



# REQUEST FOR CEO ENDORSEMENT

PROJECT TYPE: FULL-SIZED PROJECT

TYPE OF TRUST FUND: LDCF

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## PART I: PROJECT INFORMATION

Project Title: Climate risk finance for sustainable and climate resilient rain-fed farming and pastoral systems – Sudan			
Country(ies):	Sudan	GEF Project ID: <sup>1</sup>	4958
GEF Agency(ies):	UNDP	GEF Agency Project ID:	4591
Other Executing Partner(s):	Higher Council for Environment and Natural Resources (HCENR)	Submission Date:	Feb. 5, 2014
		Resubmission Date:	March 26, 2014
GEF Focal Area (s):	Climate Change	Project Duration(Months)	52
Name of Parent Program (if applicable):	n/a	Agency Fee (\$):	570,000
	<ul style="list-style-type: none"> <li>➤ For SFM/REDD+ <input type="checkbox"/></li> <li>➤ For SGP <input type="checkbox"/></li> </ul>		

### A. FOCAL AREA STRATEGY FRAMEWORK<sup>2</sup>

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Grant Amount (\$)	Co financing (\$)
CCA-2	<b>Outcome 2.1</b> Increased knowledge and understanding of climate variability and change-induced risks at country level and in targeted vulnerable areas	<b>Output 1.1.1:</b> Risk and vulnerability assessments conducted and updated;  <b>Output 2.1.2</b> Systems in place to disseminate timely risk information	LDCF	1,650,000	5,500,000
CCA-2	<b>Outcome 2.2</b> Strengthened adaptive capacity to reduce risks to climate-induced economic losses	<b>Output 2.2.1</b> Adaptive capacity of national and regional centers and networks strengthened to rapidly respond to extreme weather events  <b>Output 2.2.2</b> Targeted population groups covered by adequate risk reduction measures, disaggregated by gender.	LDCF	3,800,000	12,500,000
<b>Project Management Cost</b>			LDCF	250,000	800,000
<b>Total project costs</b>				5,700,000	18,800,000

<sup>1</sup>Project ID number will be assigned by GEFSEC.

<sup>2</sup> Refer to the [Focal Area/LDCF/SCCF Results Framework](#) when completing Table A.

## B. PROJECT FRAMEWORK

**Project Objective:** To increase climate resilience of rainfed farmer and pastoral communities in regions of high rainfall variability through climate risk financing.

<b>Project Component</b>	<b>Grant type</b>	<b>Expected Outcomes</b>	<b>Expected Outputs</b>	<b>Trust Fund</b>	<b>Indicative Grant Amount (\$)</b>	<b>Indicative co-financing (\$)</b>
Institutional framework and capacity for sustainable climate observation and early warning	INV/TA	1. Institutional and technical capacity for climate observation, forecasting and early warning strengthened at national and local levels	<p>1.1 Rainfall modelling and simulations for six target states (River Nile, Gedarif, North Kordofan, and South Darfur, Kassala and White Nile States) to enable local flood forecasts and climate projections(INV: US\$ 285,000)</p> <p>1.2 Procurement of 7 climate AWS, 6 synoptic AWS and 162 rain gauges; purchase of high resolution remote sensing data; and capacity reinforcement related to new products/equipment to enhance the availability, quality and transfer of real-time weather/climate data collection on 130,000 ha of drought-prone land for drought early warning (INV: US\$ 971,000)</p> <p>1.3 SMA, RSA and MoWRE are trained to provide sustainable services on weather/climate observation, risk analysis, forecasting and early warning including the establishment of a farm information management system and the revitalization of targeted seasonal forecast delivery for rain-fed farmers and pastoralists (INV/TA: US\$ 210,000)</p> <p>1.4 Improved communication protocols and mechanisms (i.e. partnership with mobile phone operators) to provide timely and accurate weather and climate risk forecasts to rain-fed farmers and pastoralists in 6 target states (INV/TA: US\$ 84,000)</p>	LDCF	1,550,000	3,300,000

<p>Capacities to design and deploy weather index-based insurance to address residual risk and promote long term adaptation</p>	<p>TA</p>	<p>2. Residual climate risk to rural livelihoods in the states of greatest rainfall variability addressed through parametric insurance products</p>	<p>2.1 Comparative analysis and feasibility assessment of different business models for index-based insurance (TA: US\$ 90,000)</p> <p>2.2 At least 6 index based s (e.g., weather index insurance) designed and introduced, covering at least 45,000 farmers and pastoralists who depend on rain-fed farming systems, including the creation of a nationally-based WII marketing and development team (TA: US\$ 938,000)</p> <p>2.3 Insurance literacy programme / awareness campaign designed and delivered to small businesses, community-based organisations, local farmers and pastoral communities (TA: US\$ 605,000)</p> <p>2.4 Legal and regulatory framework for risk transfer in target states assessed, policy recommendations developed and reinsurance secured. (TA: US\$ 267,000)</p>	<p>LDCF</p>	<p>1,900,000</p>	<p>7,600,000</p>
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Financial service provision for farmers and pastoralists to increase adaptive capacity of rural livelihoods	TA	3. Improved access of vulnerable farmers and pastoralists to financial services for climate change adaptation and disaster risk reduction	<p>3.1 In each state at least 1 adaptation options/packages developed to inform and enable the provision of MFI credit packages to stimulate smallholder adaptation and disaster risk reduction including the transfer of adaptation technologies to make crop and livestock production more resilient (TA: US\$ 354,100)</p> <p>3.2 Legal and regulatory frameworks reviewed, analysed and improved to increase the co-provision of microcredit and micro-insurance services (TA: US\$ 367,100)</p> <p>3.3 At least three micro-credit, flexible loan products designed and tested to account for pastoral mobility and income cycles of smallholder rainfed farmers and pastoralists (SRFP) (TA: US\$ 519,500)</p> <p>3.4 Organization and capacity development for smallholder rainfed farmers and pastoralists (SRFP) on newly developed and targeted financial services including training on a financial services management manual (TA: US\$ 759,500)</p>	LDCF	2,000,000	7,100,000
Sub-total					5,450,000	18,000,000
Project management cost (PMC)					250,000	800,000
<b>Total project costs</b>					<b>5,700,000</b>	<b>18,800,000</b>

**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 (\$)
Private	Shiekan Insurance and Re-insurance Co., Ltd.	Grant	3,200,000
National Government	Agricultural Research Corporation	In-kind	2,000,000
National Government	Agricultural Bank of Sudan	In-kind	7,000,000
Local Government	Kassala, Gedarif, River Nile, North Kordofan, White Nile and South Darfur States	In-kind	3,000,000
Local Government	Higher Council of Environment	In-kind	1,000,000
National Government	Sudan Meteorological Authority	In-kind	2,000,000
GEF Agency	UNDP	Cash	600,000
<b>Total Co-financing</b>			<b>18,800,000</b>

**D. TRUST FUND RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY<sup>1</sup>**

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	Sudan	5,700,000	570,000	6,270,000
<b>Total GEF Resources</b>				<b>5,700,000</b>	<b>570,000</b>	<b>6,270,000</b>

<sup>1</sup> 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.

<sup>2</sup> Indicate fees related to this project.

**E. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:**

Component	Grant Amount (\$)	Cofinancing (\$)	Project Total (\$)
International Consultants	480,000	0	480,000
National/Local Consultants	508,700	0	508,700

**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<sup>3</sup>**

1. No significant changes were made to the original PIF. All Outputs have been detailed and contextualized and Outputs in all Components have been restructured to emphasize the needs highlighted during the project preparation phase as noted during workshops and bilateral/multi-lateral consultations. An amendment to all components has been to target six states rather than four due to the need to address NAPA priorities in additional states. Also, this second NAPA project in Sudan (to be referred to as LDCF2) will build off the first NAPA project (to be referred to as LDCF1) by providing access to financial services to the former beneficiaries who have adopted adaptation technologies. In newly targeted states, beneficiaries will be trained in adaptation technologies/options and receive capacity reinforcement to have sustainable access to financial services. In effect, resources will be maximized across more states and more beneficiaries will be targeted under the LDCF2 project. Relative to PIF projections, the land area which will benefit from LDCF funds will increase from 30,000 to 130,000 ha and the number expected beneficiaries for insurance products will increase from 30,000 to 45,000.

2. Specific updates to the outputs include the following:

3. In Component 1, other than updating the equipment to be procured/rehabilitated and specifying the responsible agency and purpose (e.g., for localized flood forecasting), Output 1.3 has added the following ideas:

- Establishment of a farm information management system
- Revitalization of targeted seasonal forecasts

4. In Component 2, the number of Weather-Index based Insurance (WII) products expected to be developed will increase from 1 to 6. At least one WII product in each state will be developed in order to account for the different climate regimes and livelihoods in each state (i.e., dependent on the crops cultivated and the rainfall received). Livelihood categorizations were taken from the FEWS NET database. Furthermore, Output 2.2 within Component 2 will enable the creation of a nationally based WII marketing and development team to build WII awareness and literacy and have national capacity to adapt WII products as new data and sources of data become available, even after project completion.

5. Component 3 has combined expected Outputs 3.3 and 3.4 in order to ensure that microfinance (MF) product development is based on seasonally or market-based repayment schedules. Also, Output 3.1 has been clarified so that adaptation “option/packages” rather than “plans” will be offered with MF products. As an example, drought-resistance seeds will be an adaptation package included in MF products in order to ensure that Smallholder Rain-fed Farmers and Pastoralists (SRFP) practice more sustainable cultivation thereby ensuring their ability to not default on loan repayments.

6. Finally, Output 3.4 in Component 3 has been added to include an output for organizing and training SRFP. Providing insurance and microfinance services to groups offers the advantages of reducing costs, facilitating training whereby only group leaders need to be trained and reducing the need for physical collateral (members of the group can guarantee each other’s loans). Training will be included for Training of Trainers such as extension officers so that they can have the capacity to provide training to SRFPs. Capacity reinforcement has been emphasized in Components 2 and 3 because WII products (and therefore combined MF/WII products) have never been developed and offered in Sudan previously. Significant training such as guidance from a financial services management manual (to be developed with LDCF funds) and organization of SRFP will be required.

#### **A.1 National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. ]**

<sup>3</sup> 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

NBSAPs, national communications, TNAs, NCSA, NIPs, PRSPs, NPFE, Biennial Update Reports, 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:**

7. Smallholder rain-fed farmers and pastoralists (SRFP) no longer have adequate means to reduce their sensitivity to climate change, extreme weather, market adjustments and other associated risks described above. Beyond a lack of reliable rainfall forecasting and early warning in rain-fed areas, smallholder farmers and pastoralists lack a sufficient earnings and capital base to make their livelihood systems more resilient to highly variable climate risks. There is thus a need to apply alternative, proactive approaches to increase the productivity of farmers and pastoralists, so that they can become more resilient to risks and escape a downward trend towards extreme poverty and dependence on humanitarian aid post extreme events.

8. While autonomous efforts to manage and diversify climate risk are on-going in Sudan (e.g., the first LDCF-funded project which is promoting adaptation technologies for agriculture and water), SRFP have limited access to capital and remain trapped in low-productive survivalist practices that are highly sensitive to climate change. The high risk status of rain-fed climate sensitive farmers and pastoralists currently hinders their ability to access microfinance services, which prevents their ability to have means to more effectively engage in resilient agricultural production, develop productive livelihood capital and gain protection from covariate risks. Banks, MFIs and other financial service providers simply have no incentive to serve this high risk customer segment. Consequently, microfinance products are not designed to consider the specific needs of rain-fed farmers and pastoralists. SRFP are forced to borrow at high interest rates and purchasing loan products that have inflexible payment schedules. There is also limited access of rain-fed farmers / pastoralists to MF because they often live in remote locations that are not serviced regularly by financial outlets. Such an effect increases both the cost of lending for microfinance institutions, and the cost of borrowing for farmers. It has also led to a low awareness among SRFP in available financial service products.

9. Furthermore, the insurance industry is currently incapable of covering the risks faced by SRFP. For example, during the severe drought of 2000, the insurance industry experienced a 103% loss ratio in their livestock insurance scheme due to exorbitant rates of claims. In spite of the high potential for agricultural insurance in Sudan, evidenced by steady growth in insurance coverage, transaction costs remain too high. In addition, with traditional insurance products, premium costs are expected to increase as climate-related risks become more prevalent in scale and intensity. The net effect is that insurance coverage is enjoyed only by the wealthier segment of the agricultural sector, bypassing the most vulnerable farmers and pastoralists engaged in rain-fed agriculture and pastoralism, who are effectively trapped in climate poverty.

10. Additionally, SRFP are reluctant to enter into traditional microfinance or insurance plans for various reasons; insurance compensation criteria are not clear due to complex regulatory frameworks and convoluted dispute resolution processes. The choice of private insurance companies is also relatively low (~2) preventing competition and reduction of premiums. Similarly, microfinance services have very strict collateral requirements. This has pushed farmers and pastoralists to engage with informal lending sources, which generally have higher interest rates but are more flexible in terms of lending requirements and repayment processes. However, informal loans are typically small in quantity and scale because lenders generally receive personal guarantees rather than real collaterals. As such, informal loans are not geared to assist large populations nor to assist in cases of dispute or non-repayment due to the absence of a legal framework.

11. Exacerbating the problem of access to financial services by SRFP is the fact that there are limited linkages between small holders and farming technologies, which can help them adapt to climate change (exceptions include previous adaptation interventions in select locations such as the first LDCF-funded project). Consequently, SRFP are not familiar with how the technologies can help them build resilience to climate change (e.g., using rainwater harvesting to mitigate the impacts of drought). Similarly, there is no link between Microfinance/Micro-insurance (MF/MI) and weather/climate/agricultural/livestock information. Finally, on a national level, there is a lack of appropriate policies, legislation, and support to facilitate the adoption of adaptation technologies with financial services.

12. Sudan also has limited coverage of weather stations to validate insurance pay-outs when extreme weather events occur. Most States have between 1 and 3 weather stations. However, according to recommended WMO standards (one station covering a 20 km radius), in some states hundreds of rain gauges are needed to be installed for full coverage. Similarly, national satellite image production institutes have limited means to validate crop yields, as they have in the past; image data licenses have expired and freely available satellite images do not have fine enough resolution to be used to validate insurance claims. Consequently, and as noted in Stakeholder consultation meetings during the project preparation phase, SRFP are consistently discontent with pay-outs and are tending to avoid using insurance schemes.

13. The combination of a limited hydro-meteorological monitoring network and satellite imaging capability with high rainfall variability, has meant that many important regions and populations vulnerable to climate hazards are not monitored (e.g., soil moisture is not monitored in drought-prone areas and intense rainfall is not monitored in areas frequently subjected to flooding). At present, Sudan is unable to effectively provide weather forecasts and climate scenarios to help with drought and flood early warning. Exacerbating this issue is that many agencies (at least 10) within Sudan are working ad-hoc and independently to produce early warnings. As a result, rain-fed farmers/pastoralists are lacking consistent, localized weather/climate forecasts/predictions and many potentially threatening hazards have not been anticipated. The most recent flood in August 2013, which made international headlines, has been a case in point where the national hydro-meteorological services were unable to predict the impact of the floods and little of the associated mass destruction was foreseen and could be mitigated.

14. The institutional, financial, technological and informational barriers in Sudan include the following

- Insufficient coverage of weather, climate and hydrological monitoring infrastructure
- Limited cross-sectorial data sharing and institutional collaboration
- Limited availability and sustainability of tailored weather/climate information and agricultural advisories
- Long approval and complicated compensation process for existing insurance products
- No experience with weather index based insurance products
- Lack of customized and understandable microfinance services for rural clients

15. Other baseline projects have tried to address these barriers and problems (See Table C above). The project will build off of on-going early warning, adaptation, and MF/MI based projects which are planned or have demonstrated success on the ground. The following baseline projects, detailed below, will be used to support and co-finance the LDCF2 project.

16. ***The National Disaster Risk Management Programme in Sudan*** (2.27 million USD, 2013-2016) will begin implementation in late 2013 in Kassala State for flood risk management as well as work in two (2) other states for drought risk reduction. These states may include: North Darfur, North Kordofan, Northern State or Red Sea State depending upon the stability and security situation. The programme is a joint project funded by UNDP, BCPR, UNEP and ISDR. Relative to the LDCF2 project, the programme has a relevant output regarding strengthening EWS in a gender-sensitive manner through hazard monitoring, data analysis and warning dissemination. The project plans on improving the EWS by, i) forming a multi-sectorial National Early Warning Committee to provide EWS policy advice and technical guidance, ii) providing training for SMA, MoWRE and RSA on new technologies and data interpretation, iii) preparing SOPs on the dissemination of EWSs, iv) training SMA volunteers (e.g., from amongst teachers, imam mosques, farmer's unions) on weather data reporting, v) procuring and installing 2,000 rain gauges in states at high risk of flood and drought disasters, vi) providing warning dissemination equipment to HAC and Civil Defence offices and,



vii) providing a computer cluster to SMA for weather analysis, forecasting and climate predictions. Another output of the project plans to implement flood and drought risk reduction strategies at state and community levels including, i) community training, drills, awareness-raising on drought and flood mitigation schemes, ii) forming a multi-sectorial DRR committee to lead state and community strategies for drought and flood mitigation, and iii) identifying high risk locations which require flood and drought mitigation.

17. **The Food Security Policy and Strategy Capacity Building Programme** (FSPS, 8.6 million Euro, 2013-2016, EU-FAO) is also developing early warnings in Sudan but from a food security perspective. This project is designed to support the selected State Governments of Blue Nile, South Kordofan, Kassala and Red Sea in addressing the capacity gaps related to i) Food security inter-sectorial institutional coordination framework, food security policy and information system; and ii) Line ministries' policy planning, budgeting, monitoring and implementation capacity.

18. In terms of Micro-finance initiatives, IFAD has been assisting the Agricultural Bank of Sudan Microfinance Initiative (**ABSUMI**, USD 2 million) to provide nano-finance loans and savings to rural women cooperatives since 2010. Due to the great success of the project (100% repayment and 98% outreach achieved), the Government of Sudan has requested IFAD to provide support to upgrade ABSUMI to a full-fledged rural development initiative under the name of the **Rural Women Economic Empowerment and Development Programme**. The programme's main focus will be to support rural women through organizational support and financial services. To enhance the impact of the financial services on the targeted households' incomes and food security, the programme will provide technical support and training to women in crop production, livestock production, vocational training, household economy and nutrition, and business development management skills. The programme objective is to establish 32 separate microfinance units under the governances in 7 states to reach around 800,000 clients with rural financial services in 8 years. The geographic areas to be covered by the new programme will be North and South Kordofan States, Sennar, White Nile, River Nile State, Kassala, Gadarif, Red Sed and Gezira States (common States with the LDCF2 project being North Kordofan, White Nile, River Nile, Kassala and Gedarif).

19. Another baseline initiative involving micro-insurance and microfinance development is the **Connecting Farmers to Market** project (CBS, Khartoum bank, 36.5 million USD).<sup>4</sup> This project has enabled farmers to be more productive by using MF lending services linked with micro-insurance to support crop production and livestock. The project has not yet focused on solely pastoralists but rather agro-pastoralists. The services provided to farmers include MF/MI, savings, agricultural extension services and access to markets. The WFP is currently providing Food for Training. The project covers the states of White Nile, Blue Nile, North Darfur, West Darfur, South Darfur, North Kordofan, South Kordofan, Red Sea, Gedarif and Kassala states (common states with the LDCF2 project being Gedarif, Kassala, North Kordofan and White Nile). Currently, the Farmers to Market project is in its 4<sup>th</sup> season. At present, approximately 42,000 farmers and 13,500 agro-pastoralists have received microfinance and micro-insurance services. Training has been provided to the farmers on micro-insurance and savings (Note: MFIs have different payment schedules and target different crops in each state). Al-Tawania is managing the insurance, the Sudanese Microfinance Development Corporation (SMDC) is managing the funds, CBOS has acted as the fund distributor and regulatory body while WFP and the Agricultural Bank of Sudan have acted as the main buyers. (The Bank of Khartoum was an important shareholder during previous seasons.)

20. Relative to adaptation technologies, a baseline project is the **Seed Development Project** (2011 – 2017, USD 17.5 million supported by IFAD). This project is testing the model of a private public partnership (PPP) between private seed companies, the farmers and the public extension services to produce and market certified seeds for smallholder, traditional rain-fed farmers who generally grow less than fifteen feddans (6.3 ha) of land. The project area is composed of 4 localities: Rahad and Sheikan in North Kordofan and Abbassiya and Abu Gubeiha in South Kordofan. A minimum of approximately 108,000 traditional rain-fed smallholder farmers, of which at least 30,000 women, are expected to benefit from the Seed Project through increased returns from the use of quality certified seed. Furthermore, around 1,280 seed growers in approximately 32 groups are expected to benefit from the Seed project.

21. **The Agricultural Research Corporation**, as the semi-autonomous official technical arm of the Sudan Ministry of Agriculture, is supporting the Seed Development Project as well as numerous other demonstration pilots for adaptation technologies. ARC is the authorized body for crop variety release and seed certification. They have significant expertise in developing and distributing adaptation technologies for land preparation, irrigation, rangeland

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<sup>4</sup> <http://www.cgap.org/blog/innovations-islamic-microfinance-small-farmers-sudan>

and pasture improvement, plant nutrition, pest control, and agricultural engineering. In the context of the Seed Development Project, ARC is using its El Obeid-based research station in North Kordofan to conduct seed propagation and testing so that quality seed inputs are distributed and adopted by small holder traditional farmers. The primary role of the Agricultural Research Corporation (ARC) of Sudan is to assist the Extension Services with the adoption of sustainable, adaptation technologies through on-the-farm training.

22. The *Shiekan Insurance and Reinsurance Co.*, Ltd. has implemented insurance products for small holder rain-fed farmers and pastoralists since 2002. In view of catastrophic risks and the need for government support, Shiekan developed crop insurance for traditional farmers in 2002. They also have extensive understanding and capacity to provide livestock insurance. In fact, in 2011 Shiekan was able to provide crop and/or livestock insurance to 40,000 SRFP in Blue Nile, White Nile, North Kordofan, North Darfur, South Darfur and West Darfur states. Insurance products are currently marketed and distributed using Shiekan's network of 70 branches and offices throughout Sudan.

**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:

**23. Outcome 1: Institutional and technical capacity for climate observation, forecasting and early warning strengthened at national and local levels**

Without LDCF Intervention (baseline):

24. Regional early warning systems have been implemented in Sudan to produce alerts for food insecurity (by HAC and the Ministry of Agriculture) to notify residents when water is insufficient for irrigation or to notify humanitarian organizations when food aid is required. Such food security EWSs use agro-climatic data and are based on a partnership between the National Hydro-Meteorological Service (NHMS) and the Ministry of Agriculture. The NHMS also provide warnings regarding droughts and floods on national and regional levels such as to predict trans-boundary floods in the Horn of Africa.

25. Communication dissemination for early warning systems is currently housed at the Humanitarian Aid Commission (at the Ministry of Humanitarian Affairs), which provides overall coordination of post disaster aid distribution among the government and aid agencies. HAC's role is also to notify local populations (through NGO assistance) about epidemics, fires and emergencies and armed conflicts. The Office for the Coordination of Humanitarian Affairs (OCHA) is also engaged in emergency preparedness and response, involving government, international agencies and NGOs in developing contingency plans.

26. In spite of several EWSs being in place and various actors taking part in the process, none of the current systems have the robustness and the coordination needed for addressing looming food security threats and floods on a real-time basis; forecasts in themselves are not localized and have not been able to be accurate in detecting seasonal drought. Moreover, the EWSs do not operate effectively at the state and sub-national levels to serve the interests of local rain-fed farmers and pastoralists. Previously, SRFP in Sudan used indigenous forecasting methods to predict seasonal climate events. However, such traditional forecasting methods are not proving to be reliable with increasing climate variability.

27. Overall, the resources, including institutional functions, are scattered across many organizations; over 10 ministries and institutes are charged with varied responsibilities for disaster risk planning and management at federal and state levels for hazard monitoring, preparedness and ex-post aid coordination. Insufficient budgets have resulted in 162 silent rain gauges in the target states and an inability to renew model and satellite data licenses.

28. Independent reports have also verified the existing weaknesses of the early warning systems in Sudan. A study by Heynert (2006) detailed that several agencies produce their own ad-hoc flood forecasts, with often inconsistent results. A subsequent study by Michael Cawood & Associates continued on this observation and noted that after a flood forecast announcement, the tendency was to wait for assurance of this forecast by means of rising river levels before

taking action. This reduced the effective forecasting lead time by several days, preventing time for mobilization to implement risk-reducing measures (e.g., sand-bagging).

29. The following discussion details the capacities and needs of each NHMS separately. It also shows which projects have built or are building capacities within these institutions.

Ministry of Water Resources and Electricity

30. In terms of NHMS technical capacity, the Sudanese National Hydrological Service, the Ministry of Water Resources and Electricity (MoWRE) can provide several days of forecasting lead time for densely populated areas along the White and Blue Nile Rivers using the MIKEBASIN flood forecasting model. Additional lead time for forecasting on the Blue Nile can be provided using regional forecast and observed precipitation in the Ethiopian highlands.

31. MoWRE is responsible for operating and maintaining a surface hydrological monitoring network of 25 water level meters, 8 manual flow meters and 3 Acoustic Doppler Current Profiler (ADCP) flow meters. The equipment is used to validate flood forecasts. Paid observers take manual readings once a day at minimum. Data is sent daily, weekly and monthly via wireless telephone (GRPS) and transmitted to the MoWRE centre in Khartoum. An exception is reservoir level management for hydropower operations. MoWRE is currently capable of generating automatic alerts to the populations located around the dams through radio communication.

Table 1. Status of existing hydrological equipment under MoWRE

Station type	Existing	Fully operational
Water level (stage) measuring equipment	25	12
Manual flow meters	8	4
Acoustic Doppler Current Profiler (ADCP) flow meters	3	2
Hydrological stations	0	0

32. Baseline projects related to water resources are associated with the *Eastern Nile Technical Regional Office (ENTRO)*, a technical regional body supporting the implementation of *Eastern Nile Subsidiary Action Program (ENSAP)*. This program is funded by Riverside and UNESCO.

33. The overall programme is entitled, Design of an Upgraded Data Acquisition, Communication and Flood Forecasting System. ENTRO intends to provide Regional Flood Coordination in Addis Ababa to support flood forecasting and mitigation efforts in Ethiopia, Egypt, and Sudan and to facilitate data exchange between the three countries, all Eastern Nile States. Significant opportunity exists to improve the quality of forecasts in each of the Eastern Nile countries through acquisition and interchange of real-time hydrologic and meteorological data. These data can be transmitted to ENTRO/RFCU to be shared by the three national forecasting centres. The plan for this program includes 6 main actions including i) reviewing the river flood prone areas in Ethiopia and Sudan and flow forecasting needs at High Aswan Dam in Egypt, ii) designing the upgrade of the necessary hydro-meteorological data monitoring networks in Egypt, Ethiopia and Sudan required to support real time flood forecasting for these locations, iii) identifying other data sources such as weather data and satellite imagery from global sources to be used by the NFCs in Egypt, Ethiopia, and Sudan, and iv) designing the upgrade of the link between the national flood forecasting centres and ENTRO for data sharing.

34. The ENTRO project is located entirely along the main country rivers, including small portions of their flood plains (Annex 9b in the Project Document). The project site then does not include the rain-fed areas under the LDCAF2 project. Also, the ENTRO project is focused on the design of the upgrade of the hydro-meteorological system rather than the actual implementation.

35. The *Flood Preparedness and Early Warning Project, FPEW II* is the second phase of one of ENTRO’s fast track projects planned to support hydrologic forecasting and flood early warning in the Eastern Nile countries. The objective of the FPEW II project is to reduce human suffering caused by frequent flooding while preserving the environmental benefits of floods by improving flood plain management in urban centres and rural communities,

supporting operational flood forecasting through inter-country data exchange, improved emergency response by governments at all levels and community preparedness.

36. The *IGAD-HYCOS* project aims to establish a regional water management information system and to strengthen observation networks and their real-time data transmission within participating countries including Kenya, Uganda, Sudan, Ethiopia, Somalia, Eritrea and Djibouti and more recently South Sudan, Burundi and Rwanda. The overall objectives of the IGAD-HYCOS project are to promote sustainable and integrated water resources development and management in the IGAD region and enhance regional cooperation for the collection, analysis, dissemination and exchange of hydrological and hydro-meteorological data and information for water related decision making.

37. In spite of the technical capacity of MoWRE and project support to perform flood modelling along the Nile Rivers, a systematic arrangement for flood forecasting, warning and communication is not operational in Sudan and localized flood forecasts for vulnerable rain-fed farmers and pastoralists outside of the river flood plains are limited or non-existent. Most 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 40% of the equipment is not functioning. Furthermore, although MoWRE has been trained by external experts during recent years over weekly increments, this limited training has not enabled them to make national coverage of flood or water management models fully operational. Finally, the annual operation and maintenance budget for MoWRE's hydrological network is limiting at USD 223,000.

#### Remote Sensing Authority

38. The Remote Sensing Authority (RSA) is responsible for establishing and maintaining natural resources geodatabases based on remote sensing data analysis and aided by field observation. RSA is also in charge of land cover mapping / land use change detection, focusing mainly on trend, impact and consequences of the changes. RSA uses digital geo-referenced Sudan land cover databases (e.g., LCCS, MadCAT and GeoVIS), including space technology (UNOOPS and UNSPIDER) for early warning of potential agricultural problems, disaster prevention and management, forest / rangelands / wildlife monitoring, production statistics and climate change assessment.

39. Most relevant to the LDCF2 project, RSA has the capability of estimating agricultural crop area measurement and crop yield estimations incorporating low resolution satellite data such as MODIS data for crop monitoring. With land cover and socio-economic information, they can also demarcate rangeland extent and livestock routes. Furthermore, they are capable of monitoring rainfall and the spatial extent of flash floods to assess the impact of floods on the agricultural crops using different indices product from MODIS satellite data. Similarly with NDVI and other similar indices, they can develop drought information using images of evapotranspiration and soil moisture. Currently, RSA is annually allocated USD 100,000 through Government budget lines.

40. RSA is currently being supported on-demand by the United Nations Office for Outer Space Affairs (UNOOSA). UNOOSA supports RSA to attend workshops and conferences and to participate efficiently in regional satellite/space data-related initiatives. Presently, Sudan uses space technology data for natural resources management, environmental monitoring and disaster management. Furthermore, Sudan hosted a UN – SPIDER Technical Support (TAS) workshop during 22 – 26 May 2011. The workshop was planned to be a first step towards “Institutional arrangements and coordination for RSA and six major institutes (Civil Defence, MoWRE, Ministry of Health, MoAg, SMA, HAC) to form a nucleus for risk assessment and disaster managements. The UN- SPIDER program offered its support for capacity building in Disaster Risk Management through a training course which took place in May 2013 for 20 participants. The training explored the available data sources and open source software that support climate forecasting and early warning.

41. Furthermore, RSA is currently being supported by the Global Monitoring for Food Security (GMFS) project funded by the European Space Agency. The goal of this project is to build capacity within the Ministry of Agriculture and its partners in the optimization of agricultural surveys by the use of satellite earth observation. Satellite images are used to produce cultivated maps and indicative maps of crop activities.

42. In spite of its capacity and project support, RSA lacks high enough resolution satellite images to generate accurate land cover uses and yield estimates. Furthermore, despite investment in computer equipment through existing projects, licenses needs to be renewed to be able to validate crop yields and generate early warnings for potential agricultural problems.

## Sudan Meteorological Authority

43. The technical National Meteorological Service in Sudan is the Sudan Meteorological Authority (SMA) which is responsible for establishing and maintaining the national weather and climate observation network. They are responsible for 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.

44. Presently, the weather and climate observation network managed by the SMA includes 20 synoptic Automatic Weather Stations (AWS), 8 agro-meteorological AWS and 4 climate AWS as well as 186 rain gauges (see Table 2). Meteorological data is received on a daily basis (8 observations per day) and rainfall data is collected in the morning (once a day) during the rainy season at 0600 Z (0900 am LT). The stations are mainly located in the state capitals or other cities (See Annex 9c of the Project document). With a typical monitoring radius of 20 kilometres and only 1-3 stations located in each target state, more monitoring stations are required. Additionally, the network of volunteers manually reporting rainfall data in the field is in need of technical training on data transmission.

45. SMA's role is also to provide information on early warning on a daily basis as part of the regional climate outlook forum of ICPAC - Climate Prediction and Application Centre. As such, SMA produces agro-meteorological bulletins on a ten-day basis, with 3-7 day forecasts that mainly focus on drought and floods. SMA produces seasonal rainfall forecasts based on statistical models.

Table 2: Status of existing meteorological stations under the General Directorate on Meteorology in Sudan

Station type	Existing	Fully operational
Synoptic, manual	68	20
Synoptic, automatic	20	20 (being installed)
Agro-meteorological, manual	10	8
Agro-meteorological, automatic	10	8
Climate, manual	20 (all silent)	NA
Climate, automatic	4	4
Rainfall gauges	186	98
Radar	0	0
Radiosonde	3	0
Satellite receiving stations	2	2

46. For SMA, observation stations do not cover the spatial variability of the 5 different climate zones. Most existing stations are obsolete and in need of rehabilitation (with the exception of newly acquired stations acquired through the NAPA project). Also, as there is a shortage of modern and/or automated monitoring stations, data can be transmitted from existing weather/climate and hydrological stations only once a month. In the 6 targeted states: there are only 98 operating rain gauges. There are also 6 silent stations (synoptic and climate) and 162 silent rain gauges which need to be revived.

47. Furthermore, although the Sudan Institutional Capacity Programme: Food Security Information for Action (SIFSIA) project funded by FAO (2007-2010) built the capacity of SMA to have a downscaled, localized forecast called SAMIS, this programme was terminated at the end of 2012. Similarly, in 2010 the Meteorological Second Generation Satellite (MSG) was installed in SMA as part of the IGAD Climate Prediction and Application Centre (ICPAC) located in Nairobi under the project, AMESD, the African Monitoring of the Environment for Sustainable Development. AMESD had the obligation to provide required weather information to the Higher Council for Environment and Natural Resources (HCENR), the designated formal focal point for AMESD in Sudan. Upon completion, the PUMA project built off of AMESD project to make operational use of Earth Observation (EO) technologies and data for environmental and climate monitoring applications. However, at present, SMA does not have sufficient financial support to plan for the current phase of the African Monitoring of the Environment for Sustainable Development (AMESD) project, ***Global Monitoring of the Environment and Security Initiative for Africa (GMES Africa)***.

48. To overcome the insufficiencies of SMA, various on-going initiatives are trying to build satellite observation monitoring and forecasting capacities for both institutions. Relevant projects include the following:

49. SMA is currently self-financing the *Vaisala* project (USD 9 m, to be completed in 2013) by taking out a loan from a national bank. The project, being implemented by the Vaisala Company (Finland), is in the process of installing the following items:

- 30 AWSs, including 20 synoptic stations, 4 agro-meteorological stations, 2 marine stations and 4 climate stations where 28 stations of 30 will be installed at the key current operating stations and the remaining two (2) will be installed near Port Sudan Harbour for marine services. Forty (40) silent stations are required to be revived.
- 2 Upper Air stations (MW31 sounding system with GPS antenna).
- A Meteorological Information system.
- A Network and Communication Centre.

50. The *Disaster Risk Reduction project* (a baseline project discussed in Section A.4) plans on improving the EWS/CI in Sudan by the procurement of equipment, capacity building and implementing flood and drought risk reduction strategies at state and community levels. Similarly, the baseline project *Food Security Policy and Strategy Capacity Building Programme* (discussed in Section A.4) will address capacity gaps related to food security coordination, policy, budgeting and implementation capacity. Furthermore, a Finish Project- *FISU* (worth USD 513,000, to be completed in 2014) provided by the Finish Government aims to promote adaptation to climate change by reducing weather and climate-related losses through improved agro-meteorology services in Sudan. FISU addresses issues of sustainable development and peace-building by promoting North-South cooperation at the Sudan Meteorological Authority (SMA).

51. The Famine Early Warning Systems Network (*FEWS NET*) funded by the U.S. Agency for International Development (USAID) is an information system designed to identify problems in the food supply system that could potentially lead to famine or other food-insecure conditions. The FEWS NET 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. Sudan exploits FEWS NET products, such as IPC Version 2 by FEWS NET and is contributing to the Integrated Food Security Phase Classification (*IPC*) project (EU).

52. However, SMA is not currently contributing to or involved with the development of FEWS NET. In contrast, the Humanitarian Aid Commission (HAC) is working with FEWS NET to provide baseline information for livelihood zones, under a side project funded by USAID (USD 150,000, 2013-2014).

53. In spite of these on-going initiatives, SMA has limited ability to use of hydro-meteorological information for making early warning systems and long-term development plans for rain-fed farmers and pastoralists in the target States. Furthermore, relative to the LDCF2 project, SMA has limited ability to have reliable data, including long data time series, necessary for triggering pay-outs for Weather Index Insurance.

#### Overall needs and insufficiencies of Sudan's NHMS

54. Despite the support of the associated baseline projects and in-house expertise, the National Hydro-Meteorological Services (NHMS) lack sufficient hazard monitoring infrastructure e.g. rain-gauges, weather stations, weather radars, flow gauges and satellite imaging capacities. No spare parts and few manuals are available, in particular for automated equipment. Very little equipment if any is automated. Furthermore, knowledge on the implementation of modern weather, climate and hydrological forecasting is still required in Sudan.

55. Sudan also lacks effective dissemination and communication capacities. Normally the technical departments publish warning data on their websites or share it with HAC and other ministries. However, there is no formalized communication protocol between national departments and HAC for distribution.

#### With LDCF Intervention (adaptation alternative)

56. Despite the poor collaboration among various Early Warning Systems (EWS), if well consolidated, the current efforts in EWS provide a solid baseline for improved observation capacity, seasonal forecasting and early warnings which can be delivered in efficient and relevant manners.

57. Accurate and timely weather and climate information is a key component to developing successful index insurance products. By enabling a reliable stream of relevant data that permits private sector entities to price contracts and determine index values, claims can be settled quickly. By supporting continuous weather/climate monitoring, insurance companies can minimize their “basis risk” by being able to validate claims so that insurance pay-outs match actual losses. Similarly, banks offering index-based insurance schemes through their specific microfinance products will also be able to promote the sustainability of monitoring networks due to the utility of using weather/climate information to reduce risks, thereby increasing chances of loan repayment.

58. In order to build upon the existing NHMS knowledge and capacities on modelling, data analysis and forecasting within SMA, RSA and MoWRE, Component 1 will support drought and flood forecasting in addition to land cover/crop monitoring. RSA and MoWRE will receive equipment, high resolution satellite images and training to better simulate localized flood forecasts. Similarly, synoptic and climatic weather stations will be procured to assist SMA in drought forecasting and early warning. All information production agencies will receive training on equipment operation and maintenance and modelling as well as training to budget O&M costs in the future. The project will furthermore facilitate the validation of land cover satellite images and equipment monitoring in the field for all agencies. It will also promote data rescue so that more extensive weather/climate databases (longer time series) can be created. Such an approach will serve to support the continual verification and updates of weather indices used in weather-index based insurance.

59. SMA, RSA, MoWRE will also be supported to provide sustainable climate/weather services. SMA previously produced SAMIS forecasts combining rainfall and NDVI images to determine the onset of the growing season at national and state levels. In spite of their accuracy and localized information, production of SAMIS bulletins was terminated at the end of 2012 due to limited funding. As such, LDCF funds will enable SMA to revitalize and improve their targeted localized, SAMIS weather forecasts. Similarly, LDCF funds will support RSA to establish a farm management system in order to provide baseline crop and crop simulation information. Furthermore, SMA/RSA will gain expertise in predicting the onset of rains. As indicated in Stakeholder consultations during project development, such a prediction is of greatest interest to pastoralists because migration patterns depend on when grass and water are available (rather than average rainfall available over a certain period).

60. Finally, LDCF funds will be used to improve communication and data sharing among climate risk finance Stakeholders. As Stakeholder consultations indicated that there is limited coordination between information production agencies, a cloud data server will be purchased and developed so that technical information production agencies can share weather/climate/crop/land cover information with the Ministries of Agriculture and Livestock, the Humanitarian Aid Commission (HAC), MFIs, insurance companies, specific NGOs and extension services. The aim of improving data sharing will be to facilitate the generation of targeted information. Similarly, by coordinating with existing communication protocols, the LDCF2 project will work to facilitate the feedback of SRFPs to enhance advisories and record recommendations.

61. To enhance communication of weather/climate and agricultural information, a mobile phone partnership will be developed in the last two years of the project. Through this development, SMA/ARC will be able to provide weather/agricultural advisories by SMS to SRFPs. In order to determine the costs and benefits of forecast/advisory services, periodic rapid surveys of targeted users (SRFPs) will be conducted.

62. Specifically, LDCF2 funds will build on the above mentioned baseline projects (See Section A.4) in the following manner:

- Work with the National Early Warning Committee to be established in the ***Disaster Risk Reduction project*** (DRR) to enhance the utility and efficacy of forecast/advisories. The LDCF2 project will build on the training for SMA, MoWRE and RSA on new technologies and data interpretation provided by the DRR project. The LDCF2 project will also exploit the SOPs on EWS dissemination prepared under DRR. The LDCF2 project will also build on the equipment acquisitions of the DRR project, ensuring that new equipment is placed in complementary locations. (New equipment from the DRR project will include warning dissemination equipment for HAC and Civil Defence offices and a computer cluster for SMA to perform weather analysis, forecasting and climate predictions.)
- Build upon the equipment acquisitions self-financed by SMA in the ***Vaisala*** project.
- Build on the ***Food Security Policy and Strategy Capacity Building Programme*** (FSPS) project by collaborating with the Ministry of Agriculture to integrate weather/climate information into food security policies and enhance the current ability of NHMS ministries to plan long-term budgeting.

- Build upon the remote sensing capabilities of RSA provided by *UNOOSA* and *UNSPIDER* initiatives and the former *AMESD* and *PUMA* initiatives.
- Use private sector investments and Government budget lines provided by micro-finance and insurance to support weather/climate monitoring in the long-term. This will complement the *SISFIA* programme which tailors its forecasts for aid planning in response to major disasters.
- Build on the *IGAD-HYCOS project* and the *ENTRO* programme by procuring and rehabilitating complementary equipment / stations and facilitating flood-based data sharing across sectors in Sudan.
- Continue exploiting and contributing to the *FEWS NET* data portal such as by providing more detailed risk and crop yield maps to be generated by RSA under the LDCF2 project.

**Outcome 2: Residual climate risk to rural livelihoods in the states of greatest rainfall variability addressed through parametric insurance products.**

Without LDCF Intervention (baseline):

63. Insurance is a particularly well developed industry in Sudan. Livestock insurance in Sudan commenced in the 1960s. The first Sharia-compliant (takaful) insurance company was established in 1979. Since these developments, in 2002, the Central Bank of Sudan and the insurance sector were subject to major reforms upon when the country introduced the Basel requirements for the banking sector and aligned them with Sharia principles. Only relatively recently in 2002/2003, in view of catastrophic risks and the need for government support, crop insurance was developed by the Shiekan Insurance and Reinsurance Company in Sudan.

64. In spite of the numerous years of experience in traditional insurance schemes, there is a full recognition of limitations in the current system particularly with reference to covering risks related to increased climate variability. Smallholder rain-fed farmers and pastoralists (SRFP) are very rarely covered under existing insurance schemes. For example, as seen by the list of products and whom they are covering below, it is clear that SRFPs are limited in their insurance options.

- Existing agriculture insurance products:
  - Multiple Peril Crop Insurance (MPCI).
  - The Crop Insurance Policies includes:
    1. Irrigated crop insurance policy
    2. Rain fed crop insurance policy
    3. Horticultural crops insurance policy
    4. Forest crop insurance policy
    5. Greenhouses insurance policy
    6. Sugar cane insurance policy
- Clients covered:
  - Large scale semi mechanized rain fed producers and companies.
  - Irrigated small acreage farmers. (gravity irrigation)
  - Horticultural tree gardens
  - Small farmers in rain fed zone of more than 450 mm per annum linked with financial credit
  - Producers societies and cooperatives

65. Based on this list, insurance companies are quite selective in choosing which SRFP are insurable. At present, SRFP need to receive more than 450 mm of rainfall per year to be insurable. However, in reality, SRFP in the plains of the River Nile State and the northern portions of North Kordofan, White Nile, Gedarif and Kassala states can receive



less rainfall than 450 mm due to rainfall variability. In this case, SRFPs cannot access to insurance services to help build resilience to extreme events.

66. One of the underlying causes is that insurance companies are reluctant to cover high risk clients (i.e., SRFP) with existing insurance products. Experience of the insurance sector during the 2000 drought reinforced this reluctance when companies saw a 103% loss ratio for livestock insurance schemes due to high rates of claims submitted. Furthermore, in spite of the high potential for agricultural insurance in Sudan, evidenced by steady growth in insurance coverage, transaction costs for SRFP remain too high. Transaction costs are expected to increase as climate related risks become more prevalent in scale and intensity. Insurance products are costly at present because 7% of the sum insured must cover the insurance premium. There is also an unavailability of insurance agents in rural areas to deliver services and build awareness on insurance products due to the remoteness of rural populations.

67. For pastoralist production systems, the situation is particularly challenging. At present, re-insurance companies do not accept insuring livestock in open grazing lands. This leaves most nomadic pastoralists without any access to insurance or bundled MF/MI services.

68. Another issue lies within the slow product approval process by the Internal Sharia compliant committee which may take up to 4 months to approve a loan product before it is submitted to the Insurance Supervisory Authority for final approval. Also, the window in which farmers/pastoralists are able to report damage/losses is often so limited and the distances so long to reach Khartoum-based insurance companies that many claims are left unreported.

69. Furthermore, insurance companies do not have knowledge on how to develop new products targeting SRFP. Stakeholder consultations with insurance companies indicated that they are interested in piloting Weather Index Insurance. However, as climate risks vary from one state to another, the development and adaptation over time of weather indices used to judge pay-outs is complex.

70. The primary challenge with developing WII is how to establish the index. Events must be verifiable by high resolution satellite images or nearby weather station readings. For Weather Index Insurance, a long and high quality time series of meteorological data is required (approximately 30 years of uninterrupted data collection, automatic preferred). If station data is not available or in conjunction with station data, satellite data is more often used. The satellite data must be sufficiently down-scaled and accessible over long time periods. Piloting Weather Index Insurance requires reliable weather data observed fairly close to the locations of the farmer's risk exposure.

71. A secondary challenge is to ensure that good inputs are provided to farmers/pastoralists so that their productivity can be increased. In addition, extension services providing targeted and tested farming advice must be made available to farmers in order to boost their productivity. In fact, weather-risk management is enhanced when combined with properly functioning input and output markets, good governance in the management of strategic grain reserves, and adequate smallholder productivity.<sup>5</sup>

72. The third challenge is to cover the high upfront costs over the long-term. In theory, high upfront costs in developing WII will be minimized over time because administrator fees to perform individual loss assessments are not required with index insurance. By linking MF with WII, such costs can be minimized when adaptation packages are adopted enabling yields to increase as a result. As loans are more easily repaid, optimal inputs can be purchased further increasing productivity. Subsequently, as MF/WII products demonstrate their success more SRFP will be incentivized to enter such schemes. By creating economies of scale, the costs of MF/WII products can decrease over time.

73. An existing baseline initiative, *Connecting Farmers to Market* project, has managed to provide microfinance and micro-insurance to SRFP on a large scale (see Section A.4). However, Stakeholder consultations in the field noted that compensation criteria are not clear under this traditional micro-insurance scheme. As a result, an increasing number of SRFP are opting to not use insurance.

74. Consequently, there are limited insurance services provided to SRFP which can be used to address residual risks inherent to agricultural and livestock production (Shiekan Insurance and Al-Tawania being the main active insurance agencies). Insurance coverage is enjoyed only by the wealthier segment of the agricultural sector, bypassing the most vulnerable farmers and pastoralists engaged in rain-fed agriculture and pastoralism.

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<sup>5</sup> See MicroEnsure Feasibility Study (Annex 8 in the Project Document)  
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With LDCF Intervention (adaptation alternative)

75. Project Component 2 will focus on developing index insurance for climate risk management in the states of high rainfall variability where certain residual risks remain, even after adaptation measures are adopted (e.g., LDCF1 project). Weather Index Insurance (WII) is a finance mechanism which can be designed to address highly covariate climate risks (such as prolonged droughts and severe floods).

76. WII has been proposed as a new climate risk management tool to help people cope with weather/climate related-risks for a variety of reasons. In theory, product design is straightforward: a contract is written against an index establishing a relationship between lack of rainfall and crop failure, verified by long historical records of both rainfall and yields. Farmers collect an immediate pay-out if the index reaches a certain measure or “trigger,” regardless of actual losses. Such an approach gives farmers an incentive to make productive management decisions.

77. As a result, the attraction of WII is that once developed, index insurance is less expensive to administer because on-site inspections and individual loss assessments are not required. Compensation becomes objective because farmer’s cannot influence a claim (dependent on the efficacy of the index). Furthermore, the independently verifiable index enables reinsurance and facilitates insurance companies to transfer part of their risk to international markets.

78. By insuring against spatially correlated weather risks, WII facilitates the access of SRFP to financial instruments such as microfinance and savings. By developing tailored Weather Index Insurance products, local finance for adaptation can be unlocked by safeguarding loans against climate risks and thus making micro-finance services available to the most climate risk exposed rural communities that otherwise would have been considered too high risk to have access to financial services. Insurance thus enables SRFP to better protect themselves against weather risks and when linked with credit, can facilitate the diversification of activities to build resilience (e.g., purchase of more drought resistant seeds). Moreover, if properly designed, WII can mitigate food security shocks by serving as a source of emergency financing when area-wide drought/flood catastrophes take place.

79. In order to conquer the aforementioned challenges in developing WII, Component 2 will focus on the development and pilot testing of 6 Weather Index Insurance (WII) products in the different livelihood zones of each project State with the assistance of the Shiekan Insurance and Reinsurance Company and the Al-Tawania Insurance Company. Shiekan can provide lessons learned on how to best implement aspects related to crop and livestock insurance while Al-Tawania, due to its experience in the Connecting Farmers to Market project, can recommend how to best manage a micro-insurance scheme.

80. To begin with development of WII, a field study on how to improve input delivery, value chains and lending services will be conducted. The study will focus on how to best link inputs, extension services and credit with WII so that agricultural/livestock production can be maximized. Also, LDCF funds will be used to sponsor a study tour of a functional WII market in a developing, Islamic country. Based on these studies, the legal and regulatory framework for risk transfer will be analysed so that policies can be adapted and reinsurance secured. Policies must also be revised so that clear compensation criteria can be developed based on best practices to monitor and validate weather indices in each state. A formalized partnership with the Connecting Farmers to Market project (and thereby their experiences with micro-insurance) will assist with collecting and integrating lessons learned to develop revised criteria. Regulators and policy makers will be trained on these new policies so that they can implement the regulatory scheme for WII. The internal Sharia Committee will be trained on WII in order to expedite the current, lengthy loan approval processes.

81. In developing the weather-based indices, each climate zone and the particular economic and social characteristics of the target populations will be analysed. In cases where no weather station data is available, satellite data will be used. In addition, consultations with local populations will be conducted so that climate/weather trends and drought/flood impacts in each target region can be fully understood. Particular attention will be paid to creating an index which is adaptable to various regions so that it can be easily scaled-up and high upfront development costs can be recovered. A pre-feasibility study by MicroEnsure (Annex 8 in the Project Document) indicated that the ranking of droughts in terms of severity matched the TAMSAT satellite database.<sup>6</sup> As such, the purchase of TAMSAT products will be supported by LDCF funds to serve to validate triggers for index based payments. Further assessments during project implementation are required to assess how accurate TAMSAT is for the targeted areas.

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<sup>6</sup> MicroEnsure Feasibility Study (Annex 8)

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82. Based on the pre-feasibility study conducted by MicroEnsure during project development (See Annex 8 in the Project Document), initial screening indicated that the application of a Weather Index Insurance (WII) product is appropriate in Sudan because drought/flood risks are spatially correlated. In other words, villages within the same region are subject to the same weather/climate conditions. Consequently, the basis risk is low because an index can be determined to judge losses for the same region.

83. The pre-feasibility study established that approximately 1% of subsistence farmers, 10% of mixed crop farmers (i.e., those who cultivate cash crops and subsistence crops) and 2% contract farming (i.e., those that are supported by a delivery agent who provides seed and farming guidance in return for cultivated crops) can be targeted by WII products in the 6 target states. In total, approximately 45,000 farmers are likely to be covered by the WII products. However, it should be noted that the study was unable to indicate how many pastoralists can be targeted because WII has not yet had success for pastoralists in developing countries where generally pastoralists hold on to their livestock for security. An additional study is therefore required to determine the demand of pastoralists for WII (See Output 2.3, Activity 2.3.1).

84. During the development of WII products, time and resources will be invested in explaining how they work (particularly focusing on costs and benefits, risks and opportunities). The LDCF2 project will support extensive training series for the beneficiaries to raise their awareness and financial literacy as well as to cultivate trust in this new financial product for climate risk management. Specialized biannual training sessions will be organized for the MFIs to cover the main elements of index-insurance such as (i) indemnity payments under the contract; (ii) a payoff structure that defines the relationship between the index and indemnity payments; (iii) basis risk; and (iv) low cost index insurance deployment models.

85. The project also includes the development of a nationally based WII product development team who will be able to facilitate insurance outreach and improvements for WII products. The team can include insurance experts seconded from Al-Tawani or Shiekan so that the capacity of nationally-based insurance providers will be reinforced. The role of the team will be to train farmers and pastoralists (including trade unions and extension services) as well as banks, MFIs, NGOs and insurance companies. Simultaneously, they will obtain feedback from farmers and pastoralists and conduct Monitoring and Evaluation of products on-site. Ample budget and time have been allotted for the national based WII development team (with assistance from an international WII development firm) to obtain feedback from rain-fed farmers and pastoralists so that products can be improved.

86. Product development and pilot testing will occur in a staggered manner (1 product developed in the first year, 2 products during the second and third years and 1 product in the fourth year). Such an approach will provide time for the WII developers to target the WII products to the livelihood needs and to incorporate lessons learned from previous WII pilot trials. See Weather Index Insurance Stakeholder map (MicroEnsure Feasibility Study, Annex 8 in the Project Document).

87. Furthermore, throughout the implementation stage, the project will need to host a series of workshops where staff members undergo training, (branch managers and agri-business managers). Banks and MFIs will also play a participatory role in the design of bundled loan and WII products. Banks and MFIs could become clients that purchase Weather Index Insurance on behalf of farmers and pastoralists.

88. Significant budget will also be included to train insurance companies such as Shiekan Insurance and Reinsurance Company and Al-Tawania Insurance Company so that they can adapt the products based on any updates to weather station, satellite and/or new crop data. Training (including a Study Tour) will be provided to the nationally-based insurers and brokers so that they can underwrite Weather Index based Insurance, conduct a public awareness campaign on the utility and importance of agricultural insurance services for SRFP and assist in the development of presentations and brochures. To improve outreach to rural regions, LDCF funds will be used to increase the number of market outlets and insurance agents and to develop mobile banking/insurance services.

89. Also, an outreach strategy and training syllabus will be created for WII so that Training of Trainers (TOTs) can take place in each state (e.g., TOTs are likely to include 4 regional insurance agents and NGO representatives). The TOTs will then train cooperatives, farmer/pastoral trade unions, extension services and group leaders on WII.

90. Using group leaders for insurance product training has advantages: group leaders are often more literate and numerate than other members of the group so they may be able to understand the products quickly in a training session and can then communicate the key concepts effectively to other members. By vouching for the insurance products, they can increase trust in the insurance products among other members of the group.

91. The LDCF2 project will furthermore support an increase in the number of insurance/financial service market outlets including mobile units so that SRFPs in remote areas can be reached and have access to climate risk financial services. The project will also support an improved relation between the banks/MFIs and input suppliers. This will be in the form of creating farm input packages, where the farmers receive their loan in the form of seeds, fertilizers and pesticides. Such an approach was shown to be a success in other developing Islamic developing countries who have adopted WII products<sup>7</sup>.

92. Similarly, the project will promote collaboration between the Ministry of Agriculture and the MFIs/insurance companies. The Ministry of Agriculture's (MoAg) agri-extension officers will be used to conduct effective marketing and training programmes to farmers. The project will also work in collaboration with the MoAg on national and state levels because as evidence has shown, the MoAg could become a key developer for Weather Index Insurance when used for food security<sup>8</sup>.

93. Overall, WII has the potential to protect food security on both macro and micro levels. On a macro level, the Government will be able to mitigate the financial consequences of a food security shock by purchasing an area-wide product that could generate a supplemental source of emergency financing to support existing resources at the country level. Distinct advantages that can be achieved through index-based ex-ante financing include; immediate cash payment, structured rules for payment, improved correlation between need and provision, flexibility of cash payments, risk assessment and mitigation and targeted assistance to problem areas. On a micro level, farmers and pastoralists will be able to purchase Weather Index Insurance as part of a credit-enabling package, which will allow them to access a loan to purchase high quality agricultural inputs. This leads to increased productivity and additional income for farmers, allowing them to diversify their economic activities and better protect themselves against weather risks (for example, increased income could lead to purchasing irrigation equipment). In the event of a weather shock, farmers and pastoralists will be able to quickly receive cash and, depending on the season, will be able to purchase new inputs or food produce and household goods directly.

94. In the long-term, relief agencies can link up with the index-insurance scheme and select a weather-based index that can effectively serve as an early or lead indicator of an emerging crisis. This will help avoid the usual delays incurred when relief agencies must first demonstrate an emergency and then appeal for donations from governments and donors. In case of disasters of catastrophic scale, timely mobilized relief funds and government resources from Sudan's Social Fund can provide hedging for the insurance.

95. To support WII development. LDCF2 funds will build on baseline projects (discussed in Section A.4) in the following manner:

- LDCF2 funds will build off of lessons learned in the traditional micro-insurance scheme implemented by the Connecting Farmers to Market project. Lessons which will be incorporated into the LDCF2 project include detailing which compensation criteria are not clear, how to develop better outreach mechanisms and target different crops as well as how to effectively distribute insurance in the case of common states. A formalized partnership will also be built between the LDCF2 and Connecting Farmers to Market project (Activity 2.2.6).
- LDCF funds will also build off of Shiekan's experience in providing multiple peril crop insurance and livestock products to small holder rain-fed farmers and pastoralists. Shiekan has extensive understanding and capacity to carry risk as demonstrated by their ability to provide insurance to 40,000 SRFP in Blue Nile, White Nile, North Kordofan, North Darfur, South Darfur and West Darfur states in 2011. The LDCF2 project will build the capacity of Shiekan's personnel to understand and manage new Weather Index based Insurance products by training insurance agents in each state. The products will be marketed and distributed using Shiekan's existing network of branches and offices as well as the additional rural outlets to be developed in the LDCF2 project.

### **Outcome 3: Efficient and effective use of hydro-meteorological and environmental information for making early warnings and seasonal forecasts which feed into long-term development plans**

#### *Without LDCF Intervention (baseline):*

<sup>7</sup> <http://www.cgap.org/blog/reaching-small-farmers-through-innovative-finance-pakistan>

<sup>8</sup> MicroEnsure report

96. Microfinance cooperatives, CBOs and specialized banks have been in existence for several decades in Sudan (the Savings and Social Development Bank of Sudan (SSDB) developed guidelines for the implementation of MF in 1974). Since the mid 1970's, the Agricultural Bank of Sudan (ABS) has been working with rural poor communities in remote areas through cooperation with international development agencies. ABS partnerships with IFAD in the traditional rain-fed sector started in the 1980's through the En Nahud Cooperatives Development Project. Since then, ABS has established credit linkages with community managed financial intermediaries including sanduqs, village development committees (VDCs), and savings and lending groups. Through these partnerships ABS has been exposed to a diversity of rural financial markets, has developed an understanding of the type of products and services needed and has applied group guarantee systems.

97. Recently, the MF sector was revitalized in 2006-2007 when the Government of Sudan endorsed MF as a central element of its financial policies to support poverty reduction. In 2006, as a follow-up to this policy direction, the Central Bank of Sudan (CBOS) commissioned a situation analysis study on MF in which it formulated a strategy to develop and promote the MF sector in Sudan. The strategy "A Vision for the Development and Expansion of the MF Sector in Sudan" was implemented between 2007 and 2010. The strategy's goal was to: "facilitate sustained access to financial services for the economically active poor in rural, semi-urban and urban areas by expanding and developing the microfinance sector in a cost-effective, gender sensitive and sustainable manner."

98. Effectively, in 2007, the Microfinance Unit at the Central Bank of Sudan was established and is presently responsible for executing CBOS strategy to develop social and economic banking in urban and rural areas through MF with the aim of eliminating poverty and increasing economic development according to the Comprehensive Peace Agreement (CPA). The unit has issued several directives to banks to deliver microfinance services so as to increase the extension of financial services to the economically active poor. The most influential directive has been to mandate banks to allocate 12% of their annual lending portfolios to microfinance. Of this 12%, 70% should be allocated to rural areas for financing crop production, livestock production, fisheries and non-agricultural activities. As of 2012, total resources allocated to MF by the CBOS totaled SDG 350m with total expenditures of SDG 272m spread over investments to i) build capacity in Sudanese development banks, ii) empower rural women in association with the Ministry of Social Welfare (SDG 74m) and iii) co-finance with Islamic Development Banks for MF institutions (SDG 10.5m).<sup>9</sup> The low utilization of microfinance resources has been due to the fact that the commercial banks consider microfinance not profitable due to high transaction costs. Banks are also reluctant to engage with Microfinance Institutes (MFIs) which have weak capacities to manage loans.

99. To facilitate CBOS fund distribution and develop the microfinance sector, the Government supported the establishment of the Sudanese Microfinance Development Facility. Recently, SMDF became a private entity and is now known as the Sudanese Microfinance Development Cooperation (SMDC). The mission of SMDC is to ensure outreach to microfinance through strengthening the technical and financial capacities of the MFIs, linking their programs with Sudan's macroeconomic policies and priorities. Currently, SMDC is overseeing the activities of the Connecting Farmer's to Market project through a project coordinator who is guiding the central technical committee and supervising the work of state committees. SMDC's role is also to provide flexible and carefully-designed financing to qualified, high-potential microfinance institutions for institution-building, systems development, and on-lending. Both existing microfinance operations as well as start-ups are eligible for funding. Presently, all funding is provided by the CBOS, but SMDC plans to work with international donors to establish more credit lines.

100. As evidenced by the CBOS budget for MF, there is a plentiful supply of cheap capital for MF lending which is largely under-utilized by the majority of the rural population who is dependent on natural resources. (Microfinance in Sudan is largely supply-driven and government-subsidized).

101. To date, only a small portion of this amount has reached the people most in need, due to a persistent tendency of not providing loans to groups which are perceived as 'high risk'. As a result, microfinance service provisions are very limited for rain-fed communities with the exception of a few NGOs and CBOs that provide retail microfinance. Moreover, agriculture input financing through loans and micro-credits is very rare.

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1. <sup>9</sup> Sudan's MF sector is governed by the Islamic banking system. Through this system, called Shariah, banks cannot charge interest. Rather they can obtain a profit margin from selling crops. In this system, the farmers/pastoralists do not give back money but provide in-kind payments (e.g., selling the crop). In Sudan, the Islamic Development Bank is taking an active role in capacity building for MF intermediaries to setup an inclusive MF Sharia'a compatible system in favour of MFIs.

102. According to the UNDP and the Policy Assessment, Consultancy and Training (PACT) national assessment on MF in June 2012, *Mapping, Capacity Assessment and Capacity Development of Microfinance Providers in Sudan*, capacities for Value Chain Analysis are lacking and capacity of Microfinance service providers, particularly banks, in the development of products is weak in Sudan. The main products for banks are traditional credit products. These products are generalized to all clients and do not fully consider the nature and type of activities. Also in terms of technology most of the banks rely on traditional core banking systems, which do not have the ability to access the poor who are generally located in remote areas. Furthermore, training programs are also limited, and extension and Business Development Services (BDSs) require massive capacity building.

103. One of the biggest challenges is that MF products and services from formal providers are not customized to suit the needs of targeted local communities, thus giving an advantage to informal providers. Also, there is no legal framework in the area of non-traditional guarantees and inexperience in working with complementary micro-financing services (i.e., savings and insurance).

104. Furthermore, knowledge and capacities are missing at the MFIs, NGOs and insurance companies to develop and deliver coupled micro-finance/micro-insurance schemes. There is currently limited awareness on how insurance can be used to address residual climate risks when complemented with microfinance. As a result, there is little public funding available for feasibility assessments, capacity building and product development.

105. Stakeholder consultations in the 6 target states indicated that rural populations limit taking out loans from MFIs due to lack of collateral and lack of knowledge/understanding on the bureaucratic procedures and regulations. They also found that the existing products were not flexible during periods when no income could be gained (e.g., planting period).

106. Another issue is that MF is not linked with adaptation technologies which have been proven to improve productivity and increase resilience to extreme weather for SRFP. In fact, micro-finance and adaptation technologies can be seen to go hand-in-hand. Access to micro-finance enables rain-fed farmers and pastoralists to purchase the equipment which can help build their resilience to climate change (e.g., rainwater harvesting equipment, more drought-tolerant seeds). At the same time, by using technologies which are more climate-resilient, farmers and pastoralists are more likely to not default on their loan repayments.

107. Development of MF in Sudan is also polarized. Within Sudan there are formal and informal MF services. Loans from informal lending sources (Shail system) are widely spread. This is an old practice whereby small holders sell part of their expected crops to agricultural crop traders (known as Salam in Islamic banking). This informal system is flexible in terms of adapting to local circumstances which suit the farmers/pastoralists in terms of product, amount, timing, coverage and loan non-repayment. An example of informal lending flexibility was provided in the PACT assessment where 75% of informal cases in a study sample showed some sort of personal guarantee rather than real collateral being promised.

108. There are over 6 million potential microfinance customers in Sudan, yet the number of current clients is approximately 400,000. Most of the microfinance service providers are concentrated in states with lower poverty rates and few are located in rural areas. Of the total 400,000 microfinance clients covered in the year 2012, only around 93,000 i.e. 23% were rural clients. The rural clients covered represent around 6% of the rural and nomadic households of the project area excluding the River Nile State. Therefore, rural area microfinance is a relatively untapped market in Sudan.

109. As shown in Table 3 approximately 55% of rural clients in 2012 were served by Agricultural Bank of Sudan (ABS) branches and the ABS Microfinance Initiative. This is no coincidence because lending to farming and livestock production is mandatory for ABS. The remaining farmers/pastoralists were served and continued to be served by the CBOS microfinance programme, *Connecting Farmers to Market* (See Section A.4).

Table 3: Number of rural farmers in the 6 target states engaged in microfinance during 2012

<b>Household Population of the project area</b>		
<b>Banks</b>	<b>No of clients</b>	<b>% of Total</b>
The Agricultural Bank of Sudan	36,637	39%

The Savings and Social Development Bank	0	0%
The Farmers Commercial Bank	0	0%
Bank of Khartoum	19,000	20%
The Sudanese Rural Development Company	8,200	9%
Kassala Social Development Fund	14,873	16%
The Agricultural Bank of Sudan Microfinance Initiative (ABSUMI)	14,972	16%
<b>Total</b>	<b>93,682</b>	<b>100%</b>

*With LDCF Intervention (adaptation alternative)*

110. To improve productivity and increase climate resilience of SRFP, Component 3 will focus on the development of at least 6 adaptation packages linked with MF services in each target region. To develop the packages, lessons learned from adaptation technology applications by Farmer's Field Schools will be documented. The technologies will then be validated on-farm whereby they must show an increase in sustainable crop and livestock production and incorporation of local knowledge on appropriate agricultural/livestock practices in order to be deemed acceptable.

111. The ARC and Extension Departments will jointly be responsible for delivering adaptation technologies. Accordingly, the project will support the Agricultural Research Corporation (ARC) and the Agricultural Extension Departments in the respective states to test and spread adaptation technologies including for dry-land adaptation for pastoralists. On the national level, 163 researchers and Agricultural Extension officers will receive training, including 14 women. On the state levels, the following number of researchers and Agricultural Extension officers will be trained: Kasala; 5, Gedarif 6, River Nile: 20, White Nile: 3, North Kordofan: 15 and South Darfur: 4. The Project will support ARC and Extension Departments in each state to establish demonstration farms to exhibit the best practices of adaptation technologies for both crop and livestock production. These demonstration farms will be combined with Farmers Field Schools. The ARC through its Agricultural Socio-Economic Experts Cadre will ensure that adaptation technologies delivered are economically viable and socially acceptable. In order to effectively disseminate the adaptation technologies to rain-fed farmers and pastoralists, technical manuals detailing sustainable agricultural and pastoral activities for year-round cultivation and production of milk/meat products will be prepared and distributed by ARC.

112. Simultaneously, at least 3 microfinance, flexible loan products will be designed and pilot tested to account for pastoral mobility and seasonal income cycles of local farmers. To ensure the products will be accessible to SRFPs, loan conditions and regulations among MF providers will be unified ensuring flexible terms. Similarly, the adoption of climate change adaptation technologies will be mandated as a pre-requisite for obtaining access to credit/insurance services.

113. In order to disseminate the MF products, mobile banking, pastoral GPS tracking and mobile-phone advisory services will be developed. Also, Agricultural Extension and Technology Transfer Administrations (AETTA) and Training of Trainers (TOTs) will receive capacity development on how to organize SRFPs and train lead farming/pastoral focal points. A financial services manual will be designed for SRFPs to build their financial literacy on conditions for micro-credit access, credit by-laws, loan/insurance/savings products and repayment schedules. Subsequently, SRFPs will be organized and trained by lead farmers, farmer/pastoral trade unions and Farmer Field Schools in order to facilitate their access to extension services, adaptation technologies and MF/MI services.

114. In order to provide incentives to banks to provide MF services to SRFP, they will be organized into groups so that they can have collective collateral. NGOs will serve to assist with the organization of SRFP.

115. The cornerstone of this project will be to effectively link MF products with the tested WII product(s) developed in Component 2. As a WII product has never been successfully introduced in Sudan, MFIs and banks will receive significant training on how to pair MF and MI services together. At the same time, regulatory processes will be streamlined so that loan repayments become more efficient.

116. The role of micro-finance in delivering index insurance is significant, either through the banks and their micro-finance facilities or community funds – sanduqs. Without bundling insurance with credit, many farmers will lack both the capital to pay the insurance premium and sufficient incentive to use scarce resources to buy risk coverage. Placing insurance products within complementary systems with broader linkages can also facilitate simpler contract design, as other mechanisms which can deal more efficiently with the subtle aspects of risk and crop losses that cannot be indexed.

117. Therefore, establishing the linkages between farmers, insurance and credit providers will be critical for the success of the refined scheme. When lenders know that borrowers are covered by insurance, they will more likely extend credit to them opening the opportunities for rural populations to make investments that may raise their productivity, especially if the latter is incentivized by the insurance scheme as part of the requisite climate risk management conditionality spelled out in the contracts. In package, together with index insurance, MFIs become more willing to take risks and give loans to the most vulnerable SRFP for agriculture inputs.

## **Pastoral Production Systems and Microfinance**

118. Sudanese lenders have an unexplored, potential market with pastoral production systems. Dryland pastoral/nomadic livestock production systems are unique in their ability to take advantage of ecosystems where unpredictable variability is a characterizing feature. As global climate change is increasing extreme weather variability, dryland livestock production systems can be considered increasingly valuable because of their capacity to turn environmental instability into an economic asset.<sup>10</sup>

119. In fact, the economic value of the livestock sector includes various activities other than animal production, such as the production of livestock dung for fuel, the use of animal power in agriculture and transport and the value of livestock's financial services such as savings and investment, credit, insurance and risk pooling. Pastoralists very frequently use their livestock for risk pooling. Numerous rural people make their living along the livestock value chain including primary producers, trade operators, transporters and drovers, hides and meat processors, feedlots, and markets in water and fodder. Women also have important roles in pastoralist societies, from rearing the livestock kept at the camp (e.g., goats and young animals) to fetching water and firewood. In total, it has been estimated that there are at least 2.7 million nomadic herders making their livelihoods off pastoral production systems in Sudan. This figure is likely to be much bigger (perhaps 4 times bigger) because there are many additional households using subsistence services and other economic services from pastoral livestock.

120. In spite of the prevalence and benefits of pastoralist production systems and value chain activities, if not supported, pastoral systems will continue pulling out of the mobile production system, tending to compete for scarce land for farming or be lured into the unsustainable gold mining industry. In Sudan, with each generation, between 15 and 25 percent of pastoralists leave the production system because they are lured to cities or to get “rich quick” in the gold industry. This trend has been exacerbated by the fact that, at present, there is a transfer of productive livestock towards management systems that offer the highest returns, so called ‘investment marketing’. The result is that there is an increasing gap between wealthy and poor within pastoral groups. The consequences are dire including the loss of expert knowledge and a poor understanding of specialized dry-land animal production. These losses are exacerbated by the commercialization of capital stock which has opened up the system to outside investors and absentee owners with little or no ties within the pastoral society.

121. In order to support pastoralism, there is a need to provide capital to pastoralists in order to deal with rising costs of production, including the costs of feeding, watering and moving animals. These costs are becoming an increasingly heavy burden on less secure pastoralist households, particularly those in poverty who are faced with epidemics or drought spells.

122. Indeed, microfinance can be used to support the rising costs of water and crop residue (for feeding livestock) which are becoming paid-for-services due to the conversation of rangelands to other uses. As an example, MF could be used to support the purchase of large water bags or bladders known locally as “girab” which are the size of inflatable boats. For the past 5 years, herders have placed these bladders strategically to serve their camps or to enable animals to

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<sup>10</sup> Feinstein International Center, Tufts University and UNEP Study, *Standing Wealth: Pastoralism Livestock Production and Local Livelihoods in Sudan*, 2013



exploit otherwise unusable good quality pasture. One full bladder has been shown to have enough supply to water 300 sheep over 45 days in the cold dry season and 30 days during the hot, dry season.

123. The development of tailored microfinance products for pastoralists can provide the necessary capital to deal with rising costs and paid-for-services. Tailored products need to be flexible for pastoralists because pastoral/nomadic movements are particular. With few exceptions, the only time in the year in which livestock on rain-fed pasture in Sudan can put on weight is between the growth of the first grass (June) and the beginning of the cold dry season (December). At this time, nomadic pastoralists are more sedentary. This means that there is a relatively small window of opportunity for financial services to mobilize cost-effective outreach to the pastoralists at this time when they move as little as possible. Furthermore, the livestock market has a seasonal variation. Trading seasons can range from 3 to 6 months which limits the time when pastoralists can pay back loans.

124. LDCF funds will be used to support the development of flexible MF products for pastoralists. The MF products will consider loan repayment schedules relative to when the trading season takes place. They will also consider the known migratory patterns of pastoralists (see Annex 9d in Project Document) and the times when pastoralists are more sedentary on rain-fed pasture. To support the detection of migratory movements, LDCF funds will be used to support GPS tracking of pastoralists in order to facilitate outreach and financial service support (Activity 3.1.8).

125. It should be noted that the demand for Microfinance and Weather Index Insurance by pastoralists is unknown. As such, LDCF funds will be used to support an in-depth study to determine this demand during project implementation (Activity 2.3.1). This study will lay the foundation detailing how financial service providers can optimally serve the needs of the pastoral production market and its associated value chains.

126. In addition, although the development and incorporation of WII into a financial services package will be new, it should be stressed that this project will build off two successful MF initiatives. Both the ABSUMI and the Connecting Farmers to Market initiatives have successfully provided loans to farmers and agro-pastoralists. ABSUMI has also successfully established a savings program while the Farmers to Market project has combined MF with MI.

127. LDCF funds will build on these baseline projects and country initiatives in the following manner:

- Building on the *Agricultural Research Corporation's* (ARC's) expertise in improving production technologies and in facilitating the distribution and adoption of approved technologies dealing with crop and livestock production. ARC has developed adaptation technologies for land preparation, irrigation, water harvesting, rangeland and pasture improvement, plant and animal nutrition, pest and disease control, and agricultural engineering. Acting as the technical operational arm of the Ministry of Agriculture, ARC has significant experience in assisting Extension Services such as through the Seed Development Project where it is responsible for seed propagation and testing. In return, the LDCF2 project will support ARC and Extension Departments in each of the 6 states to establish demonstration farms to exhibit the best practices of adaptation technologies for both crop and livestock production and to scale-up the distribution of these technologies.
- Building on the *Agricultural Bank of Sudan's* ABSUMI initiative will enable the LDCF2 project to coordinate with the rural women who already have access to microfinance and savings services. These women are target customers for WII financial services by combining WII with their current MF products. The LDCF2 project will build a formalized partnership with the ABSUMI initiative to be able to effectively coordinate together to avoid duplication of activities and target areas so that the maximum number of beneficiaries is ensured (Activity 2.2.6).
- Collaborating with the *Connecting Farmers to Market* project which has already launched MF/MI packages to rain-fed farmers: The LDCF2 project will incorporate lessons learned from this project on how to develop flexible payment schedule approaches. Also, the LDCF2 project will also coordinate with other agencies that have significant capacity building experience within the framework of the Connecting Farmers to Market project. For instance, the LDCF2 project will exploit its planned collaboration with the Sudanese Microfinance Development Cooperation (SMDC) to gain expertise in organizing and coordinating steering committees at central and state levels.
- Building on the Central Bank of Sudan's (CBOs) current support for MF: Working with the CBOS offers an opportunity to develop index insurance that can be provided back to back with credit and other microfinance services for farmers and pastoralists in rain-fed areas. By building on the CBOS's existing lending capacities,

considerable amounts of subsidized lending for adaptation can be unlocked. Insurance contracts, loan conditions and regulatory frameworks will be re-evaluated through the LDCF2 project.

## **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:**

128. Risks and recommended countermeasures were identified during bilateral consultations during the project preparation phase.

Key risks and mitigation measures underlying project development are indicated in Table 4.

Table 4: Key risks and assumptions

<b>Risk</b>	<b>Level</b>	<b>Mitigation Measure</b>
Targeted farmers and pastoralists are skeptical and unwilling to engage into the index-insurance scheme	High	The project will invest resources in familiarizing the target community with index-insurance that will be designed to yield a benefit that exceeds the cost. The product will also be designed in a way that is affordable to the target community and so that basis risk is low.
Insurance companies are not incentivized and motivated to deal with small holders because parcels are too scattered, too remote and risks are too high (rainfall must be > 300 mm)	Medium	Flexible microfinance products linked with micro-insurance will be developed to target small holder rain-fed farmers and pastoralists. The beneficiaries will be more willing to accept the insurance products because the regulatory framework for compensation criteria will be updated so that compensation can become clear and streamlined.
Limited reinsurance companies willing to back high-risk small holder rain-fed farmers and pastoralists	Low	Experience through the Connect the Farmers to Market (CFM) project has shown that small holder rain-fed farmers can be effectively provided insurance and backed by reinsurance providers. The LDCF2 project will be building a formalized partnership with the CFM project, incorporating their lessons learned, and designing MF-MI products (e.g., WII) which will reduce the risks for insurers due to the mandated adoption of CC adaptation technologies by beneficiaries.
Delay for insurance compensation which could hinder next year harvests	Medium	The micro-insurance policies geared towards farmers and pastoralists will be reviewed and revised so that compensation criteria are clear and compensation is streamlined.
Index insurance and the adoption of creative solutions, such as remotely	High	Budget includes significant training for trainers and training for beneficiaries. The budget and workplan

sensed data-based indices, are likely to be challenging for insurance companies. Consequently, they will not have the experience and knowledge to adapt the product to new crops and data		also provide ample budget and time to properly design the WII product. Legal and regulatory frameworks will also be adapted to facilitate the development and delivery of WII. Most importantly, feedback from beneficiaries will be facilitated.
High upfront costs in developing WII may not be cost-effective and can lead others towards cheaper traditional forms of micro-insurance	High	In the long-run, index insurance is less expensive to the administrator because there are no on-site inspections or individual loss assessments to perform. (Payout is based on an independent and exogenous weather parameter.) Scaling-up in terms of policy-holders will be supported by first pilot testing the WWI product. Insurance costs become minimized over time through planning of optimal (adaptation oriented) inputs and as yields rise.
The existence of other informal rural credit programmes which provide more flexibility but which are not linked to adaptation	Medium	Informal microfinance is practiced by local merchants and community members. Informal loans are small in quantity and scale because lenders generally receive personal guarantees rather than real collaterals. As such, informal loans are not geared to assist large populations nor to assist in cases of dispute or non-repayment due to the absence of a legal framework. This project will provide the legal and regulatory frameworks to have flexible and tailored loan products and will be able to serve larger populations. Most importantly, lenders are likely to get better returns because the loans will be linked with adaptation technologies.
Limited comprehension of weather/climate information and agricultural advisories	Low	SMA has experience in providing forecasts to the farmers. Extension Services will be used to simplify and translate all messages into simplified and local languages for each target state.
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)	Medium	A cloud-based database will be accessible to all Stakeholders from the information production, dissemination and exploitation sides including SMA, RSA, MoWRE, ARC, M. Ag, M. Livestock, MFIs, Insurance companies, Extension Services, HAC, NGOs
Sudan does not have enough government financing to continue monitoring/research and will not be able to consider recurring O&M/training costs in government budget lines	Medium	By making EWS/CI more useful to various sectors, this pushes the Government to include stable, core budget lines for climate/weather services due to their cross-sectoral importance. Capacity for long-term planning and costing will be built in all information production agencies.

Trained, qualified engineers/technicians leave for more lucrative positions (“brain drain”). Unavailability and limited sustainability of requisite human resources and technical/operational capacities	Medium	Requirements for training as per signed contracts and TORs will be to stay at their respective institute for 2 years (as per Sudanese law) in order to transfer knowledge to others. Also, junior staff will be targeted and training will take place in pairs wherever possible.
Natural disasters damage infrastructure (particularly floods)	High	Robust infrastructure will be procured and training and spare parts will be provided for repair and maintenance in each technical, information production agency.

### A.7. Coordination with other relevant GEF financed initiatives

129. The proposed second LDCF project (LDCF2) will build strategically on the LDCF1 (first NAPA follow-up) project that is currently under implementation in phase II. The LDCF2 project will focus activities in the same regions of high rainfall variability, thereby providing complementary risk management mechanisms to support the on-going adaptation technology implementations in LDCF1.

130. The on-going LDCF1 project aims to introduce a set of adaptation measures targeted towards small-scale rain-fed farmers and pastoralists residing in 4 highly vulnerable agro-ecological regions (River Nile State, Northern Kordofan, Gedarif and Southern Darfur), as identified by the NAPA. The LDCF1 project is in the process of implementing measures of share-cropping, water harvesting, sand stabilization and tillage adjustments, rangeland and farm crop diversification, strengthening local leadership for adaptation, communal funds for shock absorption and community-based early warning. The choice of States for LDCF1 was justified by the Sudan Poverty Reduction Paper, which used a combined index to measure deprivation. The States of the Red Sea, Blue Nile, Kassala, and North and South Kordofan emerged as the most deprived areas for both rural and urban populations. Consequently, these regions were prioritized for poverty reduction efforts. For the LDCF2 project, by putting an additional overlay of climate risk, measured by a high coefficient of variability for rainfall, which can be directly correlated with rural incomes, Kassala, White Nile, North Kordofan and Gedarif States emerged as additional vulnerable regions and have consequently been prioritized as target locations for the proposed project. Therefore, the LDCF2 initiative will focus on implementing climate risk finance measures in the original 4 agro-ecological zones (Annex 9a in the Project Document) and will extend geographically to cover the States of Kassala and White Nile that equally meet the above criteria of climate variability, reliability on climate sensitive livelihood and high incidents of climate poverty.

131. To maximize use of financial resources in addressing residual climate risk, the LDCF2 project will work with existing beneficiaries in 4 of the 6 target states, who have already adopted adaptation technologies. As these populations are already knowledgeable and experienced on adaptation technologies, they will serve to be key target groups to test financial and insurance services. These target populations also now possess a deeper understanding of climate change and the value of participatory approaches, which will enable them to more effectively judge how the provision of financial services can help to build their resilience to climate change.

132. According to the mid-term evaluation of the LDCF1 project, it was recommended that all adaptation projects in the natural resources sector should be integrated into a single strategic, long-term approach. The LDCF2 project will be closely aligned with many of the LDCF1 objectives, and address some of the main recommendations from the mid-term evaluation of the LDCF1 project, namely to focus on organizational, economic and financial practices of the communities in the face of climate change, addressing issues such as credit, market access and insurance.

133. As such, the LDCF2 project can be seen as highly complementary to the LDCF1 by strategically filling in the gaps identified in the LDCF1 project. The gaps to be filled include:

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- Bringing additional expertise on the social, economic and business aspects of agricultural production/water management/climate change to the sites;
- Bringing additional resources for knowledge management, lesson learning, and participatory planning brought to the States and the sites; and
- Engaging with existing Stakeholders on how to improve their resilience to CC by facilitating access to financial services and conducting strategic, localized assessments with villages and state level stakeholders prior to developing the WII and microfinance products.

135. The LDCF2 project will also learn from and build on the successful aspects of the LDCF1 project by using the similar Technical Committee (TC) structure at state levels. In the case of the LDCF2 project where multi-disciplinary expertise is required, a state-based MFI focal point, state insurance agent, adaptation technology expert and gender-focused NGO/CSO will be included in the committees. The current State NAPA or NAP coordinators will provide a support role to the TCs to ensure no duplication of activities with other adaptation-related initiatives.

136. In addition to the LDCF1 project, other regional related projects focusing on early warning, adaptation and/or microfinance include the following:

137. The *FISU* project (worth €380,000, to be completed in 2014) provided by the Finish Government aims is promoting adaptation to climate change by reducing weather and climate-related losses through improved agrometeorology services in Sudan. FISU addresses issues of sustainable development and peace-building by promoting North-South cooperation at the Sudan Meteorological Authority (SMA).

138. The Famine Early Warning Systems Network (*FEWS NET* funded by USAID) 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. Sudan exploits FEWS NET products, such as IPC Version 2 by FEWS NET and is contributing to the Integrated Food Security Phase Classification (*IPC*) project (EU). The Humanitarian Aid Commission (HAC) is working with FEWS NET to provide baseline information for livelihood zones, under a side project funded by USAID (150,000 USD, 2013-2014).

139. The *Eastern Nile Technical Regional Office (ENTRO)*, a technical regional body supporting the implementation of *Eastern Nile Subsidiary Action Program (ENSAP)* has a programme entitled, Design of an Upgraded Data Acquisition, Communication and Flood Forecasting Systems. ENTRO intends to provide Regional Flood Coordination in Addis Ababa to support flood forecasting and mitigation efforts in Ethiopia, Egypt, and Sudan and to facilitate data exchange between the three countries, all Eastern Nile States. Also, the *Flood Preparedness and Early Warning Project, FPEW II* is the second phase of one of ENTRO's fast track projects planned to support hydrologic forecasting and flood early warning in the Eastern Nile countries. The objective of the FPEW II project is to support operational flood forecasting through inter-country data exchange, improved emergency response by governments at all levels and community preparedness.

140. The *IGAD-HYCOS* project aims to establish a regional water management information system and to strengthen observation networks and their real-time data transmission within participating countries including Kenya, Uganda, Sudan, Ethiopia, Somalia, Eritrea and Djibouti and more recently South Sudan, Burundi and Rwanda. IGAD-HYCOS also includes promoting enhanced regional cooperation for the collection, analysis, dissemination and exchange of hydrological and hydro-meteorological data and information for water related decision making.

141. The United Nations Office for Outer Space Affairs (*UNOOSA*) is presently supporting RSA to use space technology data for natural resources management, environmental monitoring and disaster management. Similarly, the *UN-SPIDER* program is providing support to RSA with training workshops in Disaster Risk Management which detail available data sources and open source software and free models that support climate forecast and early warning.

142. RSA is currently being supported by the **Global Monitoring for Food Security (GMFS)** project funded by the European Space Agency to optimize agricultural surveys with satellite earth observations.

143. The *North Kardofan Services Project*, which is focusing on building capacities to perform rainwater harvesting.

144. The *Great Green Wall Initiative-GGW*<sup>11</sup> (100 million USD, with donors including WB, UNEP, WFP, UNCCD and GEF, signed 2010, to begin in 2013) is an on-going initiative aiming to “green” the African continent across the 4,400 mile east-west axis of the continent as a defence against rapid, expanding desertification of the Sahara. The project includes 11 countries, one of which being Sudan having the largest GGW stretch of 1,500 kilometres long and 25 kilometres wide. The aim is to tackle poverty and the degradation of soils and it is expected that in 2013, Sudan will begin partaking in the GGW to support Sudan’s important Arabic gum belt. The GGW initiative will address policy, investment, and institutional barriers that exacerbate the effects of climate change and variability, leading to desertification and deterioration of the environment and natural resources and the risk of conflicts between communities. International Colloquiums are currently held to discuss barriers as well as share available knowledge on vegetal species.

145. *Peace Consolidation Project* (World Bank and SMDC), which is providing Microfinance services to South Darfur.

146. Overall, the proposed LDCF2 project will coordinate and share information with these other LDCF-financed interventions aiming to strengthen hydro-meteorological services and early-warning systems by providing funds to support the technical institutions (Sudan Meteorological Authority, Remote Sensing Authority, etc) to attend regional trainings in Ethiopia and/or elsewhere in Africa and abroad. As data will be centralized in a cloud database (see Figure 1 in the Project Document), it will be possible to share information with other National Meteorological Agencies and with regionally based forecasting centres to improve the quality of forecasts and facilitate downscaling.

**B. ADDITIONAL INFORMATION NOT ADDRESSED AT PIF STAGE:**

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

147. 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, housed at Ahfad University 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 adoption of financial services by women. Women groups established by and partnered with MFIs in addition to women agricultures associations who have been exposed to Training of Trainers programs in different areas will also be consulted.

148. During project development, key public participation Stakeholders including CSOs and indigenous people were identified. They will continue to be implicated during project implementation. Their expected roles are indicated in the following table.

Table 5: Stakeholder Involvement Matrix

Farmer’s Trade Union in each State	<ul style="list-style-type: none"> <li>- Identify the types of crops grown and the types of livestock raised and the production systems being followed by participating farmers</li> <li>- Select farmers who will be willing to collaborate to undertake technology field evaluation on his/her farm and provide an on-farm demonstration site to train other farmers in improved technologies and best practices</li> <li>- Facilitate the formation of Community Based Organizations to lead project implementation in the targeted village clusters</li> <li>- Participate in one or more Community Orientation/Mobilization meeting(s) in</li> </ul>
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<sup>11</sup> <http://sudanow.info/new/interview/the-african-great-green-wall-interview-with-environment-minister-hassan-a-hilal/>

	<p>each of the villages</p> <ul style="list-style-type: none"> <li>- Participate in project planning for community level activities, focusing on agriculture</li> <li>- One representative from the Trade Union will be involved in the Technical Committee for each State</li> </ul>
Pastoralist's Trade Union in each State	<ul style="list-style-type: none"> <li>- Identify the types of livestock raised and the production systems being followed by participating pastoralists</li> <li>- Select pastoralists who will be willing to collaborate to undertake adaptation and dry-land technology field evaluations</li> <li>- Facilitate the formation of Community Based Organizations to lead project implementation in the targeted village clusters</li> <li>- Participate in one or more Community Orientation/Mobilization meeting(s) in each of the villages</li> <li>- Participate in project planning for community level activities, focusing on pastoralism</li> <li>- One representative from the Trade Union will be involved in the Technical Committee for each State</li> </ul>
Practical Action	<ul style="list-style-type: none"> <li>- Inform community members about the main aspects and implementation modalities of the Project, including the importance of community participation in all stages of the entire project development process</li> <li>- Discuss the project interactions and some of the linkages with other projects (e.g., the LDCF1 project or planned NAP initiatives)</li> <li>- Assess the community's interest to participate actively in the entire project development process and the willingness to become responsible for the implementation and management of the project development</li> <li>- Discuss the need to form a representative Community Based Organization.</li> </ul>
Youth/Women Society Organizations (Women's Union of Kassala, Sudanese Youth Union)	<ul style="list-style-type: none"> <li>- Facilitating the community participatory planning process to implement activities, focusing on the involvement of women and children</li> <li>- Establish community rules and regulations by which the community cooperatives receive and pay back borrowed money for different adaptation purposes</li> <li>- Support women's involvement in microfinance promoting awareness of successful national initiatives for women such as ABSUMI</li> <li>- Participate in gender-disaggregated assessments and site identifications for community adaptation interventions</li> <li>- Serve as a permanent focal point with the State Technical Committee</li> <li>- Nominate one gender focused representative to take part in each State Technical Committee</li> </ul>
Sudanese Climate Change Network	<ul style="list-style-type: none"> <li>- Review and test of community based early warning system strategies, DRR preparedness and adaptation options</li> <li>- Documentation of adaptation and DRR good practices and relevant local innovations</li> <li>- Conduct awareness sessions at different levels including with local farmers</li> </ul>



	<p>and pastoralist communities to raise their knowledge by the project objectives, linkages and how to maximize their benefits</p> <ul style="list-style-type: none"> <li>- Facilitate meteorological data collection and early warning dissemination to improve seasonal rainfall forecasts and climate services</li> <li>- Facilitate vulnerability assessments and baseline surveys at community levels using participatory approaches and methods</li> <li>- Conduct capacity building workshops at community levels on the use of weather/climate information agricultural advisories</li> <li>- Build good linkages with other related regional and international projects, interventions and NGOs organizations particularly Pan African for Climate Change justice Network (PACJA)</li> </ul>
MASAR (pastoralist NGO)	<ul style="list-style-type: none"> <li>- Facilitate project intervention in the targeted states for pastoralists regarding: <ul style="list-style-type: none"> <li>o Formation of pastoral organizations</li> <li>o Identifying training needs / gaps</li> <li>o Planning adaptation measures</li> <li>o Facilitating access to microfinance</li> <li>o Supporting the study to determine the need and feasibility of WII for pastoralists</li> </ul> </li> </ul>

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

150. 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.

151. 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.

152. 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.

153. Specifically, in Phase 1, gender-focused NGOs/CSOs (housed at Ahfad University) will continue to be implicated and consulted in order to ensure women are properly engaged/warned. They will also conduct the gender disaggregated survey.

154. 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 and WII/MF products 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.

155. 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 provide access to weather/climate information/warnings and financial services for rain-fed farmers and pastoralists.

156. 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 to discuss appropriate weather indices for WII insurance;
- Information briefings for government and co-financing institutions on WII and MF product development;
- Initiation of public awareness campaign on EWS, MF and WII products as well as appropriate adaptation technology packages

For more details on the Stakeholders, see Section 2.9 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):**

157. The project will have significant adaptation and associated socio-economic benefits. This will be achieved by introduction of sustainable risk finance products (index based insurance) that will support lending to small-scale rain-fed agro-pastoral communities. As a result of the project intervention, farmers and pastoralists will be able to use insurance to safeguard investments that will increase their productivity as well as long term resilience to climate change. At least 45,000 people will directly benefit from this risk finance scheme. The scheme combined and delivered with micro-credit options will help the most vulnerable SRFP build wealth and acquire assets necessary to enable them to diversify livelihoods and better absorb climatic shocks.

158. Index insurance is appropriate in Sudan, particularly in the target regions because extreme weather is one of the major risks confronting SRFP households and has caused them to rely on slowly-released and unreliable humanitarian aid. The severity and frequency of droughts and floods is predicted to increase (See Sudan's Second National Communication), thereby incentivizing resilience building and the adoption of adaptive measures for farming/pastoral production systems. By combining credit provision with the delivery of adaptation services under the component 3, the project will turn local micro-finance institutions into the actual delivery channels for adaptation financing at the sub-national and local levels.

159. In order for this scheme to operate sustainably and maintain delivered benefits in the long run, the project, as described above, takes a capacity development and participatory approach. As such, under component 1, observation and forecasting capacity will be strengthened to improve accuracy and timeliness of climate data which is essential for any index-insurance scheme. Delivery of essential equipment and technical skills through a series of targeted trainings will improve the ability of the key institutions such as the Sudan Meteorological Authority and the Remote Sensing Authority to provide seasonal and long term forecasts as well as early warning services to vulnerable SRFP. Under

component 2, a series of financial literacy training courses will build the trust and confidence in WII. The index-insurance products will be developed with a direct and active participation of the communities along with the banks, public/private insurance companies, and government authorities. Similarly, micro-finance institutions will also be supported to deliver micro-finance products that respond to local adaptation priorities captured in community consultations through component 3.

160. Benefits to the project also include updates to the regulatory frameworks for reinsurance and co-provision of micro-insurance and micro-credit to facilitate the development of climate risk transfer products along with their integration with MF products that target farmers and pastoralists.

161. The largest economic benefits are expected from building capacity of the climate/environmental information production agencies to tailor climate products to the needs of private insurance companies. Together with satellite imagery used for land-use planning and monitoring, tailored climate products and early warnings will also provide significant local environmental benefits, such as detailing best water management practices which is crucial to help Sudan'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.

162. 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.

163. 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 will encourage female members of farmers and pastoralists to engage in MF because experience from the ABSUMI project shows women are diligent in repayment and have high a degree of financial discipline.

164. The UNDP Environmental and Social Screening template has also 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 10 in the Project Document).

165. Environmental safeguards being applied to the LDCF2 project include the following:

- Tailoring EWS/CI and agricultural advisories to support more climate resilient rain-fed farming and livestock practices
- Linking environmentally-friendly adaptation technologies (e.g., equipment/practices which decrease erosion and limit degradation) with financial services

166. Social safeguards being applied include the following:

- Facilitating access to financial services for the most vulnerable (women prioritized)
- Enabling smallholder rain-fed farmers and pastoralists to mitigate climate risks through access to insurance coverage
- Consulting villages with the Met Service and insurance companies to find the best station/equipment placement which benefits the most vulnerable
- Adopting adaptation technologies based on gender (women/youth/illiterate etc)
- Facilitating feedback from marginalized populations on the utility of weather/climate advisories, adaptation technologies and financial services

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

167. In order to implement a cost-effective project, other baseline projects were evaluated to see what relevant activities they are supporting. LDCF funds will be used to leverage partnerships to be created with existing projects to ensure that there is no duplication of activities. Activities within the project ensure that the LDCF2 project will coordinate with other initiatives by building capacities on levels where other projects are not (e.g., Focusing on building EWS capability on the national level rather than regionally (IGAD) and community-based (LDCF1) and improving microfinance services on state levels (CBS is currently working more on the national level)).

168. This project builds on the existing initiatives in terms of equipment acquisitions (building off of the LDCF1 project and the DRR 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. They also weighed the option on the use of manual and/or automatic stations. Due to previous experiences in deploying and operating AWS, the Sudan Meteorological Authority opted to purchase a mix of automatic and manual stations. As training for AWS is intensive, it was deemed important for the cost estimates to include accurate training and operation and maintenance costs. Fifteen percent (15%) of the running costs were designated for spare parts.

169. A key design component was to try to consolidate the training programs and workshops. A coherent training programme was emphasized where one activity can cost effectively satisfy more than one of the needs identified, such as group training on-the-farm or for the Training of Trainers. Also, other baseline programs involving capacity building for the DRM, HAC, were evaluated in order to ensure that money has been spent wisely.

170. 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. The chosen set of Outputs was reviewed in a validation workshop involving all stakeholders and the multi-stakeholder EWS focus group committee meeting. Based on group consensus, Outputs 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 6.

**Table 6: Demonstration of Cost-effectiveness for each proposed Output indicating the project barrier addressed by each Output**

OUTPUTS	Barrier Addressed	Alternatives Considered
1.1 Rainfall modelling and simulations for six target states (River Nile, Gedarif, North Kordofan, and South Darfur, Kassala and White Nile States) to enable local flood forecasts and climate projections	Insufficient coverage of weather, climate and hydrological monitoring infrastructure	<p><b>Alternative 1:</b> 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 for rain-fed farmers by establishing good monitoring networks in 6 target states.</p> <p><b>Alternative 2:</b> Different equipment manufacturers can be used. However, SMA, MoWRE and RSA have experience with the current models. Using different models will increase the training and maintenance costs according to Stakeholder discussions.</p>
1.2 Procurement of 7 climate AWS, 6 synoptic AWS and 162 rain gauges; purchase of high resolution remote sensing data; and capacity reinforcement related to new products/equipment to enhance the availability, quality and transfer of real-time weather/climate data collection on 130,000 ha of drought-prone land for drought early warning	Insufficient coverage of weather, climate and hydrological monitoring infrastructure	<p><b>Alternative 1:</b> Only use manual stations and incorporate SMS communication services: For forecasting and early warnings in Sudan, it is more cost-effective to use automatic weather stations (AWSs) because SMA has existing expertise in working with AWSs and using AWSs reduces the need to pay and train manual observers. Procuring only manual stations supports untimely manual reporting procedures at each station (e.g., data transmission each month).</p> <p><b>Alternative 2:</b> 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.</p> <p><b>Alternative 3:</b> 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 Sudan 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. Also, free satellite products do not offer high enough resolutions to support claim validation.</p> <p><b>Alternative 4:</b> Acquiring more equipment to improve national coverage: This project is focusing on capacity development for service delivery rather than excessive procurement. Good and targeted service delivery of WII products informed by accurate weather/climate information is more likely to ensure the sustainability of continued monitoring and the use of such information to support climate risk finance.</p>
1.3 SMA, RSA and	Poor long-term sustainability of	<p><b>Alternative 1:</b> 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</p>

OUTPUTS	Barrier Addressed	Alternatives Considered
<p>MoWRE are trained to provide sustainable services on weather/climate observation, risk analysis, forecasting and early warning including the establishment of a farm information management system and the revitalization of targeted seasonal forecast delivery for rain-fed farmers and pastoralists</p>	<p>observational infrastructure and technically skilled human resources</p>	<p>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 Sudan to develop national forecasting by translating open-source climate monitoring and forecasts into flooding and drought/food security information.</p> <p><b>Alternative 2:</b> 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 too high to consider this a cost-effective option.</p> <p><b>Alternative 3:</b> 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.</p> <p><b>Alternative 4:</b> 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, SMA and MoWRE already have experience with learning-by-doing and has received training for many of the specific monitoring instruments they have requested to be acquired.</p>
<p>1.4 Improved communication protocols and mechanisms (i.e. partnership with mobile phone operators) to provide timely and accurate weather and climate risk forecasts to rain-fed farmers and pastoralists in 6 target states</p>	<p>Challenges in producing tailored weather/climate information and agricultural advisories</p> <p>Challenges with cross sectorial data sharing and institutional collaboration</p>	<p><b>Alternative 1:</b> Have separate data portals for each agency to ensure security: however, this would prohibit the easy use of data across agencies and with the extension services (See Figure 1)</p> <p><b>Alternative 2:</b> Do nothing, if seasonal forecasts and early warnings are not communicated properly, alerts and forecasts will not be used to build SRFP resilience. Also, users will continue to lack confidence in alerts if the uncertainty of forecasts is not conveyed to the general public. A public awareness campaign by extension services and NGOs/CSOS is planned to inform SRFP about the utility of agricultural advisories and forecasts to help them build resilience to climate extremes.</p>

OUTPUTS	Barrier Addressed	Alternatives Considered
2.1 Comparative analysis and feasibility assessment of different business models for index-based insurance	<p>Long approval and complicated compensation process for existing insurance products</p> <p>No experience with Weather Index Insurance products</p>	<p><b>Alternative 1:</b> Rely on existing business models to create WII products; Insurance scheme viability must be tested in the field to fully understand value chains, uses of inputs, main risks and how to link credit with insurance in order to develop realistic premiums.</p>
2.2 At least 6 index based insurance products (e.g., Weather Index Insurance) designed and introduced, covering at least 45,000 farmers and pastoralists who depend on rain-fed farming systems, including the creation of a nationally-based WII marketing and development team	<p>Long approval and complicated compensation process for existing insurance products</p> <p>No experience with Weather Index Insurance products</p>	<p><b>Alternative 1:</b> Use existing classical insurance products for agriculture which are cheaper in the short time: In the long-run, index insurance is less expensive to the administrator because there are no on-site inspections or individual loss assessments to perform. (Payout is based on an independent and exogenous weather parameter.) Also, insurance costs become minimized over time through planning of optimal (adaptation oriented) inputs and as yields rise. Most importantly, because the index is quantifiable (e.g., surpassing a threshold) and not subject to the impartiality of claims adjustors, compensation criteria are clear.</p> <p><b>Alternative 2:</b> Outsource WII product development to a private company. However, little national capacity will be built so as to get feedback from end-users and be able to adapt the models as more data becomes available. Furthermore, adjusting compensation schemes based on new types of data (e.g., higher resolution satellite data) will not be possible unless outside expertise is recruited to train a nationally-based WII development team.</p>
2.3 Insurance literacy programme / awareness campaign designed and delivered to small businesses, community-based organisations, local farmers and pastoral	<p>Long approval and complicated compensation process for existing insurance products</p> <p>No experience with Weather Index</p>	<p><b>Alternative 1:</b> Use existing insurance literacy among SRFP: Stakeholder consultations indicated that SRFP do not take out insurance plans because the approval process is long and the compensation process is not understood: Because WII is new to Sudan, ample budget and time must be provided to train insurance agents on the WII product and to obtain feedback from rain-fed farmers and pastoralists on their needs. The project will invest resources in familiarizing the target community with index-insurance such that it will be designed in a way that is affordable and understandable for the target community.</p>

OUTPUTS	Barrier Addressed	Alternatives Considered
communities	Insurance products	
2.4 Legal and regulatory framework for risk transfer in target states assessed, policy recommendations developed and reinsurance secured	<p>Long approval and complicated compensation process for existing insurance products</p> <p>No experience with Weather Index Insurance products</p>	<b>Alternative 1:</b> Rely on existing legal and regulatory frameworks; however these frameworks are not adapted to facilitate the development and delivery of WII. Moreover, beneficiaries will be more willing to accept the new insurance products if the regulatory framework is revised so that compensation can become clear and streamlined.
3.1 In each state at least 1 adaptation options/packages developed to inform and enable the provision of MFI credit packages to stimulate smallholder adaptation and disaster risk reduction including the transfer of adaptation technologies to make crop and livestock production more resilient	Lack of customized and understandable microfinance services for rural clients	<b>Alternative 1:</b> Existing case is not offering adaptation technologies/practices with MF (0 USD) which will not provide a means for the SRFP to have sustainable farming/pastoral practices and can contribute to mal-adaptation practices. There are also numerous ready, proven climate change adaptation technologies developed by the Agricultural Research Commission which can easily be adopted by rain-fed farmers/pastoralists, including women and children to help them build more resilient practices.
3.2 Legal and regulatory frameworks reviewed, analysed and improved to increase the co-provision of microcredit and micro-insurance services	Lack of customized and understandable microfinance services for rural clients	<b>Alternative 1:</b> Rely on existing legal and regulatory frameworks; however these frameworks are not adapted to facilitate the development and delivery of MF geared towards SRFPs. Moreover, beneficiaries will be more willing to accept the new MF products if the regulatory frameworks are revised so that payment schedules are more flexible and adaptation technologies offered with the MF products are more geared towards specific SRFP livelihood needs.
3.3 At least three micro-	Lack of customized	<b>Alternative 1:</b> Offering classical MF (Additional cost 0 USD) rather than targeted MF

OUTPUTS	Barrier Addressed	Alternatives Considered
<p>credit, flexible loan products designed and tested to account for pastoral mobility and income cycles of smallholder rainfed farmers and pastoralists (SRFP) (Each product will specify appropriate loan size, prices, repayment schedules, and eligibility criteria geared toward rain-fed farmers and pastoralists and offered through financial service providers to increase resilience of farming and pastoral practices as prioritised in local adaptation plans)</p>	<p>and understandable microfinance services for rural clients</p>	<p>products will not enable the rural population at poverty level who have little assets or farming skills to repay their loans. By linking these loans with adaptation technologies, they will build resilient farming and pastoral practices. Furthermore, if products are not developed with flexible payment schedules based on seasonal cultivation or pastoral markets, SRFP will be unable to repay their debts and lose confidence in new products, Consequently, SRFP will likely resort to informal lenders. However, informal loans are not geared to assist large populations and without a legal framework, cases of dispute and non-repayment are often neglected.</p>
<p>3.4 Organization and capacity development for smallholder rain-fed farmers and pastoralists (SRFP) on newly developed and targeted financial services including training on a financial services management manual</p>	<p>Lack of customized and understandable microfinance services for rural clients</p>	<p><b>Alternative 1:</b> Promote individual loans for SRFPs; however, there will be a much greater chance that the MF products will not be successfully used due to an insufficient collective asset base. As SRFP are new to financial concepts, individual loans will not provide a necessary safety net to enable group training. The net loss equivalent to the cost of MF product development will be much greater than the relatively small investment required to organize and train the smallholder rain-fed farmers and pastoralists when SRFP are organized. They can be more easily guided by experienced extension officers and it becomes easier to build financial literacy and sustainable agro-pastoral practices.</p>



### **C. DESCRIBE THE BUDGETED M & E PLAN:**

171. 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.

172. **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.

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

174. 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.

175. 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.

176. 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.

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

178. 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.

179. 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:**

180. 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.

181. **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.

182. 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

183. 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.

184. 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 May 2016). 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.

185. 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).

186. 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.

187. 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.

188. 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\$ <i>Excluding project team staff time</i>	Time frame
Inception Workshop and Report	<ul style="list-style-type: none"> <li>▪ Project Manager</li> <li>▪ PIU (Project Implementation Unit)</li> <li>▪ UNDP CO, UNDP GEF</li> </ul>	Indicative cost: 10,000	Within first two months of project start up
Measurement of Means of Verification of project results.	<ul style="list-style-type: none"> <li>▪ UNDP GEF RTA/Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members.</li> <li>▪ PIU, esp. M&amp;E expert</li> </ul>	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	<ul style="list-style-type: none"> <li>▪ Oversight by Project Manager</li> <li>▪ PIU, esp. M&amp;E expert</li> <li>▪ Implementation teams</li> </ul>	To be determined as part of the Annual Work Plan's preparation.  Indicative cost is 20,000	Annually prior to APR/PIR and to the definition of annual work plans
ARR/PIR	<ul style="list-style-type: none"> <li>▪ Project manager</li> <li>▪ PIU</li> <li>▪ UNDP CO</li> <li>▪ UNDP RTA</li> <li>▪ UNDP EEG</li> </ul>	None	Annually
Periodic status/ progress reports	<ul style="list-style-type: none"> <li>▪ Project manager and team</li> </ul>	None	Quarterly
Mid-term Review	<ul style="list-style-type: none"> <li>▪ Project manager</li> <li>▪ PIU</li> <li>▪ UNDP CO</li> <li>▪ UNDP RCU</li> <li>▪ External Consultants (i.e. evaluation team)</li> </ul>	Indicative cost: 40,000	At the mid-point of project implementation.
Terminal Evaluation	<ul style="list-style-type: none"> <li>▪ Project manager</li> <li>▪ PIU</li> <li>▪ UNDP CO</li> <li>▪ UNDP RCU</li> <li>▪ External Consultants (i.e. evaluation team)</li> </ul>	Indicative cost : 40,000	At least three months before the end of project implementation
Audit	<ul style="list-style-type: none"> <li>▪ UNDP CO</li> <li>▪ Project manager</li> <li>▪ PIU</li> </ul>	Indicative cost per year: 3,000 (12,000 total)	Yearly
Visits to field sites	<ul style="list-style-type: none"> <li>▪ UNDP CO</li> <li>▪ UNDP RCU (as appropriate)</li> </ul>	For GEF supported	Yearly for UNDP

Type of M&E activity	Responsible Parties	Budget US\$ <i>Excluding project team staff time</i>	Time frame
	<ul style="list-style-type: none"> <li>▪ Government representatives</li> </ul>	projects, paid from IA fees and operational budget	CO
<b>TOTAL indicative COST</b> Excluding project team staff time and UNDP staff and travel expenses		US\$ 122,000 (+/- 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 the [Operational Focal Point endorsement letter\(s\)](#) with this form. For SGP, use this [OFP endorsement letter](#)).

NAME	POSITION	MINISTRY	DATE(MM/dd/yyyy)
Mamoun Eisa Abdelgader	GEF Operational Focal Point	MINISTRY OF ENVIRONMENT, FORESTRY AND PHYSICAL DEVELOPMENT	08/08/2011

**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		March 26, 2014	Tom Twining-Ward, Senior Technical Officer	+421259337386	<a href="mailto:tom.twining-ward@undp.org">tom.twining-ward@undp.org</a>

**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).

<b>This project will contribute to achieving the following Country Programme Outcome as defined in CPAP:</b>					
CPAP FOCUS AREA 1 OUTPUT 2: Equitable livelihoods initiatives for rural and urban communities are supported for recovery and development					
CPAP FOCUS AREA 2 OUTPUT 1: Vulnerable communities to climate change and climatic risks adapted comprehensive sets of adaptation measures					
CPAP Focus AREA 2 OUTPUT 3: Environmental governance policies and regulatory frameworks for enabling better natural resources and risk management developed					
<b>Country Programme Outcome Indicators:</b>					
UNDAF OUTCOME 1 INDICATOR 2: Number of private sector companies and microfinance institutions providing microfinance services					
UNDAF OUTCOME 2 INDICATOR 2: Number of vulnerable, especially female headed, households adopting climate change adaptation measures					
UNDAF OUTCOME 2 INDICATOR 4: Number of states with functioning early warning systems, including flood and drought preparedness systems					
<b>Primary Applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one): <u>Promote climate change adaptation</u></b>					
<b>Applicable GEF Strategic Objective and Program:</b>					
OBJECTIVE 2: Increase adaptive capacity to respond to the impacts of climate change, including variability, at local, national, regional and global level					
<b>Applicable GEF Expected Outcomes:</b>					
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					
<b>Applicable GEF Outcome Indicators:</b>					
<ul style="list-style-type: none"> <li>• Relevant risk information disseminated to stakeholders</li> <li>• Type and no. monitoring systems in place</li> <li>• % of population covered by climate change risk measures</li> </ul>					
	<b>Indicator</b>	<b>Baseline</b>	<b>Targets End of Project</b>	<b>Source of verification</b>	<b>Risks and Assumptions</b>
<b>Project</b>	1.Number of small-holder rain-fed	1. MFIs/Insurance companies have limited capacity to provide tailored	1. <u>TARGET</u> 138,500 small-holder rain-fed farmers and	1. Capacity assessment scores	RISK 1

<p><b>Objective</b><sup>12</sup></p> <p>To increase climate resilience of rain-fed farmer and pastoral communities in regions of high rainfall variability through climate risk financing</p>	<p>farmers and pastoralist households with access to MF or MF/WII products</p> <p>2.Domestic finance committed to the relevant institutions to monitor extreme weather and climate change</p>	<p>financial services for smallholder rain-fed farmers and pastoralists. Current products are too generalized and do not consider flexible payment cycles and reasonable compensation criteria. MFIs/Insurance companies have not found means to access the remote, rural areas (e.g., mobile units), organize the farmers/pastoralists nor mitigate their associated risks. As a result, it is common that farmers/pastoralists use informal lending services.</p> <p><u>BASELINE</u>:93,500 with access to MF, 0 with access to MF/WII;</p> <p>2.Existing budget plans do not have sufficient funds to maintain and operate environmental monitoring infrastructure. <u>BASELINE</u>: Annual O&amp;M budgets for weather and climate monitoring institutions are approximately, MoWRE: USD 223,000, RSA: USD 100,000 and SMA: 300,000.</p>	<p>pastoralists (SRFP) with access to MF and 45,000 SRFP with access to MF/WII</p> <p>2. <u>TARGET</u>: 30% increase in domestic financing for equipment/product operation and maintenance across all institutions (SMA, RSA, MoWRE, ARC)</p>	<p>2. Ministry budget lines for recurring costs</p>	<p>Sudan does not have enough government financing to continue monitoring/research and will not be able to consider recurring O&amp;M/training costs in government budget lines</p> <p>ASSUMPTION 1</p> <p>Capacity for long-term planning and costing will be built in all information production agencies</p> <p>ASSUMPTION 2</p> <p>There is sufficient political support and will within the relevant institutions to reinforce existing capacities for successful execution and implementation of the project.</p>
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	Indicator	Baseline	Targets End of Project	Source of verification	Risks and Assumptions
<p><b>Outcome 1</b><sup>13</sup></p> <p>Institutional and technical capacity</p>	<p>1.% increase in coverage for climate/weather monitoring in each</p>	<p>1.Currently, weather and climate monitoring coverage in the target States is limited.</p>	<p>1. <u>TARGET</u>: <u>Meteorological stations</u>: 13</p>	<p>1.Review of budget spent on equipment procurement and rehabilitation and data held on servers to show that new</p>	<p>RISK 3</p> <p>Limited comprehension of weather/climate information and</p>

<sup>12</sup>Objective (Atlas output) monitored quarterly ERBM and annually in APR/PIR

<sup>13</sup>All outcomes monitored annually in the APR/PIR. It is highly recommended not to have more than 4 outcomes.

<p>for climate observation, forecasting and early warning strengthened at national and local levels</p>	<p>of the 6 target states  <u>BASELINE:</u> On average 1-3 weather stations and 30 rain gauges are located in each target state</p> <p>2.% of rain-fed farmers and pastoralists with access to improved weather/climate information and early warnings (disaggregated by gender).</p> <p>3.Frequency of forecast bulletins provided  <u>BASELINE:</u> seasonal; daily</p>	<p>Most equipment is manual and up to 40% of equipment is not-functional. A <u>BASELINE</u> of what is operational includes in the 6 target States includes the following:</p> <p><u>Meteorological stations:</u> 28 manual, 32 automatic</p> <p><u>Hydrology equipment:</u> 17 water level, 4 manual and 1 automatic flow meters</p> <p><u>Rain gauges:</u></p> <p>98 manual</p> <p>2. There are existing regional and community-based EWS initiatives for food security, however, a national alert system concerned with extreme hydro-meteorological phenomena is lacking.</p> <p>There is also a limited understanding of technical weather/climate information jargon (e.g., alerts are not translated into all national dialects). There is also no formalized communication mechanism for alerts and weather/climate information. End-users cannot provide</p>	<p>additional automatic weather stations</p> <p><u>Hydrology equipment:</u> An additional 8 water level, 3 manual and 2 automatic flow meters</p> <p><u>Rain gauges:</u></p> <p>An additional 162 manual rain gauges</p> <p>2. 50 % increase in population who have access to improved EWS/CI  <u>TARGET:</u>  % Women who receive EWS alerts/CI in target states: <u>8%</u>  % Men who receive EWS alerts/CI in target states: <u>15%</u></p> <p>3. <u>TARGET</u>  Localized daily and seasonal bulletins for each state  Development of at least 2 tailored bulletins and presentation of market research plan</p>	<p>equipment is operational</p> <p>2.  a) Gender disaggregated survey on receipt of alerts  b) Record of debriefings by HAC post extreme weather events  c) HAC/SMA record of end-user feedback</p> <p>3. SMA forecast and bulletin archives</p>	<p>agricultural advisories</p> <p>ASSUMPTION 3</p> <p>SMA has experience in providing forecasts to the farmers. Extension Services will be used to simplify and translate all messages into simplified and local languages for each target state</p> <p>RISK 4</p> <p>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)</p> <p>ASSUMPTION 4</p> <p>A cloud data portal for all relevant Stakeholders will be created to facilitate cross-sectorial knowledge sharing cross</p> <p>RISK 5</p> <p>Trained, qualified engineers/technicians leave for more lucrative positions (“brain drain”). Unavailability and limited sustainability of requisite human resources and technical/operational capacities</p>
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		<p>feedback to improve the communication process.</p> <p><b><u>BASELINE</u></b></p> <p>% Women who receive EWS alerts/CI in target states: <u>5%</u></p> <p>% Men who receive EWS alerts/CI in target states: <u>10%</u></p> <p><b>3. <u>BASELINE</u></b></p> <p>Bulletins are currently produced seasonally and daily. However, these forecasts are not sufficiently down-scaled to give localized forecasts/advisories per state.</p>	<p>on how to implement mobile phone based agricultural advisories, both supporting targeted weather/climate service delivery</p>		<p><b>ASSUMPTIONS 5</b></p> <p>Personnel will be supported through international, regional and south-south cooperation knowledge sharing opportunities</p> <p>The Government will assist with recruitment and will mandate that trained personnel must remain working within their respective institution for 2 years in order to transfer knowledge. Sufficient qualified personnel within the NHMS will be available to handle the new equipment/models, data transmission/storage/treatment to prevent continuity breaks in monitoring.</p> <p><b>RISK 6</b></p> <p>Natural disasters (e.g., floods, strong winds) may damage infrastructure.</p> <p><b>ASSUMPTION 6</b></p> <p>Robust infrastructure will be procured and training will be provided for repair and maintenance with the provision of spare parts in each technical, information production agency.</p>
<p><b>Outcome 2</b></p> <p>Residual climate risk to rural</p>	<p>1. At least 1 WII product created for rain-fed farmers / pastoralists</p>	<p>1. Weather Index Insurance is a new concept in Sudan which has never been</p>	<p>1. <b><u>TARGET:</u></b> 1 WII product piloted in 1 state</p>	<p>1. Insurance company product log</p> <p>2.</p>	<p><b>ASSUMPTION 7</b></p> <p>Insurance companies will have the experience and knowledge to</p>

<p>livelihoods in the states of greatest rainfall variability addressed through parametric insurance products</p>	<p>2. % increase in the number of market outlets and insurance agents in the rural areas to disseminate MF / WII products</p> <p>3. Average speed of claim resettlement in all 6 States over the past 10 years</p> <p>4. Claims ratio in all 6 States over the past 10 years</p>	<p>piloted. Rain-fed farmers and pastoralists in some states are familiar with micro-insurance via the Connecting Farmers to Market project. However, unclear compensation criteria and long approval and compensation processes deter farmers and pastoralists to purchase the insurance products.</p> <p><u>BASELINE:</u> WII products have never existed in Sudan</p> <p>2. Rain-fed farmers and pastoralists are unaware of insurance and financial services because they are located in remote areas. Only Shiekan and Al-Tawania insurance agencies have state presence in the capitals and are familiar with how to cover risks experienced by farmers and pastoralists. For instance, Al-Tawania has been managing the micro-insurance scheme in the Connecting Farmers to Market project. Shiekan Insurance provided approximately 40,000 SRFP with crop and/or livestock insurance in 2011 in the Blue Nile, White Nile, N.</p>	<p>2. <u>TARGET:</u> At least 4 insurance agents per State who are trained on WII and can provide training to Farmer/Pastoral Trade Unions, Extension Services and lead farmers</p> <p>3. <u>TARGET:</u> Average speed of claim resettlement in all 6 target states by the end of the project is 15 days</p> <p>4. <u>TARGET:</u> Average claims ratio in all 6 target states by the end of the project is 0.8</p>	<p>a) Training logs for insurance companies b) Study on presence of insurance companies in rural areas</p> <p>3. Insurance statistics disaggregated according to the following categories: number of rain-fed farmers covered, number of rain-fed pastoralists covered and number of women practicing rain-fed farming/pastoralism covered</p> <p>4. Claim documentation specific to rain-fed farmers and pastoralists disaggregated by risk category and gender</p>	<p>adopt and adapt the WII to new crops and data because they will be implicated in the design. Also, there is ample budget and time to train insurance agents on the WII product and to obtain feedback from rain-fed farmers and pastoralists. Legal and regulatory frameworks will also be adapted to facilitate the development and delivery of WII.</p> <p><b>RISK 8</b></p> <p>Targeted farmers and pastoralists are sceptical and unwilling to engage into the index-insurance scheme and unable to pay for the product.</p> <p><b>ASSUMPTION 8</b></p> <p>The project will familiarize the target communities on index-insurance that will be designed in a way that is affordable to the target community. Index insurance has lower administrative costs because there are no on-site inspections or individual loss assessments to perform. Costs will be minimized over time through planning of optimal (adaptation oriented) inputs and as yields rise. In addition to lower costs, rain-fed farmers and pastoralists will be more willing to accept the</p>
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		<p>Kardofan, N. Darfur, S. Darfur and W. Darfur states. Shiekan’s network of 70 branchess and offices facilitates insurance product marketing and deployment.</p> <p>Nonetheless, these agencies are offering traditional insurance services with long approval and compensation processes. It is therefore necessary to increase rural farmer/pastoral access to WII insurance services.</p> <p><u>BASELINE:</u> 1 insurance market outlet per state</p> <p>3. According to Shiekan Insurance and Re-insurance Co. in 2012, over the past 10 years, the average time elapsed between the reported damage and the payment received, <u>BASELINE:</u> Average speed of claim resettlement in all 6 target states over the past 10 years was 35 days</p> <p>4. The actual value of the insurance compared to its cost or the Claims Ratio, is a good indicator if the insurance product is</p>			<p>insurance products because the regulatory framework for compensation criteria will be updated so that compensation can become clear and streamlined.</p> <p>ASSUMPTION 9:</p> <p>There will be no delays for insurance compensation which could hinder next year harvests.</p> <p>ASSUMPTION 10:</p> <p>Reinsurance companies will be willing to back high-risk small holder rain-fed farmers and pastoralists as experience has shown through the Connect to Farmers to Market project and the dissemination of micro-insurance with reinsurance support</p>
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		<p>appropriately priced. According to Shiekan Insurance and Re-insurance Co.:</p> <p><u>BASELINE:</u> Average claims ratio over the past 10 years in all 6 States was 0.62</p>			
<p><b>Outcome 3</b></p> <p>Improved access of vulnerable farmers and pastoralists to financial services for climate change adaptation and disaster risk reduction</p>	<p>1. Design and application (pilot testing) of at least 3 loan products for adaptation farming and livestock production which provide flexible payment schedules for farmers and pastoralists dependent on rain-fed practices</p> <p>2. One policy has been designed and agreed upon by all loan providers to mandate the adoption of adaptation technologies to be provided to rain-fed farmers/pastoralists</p> <p>3. Number and type of adaptation technologies linked with microfinance services adopted by rain-fed farmers/pastoralists (disaggregated by gender to study</p>	<p>Current Microfinance (MF) outreach serves 400,000 clients (out of a potential 6 million). Only 23% of the total MF clients are located in rural areas, and only 6% of rural and nomadic households in the target states are currently clients (excluding the River Nile State). Stakeholder consultations in the 6 target states indicated that rural populations limit taking out loans from MFIs due to lack of collateral and lack of knowledge/understanding on the bureaucratic procedures and regulations. They also found that the existing products were not flexible during periods when no income could be gained (e.g., planting period).</p> <p><u>BASELINE:</u> There are currently no MF products geared specifically towards</p>	<p>1. <u>TARGET:</u> At least 3 flexible MF products developed which are geared towards the needs of rain-fed farmers and pastoralists</p> <p>2. <u>TARGET:</u> One policy developed mandating the adoption of adaptation technologies for microfinance products tailored to rain-fed farmers and pastoralists</p> <p>3. <u>TARGET:</u> At least 3 adaptation technologies adopted by rain-fed farmers and pastoralists in the target states with 1 of these technologies targeting women or youth</p> <p>4. <u>TARGET:</u> 10% increase in</p>	<p>1. Log of MF products offered and adapted by rain-fed farmers and pastoralists (CBS, SMDC)</p> <p>2. Review of MF policies (CBS)</p> <p>3. Log of MF products (CBS, SMDC) and adaptation technologies offered and adapted by rain-fed farmers and pastoralists (RSA)</p> <p>4. Baseline survey and end of project survey noting the yield/productivity/income of rain-fed farmers and pastoralists in the target regions comparing those who have adopted MF/WII/ Adaptation Technologies/Products/Packages with those who have not.</p>	<p>RISK 11</p> <p>The existence of other informal rural credit programmes which provide more flexibility but which are not linked to adaptation</p> <p>ASSUMPTION 11</p> <p>Informal microfinance is practiced by local merchants and community members. Informal loans are small in quantity and scale because lenders generally receive personal guarantees rather than real collaterals. As such, informal loans are not geared to assist large populations nor to assist in cases of dispute or non-repayment due to the absence of a legal framework. This project will provide the legal and regulatory frameworks to have flexible and tailored loan products and will be able to serve larger populations. Most importantly, the new loans are likely to get better returns because the loans will be linked</p>

	<p>women separately)</p> <p>4.% increase in the productivity and income of rain-fed farmers and pastoralists who use adaptation options/packages linked with MF/MI (as compared with non-participating farmers/pastoralists)</p>	<p>SFFP in terms of flexible payment schedules and reasonable collateral requirements.</p> <p>Another issue is that MF is not presently linked with adaptation technologies which have been proven to improve productivity and increase resilience to extreme weather for rain-fed farmers/pastoralists.</p> <p><u>BASELINE:</u> There are no policies which mandate a link between MF and adaptation technologies and therefore no formalized means to build the climate resilience of farmers and pastoralists so that they can be more productive and capable of paying back loans.</p> <p>The lack of adaptation technologies has been addressed by the LDCF1 project which has provided rainwater harvesting know-how and materials. Also, the Agricultural Research Corporation (ARC) has significant experience in improving crop and livestock production by developing</p>	<p>yield and/or income for rain-fed farmers and pastoralists who have access to improved financial services linked with adaptation technologies</p>		<p>with adaptation technologies.</p>
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		<p>tailored products for farmers and pastoralists (e.g., equipment for irrigation and dryland improvement). ARC acts as the technical, operational arm of the Ministry of Agriculture and is the authorized body for crop variety release and seed certification (such as in IFAD's Seed Development Project). ARC also has strong collaborations with Extension Services and Farmer Field Schools.</p> <p>However, in spite of its strong technical capacity, ARC has limited financing to demonstrate best practices and up-scale its proven adaptation technologies in the rural regions.</p> <p><u>BASELINE:</u> Consequently, other than in regions covered by the LDCF1 (first NAPA project), SRFPs do not have access to any adaptation technologies or packages.</p> <p><u>BASELINE:</u> Without access to adaptation technologies farming and pastoral production for smallholders</p>			
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		is currently limited.			
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**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).

During the PIF stage, the GEF Council recommended the following:

#17, By CEO Endorsement please identify public participation Stakeholders including CSOs and indigenous people and provide details on their roles.

189. During project development, key public participation Stakeholders including CSOs and indigenous people were identified. They will continue to be implicated during project implementation. Their expected roles are indicated below.

CSO involvement during project implementation

Farmer's Trade Union in each State	<ul style="list-style-type: none"> <li>- Identify the types of crops grown and the types of livestock raised and the production systems being followed by participating farmers</li> <li>- Select farmers who will be willing to collaborate to undertake technology field evaluation on his/her farm and provide an on-farm demonstration site to train other farmers in improved technologies and best practices</li> <li>- Facilitate the formation of Community Based Organizations to lead project implementation in the targeted village clusters</li> <li>- Participate in one or more Community Orientation/Mobilization meeting(s) in each of the villages</li> <li>- Participate in project planning for community level activities, focusing on agriculture</li> <li>- One representative from the Trade Union will be involved in the Technical Committee for each State</li> </ul>
Pastoralist's Trade Union in each State	<ul style="list-style-type: none"> <li>- Identify the types of livestock raised and the production systems being followed by participating pastoralists</li> <li>- Select pastoralists who will be willing to collaborate to undertake adaptation and dry-land technology field evaluations</li> <li>- Facilitate the formation of Community Based Organizations to lead project implementation in the targeted village clusters</li> <li>- Participate in one or more Community Orientation/Mobilization meeting(s) in each of the villages</li> <li>- Participate in project planning for community level activities, focusing on pastoralism</li> <li>- One representative from the Trade Union will be involved in the Technical Committee for each State</li> </ul>
Practical Action	<ul style="list-style-type: none"> <li>- Inform community members about the main aspects and implementation modalities of the Project, including the importance of community participation in all stages of the entire project development process</li> <li>- Discuss the project interactions and some of the linkages with other projects (e.g., the LDCF1 project or planned NAP initiatives)</li> </ul>



	<ul style="list-style-type: none"> <li>- Assess the community's interest to participate actively in the entire project development process and the willingness to become responsible for the implementation and management of the project development</li> <li>- Discuss the need to form a representative Community Based Organization.</li> </ul>
<p>Youth/Women Society Organizations (Women's Union of Kassala, Sudanese Youth Union)</p>	<ul style="list-style-type: none"> <li>- Facilitating the community participatory planning process to implement activities, focusing on the involvement of women and children</li> <li>- Establish community rules and regulations by which the community cooperatives receive and pay back borrowed money for different adaptation purposes</li> <li>- Support women's involvement in microfinance promoting awareness of successful national initiatives for women such as ABSUMI</li> <li>- Participate in gender-disaggregated assessments and site identifications for community adaptation interventions</li> <li>- Serve as a permanent focal point with the State Technical Committee</li> <li>- Nominate one gender focused representative to take part in each State Technical Committee</li> </ul>
<p>Sudanese Climate Change Network</p>	<ul style="list-style-type: none"> <li>- Review and test of community based early warning system strategies, DRR preparedness and adaptation options</li> <li>- Documentation of adaptation and DRR good practices and relevant local innovations</li> <li>- Conduct awareness sessions at different levels including with local farmers and pastoralist communities to raise their knowledge by the project objectives, linkages and how to maximize their benefits</li> <li>- Facilitate meteorological data collection and early warning dissemination to improve seasonal rainfall forecasts and climate services</li> <li>- Facilitate vulnerability assessments and baseline surveys at community levels using participatory approaches and methods</li> <li>- Conduct capacity building workshops at community levels on the use of weather/climate information agricultural advisories</li> <li>- Build good linkages with other related regional and international projects, interventions and NGOs organizations particularly Pan African for Climate Change justice Network (PACJA)</li> </ul>
<p>MASAR (pastoralist NGO)</p>	<ul style="list-style-type: none"> <li>- Facilitate project intervention in the targeted states for pastoralists regarding: <ul style="list-style-type: none"> <li>o Formation of pastoral organizations</li> <li>o Identifying training needs / gaps</li> <li>o Planning adaptation measures</li> <li>o Facilitating access to microfinance</li> <li>o Supporting the study to determine the need and feasibility of WII for pastoralists</li> </ul> </li> </ul>

**ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS<sup>14</sup>**

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:

<b>PPG Grant Approved at PIF: 100,000</b>			
<b><i>Project Preparation Activities Implemented</i></b>	<b><i>GEF/LDCF/SCCF/NPIF Amount (\$)</i></b>		
	<b><i>Budgeted Amount</i></b>	<b><i>Amount Spent To date</i></b>	<b><i>Amount Committed</i></b>
1. Local consultants	24,000	7,179.51	0
2. International consultants	60,000	18,189.00	0
3. Travel	10,000	10,677.67	0
4. Technical workshops	6,000		
5. Management			
6. Consultancy Firm		35,000	0
7. Service Contracts-Individuals		15,433.12	0
8. Bank Charges		66.55	0
9. Sundry		181.16	0
10. Learning - training of counterparts		13,272.59	0
11. Services – Companies (committed but not paid)			
12. NEX Advance (not liquidated)			
<b>Total</b>	<b>100,000</b>	<b>99,999.60</b>	<b>0</b>

<sup>14</sup>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)

Not applicable