PROJECT IDENTIFICATION FORM (PIF)
PROJECT TYPE: Full-sized Project
TYPE OF TRUST FUND:LDCF

PART I: PROJECT IDENTIFICATION

Project Title:	Strengthening climate information and early warning systems in Eastern and Southern Africa for climate resilient development and adaptation to climate change – Tanzania		
Country(ies):	Tanzania	**GEF Project ID:**	4991
GEF Agency(ies):	UNDP	**GEF Agency Project ID:**	5096
Other Executing Partner(s):	Tanzania Meteorological Agency, Prime Ministers Office-Disaster Management Department, Ministry of water	**Submission Date:**	May 18, 2012
GEF Focal Area (s):	Climate Change Adaptation	**Project Duration (months):**	36 months
Name of parent programme: **For SFM/REDD+** ☐		**Agency Fee ($):**	400,000

A. FOCAL AREA STRATEGY FRAMEWORK:

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Indicative grant amount ($)	Indicative co-financing ($)
CCA-2 Increase adaptive capacity to respond to the impacts of climate change, including variability, at local, national, regional and global level	**Outcome 2.2** Strengthened adaptive capacity to reduce risks to climate-induced economic losses	**Output 2.2.1** Adaptive capacity of national early warning networks strengthened to rapidly respond to extreme weather events	LDCF	960,000	13,800,000
CCA-3 Promote transfer and adoption of adaptation technology	**Outcome 3.1** Successful demonstration, deployment, and transfer of relevant adaptation technology in targeted areas	**Output 3.1.1**: Relevant adaptation technology transferred to targeted groups **Output 3.2.1**: Skills increased for relevant individuals in transfer of adaptation technology	LDCF	2,850,000	5,065,586
Sub-total				3,810,000	18,865,586
Project management cost				190,000	924,414
Total project cost				**4,000,000**	**19,790,000**

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**	**Indicative Grant Amount ($)**	**Indicative co-financing ($)**
Transfer of technologies for climate and environmental monitoring infrastructure	INV	1. Enhanced capacity of national hydro-meteorological (NHMS) and environmental institutions to monitor extreme weather and climate change.	1.1 Procurement and installation or rehabilitation (in case of existing) of approximately 10+ hydrological monitoring stations with telemetry, archiving and data processing facilities. 1.2 Procurement and installation or rehabilitation of approximately 40 meteorological monitoring stations with telemetry, archiving and data processing facilities. 1.3 Procurement and installation or rehabilitation of radar for monitoring severe weather. 1.4 Procurement and installation or rehabilitation of upper air monitoring stations. 1.5 Procurement and installation or rehabilitation of satellite monitoring equipment to receive real time climate and environmental information.	LDCF	2,710,000	2,750,000
	TA		1.6 Training of at least 3-5 officers to maintain and repair equipment, computer infrastructure and telecommunications, including cost-effective technologies to interface with existing equipment/software (*approx. $150,000)*.			
Climate information integrated into development plans and early warning systems	TA	2. Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans.	2.1 NHMS capacity to make and use climate forecasts (on daily to seasonal, as well as medium- to long-term timescales) is strengthened by training at least 4 forecasters. (*approx. $150,000)*	LDCF	1,100,000	16,115,586
	INV		2.2 Tailored sector-specific early warning products that link climate, environmental and socio-economic information on a range of timescales are developed, based on identified user needs.			
	TA		2.3 National capacity for assimilating forecasts and monitoring into existing development planning, PRSPs and disaster management systems is built, including coordination with systems and warnings developed by other initiatives. (*approx. $390,000*)			

	INV		2.4 Communication channels and procedures for issuing warnings (through both governmental and non-governmental agencies) are enabled (e.g. radio, newspapers, mobile phones, television etc).			
	TA		2.5 Plan for sustainable financing for the operation and maintenance of the installed EWS developed and implemented, including public and private financing options. (*approx. $150,000)*			
Sub-total					3,810,000	18,865,586
Project management cost					190,000	924,414
Total project costs					**4,000,000**	**19,790,000**

C. INDICATIVE CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME IF AVAILABLE, ($)

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount ($)
National Government	Government of Tanzania/WFP/UNICEF	Grant	15,480,000
GEF Agency	UNDP	Grant	2,750,000
Bilateral agency	Government of Finland	Grant	1,560,000
Total Co-financing			**19,790,000**

D. GEF RESOURCES REQUESTED BY AGENCY, FOCAL AREAS AND COUNTRY

GEF AGENCY	TYPE OF TRUST FUND	FOCAL AREA	Country name/Global	Project amount (a)	Agency Fee (b)	Total c=a+b
UNDP	LDCF	Climate Change	Tanzania	4,000,000	400,000	4,400,000
Total GEF Resources				4,000,000	400,000	4,400,000

PART II: PROJECT JUSTIFICATION

1. The proposed project responds to priorities and actions identified in the NAPA of Tanzania which articulate the need for securing, transferring and installing critical technologies, as well as developing the necessary systems for climate change-related information to permeate into decision-making processes. The technologies required to achieve these aims will increase the capacity of the national early warning network to forewarn and rapidly respond to extreme climate events. The total amount of funding requested, as articulated in the Letter of Endorsement and not including PPG and agency fees is USD 4,000,000.

2. The NAPA clearly identifies priority projects associated with Food security, Water resources and Terrestrial ecosystems, all of which have a EWS component embedded within their priority actions. As such this EWS project is not associated with any one particular sector and is expected to be relevant to multiple sectors, including the food/agriculture, water management, health and energy sectors.

A1. **DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:**

A.1.1 The GEF focal area strategies:

3. This project is fully in line with LDCF/SCCF focal area objective 2 "Increase adaptive capacity to respond to the impacts of climate change, including variability, at local, national, regional and global level" and objective 3: Promote transfer and adoption of adaptation technology. It is specifically aligned with outcomes linked to these objectives including increased knowledge and understanding of climate variability and change-induced risks at country level and in targeted vulnerable areas, strengthened adaptive capacity to reduce risks to climate-induced economic losses, successful demonstration, deployment, and transfer of relevant adaptation technology in targeted areas and enhanced enabling environment to support adaptation related technology transfer.

A.1.2. For projects funded from LDCF/SCCF: the LDCF/SCCF eligibility criteria and priorities:

4. ***Country ownership***: The Government of Tanzania has ratified the UNFCCC and is classified among the non-Annex 1 parties. These countries have also developed and submitted their National Adaptation Plans of Action (NAPA) and are entitled to benefit from the LDC Fund for the implementation of priority measures identified in their respective NAPAs. In implementing priority interventions identified in the NAPAs, the project is consistent with the Conference of Parties (COP-9) and also satisfies criteria outlined in UNFCCC Decision 7/CP.7 and GEF/C.28/18.

5. The project focus is aligned with the scope of expected interventions as articulated in the LDCF programming paper and decision 5/CP.9. As climate impacts fall disproportionately on the poor, the project recognizes the links between adaptation and poverty reduction (GEF/C.28/18, 1(b), 29).

6. ***Compliance with programme and LDC Fund policies*:** The project complies with the NAPA-identified urgent needs, all of which are relevant for supporting national development goals and for achieving MDGs 1, 3, 6 and 7.

7. ***Financing*:** The project is designed to accommodate the additional adaptation costs of priority actions identified in the NAPAs and build on several other baseline projects and programmes. The co-funding for this project is also within the stated guidelines, with more than $5m in prospective co-funding. The relevance of the co-financing to the proposed LDCF project is outlined below and will be further elaborated on during the project preparation phase.

8. ***Institutional Synergy and Coordination***: The project outcomes will be primarily implemented through national implementation. The PIF therefore outlines project management costs that will be incurred by implementing partners at the national level (below 5%).

9. The project is aligned with the framework of Poverty Reduction Strategy Papers (PRSP). In the case of Tanzania, the relevant PRSP pillar is:

- *Growth for Reduction of Income Poverty* (which includes a climate adaptation component) and *Improvement of Quality of Life and Social Well-Being* (improve survival and well-being of vulnerable groups).

9. The project outcomes are closely aligned and coordinated with efforts already underway within Tanzania to promote development which is resilient to climate change at the national and local levels. The project is focused on strengthening the capacity of national and sub-national entities to monitor climate change, generate reliable hydro-meteorological information (including forecasts) and to be able to combine this information with other environmental and socio-economic data to improve evidence-based decision-making for early warning and adaptation responses as well as planning. The proposed project will be implemented at the country level by the lead Ministry mandated to advance climate monitoring including management of climate data in full collaboration with other relevant line Ministries who rely on the information for planning purposes (Disaster Management, Agriculture, Water, Finance and Planning etc). Sub national authorities (Provincial and/or District officers, Municipalities, civil society (women and youth associations, NGOs, media, farmers' associations) and the private sector will all also be important stakeholders (as end users) and will be provided with the space and opportunity to contribute to the design of the project in each country. Details of the institutional coordination will be spelt out in the project document that is prepared during the PPG phase with the full participation of key stakeholders in each country including GEF OFP, UNFCCC FP, and other key senior Government officials including private sector and civil society representations as well as donor representatives.

10. ***Monitoring and Evaluation***: The implementation of the project's activities will reflect UNDP-GEF monitoring and evaluation standards and procedures, in line with the requirements of the LDCF. Details for monitoring and evaluation will be articulated during the project development phase.

A.2. National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAS, NAPs, NBSAPs, national communications, TNAs, NIPs, PRSPs, NPFE, etc.:

11. The link between this project strategy and the NAPA is centered on a common goal of informing climate resilient development planning and sector management through improved national systems that generate relevant climate information.

12. The need to strengthen EWS is recognized as a potential adaptation activity for the Agriculture sector, as well as for both the Water and Health sectors. The development of an efficient and well coordinated early warning system, especially one focused on drought and flood, and one that supports emergency response and anticipatory planning, in all Districts is highlighted as an urgent and immediate need. Specific activities that have been requested include:

- Technology transfer such as Automatic Weather, Upper Air Stations including hydrogen generator (purchasing and installation);
- Forecasting and Data Visualization Tools;
- Data storage facilities for real time data management functionality;
- Laboratory equipment for temperature calibration;
- Technical support and skills development in Mapping Disaster prone areas in the country;
- Awareness to end users on weather and climate information;
- Policy development for agriculture and water sectors using information generated by early warning systems.

B. PROJECT OVERVIEW:

B.1. DESCRIBE THE BASELINE PROJECT AND THE PROBLEM THAT IT SEEKS TO ADDRESS:

Problem

13. Many countries in Eastern & Southern (E&S) Africa suffer from low rates of development. In particular, Tanzania is one of the lowest 20% of countries worldwide, ranked by both Gross National Income (GNI per capita) and the 2011 United Nations Human Development Index (ranked 152 out of 187 countries)[1]. These countries are particularly vulnerable to climate-related shocks (either to the economy or to unprotected populations), which threaten to undo years of development assistance and asset accumulation, especially within poor populations. One way to help mitigate the impact of these climate-related shocks is to warn populations, businesses and governments in advance of an impending or likely damaging event through an Early Warning System (EWS).

14. The fundamental problem in many countries such as Tanzania is that a complete EWS, which generates knowledge of the risks (vulnerability & hazard), has capacity to monitor, analyze and forecast hazards, provides communication and dissemination of alerts and warnings, either does not exist or does not function as well as it ought to be relevant and useful for long-term planning, management and risk reduction activities. In Tanzania, this status unnecessarily imperils lives, assets and productivity, recently for flood victims in the capital Dar es Salaam[2] and drought impacts on cereal and energy production[3]. Reasons for this situation involve a lack of both hard and soft technologies and the capacity to utilise those technologies in an appropriate manner. This results in: i) a limited understanding of current and future risks; ii) limited monitoring and forecasting of climate-related hazards; iii) inappropriate communication and packaging of warnings; iv) restricted responses to impending disasters and v)

[1] http://hdr.undp.org/en/reports/global/hdr2011/
[2] http://www.bbc.co.uk/news/world-africa-16299734
[3] http://www.bbc.co.uk/news/world-africa-14192896

constrained planning for slow-onset changes due to climate change that will require a transformational shift in economic development and risk reduction efforts. The infrastructure and technology on which to build these services is lacking in Tanzania e.g. hydrological stations for monitoring water levels in Lake Victoria and the Pangani/Rufigi rivers, as well as automatic weather stations for monitoring drought conditions in agricultural zones, particularly in the center of the country. Without investing in the capacity to generate information, especially the monitoring and forecasting of climate-related hazards, the EWS will never function as optimally as it could. The aim of this proposal is to strengthen the EWS of Tanzania, largely through improving national capabilities to generate and use climate information in the planning for and management of climate induced hazard risks. It will achieve this by implementing the transfer of appropriate technology, infrastructure and skills.

Changes in climate-related hazards and likely impacts

15. Africa is the continent expected to suffer the most under anthropogenic induced climate change, both due to expected increases in climate hazards and its already high vulnerabilities to those hazards across a range of sectors. Tanzania is classified as a Least Developed Country (LDC), which is recognized by the United Nations Framework Convention on Climate Change (UNFCCC) as among the most vulnerable to the impacts of climate change. These vulnerabilities span many sectors, livelihoods and assets within each country and the region in general.

16. Water is a scarce resource across Africa and it's availability both for agriculture and domestic consumption is impacted severely by drought, which has been and will continue to increase in intensity and frequency (due to both changes in rainfall and increasing temperatures), especially in sub-tropical and semi-arid regions. In Tanzania temperatures have risen by approximately 1.0°C between 1960 and 2006 and are expected to increase by between 1.1 and 3.0°C by 2060[4]. Hot nights and days will continue to increase in frequency, whilst cold days and nights will become rarer (though there have been greater increases in hot nights in the historical record). Statistically significant trends in historical rainfall indicate decreasing annual rainfall, particularly in the south of the country. Future projections of rainfall suggest a likely increase in rainfall depending on the season and location – consistent with an increase in wet season rainfall[4]. These hazardous events often lead to impacts on food security, health and power generation, such as those seen recently in 2011[3]. Flooding due to heavy rainfall over a short period of time has wreaked havoc in both urban and rural (river basins/watersheds) environments, with attendant impacts on health and the spread of disease e.g. recent flooding in Dar es Salaam[2]. Whilst the upswing in deaths attributed to floods in recent years may largely be due to population dynamics[5], many deaths can be avoided with sufficient early warning. These risks and associated losses are expected to increase in some regions due to the increased availability of atmospheric moisture and intensity of rainfall in the future[6].

17. Severe weather, associated with convective weather, atmospheric heating and moisture, will likely increase in many regions and can result in increases in rain, hail and winds, all of which are damaging to crops and infrastructure. Whilst changes in cyclone frequency are uncertain, most models and observations suggest an increase in cyclone intensity[7] (or an increase in the frequency of more intense

[4] http://country-profiles.geog.ox.ac.uk/

[5] Di Baldassarre, G., A. Montanari, H. Lins, D. Koutsoyiannis, L. Brandimarte, and G. Blöschl (2010), Flood fatalities in Africa: From diagnosis to mitigation, Geophys. Res. Lett., 37, L22402, doi:10.1029/2010GL045467

[6] IPCC, 2012:*Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation.*A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, UK, and New York, NY, USA, 582 pp

[7] Knutson1 T, Mcbride J, Chan J, Emanuel K, Holland G, Landsea C, Held I, Kossin J, K Srivastava and M Sugi (2010). Tropical cyclones and climate change. Nature Geoscience. doi: 10.1038/ngeo779.

cyclones), therefore they are likely to be more of a risk in the future (including impacts through several hazards - rainfall, storm surge and winds), particularly in the coastal region and the islands of Zanzibar and Pemba. Sea level rise is an additional problem for many low lying coastal areas where large populations often assemble and the slow and steady rise of mean sea level results in more frequent flooding and coastal erosion (potentially exacerbated by increases in cyclone induced storm surge). Rises in temperature which affects all regions, results in an increase in the frequency of heat waves and extremely hot days/nights, which in turn affect the health of humans, ecosystems and urban environments.

18. Changes in the above climate-related hazards will negatively affect a range of sectors. Of particular concern is the agricultural sector which is an important component of the economy and forms the basis of many rural livelihoods. Droughts, floods and increases in temperature reduce the ability to grow crops, as well as affecting other aspects of the value chain e.g. drying/storage and transport to market.

Underlying causes

19. Whilst the EWS in many different countries serve different sectors or users, they also currently share common problems; i) insufficient meteorological and hydrological observing stations to monitor the current state of the climate and hydrology, map risks and detect long-term trends; ii) insufficient use of satellite data for monitoring different aspects of the environment and providing information in regions not covered by the meteorological and hydrological stations; iii) limited use of climate forecasts on daily to seasonal timescales and; iv) limited packaging of different sources of information to inform risk reduction efforts in different sectors; v) inappropriate communication of EWS messages and vi) lack of trained personnel to effectively run and maintain the different aspects of the EWS.

20. A lack of meteorological and hydrological monitoring stations in Tanzania has meant that many important regions and populations vulnerable to climate hazards are not monitored e.g. drought conditions (rainfall) are not monitored for important agricultural lands, intense rainfall is not monitored in areas prone to landslides and flooding, and rapid rises in rivers as a precursor to flooding goes unnoticed. Therefore many potentially threatening hazards are not forewarned because of a lack of monitoring stations. Where stations exist they are often manually operated and do not report measurements for days to weeks after the climate hazards have passed. Equipment failure is also common and regular checks and maintenance often neglected due to insufficient funds, incentives and regulatory policies resulting in poor quality and unreliable data for making management decisions related to climate change induced disaster risks.

21. It is now common practice to utilize satellite imagery as a useful tool for monitoring areas where meteorological and hydrological monitoring stations do not exist and aspects of the environment useful for assessing current risks e.g. vegetation monitoring helps assess crop performance and images of floods help understand which areas are more at risk. Additionally satellite data may be used to predict rainfall or monitor severe weather. However, many developing countries do not utilize these technologies because they do not have the necessary equipment to access the data or do not have the human resources to use the data.

22. The radar network for monitoring severe weather is limited in Tanzania, often to airports where its main application is for air traffic control. This is largely a consequence of the high costs (for infrastructure, maintenance and human resources to run the equipment). Given most radar have a range of approximately 75-200 km covering large areas becomes very costly.

23. Climate forecasts for the coming 1-7 days are produced using a combination of Numerical Weather Prediction (NWP) models and predictions either from neighboring countries or international centres. Seasonal forecasts are also produced using tools developed at international centres. In situations where forecasts are externally sourced, forecasters are dependent on the applicability of the forecasts to local conditions and restricted in their ability to apply local observations to develop better forecasts.

24. Often forecasts and climate information is given in the same standard formats for different users and this restricts their interpretation and application. For example, agricultural extension officers require information about the start of the rains, or the frequency of days with rain, whereas those monitoring floods require information on rainfall intensity. Extracting these particular attributes from forecasts is currently not undertaken. This information is then more useful when packaged with other sources of data e.g. satellite maps showing current vegetation and rainfall, or soil moisture as an indication of flooding potential etc.

25. Further problems are caused by a lack of trained personnel who are capable of maintaining an observational network, generating information for specific sectors, as well as interpreting the data in ways that non-technical stakeholders can understand. This human capacity is required to:

- Replace components of the observing networks when they fail;
- Manage and run any forecast models;
- Understand how users interpret data and design information packages that address these needs;
- Be able to combine, manipulate and overlay different data to identify areas at risk.

Long-term solution and barriers to achieving it:

26. It is expected that as climate change unfolds the frequency and intensity of climate related shocks will change, therefore improving EWSs is one way to adapt to a changing climate. As an adaptive measure EWS also benefit the poorer segments of society, those who do not necessarily benefit from large protective infrastructure projects[8]. Furthermore, improving the EWS also provides benefits for long term planning and helps NHMS and other institutions build capacity to service other needs e.g. for land-use and agricultural planning, hydro-electric power etc.

27. To allow countries to better manage severe weather related disasters, food security and agricultural production, scarce and dwindling water resources and make their socioeconomic development process less vulnerable to climate-related risks it is essential to:

- enhance the capacity of hydro-meteorological services and networks for predicting climatic events and associated risks;
- develop a more effective, efficient and targeted delivery of climate information including early warnings;
- support improved and timely preparedness and response to forecast climate-related risks and vulnerabilities.

28. These objectives require developing robust weather and climate observation, forecasting, and monitoring infrastructure, which can be rapidly deployed, is relatively easy to maintain, and simple to use. Such a weather and climate monitoring system can provide countries with the capacity to develop: (i) an early warning system for severe weather; (ii) real-time weather and hydrological monitoring; (iii) weather forecasting capabilities (Numerical Weather Prediction); (iv) agro-meteorological information and services (including integrated crop and pest management); (v) applications related to building and management of infrastructure; (vi) land, air and maritime transport management; (vii) integrated water resources management; (viii) coastal zone and land management; and (ix) planning and policy making processes.

29. However, there are significant policy, institutional, financial, technological and informational barriers that prevent the desired situation from emerging. These barriers include:

Lack of weather and climate monitoring infrastructure

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

30. In all countries considered here there has been a steady decline in infrastructure dedicated to monitoring the climate, hydrology, environment and severe weather (e.g. meteorological and hydrological observing stations, satellite receivers and weather radar) for the last 20-30 years. Whilst this situation has been ameliorated by specifically targeted project interventions, this has often benefitted a few countries or a particular aspect of the early warning system (e.g. African Monitoring of the Environment for Sustainable Development (AMESD)[9] to improve use of satellite data or the "Weather for all" initiative to improve weather station coverage[10]). Recently the need for a systematic improvement of the observing network is recognized by the Global Climate Observing System (GCOS)[11] which in its reports to the UNFCCC notes that "Developing Countries have made only limited progress in filling gaps in their in situ observing networks, with some evidence of decline in some regions, and capacity building support remains small in relation to needs". The installation of new infrastructure also requires several practical condiderations: i) safety of the equipment; ii) power sources; iii) long term durability; iv) access for maintenance and v) transmission and archiving of data.

Limited knowledge and capacity to effectively predict future climate events

31. The scientific and technical capabilities required to effectively identify hazards and forecast their potential impacts on vulnerable communities are often weak. This may be due to a lack of either infrastructure (i.e. computational equipment), software (model code and associated routines) or human capacity/skills to programme and run the model code. Running forecast models is a highly skilled task and requires many years of education and training. Forecasters, with highly sought skills, are often lured into more lucrative work.

Inconsistent use of different information sources across and within country borders

32. If there is not a clear legal mandate for the issuing of warnings then messages may be confused (between different sources) and not acted upon. There needs to be an official process for generating warnings that include communication between sectoral ministries and with communities where disasters are experienced. Representatives from different ministries convene, assess the situation and warning messages are conveyed. This allows a wide range of views and evidence to be considered (including information from international and regional sources), though the process needs to be clear and act efficiently if warnings are to be issued in time.

No systematic forecasting of climate hazards, risks and timely dissemination of warnings

33. When climate information is available (monitoring and forecasts), it should be translated into specific hazards experienced by different sectors and users e.g. heat units for agriculture or wave heights for managing coastal shipping. Without translation into information that can be easily understood by users, the information is unlikely to be used. This information should then be combined with known vulnerabilities to identify areas and communities at risk. This is currently not part of the process for issuing warnings in most cases.

Lack of environmental databases for assessing the risks posed by climate variability and change

34. Calculating risks for known vulnerabilities requires a comprehensive archive of information related to vulnerable communities, infrastructure, roads, shipping, access to markets, flood prone areas, cropping patterns etc. This information are held in disconnected databases or computers spread across different government departments and ministries. All the information required to assess vulnerability and calculate risks needs to be accessible, either through a central database/repository, or through distributed networks.

Long-term sustainability of observational infrastructure and technically skilled human resources

[9] http://www.amesd.org/index.php?start=25
[10] http://www.un.org/apps/news/story.asp?NewsID=31193&Cr=weather&Cr1
[11] http://www.wmo.int/pages/prog/gcos/index.php

35. The maintenance of monitoring equipment, the human capacity to use and repair this equipment, process data and develop early warning packages, all require constant income streams and annual budgets. These are needed beyond the lifetime of this project and therefore require suitable business models and financial mechanisms to be developed. The NHMS often struggles to pay for the maintenance and upgrade of existing equipment which is recognized as a limiting factor[12] and various levels of public-private partnership have been suggested, including the use of an intermediary organisation[13]. Regardless of the business structure it is clear that delivery of targeted services, such as those proposed here, are essential for generating products and revenue that both public and private clients will pay for. This revenue can then support the maintenance of the observational infrastructure and the salaries of skilled staff to use it and generate the early warning products.

Baseline Project(s) the project will build on:

36. In Tanzania, UNDP's **Africa Adaptation Programme (AAP)** project "Mainstreaming CCA in the National sectoral policies of Tanzania" (with financing of **$2.97m**) seeks to mainstream CCA mechanisms in Tanzania's policy, development and investment frameworks. The expected proposed outputs are: introduction of long term mechanisms that can cope with CC uncertainties, strengthened leadership and institutional frameworks that can manage CC risks and opportunities, enhanced CC resilient polices and measures in priority sectors, national adaptation financing options established and dissemination of CC knowledge generated, stored and shared nationally, regionally and internationally. The project includes components on equipment and infrastructure procurement for early warning systems. This project seeks to strengthen the capacities of the Tanzania Meteorological Agency and other research institutions in climate change data collection, analysis, and dissemination. None of this financing has been considered as co-financing as the funds are for adaptation activities. However, it is mentioned here as this proposal seeks funds to build on activities financed by UNDP AAP.

37. **SADC Regional Meteorology Project (SAMPRO)**. Financing: **$10.4m**. SAMPRO is a regional development cooperation project based on an agreement between the Government of Finland and the Secretariat of the Southern Africa Development Community (SADC). An Inception Phase executed by the Finnish Meteorological Institute (FMI) in collaboration with the Meteorological Association of Southern Africa (MASA). The objective of the Inception Phase is build basis for multiyear regional project in Southern Africa and to strengthen the implementation of meteorology services in Southern Africa by building capacity and to make the function of early warning systems more effective. The purpose of cooperation in meteorology is based on the regional meteorology priorities set by the SADC ministers responsible for Transport and Meteorology. At present it is not clear how this investment will be distributed between countries and activities – for this PIF it is assumed that 15% is taken to be for Tanzania-specific activities (details will be clarified during the PPG phase).

38. The **UNDP** Country Programme includes a component, "**Crisis Prevention and Recovery**." This project will work with the Prime Minister's and Chief Minister's offices' disaster management departments to assist disaster-prone areas with emergency preparedness and response measures. This will include development of a framework for implementation of the disaster management policies in Mainland and Zanzibar. At the start of the project, disaster management guidelines in Zanzibar were not yet in place, and guidelines for Mainland needed updating following review. These efforts will be integrated with adaptation priorities. The budget for this particular component is **$2.75m**, according to the Country Programme document.

39. The **WFP** Project is part of the WFP Country Programme 2011-2015. The **Food for Assets** component, which features a disaster risk reduction lens, will give food as an incentive to participate in

[12] see WMO Global Framework for Climate Services
[13] See GFDRR WCIDS: http://www.gfdrr.org/gfdrr/WCIDS

activities such as "soil and water conservation measures, basic community socio-economic infrastructure, irrigation, homestead productivity intensification and income-generating activities, and tree nursery development." These "asset-creation" activities are designed to "strengthen community resilience, reduce vulnerability and enhance local food access and availability" for those susceptible to economic, climatic, or seasonal shocks, and are tied to climate change adaptation priorities. This programme will reach an average of 250,000 individuals each year. The full budget for this component is **$65.6 million** 15% of which has been taken as relevant financing (exact details will be determined during the PPG phase).

40. According to the Country Programme 2011-2015, **UNICEF** Project's **Emergency Preparedness and Response** component will have a budget of **$5.64 million** (of a total $74.7m project). UNICEF will create linkages for assessment of emergencies, information-sharing, monitoring and overall response. In high-risk districts and village councils, it will create emergency preparedness and response plans. This programme will have the following results: Communities have access to improved credible emergency information to enable early action; Relevant MDAs, LGAs, and NSAs are prepared, have adequate sectoral capacity and provide an effective intra-coordinated response in WASH, health, education, protection, agriculture, food security and nutrition in emergencies; The disaster management departments of the Prime Minister's Office and the Chief Minister's Office effectively lead emergency preparedness and response, with a focus on areas most susceptible to disasters; Refugees have access to basic services and protection in line with international norms and standards.

41. There are several additional projects which may provide co-financing and which will be elaborated during the PPG phase: The Danish Meteorological Institute is providing capacity building activities for the Tanzanian Meteorological Agency[14] and the SADC-HYCOS project (see coordinating projects) is investing in hydrological observing equipment.

B.2. Incremental/Additional cost reasoning: DESCRIBE THE INCREMENTAL (GEF TRUST FUND) AND THE ASSOCIATED Global environmental benefits TO BE DELIVERED BY THE PROJECT:

42. The first component of the proposed project seeks to establish a functional network of climate (meteorological and hydrological) monitoring stations and associated infrastructure (satellite and severe weather monitoring) as a basis for understanding climate change and building an early warning system to increase resilience to climate-related shocks. The second component concerns itself with developing connected systems and processes to enable the data from such a network to be translated, combined, reinterpreted and communicated to intended users. It will also develop the human capacity to make such a system work. The third component will coordinate activities with ongoing projects and regional activities to ensure best practices and maximise the effectiveness of implemented infrastructure and systems.

Component 1: Transfer of technologies for climate and environmental monitoring infrastructure

43. This component will procure and install infrastructure to improve access to climate and environmental information for a functioning EWS. Details of this procurement will vary depending on the required types of EWS (e.g. for floods, drought, severe weather, coastal processes etc.), existing infrastructure and telecommunications, capacity to utilise the equipment and associated data. Additionally, during the PPG phase potential climate change hotspots (where both vulnerabilities and hazards are expected to be high) will be considered when deciding where to place infrastructure e.g. meteorological stations in vulnerable regions etc.

[14] http://www.dmi.dk/dmi/en/index/klima/danish_climate_centre/developing_countries.htm

Baseline Situation including Projects

44. As of 2010, the Tanzania Meteorological Agency (TMA) had 800 rainfall-only (manually operated) observation stations (down from over 2,000 in 1977), and 1 Doppler weather radar. Many stations are in disrepair, and the collection of data depends on telephone and radio, making it unreliable. TMA also has a need to computerize its handwritten records, but most records remain unanalyzed. In 2009, therefore, TMA's ability to provide early warning and to contribute to historic climate analysis was considered to be far below its potential. Additionally different parameters such as river discharges, forest coverage, agricultural yields have been collected but is not always reliable.[15] As of 2010, TMA's computers used the database management system CLIMCOM, but the agency desired to use WMO-recommended software such as CLIDATA instead. Furthermore TMA has expressed a need for the following:

- Modernization and expansion of observation network, including remote sensing equipment;
- Upgrading of climate database management system;
- Improvement of telecommunication systems;
- Strengthening of marine weather service;
- Forecasting, post-processing and service production system;
- Climate change modeling capacity;
- Improving aviation weather services, including communication between TMA and ATC;
- Assessment of solar and wind power potential;
- Data Rescue facilities[16].

45. There is clearly a need to implement a better EWS in Tanzania as several projects incorporate early warning in their design and seek to use available climate information for this purpose (see links to the WFP, UNICEF and UNDP baseline projects). The Danish meteorological institute is providing technical assistance to Tanzania and the details of this (including financing) will be provided on completion of the PPG phase.

Additional cost reasoning

46. Under this component of the project the Government of Tanzania will be able to use LDCF resources to procure, install and/or rehabilitate critical infrastructure required to build and/or strengthen the climate-related observational network. In all equipment purchases an assessment of existing equipment will be made, noting the manufacturer, whether it is still working and whether the NHMS has an interest in continuing with particular makes/models. This will need to be weighed against the costs of potentially cheaper solutions and the added costs of training personnel to service different products.

47. Under **Output 1.1** of the proposed project, LDCF resources will be used for the procurement and installation or rehabilitation (in case of existing) of 10+ hydrological monitoring stations with telemetry, archiving and data processing facilities, which will enable the NHMS to monitor river and lake levels. In turn this allows the NHMS to identify dangerous floods before they occur, issue warnings for dam/transport managers downstream and alert communities at risk. All stations will be fitted with appropriate means for relaying data to central servers (e.g. via GPRS or satellite telemetry).

48. Under **Output 1.2**, LDCF resources will be used for the Procurement and installation or rehabilitation of approximately 40 meteorological monitoring stations, also with telemetry, archiving and data processing facilities. Comparison of the network coverage with the risk and vulnerability maps, calculated or sourced during the PPG phase, will be used to identify underserved locations where data from additional stations will be most useful. As early warning and up to date monitoring is a priority,

[15] Tanzania Africa Adaptation Project Document, p. 12
[16] SADC meteorology project SAMPRO. Government of Finland, Ministry for Foreign Affairs. p. 24

Automatic Weather Stations (AWS) using GPRS mobile telecommunications will be prioritised and where this is not available the feasibility of using more costly satellite communications will be assessed (including implications for budgets and future running costs). In cases where stations have been neglected but the site (fences, towers etc.) are still functional, LDCF resources will be used to replace existing sensors and data loggers as historical observations from the site can be used with newly acquired data to create longer timeseries for detecting climate changes. Preliminary estimates of costs for purchasing needed additional weather stations (based on government estimates) are $1m for 40 stations.

49. Under **Output 1.3,** LDCF resources will be used to procure equipment for monitoring severe weather. Radar equipment for doing this is costly (purchasing and maintaining the equipment, as well as training and paying personnel to operate it) and budgets will only allow for the purchase of 1-2 such items. Depending on the type of radar and function the useful range is of the order 75-200 km. This limits the practical use of this equipment for specific locations with either a high vulnerability to extreme weather (e.g. large urban or coastal areas prone to flooding), or high values services/assets such as airports. Alternative options using different technology to achieve similar results will be investigated and assessed, depending on the application e.g. combining satellite and in-situ observations, and lightning detection as a proxy for extreme weather.

50. Upper air monitoring stations, through either radiosonde ascents or other remote sensing technologies, are useful for improving regional numerical weather predictions and global climate models run by international forecasting centres. There were no baseline activities identified with this activity, besides regular procedures implemented by the NHMS. Through **Output 1.4** LDCF funds will be used to procure the equipment needed to make upper air soundings. The exact number of installed upper air stations will be decided as part of the PPG phase given other equipment needs. None of the ongoing baseline projects suggest that new upper air stations are being implemented, but stations to monitor upper air have been requested by the government.

51. LDCF resources will be used for the procurement of satellite receiving equipment and establishment of data/image processing facilities (**Output 1.**5). This output will build on the AMESD and recently launched SERVIR[17] programmes at the regional level, as well as Tanzania's current installation of satellite reception equipment. The potential uses of satellite data and imagery for planning and management purposes in the context of food security, and water management will be established based on country specific contexts, users of information, needs (in the short-term disaster management, medium-long term planning) etc. This will involve coordination with other projects such as FEWSNET and WFP. If online data is not available in time to support required decisions then satellite receiving equipment will be purchased and systems established to provide the required information.

52. Under **Output 1.6**, LDCF resources will be used to develop the human technical capacity required to maintain and use the equipment made available through the LDCF. Personnel responsible for the running of the equipment and receiving/archiving the data that it produces (including manually operated stations where necessary) will be trained, along with back up personnel and replacements. This includes ensuring that there is an incentive mechanism in place to sustain the system that is set up with the LDCF resources. The training will stress that cost-effective technologies are utilized, which are able to interface with existing systems and which minimise dependence on external suppliers of hard and software. No baseline activities were identified with this output besides routine NHMS activities.

[17] http://www.servir.net/africa/index.php?option=com_frontpage&Itemid=1

Table 1: Summary of needs that are relevant to Component 1 (to be developed in detail during the PPG phase):

Tanzania
Automatic Weather Stations (purchasing, installation)
Automatic Weather Observing Station (AWOS), purchasing and installation
Upper Air Stations including hydrogen generator (purchasing and installation)
Laboratory equipment for temperature calibration at TMA
Forecasting and Visualization Tools

Component 2: Climate information integrated into development plans and early warning systems

53. Much of the value of early warnings (whether a user changes their actions or lives/assets are safeguarded) is dependent on the packaging, communication and dissemination of those warnings. The effectiveness of warnings can be improved either through improving the forecasts/monitoring information, communications or the decision-making process. This component is primarily concerned with improving these aspects of the EWS. Specific details on the exact type of EWS information and risk management tools (for flood warnings, agricultural extension advisories, weather index insurance, transport planning etc) will be determined at the PPG phase and additional actions designed to meet those priority needs.

Baseline Situation including Projects

54. The EWS in Tanzania is coordinated by the Disaster Management Department in the Prime Minister's Office.

55. Tanzania Meteorological Agency (TMA) runs the following limited-area models (LAM): the Weather Research and Forecasting (WRF; horizontal resolution 5-15km; forecasting length: 48-54h); the WRF-BOGUS for TC track during the TC season (horizontal resolution 10km; forecasting length: 48-72h) for experimental purposes; and the High Resolution Regional Model (HRM; horizontal resolution 14km; forecasting length: 78h), which are also used for severe weather forecasting.

56. TMA is mainly focused on the two rainy seasons, of October-December and March-May, when most natural disasters occur in Tanzania. TMA provides climate outlooks (seasonal and monthly rainfall forecasts) and weather forecast (up to 10 days) including tropical cyclone advisories and warnings. The rainfall seasonal forecast is used by the Ministry of Water, to develop their scenarios of river flow and flooding and also by the agriculture sector to estimate yields and anticipate risks related to excess or deficits of rainfall. The Ministry of Health uses the seasonal forecasts for monitoring water borne and epidemic diseases.

57. Responsibility for the EWS is as follows: TMA: Weather and climate information (monitoring, forecasts and issuing warnings); Ministry of Water, Power Utility Company: River flow and dams (monitoring, forecasts and issuing concerned warnings); Disaster Management Department under Prime Minister's Office (Coordination of emergency response and DRR efforts); Ministry of Agriculture, Food Security and marketing: Monitoring food security; and Ministry of Health: Monitoring epidemic disease

58. The agrometeorological service provides information via emails to disaster management agencies, Ministry of Agriculture, WAMIS, the Famine Early Warning System Network (FEWSNET) offices in Tanzania. Decadal and monthly weather forecasts are also produced and TMA participates in agricultural shows and fairs to create awareness

59. CC-DARE, in conjunction with UNDP, UNEP, and Environmental Protection and Management Services, implements the project "Identification, documentation and dissemination of indigenous forecasting to adapt to climate change within selected communities."[18] This project seeks to identify indigenous forecasting through various data and information collection methodologies, then to create increased awareness and use of indigenous forecasting for early warning by various communities within the study area and across the country. In study communities, indigenous forecasting was to be combined with modern early warning systems and incorporated into TMA's work to recognize impacts of climate change and associated vulnerabilities.

60. There is clearly a need to link EWS to preparedness activities related to climate shocks in Tanzania as several projects are working to use available EWS information for managing disasters and slow onset hazards (see links to the WFP, UNICEF and UNDP baseline projects)

Additional cost reasoning

61. The capacity to make and use daily to seasonal climate forecasts will be developed through **Output 2.1**. This will link to ongoing activities at the NHMS and will ensure the capacity to run numerical weather prediction models, or be able to usefully generate and use data from these models run elsewhere with the region or at international centres. The data from these models should be linked to tailored products developed in output 2.2 and the decision processes in output 2.3. Numerical weather prediction is already undertaken and the gaps between existing forecasts systems and those required for climate resilient planning purposes will be evaluated during the PPG phase, including use of indigenous knowledge when useful (see CC DARE project[18]). Data sharing with regional NHMSs will be encouraged as this helps develop forecast products and the observations from other countries, collected through output 1.2, help understand the errors in the forecast models.

62. **Output 2.2** will develop new tailored products to serve the information requirements of users in different sectors and locations. These products will be developed through consultations with the intended users of the information and appropriate research organizations. Information and data from the monitoring infrastructure (weather and hydrological stations, radar, and satellite monitoring) will be combined to produce new user-relevant information. As an example, satellite and weather station observations can be combined to derive a spatially continuous dataset and estimate rainfall for locations which have no meteorological stations. Using these data the water balance of crops can be estimated for wider regions and these can be used as part of agricultural advisories. Improved availability of data to generate these products will also be implemented e.g. where important climate records reside in paper format, they will be digitised and used to better describe local microclimates, hence improving the baseline hazard mapping. It is currently not clear which projects are currently undertaking this work and this will be determined during the PPG phase.

63. Assimilating the forecasts from output 2.1 and tailored products from output 2.2 into existing EWS activities and processes will be the aim of **Output 2.3**. This will involve assessing the information needs of different decision-making processes e.g. for flood warnings, drought warnings, food security, water management etc and designing a set of information products that will inform the process. Existing EWS for particular sectors (e.g. Food security and floods) can be used to extend knowledge and skills to

[18] http://www.adaptationlearning.net/project/identification-documentation-and-dissemination-indigenous-forecasting-adapt-climate-change-w[19] http://www.rockefellerfoundation.org/what-we-do/current-work/developing-climate-change-resilience/grants-grantees/african-agriculture-climate-change

other sectors which need similar EWS and experience. Climate monitoring information from component 1 and forecasts from output 2.1 will be combined to identify regions where risks are currently high and likely to get worse. Where necessary satellite imagery will be used to assess the current extent of climate-related hazards and this information will be combined with agricultural (crop), flood risk or other sectoral models to help the decision making process. Training on the use of these technologies will be provided where needed. Several baseline projects are currently undertaking these activities, including FEWSNET and WFP. Coordination for this output will therefore be important and any new systems that are implemented will need to consider compatibility with existing systems and processes, as well as how to best combine different sources of information.

64. **Output 2.4** will establish communication strategies and processes targeted to each identified sector and user. The aim is to effectively communicate early warnings, and advisory packages developed through Output 2.3, in the most useful way for different users/audiences. These strategies will vary between countries as communications technologies, language and cultural norms vary. Using software and technology in innovative ways will be explored e.g. Google earth for presenting forecasts and identified risks. Lessons and experiences in other parts of Africa will be assessed for their potential to upscale e.g. using innovative techniques to communicate agrometeorological advisories[19].

65. **Output 2.5** will assess the sustainability of the EWS, taking cognizance of the current funding mechanisms and allocated budgets. It will assess where funding shortfalls are most acute and where budgets are likely to be reduced in the future. A comprehensive needs assessment for climate services will be carried out (how needs are currently met, opportunities for private partnerships and gaps in the current services), as well as the willingness and ability to pay for such services across a range of stakeholders, both private and public. Where suitable legal arrangements exist and where governments are willing, private companies will be approached to test their willingness to engage in a public-private partnership with the NHMS or associated entity. Similar activities within the country or region will be approached to learn from their experiences (e.g. the Weather Information for Development (WIND) initiative in Kenya). No baseline projects were identified with this output at this stage.

Table 2: Summary of needs that are relevant to Component 2 which will be developed further during the PPG phase:

Tanzania
Integrated multi-hazard system built - currently different components of the EWS do not communicate well
Data compiled and analysed in an integrated manner
Simple and user-friendly messages are developed
Agricultural advisories, flood warnings

[19] http://www.rockefellerfoundation.org/what-we-do/current-work/developing-climate-change-resilience/grants-grantees/african-agriculture-climate-change

B.3. 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. AS A BACKGROUND INFORMATION, READ Mainstreaming Gender at the GEF.:

66. The project is expected to deliver benefits at both the national and local levels. The installation of weather, upper air, radar and other observation and computer infrastructure will benefit the NHMS staff (through training and technological advancement). Other national institutions that will benefit from this endeavour will be Ministries of Agriculture, Water, Energy and Disaster Management, through strengthening of their computer databases, access to information and ability to communicate with other regions. One important benefit will be the improved coordination between government departments and the sharing of information, which can lead to improved products and services. It is then possible that these institutions can start marketing such information and products (satellite monitoring and climate forecast products in particular) to private entities that will pay for the services.

67. 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 knock-on effects on people's health and wellbeing and thus affects communities and social structures. Communities will immediately benefit through warnings related to agriculture, coastal management, water and flood management, wildfires etc. This total population benefiting from these developments has the potential to grow hugely if warnings extend to a reasonable percentage of the total population e.g. through a mobile phone relay or similar system. Many of the beneficiaries will be women, especially within the agriculture sector where they often make up the majority of smallholder farmers, yet are most vulnerable to food insecurity. There may also be other benefits to developing the communication systems associated with early warnings - for instance radios can also be used for arranging medical evacuations.

68. Perhaps the largest economic benefits are associated with improved transport planning, especially shipping which will take advantage of improved forecasts of winds and waves, and aviation which can take advantage of improved local forecasts. These and commercial agriculture likely represent some of the largest private clients for early warning services and tailored forecasts. Together with satellite imagery used for land-use planning and monitoring these can provide environmental benefits, including monitoring of illegal logging which has global consequences in terms of deforestation and the global carbon budget.

B.4. INDICATE RISKS, INCLUDING CLIMATE CHANGE RISKS THAT MIGHT PREVENT THE PROJECT OBJECTIVES FROM BEING ACHIEVED, AND IF POSSIBLE, PROPOSE MEASURES THAT ADDRESS THESE RISKS

Risk	Level	Mitigation
Unavailability of requisite human resources and data	High	The issue of the unavailability of requisite human resources will be mitigated by recruitment of international consultants who will work closely with in-country counterparts and by targeted capacity building activities. Training activities of local personnel will also be part of all aspects of the work and the relevant institutions will be encouraged to expand the staff base if it is weak in particular areas.
Local IT and telecommunications infrastructure weak e.g. international bandwidth and local mobile telecommunications networks	Medium	Cost-effective solutions for each particular situation will be used e.g. satellite and/or radio communications. Where feasible automatic weather and hydrological stations reporting over the mobile telecoms network will be preferred.
Insufficient institutional support and political commitments	Medium	The proposed project is strongly supported by Governments and other key stakeholders and development partners. The project, in conjunction with UNDP, will therefore take advantage of this opportunity to seek substantial support from the Governments and forge strong partnership with other development partners. Direct linkages to existing and planned baseline development activities implemented by government, securing of the necessary co-financing, as well as local buy-in will also minimize this risk. It will also be important to establish buy in from all government departments early as the project will utilize data and information from a wide range of departments.
Work progresses in a compartmentalized fashion and there is little integration e.g. government departments refuse to share data and information	Medium	This risk is always present in a project such as this. By ensuring that capacity is built across a range of departments and implementing 'quick win' measures early (developing products based on internationally available data), these issues can be mitigated.
Non-compliance by primary proponents for the successful implementation of this project	Medium	Ensuring that the project is designed and implemented in a participatory and inclusive manner, following established UNDP procedures, will mitigate the risk. Since the activities correspond to the urgent needs as expressed by the primary proponents the risk of non-compliance should be reduced
Climate shock occurring during the design and implementation phase of the project	Low to medium	There may be some delays as more urgent priorities may need to be addressed by some of the stakeholders (e.g. NHMS or disaster management) but it is unlikely that this will derail the project.

B.5. IDENTIFY KEY STAKEHOLDERS INVOLVED IN THE PROJECT INCLUDING THE PRIVATE SECTOR, CIVIL SOCIETY ORGANIZATIONS, LOCAL AND INDIGENOUS COMMUNITIES, AND THEIR RESPECTIVE ROLES, AS APPLICABLE:

Stakeholder	Relevant roles
Regional	
SADC Regional Meteorology Project (SAMPRO)	Not clear as yet – project is just starting but will likely invest in hard technologies e.g. weather stations and radars
Climate for Development in Africa Programme (ClimDev-Africa)	Promoting the use of climate information for development – potential partner for TA
African Monitoring of the Environment for Sustainable Development (AMESD)	Installing and promoting the use of satellite equipment and technology for environmental monitoring
Global Climate Observing System (GCOS)	Coordinating body for the climate observing system worldwide
Southern African Development Community Hydrological Cycle Observing System (SADC-HYCOS)	Coordinating the installation and use of hydrological monitoring equipment and information for water resource management
Global Facility for Disaster Reduction and Recovery (GFDRR)	Working mostly with disaster management, the programme also has a facility for advising on infrastructure development
IGAD Climate Prediction and Applications Centre (ICPAC)	Climate forecasts and the seasonal outlooks
Famine and early warning system network (FEWSNET)	Working across Africa to implement climate monitoring and forecasting for early warning in the food security sector
UNDP Bureau for Crisis Prevention and Recovery (UNDP-BCPR) and Environment and Energy Group	Working with disaster management, disaster and loss databases and climate risk assessments UNDP's AAP programme is investing in both hard technology and the use of climate information for risk management
Tanzania	
Tanzania Meteorological Agency	Running meteorological services and infrastructure
Prime Ministers Office-Disaster Management Department	Disaster preparedness and response
Ministry of water	Water supply and monitoring
Ministry of energy and minerals	Hydropower and geological prospecting
Ministry of agriculture	Food security and cooperatives
Ministry of livestock and fisheries	Animal diseases
Ministry of transport	Airports, road, ports
World Food Programme	Food security and development
FAO	Agriculture and food security
WHO	Health

B.6. OUTLINE THE COORDINATION WITH OTHER RELATED INITIATIVES:

69. **Climate for Development in Africa Programme (ClimDev-Africa)** is a joint initiative of the Commission of the African Union (AUC), the African Development Bank (AfDB) and the United Nations Economic Commission for Africa (UNECA). ClimDev-Africa has received strong political endorsement from AU heads of state and government, African Ministers, several key stakeholders and the International Community. In general, the ClimDev-Africa programme supports Africa's response to climate variability and change by building regional, sub-regional and national policy capacity. It will improve the quality and availability of information and analysis to decision-makers.

70. The **African Monitoring of the Environment for Sustainable Development (AMESD)** Project. The European Union funded project Preparation for the Use of MSG in Africa (PUMA) made available data and products from EUMETSAT's latest satellites, promoting African National Meteorological and Hydrological Services to provide accurate weather forecasts, monitor extreme weather phenomena, and improve disaster management. The African Monitoring of the Environment for Sustainable Development

(AMESD) initiative takes PUMA a stage further by significantly extending the use of remote sensing data to environmental and climate monitoring applications.

71. The **Global Climate Observing System (GCOS)** is intended to be a long-term, user-driven operational system capable of providing the comprehensive observations required for: Monitoring the climate system; Detecting and attributing climate change; Assessing impacts of, and supporting adaptation to, climate variability and change; Application to national economic development; Research to improve understanding, modelling and prediction of the climate system. GCOS is a joint undertaking of the World Meteorological Organization (WMO), the Intergovernmental Oceanographic Commission (IOC) of the United Nations Educational Scientific and Cultural Organization (UNESCO), the United Nations Environment Programme (UNEP) and the International Council for Science (ICSU). It includes both in situ and remote sensing components, with its space based components coordinated by the Committee on Earth Observation Satellites (CEOS) and the Coordination Group for Meteorological Satellites (CGMS). GCOS is intended to meet the full range of national and international requirements for climate and climate-related observations.

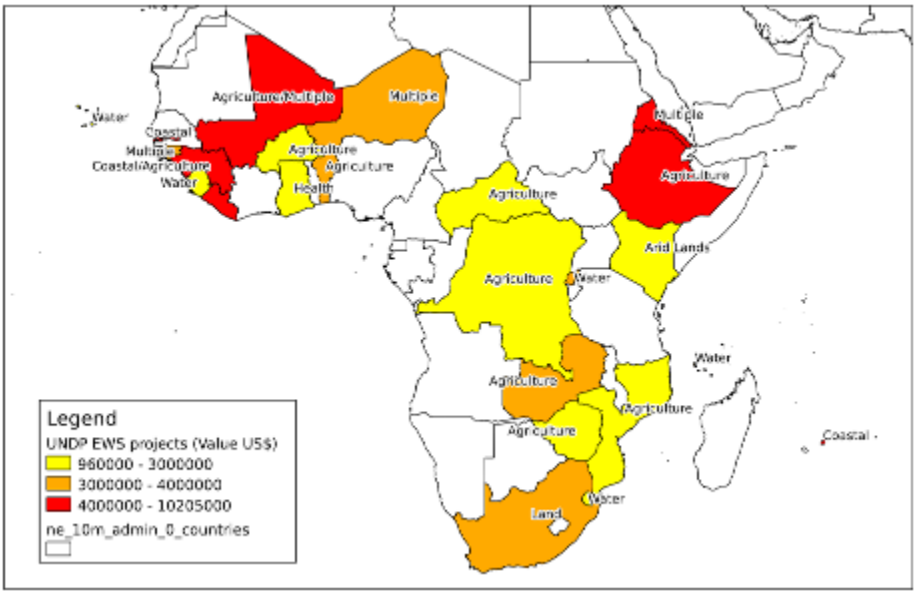
72. The **Southern African Development Community Hydrological Cycle Observing System (SADC-HYCOS)** is a regional component of the World Meterological Organisation (WMO) programme aimed at improving the basic observation activities, strengthening regional cooperation and promoting free exchange of data in the field of hydrology. The programme is guided by the World Hydrological Observing System (WHYCOS) International Advisory Group (WIAG). The aim is to ensure that participating countries, individually and collectively, attain the technical capability, effective management and equitable use of the freshwater resources of the sub-region and to establish a Water Resources Information System as an effective decision making tool

73. A component of **UNEP's LDCF-funded project, "Developing Core Capacity to Address Adaptation to Climate Change"** seeks to "provide decentralized administrations and communities with the capacity to perform coastal vulnerability assessments, as well as information and analytical tools to undertake participatory adaptation planning. This will also include local climate monitoring capacity, so as to enhance local forecasting and monitoring of climate change and sea level rise."

C. DESCRIBE THE GEF AGENCY'S COMPARATIVE ADVANTAGE TO IMPLEMENT THIS PROJECT:

74. The proposed project is aligned with UNDP's comparative advantage, as articulated in the GEF matrix, in the area of capacity building, providing technical and policy support as well as expertise in project design and implementation. Additionally UNDP has close links with governments, as well as a high level of experience managing other LDCF projects in the region, in particular those with an early warning component. The figure below shows the value and sectoral focus of projects currently managed by UNDP which have a EWS component. UNDP is therefore already working with EWS in many countries and many sectors, strengthening its capability to coordinate and providing the flexibility to handle changing needs between countries. The country offices are supported by Regional Technical Advisors at UNDP offices in Pretoria, as well as by policy, adaptation, economics and climate modeling experts in New York, Cape Town and Bangkok.

75. The UNDP country office in Tanzania is well placed to coordinate activities between different programmes and institutes. Currently it has a focus on: Programme 1 – Sustainable Management of Protected Areas and Programme 2 – Mainstreaming environment & Energy and Sustainable Land Management. It has links with both with the meteorological agency and disaster management, as well as experience running other GEF projects such as the SCCF-funded project in the Pangani Basin with a focus on climate change impacts on water resources.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C.1. INDICATE THE CO-FINANCING AMOUNT THE GEF AGENCY IS BRINGING TO THE PROJECT:

76. The total funding that UNDP is bringing to this project is US$2,750,000. The details of these projects have been outlined above.

C.2. HOW DOES THE PROJECT FIT INTO THE GEF AGENCY'S PROGRAMME (REFLECTED IN DOCUMENTS SUCH AS UNDAF, CAS, ETC.) AND STAFF CAPACITY IN THE COUNTRY TO FOLLOW UP PROJECT IMPLEMENTATION:

77. Activities and results that will be developed under this project are also fully consistent with the UNDAF outcome 2.1 "Improved sustainable Natural Resource Utilization and food security", 2.2 "Improved access to sustainable livelihoods opportunities in an innovative and competitive private sector", and UNDAF outcome 2.3 "Improved access to sustainable basic infrastructure".

78. UNDP's comparative advantage in implementing this project is underpinned by our energy and environment programme strategy which aims to mainstream environment and disaster prevention measures into national and local development policies, strategies and plans and our overarching role of capacity development.

79. Public service reform and institutional building is one of UNDP's flagship programming areas. The proposed capacity development activities in all components of the LDCF project will benefit from UNDP's overarching and strategic role in this area, helping to ensure that related outcomes are sustainable in the long-term.

80. There are other LDCF, SCCF and Adaptation Fund -financed projects within the region with similar objectives (see figure above) currently supported by UNDP, which means that there is substantial in-house technical expertise within UNDP that can be brought to bear to support the Government with the project as outlined above. UNDP country office operations are supported by regional advisory capacity based in the UNDP Regional Centre in Pretoria. UNDP has dedicated Regional Technical Advisers focusing on supporting adaptation programming and implementation in a range of technical areas relevant to this project including capacity development, coastal zone management, disaster management, infrastructure development, and ecosystem based adaptation. Our network of global Senior Technical Advisors provide additional technical oversight and leadership helping to ensure that programmes on the ground achieve maximum policy impact.

81. UNDAF and CPD priorities for all countries will be outlined after conclusion of the PPG phase.

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):

NAME	POSITION	MINISTRY	DATE *(MM/DD/YYYY)*
Dr Julius Ningu	Permanent secretary	Vice presidents office, Tanzania	04/20/2012

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF policies and procedures and meets the GEF criteria for project identification and preparation.

Agency Coordinator, Agency name	Signature	Date	Project Contact Person	Telephone	Email Address
Yannick Glemarec Executive Coordinator UNDP/GEF		May 18, 2012	Mark Tadross Technical Advisor Gr-LECRDS	+27 21 6502884	Mark.tadross@undp.org