumulated deficits resulting in drought. The recording of these data over the long term will also help build up climate records which can be used for trend analyses (climate change detection) and for training downscaling models.
Details should be provided on whether additional funding for procurement of technology can be accessed.	In Tanzania partnerships have been sought with various partners for the procurement of additional equipment for TMA or MoW. These discussions are underway, with the World Bank already supporting some equipment acquisition in other Water Basins under the Water Sector Development Plan. Other sources of funding are still being explored with other development partners.
Project goals include mitigation of flood/drought losses but have insufficient hydrological modeling described in the PIF.	In TZ hydrological modelling is being undertaken by the Ministry of Water. This project under output 1.3 will strengthen ongoing hydrological modelling through the provision of additional capacity building for flood risk mapping and flood forecasting, which were identified as gaps in the hydrological monitoring system. This will include provision of technical assistance, on-the-job training and the procurement of specific software packages for flood risk management.
Include considerations of how capacity of hydrological services (and agriculture) can be improved e.g. issue flood and drought monitoring and early warnings.	This is included in Component 1. Flood forecasting is a key output of this project. This project under output 1.3 will strengthen ongoing hydrological modelling through the provision of additional capacity building for flood risk mapping and flood forecasting, which were identified as gaps in the hydrological monitoring system. This will include provision of technical assistance, on-the-job training and the procurement of specific software packages for flood risk management. The project will also strengthen the capacity of the Ministry of Agriculture to gather crop data and to transmit agro-meteorological information through the development of the SMS/crowdsourcing platform under Output 2.4. This will allow users to receive relevant agro-climate advice (plantation, land preparation, irrigation, fertilization) as well as to upload information on crop growth, which is used to forecast food security.
Address links and gaps between representatives of hydromet and agriculture e.g. will the meteorological data work with hydrological/agricultural models, or will it require manipulating?	This aspect will be addressed during project implementation through the task force on shared databases and data portals. It is expected that each ministry will specify their information needs and that the TMA will work with each to ensure these needs are met through the shared database.
In Component 2 there is a need to articulate the types of forecasts that will be produced.	In TZ the project focuses on flood and drought forecasts, which will be provided at the start of rainy seasons (as a seasonal forecast), as well as on a real-time basis for early warning. The exact nature of these forecasts will be decided through the task force on shared databases and will include the specified needs of users of the forecasts. All other forecasts (weather, decadal bulletins) are currently being produced by the TMA. Data flow increases and increased data resolution is expected to assist in increasing the accuracy of these forecasts provided by TMA.
The focus of the PIF tends to be on early warnings and does not include long term changes to extreme weather events. Ensure that climate information can be integrated into development plans.	This is being addressed through component 2, Output 2.5. working with districts and wards, the project will help the district councils update local land use plans, district strategic development plans and district budget plans in light of emerging climate information and flood forecasts. This will be done through the provision of technical advice on the ways in which the plans can be adjusted to better respond to the issues

	posed by droughts and floods.
Hydromet products which are sold for a fee will limit uptake by vulnerable populations.	The project does not foresee selling hydro-met products to the general public, but could sell climate products to the private sector. This could include: insurance companies, tourism sector and operators, large agriculture enterprises, mobile phone operators, transport companies. The private sector engagement platform will be determined during implementation through working with the TMA, TCRA, MoW and MoA under Output 2.7.
Include consideration of how the project will benefit women, noting that evidence suggests that women do not receive EW messages via radio.	In TZ the project will ensure that information is received using all available media including radio (80% access for rural populations in TZ) and through the use of mobile phone technology that will be distributed to women and men for the establishment of a crowd-sourcing platform for Disaster Management
ACMAD, GEO and AfriGEOSS are not mentioned despite coordinating earth observations and climate observations.	These groups are included in the baseline situation analysis (Section 2), upon which the LDCF project will build. TMA undertakes regular coordination with these groups and as such, the project builds on these activities.
There is a need to include WMO and the GFCS initiative.	The TMA participates in meetings of the WMO and liaises with the WMO on a regular basis. A partnership between the WMO-UK and this project was sought during the project preparation but has not been finalized yet.

Germany comments on the PIF "Strengthening Climate Services and Early Warning Systems in the Gambia for Climate Resilient Development and Adaptation to Climate Change- 2nd Phase of the GOTG/GEF/UNEP LDCF NAPA Early Warning Project"	
A robust strategy to ensure sustainability of project, particularly with reference to investments in infrastructure and climate services, should include commitments from partners as well as an assessment of risks related to the sustainability of investments.	This project is based on strong ownership and commitment from the key project partners, including mainly the PMO, TMA, MOW and MOA. As these partners all stand to benefit, the project is based on a solid baseline of national programming, which further highlights the commitment to ensuring the project succeeds. The investments that will be made in infrastructure are supported by commitment by the partners (TMA and MoW are the only ones who will receive equipment) to undertake the installation, operation and maintenance to ensure sustainability. While the inadequacy of funds for O&M could pose a risk to the sustainability of these investments, the project is proposing as a mitigating strategy that cost savings from migrating to automated stations from manual stations can be used for O&M; similarly, the project will identify, through output 2.7, opportunities to increase public and private financing to ensure the sustainability of equipment investments.
As the proposed project requires very specialized technical expertise on meteorology (hardware and software), provide detailed information on how expertise and comparative advantages of partners is incorporated in the project	This project relies on the high degree of technical expertise available within the key ministries and provides additional support where targeted gaps have been identified. IN terms of hydrological or climate forecasting, both TMA and MoW have the necessary skilled staff to perform the tasks, but not the material - therefore materials and software will be purchased (Outputs 1.2. and 1.1) and additional training will be provided to ensure it is will used. Where no expertise was available, as in the case of the MoA Crop Department (which consists of 1 agro-meteorologist), the project has opted to build cooperative structures where each ministry can benefit from the expertise available in others. This will be ensured through the shared agro-hydro-climate database which will provide services to all the key sectors. Memoranda of Understanding are already being negotiated among the key partners, which will support the implementation of this project
The additional cost reasoning should be outlined more clearly. Much of the investment is for the weather related observational network and brings considerable co-benefits for economic activities, logistics and transport. However, a baseline development of maintaining and upgrading of	Additional cost reasoning is explained in section 2.4 of the project document. In this project, the additional costs are those that are required to ensure the hydro-climate monitoring system can cope with the expected increased frequency of severe climate events such as droughts and floods. The added benefit of this project will be to provide increased data resolution, increased data transmission frequency, and therefore to enable the deployment of effective early warnings and climate services, which is not the case today. The baseline state of the network is also described in section 2.4,

infrastructure is not described. Please elaborate on the climate and climate change related benefits in comparison to the business as usual investment.	along with the gaps that this project proposes to fill.
An up to five percent fee for "National implementation" is mentioned. Strong partner involvement and ownership in the implementation of this project is important but should not be at the expense of overall project management fees. Please outline how the five percent fee relates to the agency fees.	The project management fee is 4.8% of the total grant for Tanzania. This includes the appointment of a project coordinator and assistant coordinator, travel costs and operational costs for the duration of the project. The project coordinator will dedicate 60% of his/her time to technical activities and 40% on PM. The agency fee is being provided to the agency separately from the project grant, for its role as an Implementing Agency. That fee is 9.5% of the total project budget.

The World Bank's comments on LDCF EWS PIFs	
There is concern that approving these projects based on a template is at the expense of more robust proposals (perhaps more targeted) and could pose a reputational risk to the GEF.	The TZ project has been designed in relation to specific needs of TZ. For example, a baseline assessment was conducted during project design, which led to the reformulation of some of the project outputs, and activities. Outputs contained in Component 1 are specifically tailored to respond to the needs of the Tanzania Met Agency in terms of automation of information transmission through the acquisition of AWS, including agro-meteorology sensors. The project also identified the specific gaps and needs of the water basin authorities in the selected target basins/districts, including required hydrological monitoring equipment. All outputs were revised based on an assessment of available equipment and enhancements needed for the operation of a functioning EWS. The project design is based on extensive consultations with stakeholders, including through 2 well-attended project design workshops, as well as a series of ongoing bilateral consultations, and local consultations in selected project districts.
There is insufficient assessment of current state of hydro-met sector, past failures and their causes.	This project has been designed on the basis of an extensive assessment of the current state of the EWS, including plans and assessments by government partners. In Tanzania the current climate servicesprovided through the EWS are not extensively used at the national and local planning levels. According to the TMA and other stakeholders, the lack of data coverage, and slowness of information transmission is the main obstacle to the operation of an effective EWS, since the information does not reach the user in time. This is why the project is focused around increasing the country area under automated station coverage, so that information/data flows can increase in frequency from targeted areas and hence inform climate predictions and forecasts. Increased data coverage will also help to improve hydro-climate forecasting, characterization of climate hazards and more clearly identify those areas at risk. An assessment of the current functioning of the hydro-climate monitoring system is included in section 2.
There is insufficient consideration of the limitations of current capacity, which currently prevents many of the proposed activities in some countries.	Limitations to current capacities that could potentially have an impact on the delivery of outputs have been assessed. These concern limits in both technology and human resources available to maintenance equipment and process, analyse and package data/information. To address this, the project will provide additional training for instruments specialists, IT technicians and meteorologists, who will then be able to further train TMA staff to perform regular checks on automated equipment. The transition to automation also means that a number of manually operated stations can be decommissioned, leading to cost savings that will be applied to the operations and

	maintenance of the upgraded system. The project also includes activities to address insufficiencies in funding for the TMA and its monitoring system,through the development of a comprehensive financing plan, including outreach to the private sector, for ongoing financing needs. All other activities are designed to circumvent the existing limitations in capacity, for example by providing the MoA Crop and Irrigation Department with access to a shared agro-climate database, rather than having to maintain their own network of stations (which they did not have the capacity to deliver so far.)
Cost estimates are unrealistic and do not include variation between countries and O&M (operations & management) costs.	Detailed cost estimates have been based on actual quotes for the types of equipment to be purchased, as per specifications provided by the stakeholders. Operations and Management costs are taken on board through co-financing by the TMA and through the national budget, as per current practice.

ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS[8]

A. DESCRIBE FINDINGS THAT MIGHT AFFECT THE PROJECT DESIGN OR ANY CONCERNS ON PROJECT IMPLEMENTATION, IF ANY:

B. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES FINANCING STATUS IN THE TABLE BELOW:

PPG Grant Approved at PIF: **100,000**			
Project Preparation Activities Implemented	***GEF/LDCF/SCCF/NPIF Amount ($)***		
	Budgeted Amount	***Amount Spent Todate***	***Amount Committed***
1. Review and technical feasibility study and cost assessment analysis	46,000	37,219	8,781
2. Information collection and stakeholder consultations (including stakeholder workshops)	34,000	32,800	1,200
3. Identification of co-funding sources and formulation of project documents	14,000	11,420	2,580
4. Institutional arrangement for implementation	6,000	3,378	2,622
Total	**100,000**	**84,817**	**15,183**

[8] If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities.

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

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