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 Africa for climate resilient development and adaptation to climate change – Burkina Faso			
Country(ies):	Burkina Faso	GEF Project ID:[1]	5003
GEF Agency(ies):	UNDP	GEF Agency Project ID:	5104
Other Executing Partner(s):	Division of Environment Information and Monitoring; National Council for Sustainable Development (SP/CONEDD)	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	**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	2,614,700	24,236,210
CCA-2	**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	1,195,300	36,354,315
		Project Management Cost	LDCF	190,000	500,000
		Total project costs		4,000,000	61,090,525

B. PROJECT FRAMEWORK

Project Objective: To strengthen the weather, climate and hydrological monitoring capabilities, early warning systems and available information for responding to extreme weather and planning adaptation to climate change in Burkina Faso.

Project Component	Grant type	Expected Outcomes	Expected Outputs	Trust Fund	Indicative Grant Amount ($)	Indicative co-financing ($)

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

Transfer of technologies for climate and environmental monitoring infrastructure	INV/ TA	1. Enhanced capacity of national hydro-meteorological services (DGM/DGRE) and environmental institutions (DCIME) to monitor extreme weather and climate change (droughts, floods, strong winds)	1.1 Procurement and installation of 100 water level monitors to be placed on 11 manual, hydrological stations and 8 acoustic Doppler flow meters (ADCP) for the National Hydrological Service (DGRE). All equipment will include data transmission/processing/storage facilities which will feed into hydrological forecasting models. (INV: US$ 817,600) 1.2 Procurement and installation of 40 automatic climate stations, 10 automatic synoptic stations with telemetry and 100 rain gauges for the National Weather Service (DGM), including improved data transmission/processing/storage facilities. (INV: US$ 1,069,200) 1.3 Rehabilitation of the radar in Ouagadougou including acquisition of spare parts and knowledge sharing to build self-sufficiency within SAAGA to be able to undertake radar operation and maintenance. (INV: US$ 105,500) 1.4 Radiosonde equipment for ASECNA to provide one more sounding at midnight (in addition to at noon) to generate vertical, atmospheric profile information to feed weather forecasts according to WMO standards. (INV: US$ 236,000 1.5 Equipment for improved satellite imaging and data visualization for the Departmental Division on the Understanding of Environmental Information and Monitoring (DCIME). (INV: US$ 230,400)	LDCF	2,614,700	24,236,210

			1.6 Training for DGM (4 engineers / 4 technicians) and DGRE (3 engineers) on equipment data communication/treatment, operation and maintenance (O&M) and maintenance/monitoring principles including development of Standard Operating Procedures (SOPs) for equipment and capacity reinforcement for long-term budgeting.(TA: US$ 156,000)			
Climate information integrated into development plans and early warning systems	INV/ TA	2. Efficient and effective use of hydro-meteorological and environmental information for making early warnings and seasonal forecasts which feed into long-term development plans	2.1 DGM, DGRE and DCIME capacity to make and use climate forecasts (on hourly, daily and seasonal timescales) is strengthened by training 7 engineers and 4 specialized technicians, updating the National Water Information System Plan (SNIEau) and promoting national and regional knowledge sharing. (The Government will assist with recruitment and will mandate that trained personnel must remain working within their respective institution for at least 10 years after training. Training of personnel will occur on national and regional levels.) (INV/TA: US$ 241,000) 2.2 Tailored agricultural and extreme weather risk advisories that link climate, environmental and socio-economic information on short-term and seasonal timescales are developed to support end-user needs and to promote sustainable financing mechanisms, including research development of a mobile-phone based advisory platform. (TA: US$ 154,000) 2.3 Development of a multi-agency platform to enhance cooperation (CIMS) and to resolve lack of coordination and data sharing amongst agencies and with EWS-related initiatives. (TA: US$ 87,300)	LDCF	1,195,300	36,354,315

			2.4 Development of an open-access EWS data portal for sharing data cross-sectorally, including facilitating internet access and mobile phone services with a Public Private Partnership (PPP) and transferring data into the Global Telecommunication System. (INV: US$ 85,000) 2.5 Capacities for CONASUR and DCIME to conduct field inspection/validation assimilate forecasts and monitoring into existing development planning, PRSPs (SCADD and PEI) and the National Multi-risk Plan are built through local and regional collaborations and support from the Multi-agency Synergy Committee (CIMS). (TA: US$ 199,000) 2.6 Communication channels and standard procedures for issuing warnings by CONASUR, SIG, NGOs/CSOs are enabled through public/private partnerships with radio, newspaper, television and mobile phone services including the development of a feedback mechanism via toll-free numbers, SMS and contact with local EWS focal points and field analysis on the utility of early warning advisories and warnings. (INV: US$ 291,000) 2.7 Rural community capacity to adapt to climate shocks is strengthened by promoting understanding of alert signals and disaster risk prevention planning and gauging the receipt of alerts in a gender disaggregated survey. (TA: US$ 138,000)			
Sub-total					3,810,000	60,590,525
Project management cost (PMC)					190,000	500,000
Total project costs					**4,000,000**	**61,090,525**

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

Please include letters confirming co financing for the project with this form

Sources of Co-financing	Name of Co-financier (source)	Type of Co-financing	Co-financing Amount ($)
National Government	National Land Management Programme, PNGT Phase III project / World Bank	Grant	53,550,000
GEF Agency	UNDP - COGEL Project	Grant	4,000,000
GEF Agency	UNDP- Poverty Environment Initiative	Grant	1,600,000
Bilateral Aid Agency (ies)	US AID - WA-WASH Project	Grant	1,900,000
National Government	Ministry on Sustainable Development- MEDD	In-kind	40,525
Total Co-financing			**61,090,525**

D. TRUST FUND RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY[1]

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 adaptation	Burkina Faso	4,000,000	400,000	4,400,000
Total GEF 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 ($)	Cofinancing ($)	Project Total ($)
International Consultants	507,300	0	507,300
National/Local Consultants	203,000	0	203,000

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]

1. No significant changes were made to the original PIF. All Outputs have been detailed and contextualized and Outputs in Component 2 have been restructured to emphasize the needs highlighted during the project preparation phase as noted during workshops and bilateral/multi-lateral consultations. Stakeholder consultations emphasized the following three requirements for a sustainable EWS/CI which have been added as Outputs in Component 2.

1) Creation of platform to improve synergy amongst EWS-related initiatives by improving coordination/collaboration among agencies involved with EWS/CI (Output 2.3);
2) Improving data sharing by facilitating data transfer capabilities between agencies and internationally and establishing a centralized EWS data server (Output 2.4);
3) Reinforcing understanding of EWS/CI on local levelssuch as through a public awareness campaign (Output 2.7).

2. Furthermore, an original output in Component 2 on planning sustainable financing for Operation and Maintenance (O&M) has been included in Output 1.6 under the rationale that Output 1.6 focuses on capacity reinforcement for equipment O&M. Similarly, capacity reinforcement for the information production agencies on establishing sustainable cost-recovery mechanisms with revenues generated from selling tailored weather/climate products and risk maps is now included as an activity in Output 2.2 due to this Output's focus on establishing weather/climate services.

A.1 National strategies and plans or reports and assessments under relevant conventions, if applical

NAPAS, NAPs, NBSAPs, national communications, TNAs, NCSA, NIPs, PRSPs, NPFE, Biennial Update etc.

Not Applicable (NA).

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

N/A

A.3 the GEF Agency's comparative advantage:

N/A

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

3. In Burkina Faso, there is a limited network of hydro-meteorological monitoring infrastructure which can consistently transmit data at a fast enough frequency to effectively provide weather forecasts and help to predict climate scenarios. A lack of meteorological and hydrological monitoring stations has meant that many important regions and populations vulnerable to climate hazards are not monitored e.g. drought conditions (e.g., soil moisture) 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 go unnoticed. As a result, many potentially threatening hazards have not been anticipated and some foreseen consequences have not been mitigated. A prime example is the 2009 major

[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

flood event, one of the most destructive floods in Burkina history, where Burkina was unable to alert the population. Furthermore, where stations exist, they are often manually operated and do not report measurements for several weeks after the climate hazards have passed. Equipment failure is also common and regular checks and maintenance are often neglected due to insufficient funds and poor budget planning resulting in poor quality and unreliable data for decision-making.

4. Additionally satellite data is not fully exploited to forecast rainfall, soil moisture or monitor severe weather due to limited equipment required to download and visualize data effectively. Burkina was a recipient of the African Monitoring of the Environmental for Sustainable Development (AMESD) project until 2012 which provided a satellite receiving station for the reception of environmental data specific to Burkina. However, this program focused on procuring equipment and did not include sufficient capacity reinforcement for technical personnel on how they could effectively interpret and display the data. By not establishing the groundwork for how to deliver satellite data services such as preparing drought risk maps, Burkina Faso currently does not have the know-how and remaining visualization equipment to produce useful, localized maps and analyses which can assist long-term risk planning.

5. The radar network for monitoring rainfall is also limited in Burkina Faso; two radar exist at airports located in Ouagadougou and BoboDioulasso and are operated and maintained by the Radar and Cloud Seeding Center for Aeronautical Aviation program (SAAGA). Both radar have been installed to aid air traffic control, however, only the radar in Bobo is currently functional. (Another radar is housed within the Met Service building; however, this radar is used for African Monsoon Multidisciplinary Analysis (AMMA) research purposes only.) The radar has ceased functioning in Ouagadougou due to poor budget planning for recurring costs such as maintenance and spare parts.

6. Burkina also does not currently have the technical capacity and human resources required to prepare weather forecasts for the coming 1-7 days using a combination of Numerical Weather Prediction (NWP) models and predictions either from neighbouring countries or 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 (i.e., data assimilation). In the case of Burkina Faso, regional seasonal forecasts, such as the ACMAD's PRESAO forecasts are currently utilized by DGM, however, such forecasts are not sufficiently downscaled and localized to be appropriate for all of Burkina's three climate zones, nor useful for any further localized analysis that can aid adaptation planning.

7. Burkina also lacks tailored weather and climate products for specific socio-economic sectors. The forecasts and climate information are 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 possible; weather forecasts are published in bulletins and on television with data concerning the next 24 hours. They provide general information on the minimum and maximum temperature of the current and next day, the quantity of rainfall (mm) and the state of visibility in different geographical regions. In the context of an EWS for Burkina, it is necessary to have more refined spatial and temporal estimates of expected rainfall intensity and wind speeds to outline with greater certainty, regions at risk. Furthermore, there is a limited database of climate information required for long-term planning and better management of water storage, crop selection and cultivation cycles.

8. There are also limited trained technical personnel with the skills required to maintain an observational network, generate weather forecasts and climate predictions and interpret data in ways that non-technical stakeholders from various socio-economic sectors can understand. The lack of trained personnel is compounded by the fact that current technical staff are close to retirement. Without sufficient technical expertise it is more likely to have gaps in data collection and an absence of hydro-meteorological equipment maintenance. In the case of Burkina, human capacity is required to:

- Take manual measurements and transmit information by post;
- Replace components of the observing networks when they fail;
- Manage and run forecast models;
- Determine how users best understand data and design information packages that address user-needs;
- Be able to combine, manipulate and overlay different data to identify areas at risk.

9. In terms of communicating EWS/CI messages, consultations with NGOs/CSOs during project preparation indicated that local populations do not always understand the technical jargon associated with weather forecasts. Also, they do not understand the limitations of forecasting in terms of prediction uncertainty. Furthermore, weather forecasts are currently disseminated in the media (TV, radio, written press, all of which can be public or private), however, there is no mechanism to make the flow of climate information and alerts more efficient and standardized. Most significantly, due to various absent or false alarms (as seen in 2008, 2009 and 2010), confidence in alerts must be rebuilt.

10. Furthermore, Burkinabé women, just as women in general, are more vulnerable to the effects of climate change relative to men; they constitute the majority of the world's poor (two-thirds, O'Brien 2008) and are more dependent for their livelihood on natural resources that are threatened by climate change, particularly those living in rural regions who have limited mobility. The gendered division of household labour means that women are responsible for the majority of subsistence household chores; women are generally charged with the responsibility to secure water, food and fuel for cooking and heating and often have very little time to devote to alternative sources of income due to domestic and farming responsibilities. In addition, they may be excluded from some activities due to cultural norms, or due to lack of capital and ownership arrangements that confer all rights to men in the family (Buhl 2005; Eriksen et al. 2005, Eriksen et al. 2007). This inequality is compounded by a lack of opportunities arising from limited access to education and information services which prohibit participation in decision-making. Due to all of these reasons, it is thus important to identify gender-sensitive strategies to ensure women are included in measures designed to improve their resilience and capacity to adapt to climate change (UN Women Watch 2008).

11. In order to improve communication of alerts, particularly to women, this project will build off ofon-going grass-roots based projects which focus onparticipative community involvement. Links with local awareness groupsestablished through the USAID WA-WASH and UNDP COGEL projects will be exploited to facilitate warnings and community feedback required to improve the effectiveness of alerts. These significant baseline projects, along with the PNGT3 National Land Management Programme, the Poverty and Environment Initiative and the Ministry of Sustainable Development (See Table C above), will be used to support and co-finance the LDCF2 project, and are detailed below:

- **The UNDP COGEL** project – The UNDP financed project ***Consolidation of the Local Environmental Governance*** was approved in October 2011 for **$4.0m**with UNDP core funds (TRAC) plus **$630K** from the Government. Operating at both national and sub-national levels, the project focuses on strengthening relevant structures and community based organisations to integrate a practical approach to sustainable development and natural resource management as a means to roll-out the National Strategy for Accelerated Growth. The project is focused on the regions of eastern and central-northern Burkina. This project will serve to co-finance this project for **$4m**.
- The ***WA-WASH*** project of **USAID** aims to improve access to potable and treated water in 4 West African countries including Burkina Faso, Niger, Mali and Ghana. Project financing is 28 M USD for all countries. Sub-projects aim to improve the agricultural productivity and life conditions in rural, farming regions by promoting sustainable agricultural and water management activities. Capacity reinforcement and microfinance mechanisms are also used to ensure the sustainability of the projects. These rural projects use ground-based support representatives. Co-financing for this project is**$1.9m**.
- **PNGT3 –** ***National Land Management Programme***(World Bank co-financed under its *Community Based Rural Development Project*). The third phase of this project will begin in June 2013. The project supports rural communes in planning and implementing local development activities with a participatory and sustainable approach. PNGT works on the community level to give resources and support to local populations for their case specific needs. The Project contributes to the second phase of the National Programme for Decentralized Rural Development. It has three main components: A) strengthening capacity for decentralized rural development; B) local development financing; and C) rural land tenure reform. Behind the project's implementation is an investment of **$103m**, of which **$73m** were committed by the World Bank. Some 3,000 villages have been covered by the implementation of more than 18,000 micro projects and various capacity building activities. Many of these micro projects are located within the LDCF project zones. Co-financing provided by thePNGT3 project is**$53.5m**.
- **UNDP's Poverty Environment Initiative (PEI):**PEI-Burkina, formulated by the UNDP CO, supports sectoral policies integrating environment and climate change as a cross-cutting issue into revised development plans.

The LDCF2 project plans to facilitate updates to the PEI by linking early warnings and climate information with poverty reduction. Co-financing for this LDCF2 project by UNDP PEI is **$1.6m**.

- **Ministry of Sustainable Development (MEDD)** will support the LDCF2 project with their existing budget used to promote environmentally-focused projects such as for sustainable water supply and reforestation. MEDD will provide **$40,525** in co-financing.

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:

12. Outcome 1: Enhanced capacity of national hydro-meteorological services (DGM/DGRE) and environmental institutions (DCIME) to monitor extreme weather and climate change (droughts, floods, strong winds)

Without LDCF Intervention (baseline):

13. Regional early warning systems are in place in Burkina Faso to produce alerts for food insecurity (by the Direction of Production and Rural Economy (DGPER) in the Ministry of Agriculture) or to notify residents near any of the 15 national dams that they are at risk for flooding or when water is insufficient for irrigation (alerts provided by DGRE). The existing food security EWS uses agro-climatic data and partnerships between the NHMS and the Ministry of Agriculture. Currently, DGM contributes data for agricultural planning including daily/monthly/annual rainfall, air/soil temperature, water vapour levels, and wind speed, among others. To acquire this data, DGM collaborates with various regional and international partners.[4]

14. The General Directorate on Water Resources (DGRE) is responsible for operating and maintaining a surface hydrological monitoring network of 71 water level meters, 11 manual flow meters and 1 Acoustic Doppler Current Profiler (ADCP) flow meter. Paid observers[5] take manual readings once a day at minimum. Data is sent either weekly or monthly via post or telephone to DGRE, often resulting in critical delays which have made early warnings for flooding practically impossible. An exception is DGRE's management of hydropower operations (dam spillways and reservoir levels). They are currently capable of generating automatic alerts to the populations located around the dams through radio communication. The DGRE's annual operation and maintenance budget for the hydrological network is ~US$ 81,000.

15. At present, a number of challenges limit the DWRM's water resource monitoring and assessment capacity. Coverage of the country is very limited. All hydrological equipment is manual which prevents rapid warnings for inundation and flash floods from being generated and disseminated. Some flow gauges have been damaged during floods and others have been poorly maintained. At present, approximately 60% of the equipment is not functioning. DGRE has existing hydrological modelling software, HECRES and MIKEBASIN. They have been trained by external experts during recent years over weekly increments. However, this limited training has not enabled them to make the flood or water management models fully operational.

Table 2:Status of existing hydrological equipment under the DGRE (see Annex 6 for location and operation status of existing equipment).

Station type	Existing	Fully operational
Water level (stage) measuring equipment	71	60
Manual flow meters	11	7
Acoustic Doppler Current Profiler (ADCP) flow meters	1	Not deployed because lack of understanding on how to use equipment

[4]Christian Aid report. Nov. 2010. "EWS Networks in Mali and Burkina Faso." Accessible at: http://community.eldis.org/.59e99ac1
[5]Observer salaries are paid by government budget lines

16. The General Directorate on Meteorology (DGM) is responsible for establishing and maintaining the weather and climate observation network in Burkina Faso. This includes data collection, analysis and exchange as well as the production of weather and climate information and products (including warnings) to support social and economic development. ASECNA, the regional Meteorological Forecast Center, is an operational arm of DGM which is concerned with forecasting for aviation and launching the radiosondes in Ouagadougou and Bobo once per day. Presently, only ASECNA has the capacity to produce forecasts. SAAGA, the Radar and Cloud Seeding Center for Aeronautical Aviation, is responsible for radar operation.

17. The weather and climate observation network managed by the DGM includes 20 synoptic, 20 agro-meteorological and 8 climate stations as well as 100 rain gauges. Two satellite receivers, one at DCIME and one at DGM exist. Two radar exist at airports located in Ouagadougou and BoboDioulasso. Both radar have been installed to aid air traffic control, however, only the radar in Bobo is currently functional.

18. Presently, observation stations do not cover the spatial variability of the three different climate zones(See Figures in Annexes 6 through 9). Most existing stations are obsolete and in need of rehabilitation (with the exception of newly acquired stations acquired through the NAPA1 project, See Section A.7). DGM has limited spare parts and insufficient maintenance and calibration equipment. There is a shortage of modern and/or automated monitoring stations. As a result, data is transmitted from existing weather/climate and hydrological stations typically once a month. This inhibits the use of hydro-meteorological information for making early warning systems and long-term development plans.

19. In addition, the one radiosonde launch per day does not adhere to WMO recommendations to monitor the atmospheric vertical profile twice per day (at noon and midnight) to effectively contribute to regional forecasting models. Furthermore, the radar in Ouagadougou has ceased functioning due to poor budget planning for recurring costs such as maintenance and spare parts. Repair is quite expensive because SAAGA is dependent on an American company to send qualified personnel and spare parts to perform maintenance.

Table 3: Status of existing meteorological stations under the General Directorate on Meteorology in Burkina Faso.

Station type	Existing	Fully operational
Synoptic, manual	20	0
Agro-meteorological, manual	20 (6 automatic)	7
Climate, manual	8	5
Rainfall gauges	100	60
Radar	2	1
Radiosonde	2	2
Satellite receiving stations	2	2

20. Despite the existing monitoring capabilities and support from associated baseline projectsdescribed in Section A.7, infrastructure and knowledge on the implementation of modern weather, climate and hydrological forecasting is still required. No repair tools or manuals are available, in particular for automated equipment. Very little equipment if any (none in the case of DGRE) is automated. Furthermore, despite investment in computer equipment through existing projects, limited training in relevant software has been provided to DGM and DGRE personnel. This prevents the development of modern weather forecasting and climate change modelling capabilities. Also, little data from Burkina Faso is transmitted internationally through the Global Telecommunications Network (GTS). This is as a result of the obsolete and inadequate status of meteorological infrastructure in the country. Weather and climate observations from Burkina Faso are therefore not being effectively incorporated into regional and global circulation models which decreases the accuracy of these models for the Burkina context.

With LDCF Intervention (adaptation alternative)

21. Under this component the Government of Burkina Faso will use LDCF resources to procure, install and/or rehabilitate critical infrastructure required to build and strengthen the climate-related observational network nationally

for multi-risk purposes (floods, droughts, and strong winds). All existing EWS projects are focused on predicting floods, famine or best dam management practices in localized geographical areas. In contrast, this component will focus on establishing national hydro-meteorological monitoring capabilities in order to produce EWS/CI for the three climate zones in Burkina, particularly the most vulnerable agro-ecological zones indicated by the NAPA.

22. Data will be communicated by improving SMS transmission (for existing manual stations) or with GPRS connections (in the case of automatic weather stations). Data will also be transmitted through the acquisition of CB radios provided for key information producers. Existing written records will be digitized and all data will be stored in secured servers housed within each information production agency. Treated, comprehensible data will be transmitted to an open-access data server (see Component 2).

23. In addition, this component will address current equipment failures (radar in Ouagadougou) and insufficiencies (need for an additional radiosonde launch). The concrete output and activities of this component include training required to support the sustainability of monitoring infrastructure. The outputs address the needs highlighted by EWS information production agencies during bilateral consultations held during project preparation phase between September and November 2013 (See Annex 4 and 5).

24. Note that salaries for DGM, DGRE and DCIME are covered under existing Ministry of Transport, Ministry of Water and Ministry on the Environment (SP/CONEDD) budget lines respectively. New recruited personnel will be mandated to stay in their specified positions after being trained for 10 years in order to ensure knowledge sharing as per the TORs.

25. Specifically, LDCF funds will build on the above mentioned baseline projects in the following manner:

- Create a formalized partnership between DCIME, DGM and the University of Ouagadougou for climate data collection and dissemination by implicating all these parties in the EWS/CI project: Each of these agencies has a large role in the LDCF2 project and has been consulted during Stakeholder consultations to get feedback on their capacity reinforcement and equipment needs in order to effectively implement the project.
- Establish a strong synergy with the GFDRR project in order to complement the activities for developing EWS: It should be noted that the development of EWS in the GFDRR project is on a limited scale in pilot areas. In fact, the budget for hydro-meteorological equipment is 3 times less than that of the LDCF2 project. As a result, the LDCF2 project will expand the EWS initiative to the national scale by focusing on larger agro-ecological zones and building off the equipment acquisitions to expand weather/climate/hydrological monitoring networks nationally.
- Reinforce collaboration with AMESD/MESA, FEWS NET and the recently launched SERVIR[6] program at the regional level which have assisted in reinforcing satellite reception equipment at DCIME: In all of these satellite data initiatives, there have been no measures to build capacity to effectively visualize and analyze the data to produce multi-risk alerts specific to Burkina.The LDCF2 project will complement these projects by enabling DCIME to exploit the satellite data to create risk vulnerability maps for multi-risk events including floods, droughts and strong winds. The LDCF2 project will focus on producing short-term seasonal forecast mappings as well as long-term projections of climate change risks.
- Build off the ViGIRisC project (ACMAD) by using their knowledge on EWS in the region and exploiting knowledge sharing opportunities sponsored by the ViGIRisC project: The LDCF2 project includes funds to send DGM personnel to ViGIRisC's training courses for West Africa.
- Build on the existing WHYCOS regional hydrology project: The National Hydrological Service (DGRE) has gained experience in watershed modeling in two watersheds, Volta and Niger. The LDCF2 project will reinforce the existing hydrological modeling expertise by updating modeling licenses, adding new equipment to assist with downscaling and training new technical personnel.

Outcome 2: Efficient and effective use of hydro-meteorological and environmental information for making early warnings and seasonal forecasts which feed into long-term development plans

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

Without LDCF Intervention (baseline):

26. 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. Presently, Burkina does not have the ability to produce weather forecasts for the coming 1-7 days or seasonally using a combination of Numerical Weather Prediction (NWP) models and predictions. Weather forecasts are published in bulletins and on television with data concerning the next 24 hours. They provide general information on the minimum and maximum temperature of the current and next day, the quantity of rainfall (mm) and the state of visibility in different geographical regions. However, it is necessary to have more refined spatial and temporal estimates of expected rainfall intensity and wind speeds to outline with greater certainty, regions at risk.

27. Burkina Faso also does not have the capacity to target weather/climate products to end-users. Through WMO's Global Framework for Climate Services, Burkina has taken the first steps to formalize the needs of various socio-economic sectors for weather/climate information. However, this framework has yet to be implemented. Furthermore, there is a limited database of climate information required for long-term planning and better management of water storage, crop selection and cultivation cycles. Early warning systems for food security use information from the major international food security monitoring systems such as the USAID-sponsored Famine Early Warning System (FEWS NET) and AGRHYMET are used by Burkina, however this information is not sufficiently downscaled and crop-specific for localized contexts (e.g. for subsistence farmers).

28. Current EWS-related activities related to Component 2 deal predominantly with building capacity within CONASUR on national and regional levels (not local). Consequently, local disaster risk management units have limited technical and operational capacities.Projects building DRM capacity are detailed in Section A.7.

29. Furthermore, communication mechanisms to decentralized agencies/NGOs/CSOs, particularly those most vulnerable are weak. Local capacity to understand alerts and the utility of climate information for adaptive planning is also extremely limited. Nonetheless, there are significant grass-roots based projects which involve communities. The links established with communities such as through the UNDP COGEL, USAID WA-WASH and UNDP COGEL projects need to be built upon. Descriptions of these important baseline projects which will be used to support and co-finance the LDCF2 project are detailed in Section A.4.

30. Furthermore, there have been limited efforts to strengthen the link between CONASUR and DGM/DGRE to establish a streamlined alert procedure. Alert generation is compartmentalized and managed by different Ministries for food security or dam management. There is very little synergy among EWS-related initiatives and between EWS agencies. Also, data is not shared between weather/climate information production agencies. As a result, there is a need to formalize alert communication into one national Standard Operating Procedure (SOP) for multi-risk events.

31. It should be emphasized that currently, the Direction of Communication has well-developed methods for disseminating information and alerts to the general public on national, regional and local levels. However, there is little coordination between the information production institutions (DGM, DGRE and DCIME) and the Direction for Communication. Also, during project preparation, the Direction of Communication expressed their confusion with technical forecasts and their need to simplify this information for end-users. This project will help to bridge the gap in message dissemination and clarification between the producers and communicators of EW messages through the Outputs of Component 2.

32. At the same time, the following existing means of communication will be exploited for disseminating alerts:

A mailing list which provides messages to a broad audience including ministers, ambassadors, NGOs and community organizations (already existing at SIG);

- A call centre which is operational and funded since the end of September 2012, consisting of 4 people on-line 24 hours a day, 7 days a week (already existing at SIG);
- Toll-free telephone numbers for inquiries (already existing at SIG and CONASUR); and
- A website for general information (already existing at SIG).

33. Despite the support of the baseline projects outlined in Sections A.4 and A.7, additional support is required to: i) increase the accuracy, timeliness and applicability of weather and climate forecasts; ii) enhance awareness at all levels

on the impacts of climate change on socio-economic development and the importance of weather and climate information to assist local communities and sectors to adapt to these impacts; and iii) strengthen coordination procedures and communication channels for sharing and disseminating weather and climate information to decision-makers in government, private sector, civil society, development partners and local communities. This will make the work of DGM, DGRE and DCIME more visible and better appreciated by other government ministries and local communities.

With LDCF Intervention (adaptation alternative)

34. This project outcome will be used to ensure that multi-risk EWS/CI is used effectively by being communicated clearly to end-users and integrated into disaster mitigation planning. In order to improve the current lack of coordination amongst EWS agencies, this component will include the formalization of a multi-agency synergy platform (Comité Inter institutionnel et Multi Disciplinaire de promouvoir la Synergie, CIMS) with the specific task of promoting a synergy amongst agencies and EWS-related initiatives. Data sharing amongst information producers and the DRM will be facilitated. Forecasting capacity will also be developed under this component through internal and external knowledge sharing sessions. Based on the forecasting expertise built through this project and additional capacity building measures, information producers will develop the skills to tailor early warning and climate information products on short-term and seasonal scales for both public and private user-needs.

35. Additionally, a Standard Operating Procedure (SOP) for alert communication and a formalized national alert guide with thresholds will be developed for the first time in Burkina through this Component. Activities will focus on improving local technical and operational capacities to disseminate alerts and to understand the technical jargon of weather bulletins and other climate-related information, as well as provide input into the design of tailored advisories and information products. A feedback mechanism (via SMS, toll-free numbers and local EWS focal points) will be provided to ensure that end-users are engaged and are able to provide their suggestions on how to improve communication and alerts. To ensure that alerts are received by end-users, they will be provided through multiple media outlets in all national languages.

36. Specifically. LDCF funds will build on the baseline projects detailedin SectionsA.4 and A.7in the following manner:

- Ensure no duplication of activities reinforcing CONASUR's capacities: During the project preparation phase, CONASUR evaluated the activities proposed in the LDCF2 project. The outputs and activities of both the UNDP/BCPR project and the LDCF2 project are in alignment to build capacity within CONASUR and to integrate disaster prevention strategies into national planning and policies to the fullest extent possible. The LDCF2 project differentiates itself by working on building the capacity of CONASUR's decentralized branches in local departments, CODESUR offices, and within locally-represented NGOs/CSOs. Furthermore, primary activities for the UNDP/BCPR project have a narrower focus assisting pilot regions and working to improve food security.
- Build a strong synergy with the GFDRR project in order to complement the activities building CONASUR's capacity nationally. The GFDRR project is also conducting parallel activities which can support the LDCF2 project such as strengthening local legal frameworks and conducting analytical studies on disaster risk. Consequently, the LDCF2 project will build a synergy with the GFDRR project by taking into account any studies or new policy developments and incorporating lessons learned from the GFDRR pilot studies.
- Complement the UNDP-CO project by building the capacity of CONASUR: Rather than focus on national and regional capacity building, the LDCF2 project will stress training and knowledge transfer to the local focal points within CODESUR. The UNDP-CO project also focuses on building the response and recovery capacity of CONASUR which balances the LDCF2 project's goal of improving the preventive and warning capacities of CONASUR. Overall, the LDCF2 project will capitalize on the work of the UNDP CO project by building off their pilot work and their studies (e.g., a study on the resilience capacity of the most vulnerable).
- Collaborate with the COGEL project: Since 2011, the COGEL project has been building the resilience of populations to climate change in the regions of eastern and central-northern Burkina. Due to its significant ground-based experience, the LDCF2 project will exploit the local dialogue chains already implemented in the

UNDP COGEL project to assist with alert dissemination. Furthermore, the LDCF2 project will build off the catastrophe response mechanisms developed on-the-ground under the COGEL project.

- Build off the USAID WA-WASH project: USAID has made significant progress in coordinating local NGOs in specific areas for climate change related initiatives. The LDCF2 project will build off the local coordination mechanisms already in place. NGOs already implicated in USAID initiatives can play a support role in alert and information dissemination. In return, USAID local projects would benefit greatly from extreme weather forecasts to help farmers plan for droughts and rainy seasons. Flood alerts can also be used by the communities to ensure that potable water wells are properly covered and sealed to prevent water contamination.
- Build a strong synergy with the National Program for Rural Development (PNGT3) project: The PNGT3 project has developed strong communication mechanisms with numerous local populations in rural areas spread across Burkina. Many of these rural areas are located in the vulnerable agro-ecological zones where the LDCF2 project will be targeting its alerts. In effect, the LDCF2 project will build off the community level communication mechanisms to launch the public awareness campaign on EWS/CI planned under Component 2 of this project. In return, the PNGT3 project will be able to exploit EWS/CI to support their concrete development activities which aim to build resilience to climate change.
- Support the development of Burkina's Poverty Environment Initiative by building the capacity of EWS agencies to integrate EWS/CI into the SCADD and PEI policies as well as specific sectoral policies.

A.6 Risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and measures that address these risks:

Risks	Risk Level	Mitigation Measure
Burkina Faso does not have enough government financing to continue monitoring and to cover recurring O&M costs	Medium	By making EWS/CI more useful to various socio-economic sectors (e.g. health, agriculture, building construction, cotton, mining), this will push the Government to include stable, core budget lines for climate/weather services due to their cross-sectoral importance Capacity for long-term planning and budgeting on EWS monitoring and IT equipment will be built in all information production agencies.
Lack of qualified personnel within the NHMS to operate and maintain new equipment, data transmission/treatment/storage processes and forecasting models	High	A major part of the project is to strengthen the technical capacity of human resources with O&M and data transmission/analysis/storage. Personnel will be supported through knowledge sharing opportunities to gain expertise (e.g., ACMAD, Météo France). Collaborations with regional EWS initiatives (Benin, Mali, Niger) will also be developed The Government will assist with recruitment and will mandate that trained personnel must remain working within their respective institution for at least 5 years after training.
Natural disasters damage infrastructure (particularly floods)	Medium	Robust infrastructure will be procured and training will be provided for repair and maintenance with the provision of spare parts in each information production agency.

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)	Low	An open-access data portal for information producers will be developed where knowledge will be shared for cross-sectoral use (e.g., health, agriculture planning). A Public Private Partnership and service level agreement between the information production agencies and SONABEL, an internet and mobile phone service provider, will be established with regards to minimizing start-up costs for mobile phone plans and modems as well as increasing bandwidth for internet connections.
Procurement and installation of hydro-meteorological equipment, including hardware and software, is delayed because of complications with the release of funds and/or national procurement procedures.	Low	Funds will be distributed directly to the Directorates (DGM/DGRE/DCIME/CONASUR) by their respective Ministry so that they can have sufficient upfront funding to perform their activities such as procurement. Procurement will be staggered to reduce the risk that a large quantity of funds cannot be released.

A.7. Coordination with other relevant GEF financed initiatives

37. This project will build on and complement existing Early Warning System related programs in Burkina Faso. Existing alert programs are used for famine and hydropower in Burkina Faso. Alerts for food security are coordinated by the Direction of Production and Rural Economy (DGPER) in the Ministry of Agriculture and Hydraulics with assistance from several national / regional institutes and technical and financial partners. In the regions around dams, DGRE provides alerts for 15 national dams when water is insufficient for irrigation or when reservoir levels need to change to mitigate floods for downstream residents. Because the current alert systems are targeted to specific risks in localized areas, neither of these alert programs is capable of generating multi-risk warnings on a national scale.

38. At presentthere are many projects and programmes – both climate and non-climate related – which support EWS/CI. In order to ensure that the LDCF funds are used in a strategic manner, the LDCF project will build upon the initiatives and partnerships already in place. For instance,a partnershiphas been signed between the Departmental Division on the Understanding of Environmental Information and Monitoring DCIME (Division du Développement des Compétences, de l'Information et du Monitoring de l'Environnement),the National Meteorological Service, DGM, and the University of Ouagadougou to generate and disseminate climate data for local and national planning, downscaling, and climate vulnerability and adaptation multi-sector analysis.

39. Various development partners and projects in Burkina Faso are investing in: i) hydrological and meteorological infrastructure and training in the country to support the DGM and DGRE to address their current capacity gaps; ii) providing disaster risk reduction to support the national and regional capacity of Burkina's Disaster Risk Management Unit, CONASUR; and iii) community-based natural resource management and agricultural production(for iii) See baseline cofinancing projects discussed in Section A.4).

40. Baseline projects related to water resources include i) the GFDRR project *Mainstreaming Disaster Reduction and CCA in Burkina Faso* which has established a pilot study early warning system and purchased hydro-meteorological equipment including hydrological flow meters and rain gauges in the pilot zones and ii) the WHYCOS (World Hydrological Cycle Observing System) project. Local watershed modelling initiatives under WHYCOS, the Volta-HYCOS and Niger-HYCOS projects, are focusing on cross-boundary watersheds by exploiting and sharing satellite information related to hydrology to model common drainage basins which traverse country boundaries.

41. For spatial data, 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. For West Africa, ECOWAS adopted the theme of water resource management and the management of crops and pastures. The project was entrusted to the Niamey-based Regional Centre for Training and Application of Agrometeorology and Operational Hydrology (AGRHYMET). Funding for this project ended in 2012 and will continue in 2013 under the MESA project. The MESA project will enable DCIME to have access to satellite data.

42. Similarly, the Group on Earth Observations (GEO) AfriGEOSS initiative is building satellite data acquisition capacity in Burkina Faso. As Burkina is one of the 22 members of the AfriGEOS initiative, they will be able to exploit regional education and training programmes, have greater access to open-source software and systems and more easily share data internationally.

43. Burkina Faso also exploits the Famine Early Warning Systems Network (FEWS NET) funded by the U.S. Agency for International Development (USAID). FEWS NET is an information system designed to identify problems in the food supply system that could potentially lead to famine or other food-insecure conditions. Its data portal provides access to geo-spatial data, satellite image products, and derived data products in support of FEWS NET monitoring needs throughout the world.

44. Furthermore, Burkina is an active member of a regional project called ViGIRisC, funded by the African Center of Meteorological Application Development, (ACMAD). ViGIRisC is a current baseline initiative used to develop capacity within National Meteorological Agencies and to facilitate coordination of other Met Agencies within West Africa. The goal of the ViGIRisC project is to build forecasting expertise within West Africa's National Meteorological Services and train them to establish an EWS for the region.

45. Finally, there are various baseline projects building DRM capacity on national and regional levels. These include the following:

- **UNDP National Capacity development for natural disaster risk management in Burkina Faso** with **$1.23m** of funding from **UNDP and BCPR**. The project has three components; 1. Institutional capacity development in disaster risk management 2. Integrated information system management at national and two regional levels (2 pilot sites: 'les HautsBassins' and the North) 3. Mainstreaming of Disaster Risk Management in National strategy. The project is therefore active in reinforcing the capacity of CONASUR.
- The **GFDRR** project ***Mainstreaming disaster reduction and CCA in Burkina Faso*** has **$4.5m** of financing, ending in 2014. It will accomplish the following goals relevant to Component 2: Strengthen CONASUR, improve its relations with other institutions; Strengthen the response capacity of CONASUR institutions; Implement climate change adaptation actions at the village level.[7]
- The **UNDP CO-executed** project, ***National capacity building for disaster management and crisis recovery in Burkina Faso*** This 3-year, **$1.8m** project seeks to strengthen preparedness, response, and disaster risk management through provision of additional resources (human resource, financial, and material); develop an integrated information system on disaster risk and tools for DRR at various levels; integrate DRR into relevant frameworks and plans; and support the formulation of a national disaster management and recovery system with consultation from technical and financial stakeholders and partners.[8] The project focuses on strengthening the capacity of CONASUR and COPROSUR on the national and regional levels.

46. At the same time, there are numerous related initiativespromoting activities to ensure food security and adaptation to climate change. As these projects already engage with local populations on building adaptation strategies, this project will build a strong synergy and coordinate with all of the following relevant on-going or soon-to-be implemented initiatives described below.

47. The proposed LDCF (LDCF2) project will coordinate frequently with the on-going NAPA priority initiative that has already been funded through the GEF-LDCF (LDCF1) and is currently under implementation. The LDCF1 project is entitled***Reducing vulnerability to climate change by strengthening prevention schemes and managing food security crises in the Oursi and Boulsa zones***. The LDCF1 project has a component to develop a small-scale EWS to support food security. Thus far, 10 manual synoptic weather stations and 6 automatic agro weather stations have been

[7] (http://www.gfdrr.org/gfdrr/ca_projects/detail/3838)
[8] http://www.pnud.bf/FR/fcrises.html

installed. In partnership with DGM, the LDCF1 project is training farmers to make better use of seasonal forecasts and local daily climate data to improve agriculture practice. The LDCF1 project has shown good results as a pilot project. The LDCF2 project will place additional weather stations in complementary locations to those planned by the LDCF1 initiative in order to establish national monitoring coverage and will effectively be used to scale-up the LDCF1 project.

Other adaptation to climate change related initiatives in Burkina with which the LDCF2 project will build a synergy include the following:

- UNDP/DANIDA's ***Adaptation to climate change for the improvement of human security in Burkina Faso*** ($870,000, based on a NAPA priority): This project has been successful in raising awareness of decision makers to adverse effects of CC and adaptation measures and has implicated many of the same NGOs/CSOs in project implementation due to their experience and knowledge of CC;
- Japan's ***Capacity reinforcement to better plan and implement developmental programs and projects linked to climate change*** ($2.9m, based on a NAPA priority): This project is involved with reinforcing the capacity and strategic planning of adaptation to CC, yet, on a global level by looking at the portfolio of CC projects in Burkina and ensuring their synergy;
- UNDP-GEF (LDCF)'s ***Capacity reinforcement for adaptation and vulnerability reduction to climate change*** ($3.4m): This project stresses good adaptation practices and best available technologies for agro-pastoralism in 6 pilot areas. The EWS/CI project can serve to feed the needs of these agro-pastoralists;

48. Future related projects building resilience to climate change within Burkina Faso which have yet to be implemented include 1) a UNDP-GEF/LDCF financed project, ***Integrating Climate Resilience into Agricultural and Pastoral Production for Food Security in Vulnerable Rural Areas Through the Farmers Field School Approach***which will build resilience for agro-pastoral communities to climate change impacts; and 2) the UNDP $9.5m (2013-2016) ***Multi-year program for the resilient restoration of means of existence and for the reduction of Risks and Catastrophes in Burkina Faso***which will build resilience of vulnerable populations to crises and catastrophes in the Sahel and Northern regions of Burkina Faso. Details of linkages to these two projects will be elaborated as the LDCF2 project is implemented.

49. Also, a significant related initiative is **WMO's Global Framework for Climate Services (GFCS)**. Just before the beginning of the LDCF2 project preparation, the GFCS funded a workshop in Burkina to establish a framework for climate services at the national level. This initiative was a first step to improving communication between different sectors (health, agriculture, food security, private) on their needs for climate services. Pending financing, other goals of this initiative in Burkina will be to strengthen capacity for disaster risk reduction and early warning, perform large-scale data recovery and digitization, develop National Climate and Health Working Groups and partner climate services and water resources management.

50. This LDCF project is also related to similar initiatives developing climate information and Early Warning Systems in Africa. To date, 10 African countries including Benin, Burkina Faso, Ethiopia, Liberia, Malawi, Sierra Leone, São Tomé & Príncipe, Tanzania, Uganda and Zambia are in the process of detailing best practices and plans to develop EWS/CI. These projects will work in coordination through a regional team of experts to be hired between the projects. Their role will be to enhance the cost-effective hiring of specialized technical staff, coordinate data and information collection (including inter-country data sharing where feasible), training (on equipment operations & maintenance and the development of weather forecasts / climate predictions) and the effective use of communication and standard operating procedures.

51. Details of activities, which will benefit through the multi-country programme are described in section B.3. For Burkina Faso, equipment procurement / rehabilitation Outputs 1.1, 1.2, 1.3, 1.4 and 1.5 will be enhanced by exploiting the common pool of regional experts to assist with acquiring the most appropriate/cost-effective technology/equipment and optimal placement/design of hydrological and meteorological monitoring networks. Outputs 1.6 as well as activities under Outputs 2.1 and 2.2 will also use the regional expertise to maximize training on infrastructure operation and maintenance and the development of tailored warnings/advisories/forecasts/climate predictions. Specifically, regional support can be used to engage multi-national corporations to invest in climate services (e.g., the mining and building construction industries) in Activity 2.2.3 which includes a pilot study to explore the economic viability of tailored forecasts / predictions. Further benefits of a regional approach can also be pursued through Output 2.4 where international data transfer can be facilitated to assist with cross-boundary hydro-meteorological forecasts / predictions.

Similarly, through Output 2.6, countries can share knowledge on effective warning and communication strategies and integrate warnings issued by neighbouring countries in the case of shared watersheds.

52. Other regional related projects focusing on adaptation and/or climate monitoring include the following:

- Africa Adaptation Programme (AAP) – Burkina Faso (Funded $2.9m by Japan): This project is mainstreaming climate change information into national development policies, including disaster risk reduction actions. The LDCF2 project will serve to generate EWS/CI for integration into policies9 and policy formulation frameworks, therefore completing the work that was started with the Govt of Japan funding;
- Centre Regional de Formation et d'Application en Agrométéorologie et Hydrologie Opérationnelle (AGRHYMET, $4m) and the Permanent Inter-state Committee for Drought Control in the Sahel (CILSS): AGRHYMET developed the CILSS International Committee to invest in research which promotes food security and fights against droughts and desertification in the Sahel. In February 2013, they launched an adaptation to climate change project in West Africa to improve climate information. AGRHYMET hydrological and agro-meteorological monitoring data and forecasts, as well as satellite data will be used to enhance EWS/CI in Burkina.
- Permanent Inter-state Committee for Drought Control in the Sahel (CILSS, $13.25 funded by the EU, FFEM, CRDI and CILSS): This project is contributing to sustainable land management and capacity reinforcement for adaptation to climate change in West Africa in order to achieve the MDGs.
- Climate for Development in Africa Programme (ClimDev-Africa): Promoting the use of climate information for development;
- SERVIR project: Developing an integrated platform for data service discovery, acquisition, sharing, and use;
- Global Climate Observing System (GCOS): Coordinating body for the climate observing system worldwide;
- ReliefWeb (2011-2013): Information database providing Food Insecurity in the Sahel;
- Global Information and Early Warning System (GIEWS) (FAO): Information website providing data on Food Security worldwide including information specific in Burkina Faso

B. ADDITIONAL INFORMATION NOT ADDRESSED AT PIF STAGE:

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

53. The Stakeholders identified during project preparation will continue to be implicated in project implementation. 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. All Stakeholders involved in the baseline self-capacity assessment will be addressed again in order to track the efficacy of Stakeholder capacity building both operationally and technically. Also, the women's interest organizations, the Women in Law and Development in Africa organization, WILDAF and the Women's Forestry Association, will continue to be implicated and consulted in order to ensure women are properly engaged/warned. These gender-focused NGOs/CSOs will conduct the gender disaggregated survey indicating the receipt of alerts and utility of weather/climate information planned.

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

55. Phase 1 – Developing a strategy and action plan;

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

[9]"http://www.adaptationlearning.net/project/strengthening-capacity-address-climate-change-adaptation-concerns-preparation-and-implementa" http://www.adaptationlearning.net/project/strengthening-capacity-address-climate-change-adaptation-concerns-preparation-and-implementation

56. Phase 2 – Consultation through implementation; and
This is the main implementation phase where investments will be made on the ground in the target areas and stakeholder consultation about engagement will focus on output oriented action.

57. Phase 3 – Project completion and scale up promotion.
The third and final phase represents the completion of the project. The plans for scale-up and long-term sustainability of the LDCF investments will be developed. Consultation will focus on learning, bringing experience together and looking at processes for continued post-project impact.

58. Specifically, in Phase 1, gender-focused NGOs/CSOs (WILDAF and the Women's Forestry Association) will continue to be implicated and consulted in order to ensure women are properly engaged/warned. They will also conduct the gender disaggregated survey.

59. In Phase 2, public consultations will become more of an on-going exchange of information where there will be two main purposes:

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

60. Phase 3 will be a process of ensuring completion, hand-over and long-term sustainability of the LDCF investment. Consultation will focus on bringing experience together, sharing key lessons learnt (through the UNDP ALM and other forums) and looking at processes for promoting scale up of this project in order to have efficient and reliable EWS in the country.

61. Overall the types of consultation mechanisms to be used include:

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

For more details on the Stakeholder Involvement Plan and a matrix showing stakeholders and activities planned during implementation and evaluation, see Annex 10 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):

62. The largest economic benefits are expected from building capacity of the climate/environmental information production agencies to tailor climate products to the needs of various socio-economic sectors (e.g., agriculture, health cotton, and mining). By the project enabling a pilot study on tailoring climate services and market research on the potential for mobile phone-based agricultural advisories, the foundations will be set for self-sustainable NHMS. For instance, although Burkina's cotton sector has become less productive over the years (NAPA 2008), it can take advantage of improved local forecasts of winds, rain and temperature. The mining sector also represents a likely large private sector client for early warning services and tailored forecasts.

63. Together with satellite imagery used for land-use planning and monitoring, tailored climate products can also provide significant local environmental benefits, such as detailing best water management practices which is crucial to help Burkina's fight against desertification. At the local level, early warnings and climate hazard mapping can provide economic benefits by reducing losses of agricultural produce, infrastructure (roads and bridges) and disruption to people's livelihoods.

64. Communities will also immediately benefit from the Standard Operating Procedure to be implemented for alert communication. The 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. Also, the feedback mechanism can enable the communication mechanism to be improved via end-user comments/suggestions.

65. In addition, this project will build a multi-agency platform whose sole role will be to ensure that there is synergy amongst EWS related initiatives. This will support the elimination of duplicate roles and wasted financial and human resources. Furthermore, it is expected that the open-access data portal will facilitate data sharing between ministries/agencies and potentially international institutions.

66. Many of the beneficiaries will be women, especially within the agriculture sector who do not have access to information, yet are most vulnerable to food insecurity and climate change due to their dependence on natural resources for subsistence household chores and their limited access to education and information services which prohibit participation in decision-making. The project has and will continue to target women by implicating women-focused NGOs/CSOs, the Women in Law and Development in Africa organization, WILDAF and the Women's Forestry Association in order to ensure women are properly engaged/warned and are receiving useful weather/climate information.

67. The UNDP Environmental and Social Screening template has been applied to ensure environmental and social safeguards are in place. According to this checklist, the project is considered Category 2 where no further safeguards must be incorporated because no environmental or social risks are foreseen (See Annex 14).

68. Environmental safeguards being applied include the following:

- Tailoring EWS/CI to support better farming, water and coastal management practices
- Consulting local reps to find best station/equipment placement

69. Social safeguards being applied include the following:

- Mandating station placement/equipment must benefit the most vulnerable, not only the private sector
- Including women representation organizations
- Facilitating feedback from marginalized populations with the communication feedback mechanism

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

70. To ensure cost-effectiveness for Component 1, other baseline projects were evaluated to see what relevant activities they are supporting. This project builds on the existing initiatives in terms of equipment acquisitions (building off of the LDCF1 project). To ensure cost-effectiveness for Outcome 1, it was critical to evaluate the equipment purchases. An assessment of existing equipment was made, noting the manufacturer, whether it is still working and whether the NHMS has an interest in continuing with particular makes/models. The NHMS weighed current costs against the costs of potentially cheaper solutions and the added costs of training personnel (See Annex 4). They also weighed the option on the use of manual and/or automatic stations. Training costs can be particularly high if new automatic stations are acquired and the EWS agency has had no experience using the equipment. Therefore, it was quite important for the cost estimates to include accurate training and operation and maintenance costs. Twenty-five percent (25%) of the running costs were designated for spare parts.

71. For Component 2, a key design component was to try to consolidate the training programs and knowledge sharing sessions which are required to improve EWS/CI message dissemination to ensure cost-effectiveness. A coherent training programme was emphasized where one activity can cost effectively satisfy more than one of the needs identified, such as group training for NGO/CSO focal points. Also, other baseline programs involving capacity building for the DRM, CONASUR, were evaluated in order to ensure that money has been spent wisely.

72. To facilitate decisions on cost-effectiveness, a baseline self-capacity assessment was conducted during the project preparation phase. The assessment enabled alert production and dissemination agencies to prioritize their needs (see Section 2.8). Due to project budget limitations, it was necessary to select from the long-list of equipment / capacity building needs and identify those within the scope and cost-effectiveness of this project. In response, a set of criteria to prioritize needs / requested activities was formulated. The criteria were also used to assess the relevance of the LDCF2

project to tackle these priority needs, given its overall objective. Annex 4 shows the criteria for cost-effective adaptation interventions.

73. The chosen set of activities was reviewed in a validation workshop involving all stakeholders and the multi-stakeholder EWS focus group committee. Based on group consensus, Outputs/Activities were revised accordingly. The Outputs outlined have been chosen based on their financial feasibility. They have been chosen over alternative ways to address project barriers as shown in Table 5 below.

74. 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.

75. By surveying the technical support needs for each country during the project preparation phase, 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.

76. Training and capacity building for operations and maintenance of the hydromet infrastructure and for modeling and forecasting (Outputs 1.1 - For Burkina Faso, equipment procurement / rehabilitation Outputs 1.1, 1.2, 1.3, 1.4 and 1.5 1.6 and 2.1) can be conducted at the regional level, bringing together participants from all countries to encourage knowledge sharing and the development of collective skills. This has several advantages, namely: i) promoting the sharing of information and learning between countries; ii) encouraging discussions of best practices i.e. what works, reasons for failure etc; and iii) increasing the effective pool of skilled resources which each country can draw upon (increasing the potential for future trainings to be conducted by experts within the region). Such activities will be closely coordinated with other regional and international partners/centres e.g. WMO/GFCS, ACMAD, AGRHYMET etc.

77. Regional collaboration will facilitate the integration of warnings issued by neighbouring countries e.g. in the case of shared watersheds. Data sharing abroad will similarly be supported by the regional component when cross-boundary hydro-meteorological data transfer between national data portals (Output 2.4) is required to update forecasting models. Regional support will also be used to help strengthen the development of standard operating procedures in Burkina (both the procedures themselves and their legal basis), for the issuing and communication of warnings/advisories, supporting Output 2.6 of this project. 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 bargaining for data services, as well as engaging with corporate social responsibility programmes to enhance services where possible. Finally, when tailoring products to the private sector in Output 2.2, the regional component can facilitate the engagement of multi-national corporations in multiple countries to make continual investments in hydro-meteorological / climate services which are geared to specific needs (e.g. cotton cultivation seasonal forecasts or localized, short-term weather forecasts for construction activities).

Table 5: Demonstration of Cost-effectiveness for each proposed Output indicating the project barrier addressed by each Output

OUTPUTS	Barrier Addressed	Alternatives Considered
1.1 Procurement and installation or rehabilitation of 100 water level monitoring stations with telemetry, 2 automatic Doppler flow meters with data transmission capabilities and data processing and storage facilities to feed hydrological models.	Lack of hydrological monitoring infrastructure required to improve forecasts, validation and monitoring Slow transmission of hydrological information from manual hydro-meteorological infrastructure	**Alternative 1:** Expand the hydrological monitoring network based on a cross-border watershed approach; however, this requires cross-border data sharing and more financial resources. This project lays a foundation for future initiatives to model hydrology in river basins by establishing good monitoring networks to build off of. **Alternative 2:** Different equipment manufacturers can be used. However, DGRE and DGM (see Output 1.2) have experience with the current models which were chosen based on previous cost-effectiveness studies (Annex 4). Using different models could increase the training and maintenance costs by 20% according to Stakeholder discussions.
1.2 Procurement and installation of 40 automatic climate stations and 10 automatic synoptic stations with telemetry, including improved data transmission/processing/storage facilities.	Lack of weather and climate monitoring infrastructure required to improve forecasts, validation and monitoring Slow transmission of climate information from manual hydro-meteorological infrastructure	**Alternative 1:** Only use manual stations and incorporate SMS communication services: DGM believes that it is more difficult to manage telephones required for SMS data transmission which can be easily lost or damaged. Also, as shown in Annex 4, DGM weighed two options, one with only manual stations and the second with only automatic. The options are competitive, so for EWS in Burkina, it is more cost-effective to use automatic stations. Using automatic stations also reduces the need to pay and train manual observers at each station. **Alternative 2:** Use stations with cheaper sensors to decrease the cost of spare parts: If sensors do not adhere to WMO standards, WMO will not consider the station data in regional and global models. As a result, the country's data would not be assimilated to improve the regional and international forecasting models the country will exploit and downscale. **Alternative 3:** Acquiring more equipment to improve national coverage: This option was considered as per the feasibility studies and development plans which demanded more monitoring equipment. However, this project is focusing on capacity development for service delivery which is lacking in Africa rather than excessive procurement. Good and targeted service delivery of EWS/CI is more likely to ensure the sustainability of continued monitoring and the use of tailored EWS/CI into long-term development plans.
1.3 Rehabilitation of the radar in Ouagadougou including acquisition of spare parts and knowledge sharing to build radar O&M self-sufficiency	Lack of extreme weather monitoring infrastructure required to improve severe weather warnings and potential flooding	**Alternative 1:** Lightning detection systems: At present, there is considerable variability around the costing for lightning detection systems ranging from $50,000 to $3.5m (Sources: Astrogenic, SAMPRO, Earth Networks). Besides startup costs, which in some cases are a significant portion of the project budget, the costs of implementing new technologies, training and maintenance, as well the requirement for ground based observations (for calibration) and the untested nature of the technology in Africa were significant concerns.
1.4 Radiosonde equipment for ASECNA to provide one more	Lack of atmospheric monitoring infrastructure	**Alternative 1:** No additional radiosonde launch would reduce costs. However, the launching station and capacity to launch exists. An additional sounding adheres to WMO standards (one

sounding at midnight	required to improve forecasts	launch at noon and another at midnight) and ensures the integration of this data into global databases which are used to generate global and regional forecasting products.
1.5 Equipment for improved satellite imaging and data visualization (DCIME).	Inability to obtain and use satellite data and combine with other sources of environmental/climate/weather information	**Alternative 1:** SADIS ($50,000) is a satellite data distribution system. The system works well, but forecasters must build enough qualifications to use the system, so capacity building costs are high. **Alternative 2:** Use outside satellite viewing products for free: this option will be considered where regional and international databases (e.g., FEWSNET and NOAA's CFS tools) will be exploited to support Burkina to assimilate data into national forecasting. However, satellite data is difficult to interpret real-time without significant experience. As a result, such free satellite visualization tools are planned to validate forecasts or be used in climate change projections.
1.6 Training for DGM (2 engineers / 2 technicians) and DGRE (2 engineers / 2 technicians) on information collection, data treatment, operation and maintenance (O&M) and maintenance/monitoring principles including development of Standard Operating Procedures	Unknown sustainability of observational infrastructure and technically skilled human resources	**Alternative 1:** All operation and maintenance can be outsourced to a private company through a PPP (public private partnership) to enable the company time to train information production personnel over a longer period of time. However, DGE/DGRE already has experience with learning-by-doing and has received training for many of the specific monitoring instruments they have requested to be acquired. **Alternative 2**: One-time training to save financial resources: This project will procure in a staggered manner a rational amount of stations considering human resource constraints so that the new stations can be well-integrated with existing NHMS and there are no continuity breaks in monitoring (i.e., problem if all resources are focused on procurement and existing stations are neglected). Budget has therefore been allotted to provide training each year as more personnel are absorbed and more equipment is procured.
2.1 DGM, DGRE and DCIME capacity to make and use climate forecasts (on hourly, daily and seasonal timescales) is strengthened by training 4 engineers and 4 specialized technicians through knowledge sharing and south-south cooperations.	Lack of weather/climate information tailored to user-needs	**Alternative 1:** Do not acquire the SYNERGIE system, a satellite, observation, and radiosonde data integration tool which acts as a forecasting interface; DGM has limited forecasting capacity and will gain specialized skills through mandated knowledge transfer from ASECNA. However, ASECNA forecasts are specific to aviation and do not consider multi-risks. As such, the initial cost of SYNERGIE (approximately $140,000 for installation) is justified by the goal of DGM having a working operational forecast center by the end of the project. An external expert is planned to build DGM's capacity to include annual license renewal costs and forecasting training costs in future budget lines. **Alternative 2:** DGM could rely solely on regional and international centers for training but this is not cost-effective because the option does not take advantage of internal forecasting expertise within ASECNA. **Alternative 3:** DGM could rely on only ASECNA. (Again, ASECNA is an internal semi-private organization which acts as the operational arm of DGM.) However, ASECNA is not specialized

		with forecasting multi-risk extreme weather. **Alternative 4:** Use outside forecasting products for free: this option will be considered, such as NOAA's CFS forecasting tool which is readily available and free, however, these products must be downscaled and calibrated with in situ data. Therefore, regional and international databases (e.g., FEWSNET and NOAA's CFS tools) will be exploited to support Burkina to develop national forecasting by translating open-source climate monitoring and forecasts into flooding and drought/food security information.
2.2 Tailored agricultural and extreme weather risk advisories that link climate, environmental and socio-economic information on short-term and seasonal timescales are developed to support end-user needs and to promote sustainable financing mechanisms, including research development of a mobile-phone based advisory platform.	Lack of weather/climate information tailored to user-needs	**Alternative 1:** Rely on additional infrastructure to improve EWS/CI, however, delivery of hardware will not change the uptake of warnings and climate information by users, especially while service delivery is weak in Africa. Most importantly, by making EWS/CI more useful to various sectors in the country, this pushes the Government to include stable, core budget lines for climate/weather services due to their cross-sectoral importance
2.3 Development of a multi-agency platform to resolve lack of coordination and data sharing amongst agencies and with EWS-related initiatives.	Lack of synergy between agencies and lack of coordination amongst EWS initiatives	**Alternative 1:** If nothing is done, the current EWS initiatives will continue to work independently (for zonal famine and dam management) and little national capacity will be built. **Alternative 2:** No platform to formalize synergy: this is currently the case in all other EWS and CC-related projects. For the case of the UNDP-CO project, this has led to a delay in project implementation and a lack of coordination with other on-going projects.
2.4 Development of an open-access EWS data portal for sharing data cross-sectorally and internationally, including data integration into the Global Telecommunication System	Inconsistent cross-sectorial information dissemination and data sharing across and within country borders	**Alternative 1**: Have separate data portals for each agency to ensure security: however, this would prohibit the easy use of data across agencies and an easy collaboration for international data sharing **Alternative 2:** Do nothing, however watersheds and rivers traverse country boundaries and rain

		patterns upstream must be communicated to downstream Burkina. Therefore, with this option models would lack appropriate boundary and initial conditions because Burkina would not be able to utilize trans-national data.
2.5 National and local capacity for CONASUR and DCIME to assimilate forecasts and monitoring into existing development planning (SCADD and PEI) and disaster management systems is built.	Limited capacity to disseminate warnings on local, decentralized levels Unknown sustainability of observational infrastructure and technically skilled human resources	**Alternative 1:** Build CONASUR capacity without coordination with other initiatives will lead to redundant activities and a waste of financial resources.
2.6 Communication channels and standard procedures for issuing warnings by the DRM unit, NGOs/CSOs are enabled	Limited capacity to disseminate warnings on local, decentralized levels	**Alternative 1:** Enable each information dissemination agency to disseminate alerts by obtaining alerts from DGM directly: With this option, there is no central focal point for all NGOs, CSOs to report to for high level questions and to clarify disaster prevention strategies. Also, on the feedback chain there would be no clear contact for end-user comments/suggestions. Developing a Standard Operating Procedure is therefore the best mechanism for effective communication (SOP).
2.7 Rural community capacity to adapt to climate shocks is strengthened by promoting understanding of disaster risk prevention planning and alert signals	Limited capacity to disseminate warnings on local, decentralized levels	**Alternative 1:** Do nothing, if the locals are not informed on the utility of EWS/CI, alerts will continue to be misunderstood. Also, users will continue to lack confidence in alerts if the uncertainty of forecasts is not conveyed to the general public. Furthermore Output 2.7 includes training and a public awareness campaign for decentralized NGOs to inform local populations about the potential of EWS/CI to assist them in building resilience to climate extremes

C. DESCRIBE THE BUDGETED M &E PLAN:

78. The project will be monitored through the following M&E activities. The M&E budget is provided in table 6 below. The M&E framework set out in the Project Results Framework in Part III of this project document is aligned with the AMAT and UNDP M&E frameworks.

79. **Project start**: 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 program advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan.

80. The **Inception Workshop** should address a number of key issues including:

81. Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of UNDP CO and Regional Coordinating Unit (RCU) staff (i.e. UNDP-GEF Regional Technical Advisor) vis-à-vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.

82. Based on the project results framework and the LDCF related AMAT set out in the Project Results Framework in Section III of this project document, and finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.

83. Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.

84. Discuss financial reporting procedures and obligations, and arrangements for annual audit.

85. Plan and schedule Steering Committee meetings. Roles and responsibilities of all project organisation structures should be clarified and meetings planned. The first Steering Committee meeting should be held within the first 12 months following the inception workshop.

86. An **Inception Workshop report** is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

Quarterly:

87. Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform.Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS.Risks become critical when the impact and probability are high. Note that for UNDP/GEF projects, all financial risks associated with financial instruments such as revolving funds, microfinance schemes, or capitalization of ESCOs are automatically classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical).

- Based on the information recorded in Atlas, a Project Progress Reports (PPR) can be generated in the Executive Snapshot.
- Other ATLAS logs will be used to monitor issues, lessons learned. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

88. **Annually**: Annual Project Review/Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period (30 June to 1 July). The APR/PIR combines both UNDP and GEF reporting requirements.

89. The APR/PIR includes, but is not limited to, reporting on the following:

- Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative)
- Project outputs delivered per project outcome (annual).
- Lesson learned/good practice.
- AWP and other expenditure reports
- Risk and adaptive management
- ATLAS QPR

90. Periodic Monitoring through site visits: UNDP CO and the UNDP-GEF region-based staff 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.

91. Mid-term of project cycle: The project will undergo an independent Mid-Term Review at the mid-point of project implementation (expected to be in October 2015). The Mid-Term Review will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term review will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term review will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit (RCU) and UNDP-GEF. The LDFC/SCCF AMAT as set out in the Project Results Framework in Section III of this project document) will also be completed during the mid-term evaluation cycle.

92. End of Project: An independent Terminal Evaluation will take place three months prior to the final PB meeting and will be undertaken in accordance with UNDP-GEF guidance. The terminal evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term review, if any such correction took place). The terminal evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF. The LDFC/SCCF AMAT as set out in the Project Results Framework in Section III of this project document) will also be completed during the terminal evaluation cycle. The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response, which should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Centre (ERC).

93. Learning and knowledge sharing: Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums.

94. 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.There will be a two-way flow of information between this project and other projects of a similar focus.

95. Audit: Project will be audited in accordance with UNDP Financial Regulations and Rules and applicable audit policies.

Table 6: Project Monitoring and Evaluation work plan and budget

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project team staff time*	Time frame
Inception Workshop and Report	▪ Project Manager ▪ PIU (Project Implementation Unit) ▪ UNDP CO, UNDP GEF	Indicative cost: 10,000	Within first two months of project start up
Measurement of Means of Verification of project results.	▪ UNDP GEF RTA/Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members. ▪ PIU, esp. M&E expert	To be finalized in Inception Phase and Workshop.	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on output and implementation	▪ Oversight by Project Manager ▪ PIU, esp. M&E expert ▪ Implementation teams	To be determined as part of the Annual Work Plan's preparation. Indicative cost is 20,000	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	▪ Project manager ▪ PIU ▪ UNDP CO ▪ UNDP RTA ▪ UNDP EEG	None	Annually
Periodic status/ progress reports	▪ Project manager and team	None	Quarterly
Mid-term Review	▪ Project manager ▪ PIU ▪ UNDP CO ▪ UNDP RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost: 30,000	At the mid-point of project implementation.
Terminal Evaluation	▪ Project manager ▪ PIU ▪ UNDP CO ▪ UNDP RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost : 45,000	At least three months before the end of project implementation
Audit	▪ UNDP CO ▪ Project manager ▪ PIU	Indicative cost per year: 3,000 (12,000	Yearly

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project team staff time*	Time frame
		total)	
Visits to field sites	▪ UNDP CO ▪ UNDP RCU (as appropriate) ▪ Government representatives	For GEF supported projects, paid from IA fees and operational budget	Yearly for UNDP CO, as required by UNDP RCU
TOTAL indicative COST Excluding project team staff time and UNDP staff and travel expenses		US$ 117,000 (+/- 5% of total GEF budget)	

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)*
MamadouHonadia	Permanent secretary	Ministry of Environment and sustainable development, Burkina Faso	04/16/2012

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, Officer-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(either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

This project will contribute to achieving the following Country Programme Outcome as defined in CPAP: CPAP OUTPUT 1: The response capacity of national prevention institutions at national and local levels are reinforced CPAP OUTPUT 2: Catastrophe management institutions at national and decentralized levels are better equipped and able to respond to emergencies					
Country Programme Outcome Indicators: Early warning system (EWS) and contingency plans.					
Primary Applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one): Promote climate change adaptation					
Applicable GEF Strategic Objective and Program: OBJECTIVE 2: Increase adaptive capacity to respond to the impacts of climate change, including variability, at local, national, regional and global level					
Applicable GEF Expected Outcomes: Outcome 2.1: Increased knowledge and understanding of climate variability and change-induced risks at country level and in targeted vulnerable areas Outcome 2.2: Strengthened adaptive capacity to reduce risks to climate-induced economic losses					
Applicable GEF 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[10] To strengthen the climate monitoring capabilities, early warning systems and available information for responding to climate shocks and planning adaptation to climate change in Burkina Faso.	1.Capacity as per capacity assessment scorecard (BASELINE: 74; TARGET: 161) (see Annex 13) 2.Domestic finance committed to the relevant institutions to monitor extreme	1.Limited capacity to generate EWS and CI on a national scale for extreme hydro-meteorological phenomena Limited disaster risk prevention capacity on local levels within CONASUR	1. Capacity assessment TARGET score 161 for all combined EWS agencies 2. TARGET: 30% increase in domestic financing for equipment operation and maintenance across all institutions	1. Capacity assessment scores 2. Ministry budget lines for recurring costs	Burkina has enough government financing to continue monitoring and will consider recurring O&M costs for new infrastructure in government budget lines because of the utility of EWS/CI. There is sufficient political support and will within the EWS agencies to reinforce existing capacities for

[10] *Objective (Atlas output) monitored quarterlyERBM and annually in APR/PIR*

	weather and climate change	No Standard Operating Procedure (SOP) for alert communication by ANPC with the support of NGOs/CSOs Current score: 74 2.Existing budget plans do not have sufficient funds to maintain and operate environmental monitoring infrastructure			successful execution and implementation of the project.

	Indicator	**Baseline**	**Targets** **End of Project**	**Source of verification**	**Risks and Assumptions**
Outcome 1[11] Enhanced capacity of national hydro-meteorological services (DGM/DGRE) and environmental institutions (DCIME) to monitor extreme	1.% national coverage for climate/weather monitoring	1.Currently, there is 25 % national coverage for climate/weather monitoring with respect to the optimal arrangements defined in DGM/DGRE	1Increase to 75 % NHMS optimal monitoring arrangements as defined in feasibility studies (8 Acoustic Doppler Current Profilers (ADCPs) for flow measurements, 40 automatic climate stations, 10 automatic synoptic stations with telemetry and 100 additional rain gauges) Meteorological stations: 242	1.Review of budget spent on equipment procurement and rehabilitation and data held on servers to show that new equipment is operational 2.Analysis of data frequency	Procurement and installation of hydro-meteorological equipment, including hardware and software, is delayed because of complications with the release of funds and/or national procurement procedures.

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

weather and climate change (droughts, floods, strong winds)	2.Frequency and timeliness of climate-related data availability (BASELINE: monthly;	feasibility reports and WMO standards(Twenty synoptic stations, 20 agro-meteorological stations, 8 climate stations, 100 rain gauges, 71 water level meters and 11 manual flow meters are in place). Meteorological stations: 142 manual, 6 automatic Hydrological stations: 82 manual, 0 automatic 2.Data from manual weather and hydrological stations is collected monthly and transmitted by post.	manual, 56 automatic Hydrological stations: 93 manual, 8 with telemetry 2. TARGET for data transmission frequency: daily	transmission using storage servers within each information production agency	Manual equipment rehabilitated with enhanced SMS communication systems will enable transmission of data to NHMS at least daily. There is and will continue to be sufficient qualified personnel within the NHMS to handle the new equipment, data transmission/storage/treatment to prevent continuity breaks in monitoring. Natural disasters (e.g., floods, strong winds) may damage infrastructure. Sufficient spare parts and tools have been procured to assist with equipment repair.
Outcome 2 Efficient and effective use of hydro-meteorological and coastal information for making early warnings and seasonal forecasts which feed into long-term development	1.% of population with access to improved climate information and flood, drought, strong wind and coastal warnings (disaggregated by gender) 2. Development frameworks	1.There are existing EWS initiatives for regional dam management and famine alerts, however, a national alert system concerned with extreme hydro-meteorological phenomena is	1. 50 % increase in population who have access to improved EWS/CI Women: 8% Men: 15% 2. At least 2 of the PRSP policy briefs incorporate analyses of risk maps and/or climate change projections influencing long-term planning proposals 3. Development of at least 2	1. a) Gender disaggregated survey on receipt of alerts b) Record of debriefings by CONASUR post extreme weather events c) CONASUR record of end-user feedback	Data sharing and alert/climate information communication will not be hindered by lack of coordination between agencies or by technical constraints such as bandwidth issues or local mobile telecommunication networks.

plans	(SCADD, PEI) that integrate climate information in their formulation of poverty reduction strategies and links between poverty and the environment at local levels (BASELINE: No integration; TARGET Integration into the revised SCADD and PEI in 2015) 3. Sector-specific EW products and strategies that integrate climate risks (agriculture, health, and cotton production sectors)	lacking. There is also a limited understanding of technical alert jargon (alerts are not translated into all national languages). There is also no mechanism for end-users (most vulnerable populations) to be involved in the alert process to ensure its sustainability. Women: 5% Men: 10% 2.Development frameworks do not incorporate any EWS/CI products such as risk maps or climate change predictions into long-term planning 3. Sector specific strategies do not include EWS/CI because the quality of weather forecasts and climate	tailored climate products and presentation of market research plan on how to implement mobile phone based agricultural advisories, both supporting targeted weather/climate service delivery	2.Review of SCADD, and PEI documents to validate incorporation of risk, weather and/or climate information 3.Partnerships formed between information producers and the Ministries of Health and Agriculture, private sectors, NGOs and women organizations to support weather/climate service delivery	Ministries have a vested interest to fully integrate climate information into their poverty reduction strategies and disaster risk management plans. NHMS will acquire enough capacity to tailor climate products to different socio-economic sectors (e.g., subsistence agriculture, cotton, mining, building construction) by the end of the project. False alarms may occur but enough awareness has been provided to end-users to understand the reality of forecasting uncertainty and to inform them how they can get involved to improve early warnings and tailor CI suited to their needs

		predictions are poor and not tailored for specific uses, particularly seasonal forecasts.			

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	
Burkina Faso: Strengthening Climate Services and Early Warning Systems in Burkina Faso for Climate Resilient Development and Adaptation to Climate Change	
Include detailed activities related to production of climate/hydrological information, communications and sustaining this work and retaining expertise, particularly under component 2.	The production of climate/hydrological information is addressed in Output 2.2. A feasibility study following by a pilot study (Activities 2.2.2 and 2.2.3) will be used to demonstrate the economic potential of tailoring and selling weather/climate information to different agricultural sectors (e.g., cotton), the mining industry and the building construction industry. A workshop between the information production agencies and representatives from the private sector has indicated that more frequent and longer time scale national bulletins can be revenue-generating products (e.g., seasonal forecasts to predict the rainy season or daily forecasts to indicate maximum wind speeds for cotton cultivation). The LDCF project will reinforce the capacity of the DGM/DGRE/DCIME (Output 2.2 p 36) to produce such tailored climate products and hence the attractiveness of products that the private sector is willing to pay for. Tailoring products to the private sector will thus serve as a way to gain revenue and recover costs. Cost recovery funds can help with equipment O&M costs and modernization of equipment. Outputs 2.6 and 2.7 (p 50-51) focus on the communication of information including the development of a Standard Operating Procedure (SOP) to clearly identify the role of the Disaster Risk Management unit (CONASUR) and how there will be a chain of communication with NGOs/CSOs down to the local level (mayors). Also, Output 2.7 includes a public awareness campaign to inform the local populations on the utility of this information for adaptation to climate change. Expertise in generating hydro-meteorological information will be retained by mandating all trained technicians/engineers within the NHMS to remain in their position for 10 years to ensure knowledge sharing. This and the development of new products and a diversified sector is expected to help retain trained staff.
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.	This project is using the Global Framework for Climate Services established by WMO as a related initiative. Under this project, WMO already developed a National Framework for Climate Services in Burkina following a three-day workshop led by WMO in late July 2012. A pilot project is planned to occur in Burkina (funding approximately $2.65m) with the goals of developing National Climate and Health Working Groups and partnering climate services and water resources management. This project will ensure there is a solid collaboration with EWS-related projects supporting climate and hydrometeorological services in the west African region including ClimDevAfrica (climate information in Africa), AGRHYMET (agriculture), ViGIRisC (establishment of vigilance systems for climate risk), Niger-Hycos and Volta-

	Hycos(transboundaryhydrological modeling in the Niger and Volta watersheds) and AMESD (satellite data retrieval to assist with food security forecasts).
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	As discussed during the workshop between the information production agencies and private sector representatives, service delivery of climate/weather information products will be targeted towards the cotton, building construction and mining industries who have already expressed interest in purchasing tailored products (Annex 4). User-friendly communications, SMS services and the Governmental Information Service (SIG) will be supported to provide user-driven information and make it accessible. SIG already has numerous effective ways of communicating to the general public (call center, toll-free number, etc See Section 2.4.4 p 35), but they rarely collaborate with NHMS. The LDCF project will develop a partnership between SIG, the DRM (CONASUR) and the information producers to generate alerts rapidly. End-user feedback on the utility of information will be highly valued in project implementation and thereafter by including a feedback chain to enable end-users to voice their needs/concerns to local EWS focal points (Activity 2.6.4 p 40).
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.	Under Activity 2.6.3 (p 39) grass-roots based NGOs/CSOs and local mayors will be trained on how to most efficiently and effectively communicate alerts and information. A Standard Operating Procedure (SOP) for communication will be developed to clearly define the roles of each agency in the EWS/CI communication chain. The SOP will include designating EWS/CI focal points which the local communities can contact. End-user feedback on the efficacy and speed of EWS/CI alerts will be made possible by including a feedback chain to enable end-users to voice their needs/concerns to the local EWS/CI focal points (Activity 2.6.4 p 40). Furthermore, local populations will be used to assess the project indicators (See Project Results Framework Section 3). In the beginning of the project, a gender dis-aggregated survey will be conducted to determine how many people receive alerts (highlighting women). This same survey will be conducted at the end of the project once the EWS system has been implemented. The Stakeholder Involvement Plan (Section 2.9 p 52 Annex 5) describes how women-focused NGOs/CSOs (WILDAF and the Women's Forestry Association) will be responsible for conducting the survey in order to ensure that women receive alerts. Furthermore, during the preparation phase (see Annex 4, Key assessment report and section 2.9 Stakeholder Baseline Analysis p 52) these women-focused NGO/CSOs were fully integrated into the participatory design process.
Activities related to data stewardship should be expanded to include a plan for data sharing throughout the region and globally.	As evidenced by Burkina's active role in the Niger-Hycos and Volta-Hycos projects (international watershed hydrological model development projects), transboundary data sharing is quite critical for Burkina. Weather patterns move progressively over the region (p 12). This project will facilitate data sharing by using an existing server at DCIME as a centralized EWS information server (Output 2.4, p 37). Technical NHMS, research organizations and the Disaster Risk Management Unit (CONASUR) will be able to have privileged access

	to this information. An ftp connection will also be established to facilitate data sharing regionally. Globally, data will be communicated to the Global Telecommunication System in Activity 2.4.1 (p37). Furthermore, the database will serve to build links with the catastrophe databases in Burkina managed by the China and Japan National Centers for Catastrophes and link to the open access spatial data from the UN Office for Outer Space Affaires (UN OOSA) and the UN SPIDER project which is concerned with developing the capacity of countries to use an open network of all types of space-based information to support disaster management activities.
Clearly articulate the sectors that will benefit from the project, and include considerations of the adaptation priorities and needs of local communities.	The capacity of climate/environmental information production agencies (DGM/DGRE/DCIME) to provide rapid alerts and tailor climate products to the needs of various socio-economic sectors will be reinforced providing benefits to approximately 150 people within these respective ministries (e.g., agriculture, health, cotton, Section 2.3.4 p 22) (Approximately 340 people will benefit in the NHMS and the DRM, see Section 2.3.4 p24). Similarly the decentralized information dissemination agencies will be trained to understand EWS/CI technical jargon so that it can be relayed simply to local populations. This entails that approximately 840 people in local CONASUR branches, NGOs/CSOS will become beneficiaries of the project. Data sharing will also extend weather/climate information to the Ministries of Health and Agriculture which account for 20,000 beneficiaries. By the project enabling a pilot study on tailoring climate services and market research on the potential for mobile phone-based agricultural advisories, Burkina farmers can take advantage of improved local forecasts of winds, rain and temperature. Together with satellite imagery used for land-use planning and monitoring, tailored climate products can also provide significant local environmental benefits, detailing best water management practices which is crucial to help Burkina's fight against desertification. At the local level, early warnings and climate hazard mapping can provide economic benefits by reducing losses of agricultural produce, infrastructure (roads and bridges) and disruption to people's livelihoods. The selected target zones are considered the most vulnerable agro-ecological zones as identified in Burkina's NAPA (2007). Communities will also immediately benefit from the Standard Operating Procedure to be implemented for alert communication. The total population benefiting from these developments has the potential to grow immensely if warnings extend to a reasonable percentage of the total population e.g. through a mobile phone relay. Also, the feedback mechanism can enable the communication mechanism to be improved via end-user comments/suggestions. Finally, during project development it was indicated that at least 12 private sector industries or companies, spanning a range of sectors,can benefit from EWS/CI.
The proposal requests funding for an "appropriately equipped hydrological boat for comprehensive profiling of salinity". We request UNEP and UNDP to explain why this platform was chosen over lower cost platforms.	In this project, one Zodiac inflatable boat (for the Hydrological Service, DGRE B) will be purchased because it is the most cost-effective method to deploy instruments at different locations for hydrological monitoring, as opposed to having 6 or so permanent

	fixed structures which would be more costly.
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 gaps and needs for each country.	The outputs for this LDCF project have been tailored to address the gaps and needs for the NHMS, (DGM (including ASECNA (radio-soundings) and SAAGA (Radar)), DGRE and DCIME) as well as the Disaster Risk Management Unit (CONASUR), relevant NGOs/CSOs (see Stakeholder section 2.9 p 51) and local communities in Benin. The gaps and needs of these key early warning institutions and end-users of early warning system information have been identified through multi-stakeholder consultations conducted including the inception workshop held during September 2012 which was used to identify relevant EWS agencies involved with climate and hydro-meteorological information production as well as agencies that should be implicated in alert dissemination to vulnerable populations, most notably farmers and rural women. This workshop was also used to detail the baseline of EWS-related initiatives (outlining gaps, successes and failures) and identify potential co-financing sources including institutions who are managing/developing relevant on-going/planned EWS related initiatives. A second mission workshop in November 2012 was used to 1) to define and validate Early Warning System (EWS) costs provided by each agency in Benin 2) to perform a capacity assessment of all information production and dissemination agencies and 3) to formalize the roles of each EWS agency in information dissemination. Results from the self-assessment on capacity and prioritized needs are detailed in Annex 4. Thirdly, and most recently, the final validation workshop was held in April 2013 and was used to confirm the Management Arrangements, partnerships, project indicators, risks, assumptions, synergy mechanisms and project outputs and budgets.
Long term data records require sustainability and therefore need more detail for output 2.5 (sustainable financing) and how it will overcome barriers.	Long-term data records will be reinforced by digitizing data in Component 1 (Activities 1.1.5 and 1.2.6 p 29) and having designated servers for data storage, including back-up methods, in each information production agency. In order to ensure that data will continue to be collected, several design aspects to ensure project financial sustainability have been made (See Sustainability Section 2.7 p 49 for more details). 1) Equipment procurement will be staggered so that enough technical support is available to continue operation and maintenance of existing equipment and to be trained on new equipment installations. This will prevent any interruptions in equipment operation/data collection. 2) Continued support for monitoring will be established by developing a framework for DGM/DGRE/DCIME to properly plan sustainable government budget lines including cost recovery mechanisms (Output 1.4 p 32). To date, all equipment operation and maintenance is funded by existing government budget lines. 3) Tailoring products to the private sector will also serve as a way to recover costs in the long term. Significant capacity building regionally will be supported so that cross-sectoral weather/climate/hydrological products can be delivered. By making EWS/CI more useful to various sectors, this pushes the Government to include core budget lines to support monitoring equipment operation

	and maintenance due to the cross-sectoral importance of EWS/CI (e.g., health epidemics linking to temperature trends, agricultural advisories based on rain patterns)
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.	Burkina Faso is using a mix of technologies because the radar and radiosonde launching station are already installed and the costs of rehabilitation and training are considered to offer a cost effective solution for providing these data. Radar data is generated by SAAGA, one operational arm of the Met Service while radiosonde data is generated by another operational arm, ASECNA. Data, such as is the case presently, will be transferred to DGM. In the case of the radar data where power outages have been frequent, a microwave link will be used to improve data transmission (Activity 1.3.3 p30). This project will also support satellite data use and analysis through its capacity reinforcement for the environmental data institution (DCIME). Finally, to integrate all of this information, Burkina Faso will procure the SYNERGIE system (MeteoFrance).
Projects will be challenged by a lack of IT infrastructure (bandwidth, etc.) to collect, analyse, exchange and archive data.	Significant IT equipment has been included in Component 1 for data downloading, data archive and exchange and in Component 2; the already existing server at DCIME will be configured to exchange data between ministries/organizations (Activity 2.4.1 p38). Back-up servers will also be acquired where appropriate. For new IT developments training in data transmission/storage/usage will be provided by a Communications expert in Output 1.6 (p 32), for DGM, DGRE and DCIME. It is recognized that bandwidth is limited in Burkina Faso and is listed as a risk in the Project Results Framework Section 3 and the Risk Analysis Annex 1. To improve bandwidth, an activity has been developed to establish a public-private partnership and service level agreement between DNM and the mobile service/internet service provider (SONABEL) with regards to standardizing start-up costs for servers and modems as well as increasing bandwidth for internet connections.
There is a lack of workstations to make forecasts, access global products for downscaling etc.	The SYNERGIE (MeteoFrance) forecasting interface will be procured under Component 2.1 (p36) including required IT equipment to handle forecast visualization, data assimilation and downscaling. Data in SYNERGIE comes from a combination of weather station, radiosonde and satellite observations. There is significant budget allotted to training for DGM/ASECNA and use of the SYNERGIE system as well as budget and an activity to plan for license renewal after completion of the project. ASECNA, who is already performing forecasting and familiar with forecasting technologies such as SYNERGIE, will assist in continual knowledge sharing with DGM (ASECNA acts as an operational arm of DGM). Three (3) work stations for data collection/use and forecasting will be procured under Activity 2.1.1 p 36.
There is a lack of private capital to support the large costs of modernisation.	A workshop was conducted in the beginning of March 2013 (see meeting notes in Annex 5 p139) including the information production agencies, DGM/DGRE/DCIME and private sector representatives from the cotton, building construction, and mining industries. All 3

	sectors show high potential for future investment in tailored weather/climate products. Specifically, the building industry needs high quality forecasts to know when to shelter their building materials while the cotton industry requires rain gauge information near specific cotton plots in order to plan their cultivations. Revenues obtained from selling tailored products to the private sector can help with equipment O&M costs and costs to continue to modernize equipment. Recurring costs for weather/climate/environmental monitoring will be included in national budget lines in order to ensure their financial sustainability.
Specific details on which hazards are important and where should be included.	Burkina Faso hazards include floods, drought, and strong winds (e.g., harmattan trade winds from the Sahara desert). Target vulnerable areas experience all of these risks to some degree depending on the climate regime (3 regimes, see Figure 8, Annex 4 p140) as detailed in the Burkina NAPA (2007). The most northern climate regime closer to the Sahara experiences more drought and harmattan winds while the southern regimes have experienced more severe flooding. This was discussed during workshops and considered when deciding target EWS activities.
More analyses of climate needs to be included in determining where hydromet stations should be located.	Climate stations with the role of measuring climate variables (namely temperature and rainfall) will be procured and DGM has conducted feasibility studies to see where these specific stations should be best placed. They have concluded that they need a climate station in each of the provinces and a rain gauge in each of the departments (Global Project For Modernization and Reform of Burkina Faso's National Meteorological Service, October 2007, Annex 4) and this assessment will be built on (refined through discussions during implementation) to determine hydromet locations.
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.	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. These measurements will be important for making assessments of current agrometeorological conditions. Flow meters and water level meters will provide discharge measurements every hour, and will feed into flood monitoring and forecasts. Radar will be used to measure rainfall droplets at a rate of every 10 minutes and then averaged every hour in order to identify locations at risk of flash flooding (combined with monitoring of saturated soils). Radiosondes will give a vertical profile of atmospheric variables including temperature and pressure two times a day (at noon and midnight in accordance with WMO standards) which will support daily weather forecast generation using both external forecasting products (e.g., COSMO, NCEP GFS, and ECMWF) and allowing subjective analyses of these forecasts by trained meteorologists. For climate analyses, climate stations measuring rainfall and temperature and satellite images used to detect images of the Earth's surface on a daily basis will be used to predict climate trends, the occurrence of flood/drought periods, and soil moisture measurements to identify long dry periods.

Provide data to world climatic data centres.	Yes, climate/meteorological data will be supplied to GTS (Activity 2.4.1 p38) (Global Telecommunication System) – the international system for met data collection/analysis and hydrological data will be provided to the WHYCOS project (World Hydrological Cycle Observing System, WMO). BKF provides data to WHYCOS through its on-going Niger-Hycos and Volta-Hycos projects.
Clearly distinguish between weather and climate observations and how they are used.	Weather observations will be used in hydro-meteorological models to produce daily forecasts for predicting extreme and severe weather and potentially for deriving weather-related seasonal forecasts such as for dry spells etc. They also form the basis for monitoring the current state of the atmosphere and surface conditions and long-term, are accumulated to be used for climate studies. Climate observations will be used for long-term predictions (on the order of years) and will be provided to planners (DCIME, Ministry of Agriculture etc) and will feed into the next PRSPs (SCADD and Burkina's PEI). Output2.1 p 35 and Output 2.3 p 38. Both weather and climate observations may also be used within downscaling models for predicting the future seasonal and long-term climate, depending on the methodology used.
Details should be provided on whether additional funding for procurement of technology can be accessed.	The project will build off of existing initiatives which are in the process of procuring equipment. The first LDCF financed project supporting Burkina' NAPA installed 10 manual synoptic weather stations and 6 automatic agro-climate stations in two agro-ecological zones (See Baseline Section 2.4.1 p 25). A GFDRR project has also purchased hydro-meteorological equipment including hydrological flow meters and rain gauges in pilot zones (Section 2.4.1 p 25). Additionally funding to maintain and operate the equipment will be provided by the government in their budget lines. New equipment is not planned in the immediate future but has been outlined in the feasibility studies of DGM and DGRE (See Annex 4) and future funding sources will be identified where they exist.
Project goals include mitigation of flood/drought losses but have insufficient hydrological modeling described in the PIF.	Hydrological modeling with HECRES and MIKEBASIN models (to provide watershed modeling and hydropower/pipeline modeling respectively) has been added since the PIF. Current capacityfor hydrological modeling in Burkina Faso is low and will need to be built during the project. Please see Output 1.1 for details.
Include considerations of how capacity of hydrological services (and agriculture) can be improved e.g. issue flood and drought monitoring and early warnings.	Hydrological services in Burkina Faso need to be improved because current technical capacity is weak. The hydrological service (DGRE) has focused on hydropower/dam management modeling up until now. This project will be used to collect more hydrological measurements (flow and water level) and combine this information with upstream/downstream watershed models in order to predict floods and potential periods of droughts (e.g., when reservoir levels are low). The project document now considers/identifies a range of capacities that need to be built to improve flood and drought warnings.
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?	The NHMS and the agriculture sector already work together to produce alerts for famine. The alerts are produced by multi-disciplinary working groups (GTPs). The GTPs will continue to be

	used in this project for technical support. Data will still likely require manipulating, especially with the generation of new products. Generally, the hydrological/agricultural models require temperature, rainfall, wind, evapotranspiration and soil moisture inputs on daily to monthly timescales, which are provided by existing stations, though it is sometimes difficult to obtain continuous daily data (this will be improved through new AWS and AWLS fitted with GPRS modems). New stations will also expand the network coverage measuring these weather/climate characteristics.
In Component 2 there is a need to articulate the types of forecasts that will be produced.	Burkina Faso requires early warnings on short-term scales, (hourly, daily and weekly) to produce weather forecast bulletins indicating rainfall intensity and wind speeds daily. They also require long-term seasonal forecasts for extreme weather (floods, droughts and strong wind periods) to help with generating agricultural advisories. *Output 1.2 p30).
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.	The focus of the project is developing 'EWS/CI' (Early Warning System / Climate Information). The project is therefore focused on strengthening climate information for both short-term, seasonal forecasts and long-term climate predictions. The latter is mostly through the collecting of daily data over a long period, which will help both detect trends and observe changes in extreme weather events. These data can also be used with suitable downscaling models and CMIP5 data to project future climate change. Integration of EWS/CI into the next Poverty Reduction Strategy Papers, (PRSPs, namely SCADD and PEI) is an activity in Output 2.5 Activity 2.5.1 (p 39). This activity mandates the EWS synergy building platform (CIMS) to facilitate and promote as a national priority the integration of EWS/CI into development plans to help Burkina Faso prepare for crises/catastrophes.
Hydrometproducts which are sold for a fee will limit uptake by vulnerable populations.	Hydromet products will be free for the general population such as the current situation. Fees will be obtained from the private sector that has the means to pay for tailored climate products i.e. specifically designed for a particular sector. Revenue from these fees can be used to tailor products for local end-users (e.g., subsistence farmers) who do not have financial means to pay. A market research study will also be conducted to see if it is feasible to sell mobile-phone agricultural advisories such as the idea of Plantwise.org.
Include consideration of how the project will benefit women, noting that evidence suggests that women do not receive EW messages via radio.	Yes, this has been reflected and citations to Karen O'Brien's research on women's lack of involvement in EWS are cited. The gendered division of household labour in Burkina means that women are responsible for the majority of subsistence household chores where they are more dependent on natural resources (e.g., fetching water); in addition, they may be excluded from some activities due to cultural norms, or due to lack of capital and ownership arrangements that confer all rights to men in the family. To ensure that this project is successful in proving alerts to women, a gender dis-aggregated survey will be conducted to determine how many people receive alerts (highlighting women). This same survey will be conducted at the end

	of the project once the EWS system has been implemented. The Stakeholder Involvement Plan (Section 2.9 p 52 Annex 5) describes how women-focused NGOs/CSOs (WILDAF and the Women's Forestry Association) will be responsible for conducting the survey in order to ensure that women receive alerts. Furthermore, during the preparation phase (see Annex 4, Key assessment report and section 2.9 Stakeholder Baseline Analysis p 52) these women-focused NGO/CSOs will be fully integrated into the participatory design process.
ACMAD, GEO and AfriGEOSS are not mentioned despite coordinating earth observations and climate observations.	This project will build off the ViGIRisC project (ACMAD) by using their knowledge on EWS in the region and exploiting knowledge sharing opportunities sponsored by the ViGIRisC project. The LDCF project includes funds to send DGM personnel to ViGIRisC's training courses for West Africa in Output 2.1.2 p 36 (General discussion in Section 2.4.2 p27). This project will also build collaboration with the ClimDevAfricaprogramme part of GCOS (the Global Climate Observing System) (Related initiatives p 22). Already, ClimDevAfrica through ACMAD provides capacity building to DGM by providing a fellowship for specific training in ACMAD in Niger. Furthermore, a related initiative in Burkina is the AGRHYMET initiative which incorporates satellite data (formerly the AMESD project and now the MESA project) to improve climate information and the WHYCOS (World Hydrological Cycle Observing System) projects (Niger-HYCOS) which exploit and share satellite information related to hydrology to model common drainage basins which traverse country boundaries (Section 2.4.2 p27).
There is a need to include WMO and the GFCS initiative.	The GFCS initiative (WMO) is very active in Burkina Faso and is considered an on-going related initiative (Section 2.3.1 p 20). In July 2012, the GFCS funded a workshop in Burkina Faso to establish a framework for climate services at the national level (See conclusions Annex 4+E41). This initiative was a first step to improving communication between different sectors (health, agriculture, food security, private) on their needs for climate services. Other goals of this project are to: strengthen capacity for disaster risk reduction and early warning, perform large-scale data recovery and digitization, and develop National Climate and Health Working Groups, partner climate services and water resources management. Due to the related initiatives of GFCS with the LDCF project, the WMO regional focal point is considered a coordination entity in the Implementation Arrangement. As such, the project will relay project developments to the WMO focal point to ensure there is synergy with WMO activities.
Clarify how it plans to promote coordination between ministries at both the national and provincial level. We appreciate the involvement of multiple government agencies and institutions as this EWS will not only require input from various sector experts but also produce information applicable to numerous ministries and institutions.	Synergy with other initiatives, particularly those housed in the Disaster Risk Management Unit (CONASUR) was voiced as a major issue during project development. As a result, in Component 2, an Output has been developed to create a Multi-agency and Inter-disciplinary platform for Synergy (CIMS) to ensure coordination with other EWS agencies (from national down to local levels) and synergy with EWS-related initiatives to maximize project complementarity. This includes early warnings already in place for famine. Technical

	focal points from information production and dissemination agencies will form a technical support group. They will work with the already formed GTPs, Technical Working Groups, which produce alerts for famine and dam management and include focal points from cross-sector institutions/organizations. The Disaster Risk Management agency, CONASUR, will have a decentralization support committee including representatives on regional (prefect), local community levels (mayors), and representatives from NGOs/CSOs to help with information and alert dissemination.
Outline how users will be involved both in the design of the EWS and in deciding what information is produced from the EWS as well as how information will be disseminated. Better results can be achieved by ensuring that climate information and early warning system products are user-driven and communicated to users through various innovative channels	The Burkina Faso EWS/CI includes the development of a feedback mechanism in the Standard Operating Procedure for communication to be implemented. The feedback mechanism via SMS and toll-free numbers to designated EWS focal points will ensure that end-users are engaged and are able to provide their suggestions on how to improve communication and alerts. They will also be able to get involved in a pilot study to demonstrate how best agricultural weather advisories should be customized to their needs. Climate/weather products that are service-based and end-user driven, such as weather bulletins and SMS agricultural advisories (Plantwise.org) will be developed under Output 2.2.
Clarify how it will communicate results, lessons learned and best practices identified throughout the project to the various stakeholders both during and after the project; and	The Multi-agency and Inter-disciplinary platform for Synergy (CIMS) will hold regular information, lessons learnt and good practices meetings to strengthen collaboration among EWS agencies and EWS-related initiatives. From a project development point of view, the UNDP Monitoring and Evaluation mechanism will be used to track project progress with the quantitative indictors outlined in the Project Results Framework (See Section 3).
Engage local stakeholders, including community-based organizations and environmental NGOs in both the development and implementation of the program	All relevant NGO/CSOs including women representing NGOs (WILDAF) have been consulted during project development and will continue to be engaged through the Stakeholder Implementation Plan. Also, Output 2.7 is dedicated to working with the local stakeholders through a public awareness campaign and holding workshops in the target EWS regions in order to get local stakeholder input.

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.	In terms of risks for the sustainability of this project, the Validation workshop concluded that there are 2 main risks which must be accounted for (See Risk Analysis Annex 1). It is possible that Burkina Faso will not have enough government financing to continue monitoring and to cover recurring O&M costs. It is also possible that there will be a lack of qualified personnel within the NHMS to operate and maintain new equipment, data transmission/treatment/storage processes and forecasting models. To combat these risks, this project is focused on making EWS/CI useful to various sectors (e.g., agriculture, health, and economics) (See Activities 2.2.2 and 2.2.5 p 37). By developing products that are user-driven the EWS/CI responds directly

	to national needs (e.g., targeted agricultural advisories to improve the cotton sector's production). Through this approach, the Government will gain incentives to include budget lines to provide continual support for climate/weather/environmental monitoring due to its cross-sectoral importance and profitability (even if just the potential for profit is demonstrated by the end of the project). Furthermore, in Activity 1.6.3, capacity for long-term operation and maintenance planning and budgeting will be built in all information production agencies through regional support training. Co-financing agreements have already been agreed upon to support the project as well (Table 3 p 45). The Ministry on Sustainable Development has agreed to support the project with approximately $40,000 while the World Bank PNGTIII project will be co-financing the project for $54 m. In both cases, the Ministry and the World Bank see the utility of weather/climate information to help the local populations adapt to weather risks and a changing climate.
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	Significant technical capacity building is included for DGM in Output 2.1 (p 37). At the moment, the majority of forecasting skills are housed within ASECNA, the operational arm of DGM concerned with civil aviation. ASECNA will be responsible for transferring their forecasting skills and sharing their hardware (work stations) and software with DGM. Furthermore, Activity 2.2.2 (p 37) will support knowledge sharing for DGM on Numerical Weather Prediction models (e.g., WRF and COSMO) with international centers (e.g., MeteoFrance) and regional centers (ACMAD, responsible for the African Early Warning and Advisory Climate Services, AEWACS or ViGIRisC project and for the ClimDevAfricaprogramme) to build forecasting expertise. Additionally, it should be noted that 10% of the budget will be used to support a pool of technical regional experts whose role will be to support this project full-time in the fields of hydrology, meteorology/climatology forecasting and prediction, and communication systems. (See TORs in Annex 6).
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 infrastructure is not described. Please elaborate on the climate and climate change related benefits in comparison to the business as usual investment.	Approximately, 60% of the hydro-meteorological equipment is functional. Equipment is not functioning because there have been insufficient government funds to maintain and operate the hydro-met stations. To have better infrastructure, LDCF resources in Component 1 will be used to procure, install and/or rehabilitate critical infrastructure required to build and strengthen the climate-related observational network nationally for multi-risk purposes (floods, droughts, and strong winds) (Output 1.1 and 1.2 p 35). All existing EWS projects are focused on predicting floods, famine or best dam management practices in localized geographical areas. In contrast, this component will focus on establishing national hydro-meteorological monitoring capabilities in order to produce EWS/CI for the three climate zones in Burkina, particularly the most vulnerable agro-ecological zones indicated by the NAPA. Through this project, the weather and hydrological equipment will be upgraded by increasing the frequency of data transmission (via SMS or GPRS) and procuring complementary automated equipment to the existing manual equipment. Data transmission is expected to go from 1

	month to 1 day (Activity 1.1.4 and 1.2.4 p 33 and 35 respectively) where equipment is installed. Capacity building will initially be provided by the equipment manufacturers (generally for 2 weeks after installation). Capacity will continue to be built to maintain and operate equipment with regional technical support training on at least a biannual basis (See TORs Annex 6). Furthermore, equipment has been budgeted to include the cost of spare parts (approximated to be 25% of running costs if not known) and field trip validation costs to verify equipment operations are also included (Output 1.1 and 1.2 p 33 and 35).
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 Costs are the costs to run the project by the National Implementing Partner (The Permanent Secretariat for the National Advisory on the Environment). These funds will be used to support the Project Coordinator, Financial and Administrative Assistant, Indemnity fees for the Project Coordinator, and will cover in-country logistics and supplies. These costs are distinct from Agency fees which are to provide oversight and quality assurance of the project-- which in this case is by UNDP (through its country office, region based staff and HQ-based staff).
Recommend targeting the amount of people that should be reached through communication channels in sub-component 2.2 (quantification) and to make sure that the most vulnerable populations are reached.	On a local level, Burkina's NAPA has outlined that, currently, the extreme northern, eastern and western regions in addition to the central plateau are particularly vulnerable and require improved rapid warnings for food security and extreme weather events (NAPA 2007, Figure 1 p 24). During the project planning phase, five tentative localities having a total population of approximately 4 million people have been outlined based on the NAPA and the responses from NGOs during the capacity assessment held during the second workshop. Further analysis to validate and specify the choice of zones to gauge project indicators will be conducted by DCIME during project implementation (Activity 2.1.5 p 36). NGOs/CSOs who are grass-root based will be implicated in this project to make sure the most vulnerable are reached (See Stakeholder Implementation Plan Section 2.9.1 p 52). Also, the project is being by co-financing institutions, such as the World Bank's PNGT3 project, which has developed significant ground based presence through their project in the target vulnerable zones which will be exploited for information dissemination (See Discussion in Section on Adaptation Alternatives p 35).
It is recommended to explain the selection process i.e. definition of the "most vulnerable communities" in Output 3.2.	Five tentative localities have been chosen to target and test EWS/CI (Section 2.3.4, National and Local Benefits p 25). These are areas defined by the BKF NAPA (2007) as vulnerable agro-ecological zones. The local people's vulnerability is in reference to their inability to be food secure and/or to have been greatly impacted by weather/climate risks such as drought or floods.

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	Throughout the project preparation activities there have been extensive consultations with stakeholders and government in Burkina Faso to ensure that all outputs address identified needs and barriers specific to Burkina Faso. Where aspects of the original PIF

a reputational risk to the GEF.	were deemed not appropriate they have been removed and all remaining components and outputs have been modified to accommodate the concerns articulated in the comment.Burkina can be considered to be a step forward from many other countries in Africa with regards to EWS/CI because WMO has already conducted a workshop to support the development of a framework for climate services. Project development has taken this into consideration as well as other baseline initiatives which have purchased equipment (e.g., LDCF financed NAPA and GFDRR project). Consequently, Component 1 deals with specific equipment procurement/rehabilitation and training needs for DGM/DGRE and DCIME (the Met, Hydrological and Environmental Data service respectively). Outputs include radar repair and an additional radiosonde launch. The second component deals with how the data collected will be targeted to the subsistence farmers and the potential private sector clients (building, mining and cotton). The project will build off regional initiatives (ViGIRisC, AMESD) and baseline projects (UNDP-COGEL, WA-WASH USAID). All risks, assumptions, outputs and indicators are specific to Burkina.
There is insufficient assessment of current state of hydro-met sector, past failures and their causes.	This question relates to several aspects of the project, including the radar in Ouagadougou, which will be repaired as part of this project. The cause of radar failure was lack of technical capacity and spare parts to perform repairs. As requested by government, this project will build specialized capacity within SAAGA in order to be self-sufficient with regard to radar repairs and have the ability to plan for recurring costs (Output 1.3 p 36). Whilst it is recognised that this is no guarantee that the radar will remain operational after repair, this is considered a cost-effective solution, which will move towards self-sufficiency in the long-term. Hydro-meteorological equipment failure has also been caused by a lack of technical personnel to maintain and operate the equipment. Many technical personnel have recently retired. This project includes significant technical recruitment considering the needs to maintain/operate new equipment and run forecasting models. Terms of reference mandate that any new personnel who are trained must remain in their respective institution for at least 5 years in order to ensure knowledge sharing (See TORs Annex 6). Capacity will continue to be built to maintain and operate equipment with regional technical support training on a biannual basis (See TORs Annex 6). Furthermore, equipment has been budgeted to include the cost of spare parts (approximated to be 25% of running costs if not known) and field trip validation costs to verify equipment operation are considered (Output 1.1 and 1.2 p 33 and 35). Furthermore, in Activity 1.6.3, capacity for long-term operation and maintenance planning and budgeting will be built in all information production agencies through regional support training.
There is insufficient consideration of the limitations of current capacity, which currently prevents many of the proposed activities in some countries.	A thorough baseline assessment has been undertaken during the project preparation phase to identify the main limitations and barriers to the proposed outputs and activities. Where technical and human capacity is weak, outputs and suggested activities have been adapted to address these weaknesses. Even with capacity building activities, which are listed in the Replicability Section 2.8 p 50, it is still expected that activities, building on these training and knowledge sharing opportunities, will encounter difficulties due to existing barriers. These barriers are present in all projects of this nature and include slow data transmission from manual hydro-meteorological infrastructure, institutional cooperation, poor long-term budget planning, and insufficient technically skilled human resources (Section 1.3 p 9). As a result, the design reflects what has been learned from trying to tackle these barriers through other projects (See Baseline initiatives Section 2.4.2 p 30) and identified in the risks of the Project Results Framework (Section 3 p 60). Countermeasures and management responses to these limitations are listed in the Risk

	Analysis (Annex 1 p77).
Cost estimates are unrealistic and do not include variation between countries and O&M (operations & management) costs.	Costs are based on budgets provided by each national agency during project development (DGM, SAAGA, ASECNA, DGRE, DCIME, CONASUR and CPF See Annex 4). The choice of equipment/technology/approach has been based on a cost-effectiveness evaluation (See Section 2.6 p 45). Costs have been weighed against the intensive time and expenses required for training with new equipment where appropriate. In each of their respective budgets both future running costs and the ease of maintenance were considered. For DGM, they want to automate the meteorological network and based on their success with automatic stations under the LDCF financed NAPA1 project, only automatic weather stations will be procured (Output 1.2). In contrast, DGRE has more limited experience so a mix of automatic and manual equipment has been proposed (See Output 1.1 p 34). Repairing the radar and launching an additional radiosonde were considered cost-effective given the benefits derived from continuing these operations. All costs for monitoring equipment, IT equipment (to support DCIME with satellite data visualization and the procurement of the SYNERGIE system for forecasting) are based on a combination of government estimates and supplier costs – making allowances for local taxes etc. Operational and training costs in terms of supporting data transmission through SMS/GSM, training manual observers and security for hydro-meteorological stations, are included. Maintenance costs such as to re-calibrate rating curves or sensors on weather stations as well as basic upkeep and the costs for associated field visits have been included (Output 1.1 and 1.2). Costs for purchasing spare sensors and parts (25%) are also included.

ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS[12]

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 To date***	***Amount Committed***
1. Review and technical feasibility study and cost assessment analysis	46,000	35,267	10,733
2. Information collection and stakeholder consultations (including stakeholder workshops)	34,000	31,623	2,377
3. Identification of co-funding sources and formulation of project documents	14,000	11,810	2,190
4. Institutional arrangement for implementation	6,000	4,206	1,794
Total	100,000	82,906	17,094

[12] 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)