PROJECT DOCUMENT

SECTION 1: PROJECT IDENTIFICATION

1.1 Project title: Enhancing the resilience of communities living in climate change vulnerable areas of Sudan using Ecosystem Based approaches to Adaptation (EbA)

1.2	**Project number:**	GFL/ PMS:
1.3	**Project type:**	FSP
1.4	**Trust Fund:**	LDCF
1.5	**Strategic objectives:**	Climate Change Adaptation
	GEF strategic long-term objective:	Climate Change Adaptation
1.6	**UNEP priority:**	Climate Change Adaptation
1.7	**Geographical scope:**	National
1.8	**Mode of execution:**	External
1.9	**Project executing organization:**	Higher Council on the Environment and Natural Resources (HCENR)
1.10	**Duration of project:**	48 months Commencing: September 2016 Technical completion: September 2020
	Validity of legal instrument:	54 months

1.11 Cost of project	**US$**	**%**
Cost to the GEF LDCF	4,284,000	35
Funds managed by UNEP	1,400,000	11
Co-financing		
In-kind		
White Nile State's Water Corporation (local)	2,415,200	20
Animal wealth administration of the White Nile State (local)	2,000,000	16
Range and Pasture administration of the White Nile State (local)	500,000	4
White Nile State Ministry of Agriculture, Irrigation and Forests (local)	1,600,000	13
Sub-total	*6,515,200*	*53*
Total	**12,199,200**	**100%**

1.12 Project summary

As climate change evolves with increasing temperatures and more erratic rainfall throughout Sudan, there is a need to find approaches that can reduce the sensitivity of small holder rain-fed farmers and pastoralists (SRFP) to increasing rainfall variability and a higher frequency of climate-related hazards. Typically, SRFP are living in conditions of persistent poverty, relying on rainfall and traditional practices that are decreasing in productivity (e.g., grazing in degrading grasslands). This combination renders SRFP highly vulnerable to climate variability, as evidenced by widespread suffering in rural areas during past droughts, as well as floods.[1]

As indicated in Sudan's NAPA and NAP, SRFP in the White Nile State are particularly vulnerable to climate change due to inappropriate and unsustainable practices, insufficient water and land management and lack of alternative non-agricultural and non-pastoral income generating activities. Ecosystem services play a major role in maintaining and improving rural livelihoods in the White Nile State to support local communities in improving farming, pastoral and water management practices under current climate variability. However, with limited funding, such efforts are insufficient to adapt to the climatic zone shifts anticipated in the coming decades. As an example, the Sahara desert is advancing at a rate of about one mile a year, eliminating grazing land and water holes.[2] To become resilient to such impacts, Ecosystems based Adaptation (EbA) approaches have been proven to be a very cost-effective and multi-beneficial strategy for adaptation.[3] However, they are currently poorly understood and rarely integrated into national, state and community level policies and strategies in Sudan and the White Nile State.

The proposed project, financed by the GEF's LDCF, thus aims to increase the climate change resilience of livelihoods and integrated productive agricultural systems in the White Nile State through Ecosystem Based Adaptation approaches. The project will be implemented at multiple levels aiming to mainstream EbA approaches into policies, planning and budgets and to develop capacities at national, state and local (community) levels on EbA. It will apply alternative, proactive EbA approaches to increase the productivity of farmers and pastoralists such as rangeland regeneration, afforestation, rainwater harvesting and drought-tolerant agriculture. The project will also support SRFP, particularly women, to develop alternative livelihoods (such as backyard gardening) that are more resilient than current practices to climate shocks. Finally, the project will be the first in Sudan to provide knowledge management on successful EbA measures in addition to evaluating and promoting the cost-benefits of such measures. Through such an approach, successful EbA will be able to be easily up-scaled in the future for other SRFP by the various socio-economic sectors that can benefit from improved ecosystem services. Most importantly, the project will contribute to preventing farmer's and pastoralist's current downward trend towards extreme poverty and dependence on humanitarian aid post extreme events.

[1] The flood of 2013 affected 300,000 people (Source: Higher Council of Civil Defense which is composed of different related ministries including Ministry of Health).

[2] http://www.encapafrica.org/documents/biofor/SUDAN%20ETOA%202012%20wg.pdf

[3] Monroe, R. et al. *Does EbA Work? A review of the evidence on the effectiveness of ecosystem-based approaches to adaptation, International Institute for Environment Development: Research Highlights, Nov 2011.*

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ACRONYMS AND ABBREVIATIONS

AAKNET	African Adaptation Knowledge Network
ADAPT	Adapt for Environmental and Climate Resistance in Sudan
AFA	Administrative and Financial Assistant
AR5	Fifth Assessment Report on Climate Change by IPCC
ARC	Agricultural Research Corporation
CC	Climate Change
CCA	Climate Change Adaptation
CRFP	Climate Risk Finance Project
CSO	Civil Society Organization
CTA	Chief Technical Advisor
EbA	Ecosystem-based Adaptation
EIA	Environmental Impact Assessment
FAO	Food and Agriculture Organisation of the United Nations
FNC	Forest National Corporation
FSP	Full-Sized Project
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GoS	Government of Sudan
HCENR	Higher Council on the Environment and Natural Resources
HDI	Human Development Index
IFAD	International Fund for Agricultural Development
IPM	Integrated Pest Management
IPCC	Intergovernmental Panel on Climate Change
ISP	Integrated Solutions Project
LDCF	Least Developed Country Fund
LMRP	Livestock Marketing and Resilience Program
MoAg	Ministry of Agriculture
MoARFR	Ministry of Animal Resources, Fishery and Rangeland
MENRPD	Ministry of Environment, Natural Resources and Physical Development
MoWRE	Ministry of Water Resources and Electricity
MFI	Microfinance Institute
MTR	Mid-Term Review
NAP	National Adaptation Plan
NAPA	National Adaptation Programme of Action
NDP	National Development Plan
NGO	Non-Governmental Organization
NPD	National Project Director
NRM	Natural Resources Management
PC	Project Coordinator
PCWG	Project Coordination Working Group
PD	Project Document
PMU	Project Management Unit
PSC	Project Steering Committee
RLACC	Rural Livelihoods' Adaptation to Climate Change in the Horn of Africa programme
SRFP	Smallholder Rain-fed Farmers and Pastoralists
SSNRMP	Sudan Sustainable Natural Resources Management Project
TOR	Terms of Reference
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme

UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
WB	World Bank
WFP	World Food Programme
WMO	World Meteorological Organization

SECTION 2: BACKGROUND AND SITUATION ANALYSIS (BASELINE COURSE OF ACTION)

2.1. Background and context

1. The Least Developed Country Fund (LDCF) has approved funds for the implementation of the Full-Sized Project (FSP) entitled: "Enhancing the resilience of communities living in climate change vulnerable areas of Sudan using Ecosystem Based approaches to Adaptation (EbA)". The project is the third full-sized project to be implemented in Sudan.[4] Hereafter this FSP will be referred to as the LDCF3 project or "the Project."

Brief introduction

2. The Republic of the Sudan (hereafter Sudan) has a population of ~39 million people[5], with approximately 60% of the population dependent on traditional, rain-fed agriculture and pastoral practices. There are high rates of unemployment, limited financial resources and poverty in the country. The growing population density in the rural regions – coupled with poor land use planning and governance – has resulted in a wide range of social and environmental problems. In particular, poor governance of Sudan's environmental sector has led to the overexploitation of natural resources. For example, rangelands and farmlands are being destroyed rapidly.

3. Under the current and predicted effects of climate change – including increases in the frequency and severity of drought events – it is likely that the poor living conditions of rural communities will be further exacerbated. For example, increased frequency and intensity of drought events are likely to affect agricultural yields negatively, thereby compounding food insecurity in the rural region.

4. As outlined in Sudan's NAPA (2007), the groups that are the most vulnerable to climate risks are traditional smallholder rain-fed farmers and pastoralists (SRFP). During past droughts, there has been large-scale human suffering from hunger among these groups, including forced out migration from rural areas and the death of their livestock herds. Flooding also has caused widespread damage in the form of destruction of property and the death of livestock herds. There is ample evidence of past climatic shocks generating a chain of events that has led to the disintegration of community and the discontinuity of human habitation. In general, this has been due primarily to a combination of extreme poverty levels and lack of alternative non-agricultural income-generating activities.

5. As one of Sudan's most vulnerable regions, the White Nile State is severely impacted by the climate change induced droughts and floods described above. The White Nile State recently prepared its National Adaptation Plan (NAP) where a team of experts was established in the State with representatives from water resources, agriculture and food security, health sectors, research and civil society. The team, benefiting from the training and capacity building programme of the NAP project, conducted a V&A assessment of the three priority sectors in the White Nile State to the impacts of climate change. Almost all localities on the western side of White Nile River were found to be among the most vulnerable to droughts and other impacts of climate change (including localities of Edwaim, Tendalti, Alsallam, and Gulli, which will be the pilot communities of this project). These impacts have already been manifested in declining crop productivity, loss of grazing resources and rangeland valuable species, land degradation, increased frequency of crop diseases, loss of livelihoods and human migration in search for jobs and alternative livelihoods. These communities are particularly vulnerable because of their low capacity for dealing with impacts due to the following factors: low general awareness of climate change, lack of knowledge about water harvesting, lack of access to improved seeds and other agriculture inputs,

[4] **LDCF1:** Implementing NAPA Priority Interventions to Build Resilience in the Agriculture and Water Sectors to the Adverse Impacts of Climate Change in Sudan, supported by the LDCF and implemented by UNDP (2009-2013, US$3.3 million) and **LDCF2**: Climate risk finance for sustainable and climate resilient rain-fed farming and pastoral systems (2014-2017, US$5.7million, funded by the LDCF and being implemented by UNDP)

[5] Data Bank 2014. Population Statistics. The World Bank Group.

presence of overgrazing, severe deforestation, lack of alternative livelihood systems and lack of technology and know-how for better agricultural practices.

Geographical context

6. Sudan is located in north-eastern Africa and is the third-largest country in Africa. The White Nile State is located in Southern Sudan and is delimited by the republic of South Sudan in the south and North Kordofan State in the west, Sinnar and Gazira States in the east and Khartoum State in the north. The total land area of the White Nile State is approximately 39,701 square kilometres encompassing mostly flat areas traversed by the White Nile River from south to north. Administratively the State is divided into 23 localities.

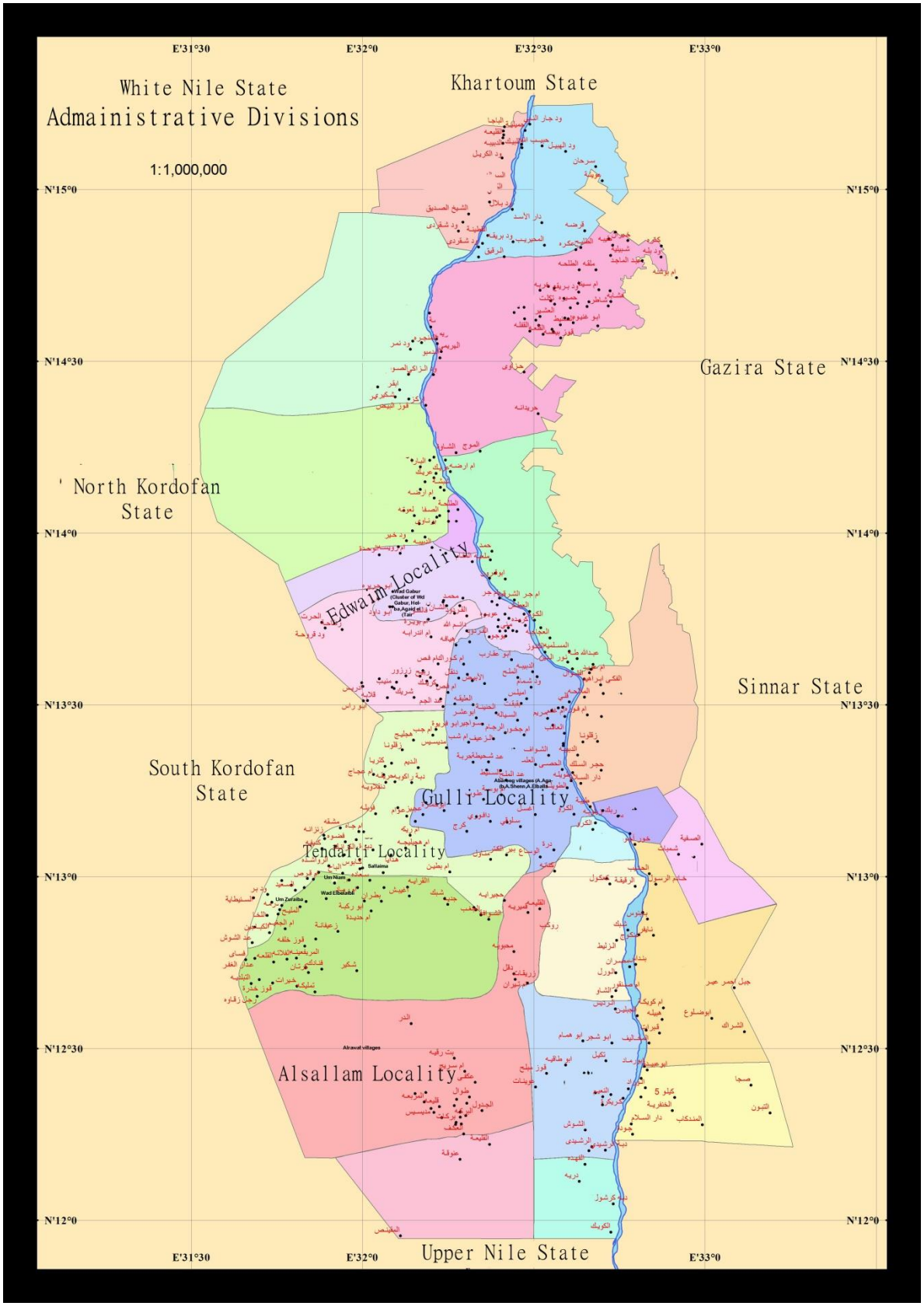

Figure 1: Map of target localities (noted in English) in the White Nile State

Political and socio-economic Context

7. Since 2011, Sudan has been suffering from high inflation rates and a dramatic economic downturn instigated by the loss of oil revenues after the separation of South Sudan[19] and depletion of income-generating natural resources (e.g., gum Arabic)[6]. The secession of the Republic of South Sudan caused inflation to reach over 46% which adversely impacted the agricultural/livestock sector. As a consequence, farmers and pastoralists have had to deal with fluctuating prices within and between seasons, due to adjustments in local or world markets (e.g., currency devaluations). Furthermore, without a stable currency and dependence on natural resources, droughts have reduced food stocks and caused prices to rise as much as three-fold (Zakieldeen, 2007).

8. In 2013, Sudan's population was estimated to increase at an annual rate of 2.3%.[7] The Human Development Index (HDI) ranks Sudan 171 out of 184 countries and 46.5% of the population are below the poverty line of US$1.25 per day.[8]

9. Rain-fed farming is the major agricultural production system in Sudan and contributes appreciably to the countries crop production (mainly millet, sorghum, groundnut and sesame) and gross domestic product (40%). Similarly, pastoralism contributes approximately 25% to the GDP and provides over 20% of the country's foreign exchange earnings[9].

Water infrastructure and planning

10. In spite of the area's high potential for agriculture, poor water infrastructure and maladaptive water management practices prohibit sustainable water use. In fact, large swaths of arable land and forests go unused due to poor water infrastructure. Similarly, poor water planning at scarce water points has led to severe overgrazing of rangelands and disruption of traditional migratory routes.

11. Migration between states has increased by 5 times during the last 52 years, predominantly from rural to urban areas, thus weakening rural productive capacities.[11] Many Sudanese have moved from northern, drier regions to the southern White Nile State. Existing water infrastructure designs in the White Nile State are insufficient to meet current demands and completely under-sized for an influx of climate refugees.[10]

12. Furthermore, insufficient water supplies have had a detrimental impact on women and youth. Women and children lack opportunities due to the need to fetch water. In Sudan, women and children travel increasing distances to fetch potable water (e.g., up to 4 kilometres (kms) in the West Kordofan state in Sudan).[11] This additional labour has forced girls in rural areas to drop out of schools.

Agriculture and Livestock

13. Sudan has a strong farming and pastoral tradition. Approximately 60 percent of Sudan's rural households are dependent on traditional, rain-fed farming and pastoral practices. Also, approximately 80% of Sudan's population is directly dependent on the natural environment for survival (Country Programme Action Plan - CPAP Sudan). Agriculture provides 90% of the raw material for local industries, and employment and income for more than 80% of the population.

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[6] Sudan acts as the world's largest exporter of gum Arabic producing 75-80% of the world's total output.[20] However, the sustainability of gum Arabic production is precarious because the rate of deforestation in the south of Sudan alone is 2.2%[6] and frequent drought cycles are deteriorating the gum Arabic belt.[6]

[7] Verner, Dorte, 2012. *Adaptation to a Changing Climate in the Arab Countries*, MENA Development Report, The World Bank

[8] CIA Factbook 2014.

[9] Sudan Council of Ministers (SMA report)

[10] Republic of the Sudan. Ministry of Environment, Natural Resources and Physical Development. Higher Council for Environment and Natural Resources. *National Adaptation Plan.* May 2014.

[11] Field survey by SWC in West Kordofan, Sudan, 2015, Abu Zabad locality.

14. In the White Nile State in particular, almost 70% of the 1.7 million inhabitants live in the rural areas and are dependent on traditional rain-fed agriculture and livestock rearing for their livelihoods. The White Nile State's animal resources are estimated at 7.9 million heads.

Ecosystems and protected areas

15. Three different ecological zones share the land area of the White Nile State. The larger area falls within the semi-arid zone (semi dry and dry), which is also known as the Savannah zone (to the west on sandy soils and to the east on clay soils). Currently, there are no officially designated protected areas in the White Nile State. There are also only a few proposed range enclosures.

General climatic conditions

16. Three different ecological zones share the land area of the White Nile State. The larger area falls within the semi-arid zone (semi dry and dry), which is also known as the Savannah zone (to the west on sandy soils and to the east on clay soils). The northern area of the State is part of the semi desert zone while a small area in the south lies within the sub-humid zone. Accordingly the annual rainfall ranges between 300 mm in the north and up to more than 600 mm in the south. Roughly 90% of cultivated areas depend exclusively on rainfall. Quantity and distribution of rain is thus a central determinant of crop success in Sudan, with fluctuation in crop yield attributed almost solely to fluctuations in rainfall.

Observed climate change

17. Changes in temperature and rainfall patterns represent a priority threat to food security in Sudan's agriculture-based economy and have caused a shift in the precarious distribution of ecological zones in the productive capacity of rain-fed agriculture. Sudan's First and Second National Communication as well as the NAPA from 2007, have documented how climate change is amplifying and increasing the frequency of many of the climate related hazards already affecting Sudan. An impact of climate change is an increasing frequency of extreme flooding events caused by an increase in intensity of rainfall both during the rainy season (seasonal flooding) and in rainstorms (flash flooding).[12] According to the World Bank's Natural Hotspots Study[13], Sudan has 29% of its population in areas at relatively high risk from multiple natural hazards.

18. Most notably, increasing temperatures, decreasing trends of annual precipitation as well as increased variability, is causing a gradual shift of ecological zones from north to south. Desertification is spreading across the country and impacts the majority of the country as a result (See Figure 2).

[12] Flooding recently in July-August 2013 affected 47,000 families, killing 56 people and 36,000 heads of cattle and damaging 8,400 ha of cultivated land.

[13] Natural Hotspots Study: A Global Risks Analysis (Disaster Risk Management Series No. 5, World Bank, 2005).

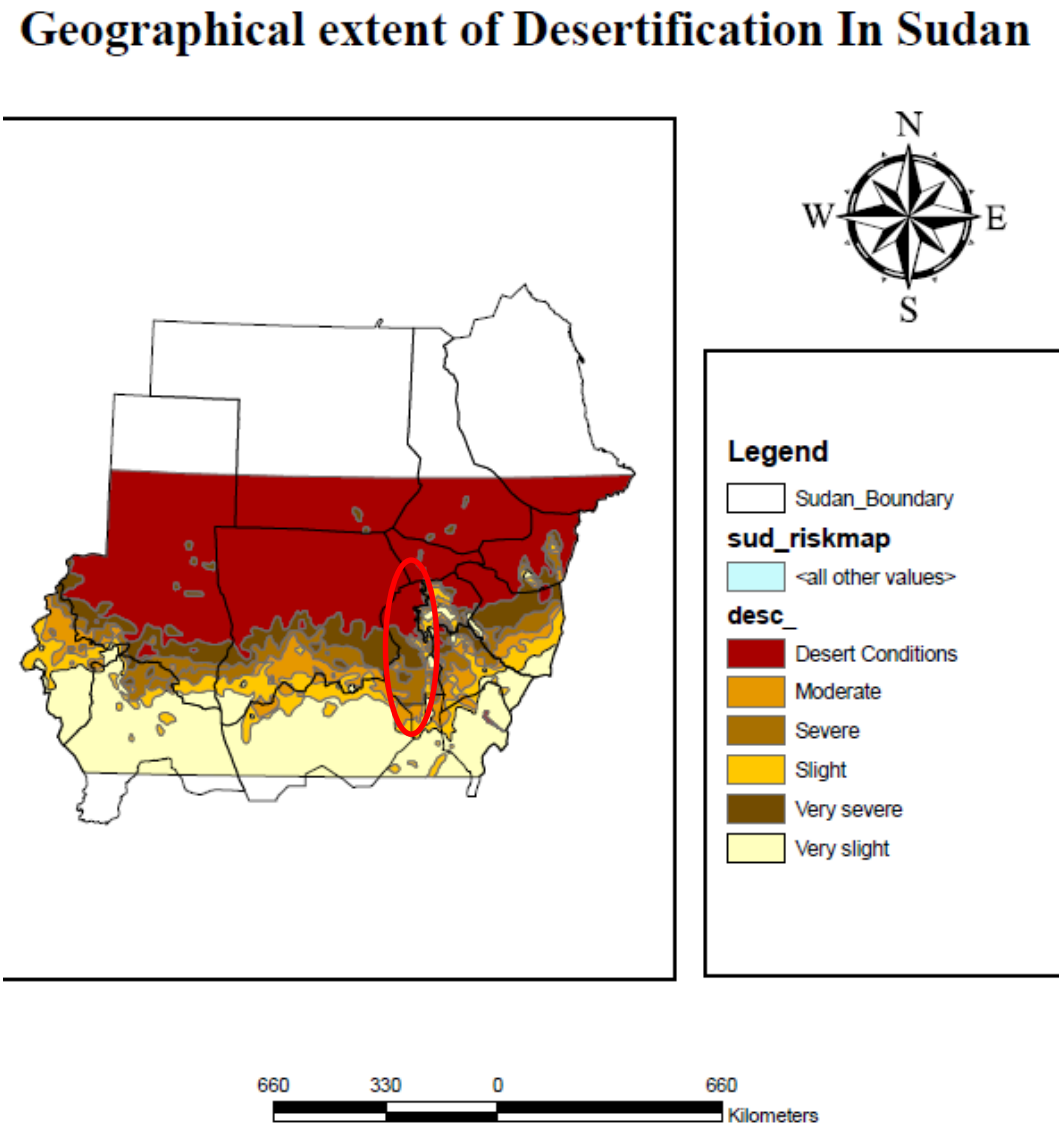

Figure 2: Geographical extent of Desertification in Sudan, 2012, with circle highlighting the White Nile State, Source: RSA

19. Formerly semiarid ecological zones, such as the majority of the White Nile State, are gradually moving southward as the climate becomes increasingly arid and hot, thus taking on characteristics similar to the arid zones found further north. For example, severe drought events in 1983/84 -1987 and 1990/91, 2000 and 2003 resulted in declines in livestock populations by 60 to 70 percent in some areas of Sudan (in addition to affecting at least 8 million people during each event). Due to a creeping trend towards drier conditions throughout Sudan,[14] the southern region of Sudan has one of the largest displaced populations in the world.[15]

Predicted effects of climate change

20. Climate change projections for temperature have predicted a minimum increase of 2.5 degrees C to a maximum of 5 degrees C by 2030 in the White Nile State.[11] Future climate change scenarios also

[14] UNEP *Natural Disasters and Desertification:* Chapter 3 Sudan Post-Conflict Environmental Assessment 2007.
[15] UNFPA United Nations Population Fund data 2013.

project an increase in the variability of rainfall patterns which is likely to result in delayed onsets of extreme rainfall and less rainfall at certain critical times of the year. According to a World Bank study, droughts are likely to intensify due to reduced precipitation and/or increased evapotranspiration. [16] If present rainfall trends continue, a large number of people will be exposed to increased food insecurity and spreading desertification.[17]

21. Climate change is predicted to affect the **agricultural sector** and represents a priority threat to food security. According to the MDG report, 30% of Sudanese are already classified as undernourished. Farming productivity is highly impacted because climate change is causing inter alia: i) an increased water demand and reduced water supply as a result of rising temperatures; ii) reduced crop productivity owing to increased temperature, prolonged droughts and changes in rainfall patterns; iii) loss of arable land as a result of increased erosion from desertification and flooding; and iv) reduced productivity of livestock as a result of heat stress and disease.

22. The Agriculture and Forestry Vulnerability Assessment results suggest that, in 2030 and 2060, the humid agro climatic zones will shift southward, rendering areas of the North increasingly unsuitable for agriculture. Crop production is predicted to decline by between 15 and 62% for millet and between 29 and 71% for sorghum. In addition, climate change models project a decline in the length of the growing season for crops in Sudan. Consequently, the predicted increase in average temperature and more erratic rainfall will negatively affect smallholder agricultural and livestock producers. Farmers and pastoralists who lack the technical capacity to adapt to changing conditions will be particularly affected.

23. Similarly, stresses of climate change are likely to exacerbate the **livestock sector**. Escalating the competition over scare water resources between farmers and pastoralists and are likely to undermine livelihoods, worsen job prospects in rural areas and accelerate migration to urban areas.[18] Migration between states, primarily by pastoralists, has increased by 5 times during the last 52 years, predominantly from rural to urban areas, thus weakening rural productive capacities.[11] Pastoral groups are now moving permanently away from the region because they are spending most of their financial resources on purchasing and transporting water to their herds. Pastoralists are likely to leave their livelihoods for insecure, ill-paid and temporary jobs, such as gold mining,[19] thereby increasing already high unemployment rates.

24. Furthermore, the impacts of climate change and climate variability on pastoral and nomadic groups in the semi-arid areas of Sudan are worsening and causing clashes between nomads and farmers. The situations of drought, desertification and scarce resources have been factors behind prolonged stays of nomads in areas of agricultural production ("Talq"), which has caused clashes between nomads and farmers.[20] Clashes are worsening with climate change, because climate change impacts have caused farmers to intensify continuous cultivation (limit fallow periods), expand land use, construct more fencing and abandon previous mutual interdependencies between cultivation and pastoralism (e.g., manurism, sharing of crop residues, animal transport of crops)[21]. Consequently, there have been complete changes in ways of animal husbandry and migration patterns, and livestock production remains consistently low.[22]

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[16] Verner, Dorte, *Adaptation to a Changing Climate in the Arab Countries*, MENA Development Report, World Bank 2012.

[17] Yousif, S. *Assessment: Vulnerability of the Water Resources in Sudan to Climate Change.* 2012.

[18] See Osman-Elasha B. 2008. Climate Variability and Change/ Impacts on Peace and Stability in Sudan and the Region, Nils Development forum – Khartoum – January 2008.

[19] Feinstein International Center, Tufts University and UNEP Study, *Standing Wealth: Pastoralism Livestock Production and Local Livelihoods in Sudan,* 2013

[20] *Land Issues and Peace in Sudan*, Sudanese Environmental Conservation Society (SECS) and UNDP November 2006.

[21] Feinstein/UNEP Study, 2013, *Standing Wealth: Pastoralist Livestock Production and Local Livelihoods in Sudan.*

[22] In some areas, herders are forced to migrate further to find grazing, and this is now taking them into the pest-infected areas.

25. Water resources are extremely important to Sudan's continued economic development and social cohesion.[23] However, climate change will likely have an adverse effect on the **water sector**. The spatial and temporal distribution of the availability water resources will likely be compromised as a result of increases in the frequency and/or intensity of droughts associated with climate change. According to data trends between 1962 and 2011, available water resources in Sudan decreased five-fold.[20] In addition, an increased incidence of floods and droughts across Sudan will reduce water quality because of associated erosion and siltation.

26. The predicted effects of climate change will also have a negative effect on the **health sector**. Due to poor water quality, Sudan had the second highest costs attributed to diarrheal deaths relative to all Arab States and spent a total of $668 million in 2010.[24] Approximately 2% of Sudan's GDP is spent on buying water resources and treating diarrheal cases. Climate change is expected to increase the incidence and spread of epidemics (e.g., Rift valley fever), malaria, and other diseases, which will put an additional burden on Sudan's already struggling economy.[25]

27. In the **environmental sector,** climate change will result in ecosystem degradation and loss of biodiversity in Sudan. Most recently, the IPCC's Fifth Assessment Report (AR5) shows robust evidence that there will be changes in the ecosystem structure of Sudan. Due to the climate drivers of increasing temperatures and decreasing precipitation, there will be a southward shift in the Sudanese savanna vegetation zones.[26] This is already evidenced by a significant decline in tree density and desertification. These climate trends and risks are predicted to be exacerbated by a number of non-climate issues such as: decreased vegetation cover due to overgrazing and deforestation, and inefficient management of water resources.

2.2. Global significance

28. Sudan's three diverse agro-ecological zones in the White Nile State offer the potential to produce a range of crops, as well as livestock. However, as noted in Sudan's recent NAP, the White Nile State is one of Sudan's most vulnerable states because increasing temperatures, decreasing trends of annual precipitation as well as increased variability, are causing a gradual shift of climate end ecological zones from north to south. That is, formerly semiarid ecological zones, such as the majority of the White Nile State, are gradually moving southward as the climate becomes increasingly hotter, thus taking on characteristics similar to the arid zones currently found further north.

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[23] Republic of the Sudan. Ministry of Environment, Natural Resources and Physical Development. Higher Council for Environment and Natural Resources. *National Adaptation Plan.* May 2014.

[24] UNDP-RBAS and SIDA. *Water Governance in the Arab Region: Managing Scarcity and Securing the Future.* 2013. Verner, Dorte, *Adaptation to a Changing Climate in the Arab Countries*, MENA Development Report, World Bank 2012.

[25] Seneviratne, S.I., N. Nicholls, D. Easterling, C.M. Goodess, S. Kanae, J. Kossin, Y. Luo, J. Marengo, K. McInnes, M. Rahimi, M. Reichstein, A. Sorteberg, C. Vera, and X. Zhang, 2012: *Changes in climate extremes and their impacts on the natural physical environment. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, UK and New York, USA, pp. 109-230.

[26] Christensen, J.H., K. Krishna Kumar, E. Aldrian, S.-I. An, I.F.A. Cavalcanti, M. de Castro, W. Dong, P. Goswami, A. Hall, J.K. Kanyanga, A. Kitoh, J. Kossin, N.-C. Lau, J. Renwick, D.B. Stephenson, S.-P. Xie and T. Zhou, 2013: Climate Phenomena and their Relevance for Future Regional Climate Change. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, USA. Ch 14.

29. To combat this creeping of ecosystems, the LDCF3 project will contribute to the conservation of important rangelands and farmlands through appropriately designed, implemented and monitored EbA interventions such as inter alia: i) restoring rangelands and forests and; ii) promoting community-based management of restored ecosystems. By restoring these ecosystems, the LDCF3 project will contribute to increasing the availability of resources integral to local farming and pastoral livelihoods. Consequently, the project will help to improve regional food security and secure local livelihoods. Additionally, afforestation interventions will contribute toward global mitigation of climate change through carbon sequestration.

30. Information produced by the project, such as sectoral vulnerability assessments, vulnerability maps and EbA protocols, will be stored so that lessons learned through LDCF3 project interventions can contribute towards a global understanding of best practice adaptation in other Arid and Semi-Arid Lands (ASALs) as well as low rainfall savannah regions.

2.3. Threats, root causes and barrier analysis

The problem addressed by the project and the preferred solution

31. The White Nile State recently prepared Sudan's National Adaptation Plan (NAP). A team of experts established in the State conducted a V&A assessment of the priority sectors which are most vulnerable to the impacts of climate change. The SRFP in the four localities of Tundalti, El Dweim, Gulli and Alsallam are particularly vulnerable because of their low capacity for dealing with climate change impacts.

32. There is also a general lack of good practical examples on how ecosystem services can provide adaptation benefits in a Sudanese context and how such approaches can be mainstreamed into a broader development agenda. Ecosystems based Adaptation (EbA) approaches, which are likely to be a very cost-effective and multibeneficial strategy for adaptation in Sudan and the White Nile State,[27] are currently poorly understood and recognized at the national, state and community levels.

33. There are also limited linkages between SRFP and farming/pastoral technologies and practices (particularly for women), which can help them adapt to climate change (exceptions include previous adaptation interventions in select locations such as by the first LDCF-funded project). For example, even if rangeland rehabilitation was noted as a priority during community consultations, most SRFP do not have the capacity to protect valuable range areas. Furthermore, farmers are not familiar with how appropriate technologies and practices can help them build resilience to climate change (e.g., using rainwater harvesting and improved seeds to mitigate the impacts of drought). The State authorities and agricultural extension services do not have sufficient human capacity to support local adaptation processes. Instead, in spite of the Government forbidding the use of tractors, farmers are often using them which causes erosion/degradation and destruction of vegetation cover in sandy Qoz soils.

34. With very limited public resources for support of rural development at both national and state levels and with generally low investment capacity of local communities (due to widespread poverty), investments in agricultural development in the White Nile State remain chronically insufficient. This in turn makes sustaining livelihoods and keeping up agricultural productivity with a steadily rising population, a huge challenge even under current climate conditions.

35. The **preferred solution to the problem** is to mainstream EbA approaches at both national, state and local (community) levels by strengthening government awareness and capacity for implementation of EbA at all levels. The project will build the climate resilience of ecosystems and local communities in the

[27] Monroe, R. et al. *Does EbA Work? A review of the evidence on the effectiveness of ecosystem-based approaches to adaptation, International Institute for Environment Development: Research Highlights, Nov 2011.*

White Nile State by improving their access to ecosystem services, such as agriculture, food and water. The LDCF3 project will increase rangeland productivity and support communities to manage agro ecological systems in a sustainable manner. Climate-resilient ecosystems will increase the adaptive capacity of local communities by providing an important buffer against extreme weather events. Simultaneously, the project will also facilitate the upscaling of such benefits to the national level by mainstreaming EbA and CCA into policies and conducting cost-benefit analyses of EbA interventions. Successful, cost-effective EbA measures will be codified and disseminated across sectors. The solution will be achieved through the following components:

Component 1: Capacity development for Ecosystems based Adaptation (EbA) and policy mainstreaming

Component 2: Implementation of EbA measures to build adaptive capacities of vulnerable communities

Component 3: Knowledge management for appropriate EbA design.

36. The project will be executed through the Higher Council for Environment and Natural Resources (HCENR) and implemented in cooperation with the Ministry of Agriculture, Animal Resources, Irrigation and Forestry of the White Nile State and a number of critical stakeholders on climate change, agriculture, water management and natural resource management, including the White Nile State's Environment Committee.

37. Specifically, the solution will include:

- Mainstreaming of EbA in national policies and into state and locality development plans
- Piloting of EbA support measures integrated into existing local community livelihood activities including water harvesting, use of improved seeds, rangeland improvements, afforestation
- Alternative livelihood support such as backyard gardening and poultry raising
- Afforestation and reduction of pressure on forest resources with the introduction of improved cookstoves and alternative building materials
- Development of cost-benefit analyses and cost-effectiveness demonstrations to support the replication and upscaling of EbA measures
- Support for private sector investment in EbA measure replication
- Knowledge management for EbA

Mitigation

38. By placing the EbA approach at the center of the project approach, it is expected that it will generate not only adaptation benefits but also mitigation benefits such as through carbon sequestration via afforestation and promotion of energy-efficient cook stoves and alternative building materials.

Barriers to implementing the preferred solution

39. The normative solution is hindered by a number of institutional, financial, technological and informational barriers, including:

Lack of inter-ministerial coordination with regards to planning for climate change adaptation

40. An effective national response to climate change requires coordination between relevant national ministries and their state branches, including *inter alia*: the Ministry of Agriculture (Rain-fed Agriculture Department), the Ministry of Animal Wealth (Range and Pasture Administration), the State Ministry of Physical Resources (State Water Corporation) and the Forest National Corporation. Historically there has been limited coordination between government departments and projects involved in climate change adaptation in Sudan. To address this gap, HCENR was established and has a high degree of political influence and technical knowledge about climate change. However, the secretariat of HCENR is under-

capacitated with regards to promoting and mainstreaming EbA. Consequently, effective inter-ministerial coordination regarding planning for climate change adaptation is currently required.

Limited awareness and mainstreaming of Ecosystem-based Adaptation (EbA)

41. There is a general lack of good practical examples on how ecosystem services can provide adaptation benefits in a Sudanese context and how such approaches can be mainstreamed into a broader development agenda. To date the current national legislation, policies and development plans in the area of natural resources, such as the Forest Act (2000), forest policy and the five years plans of the forest, rangeland, agriculture and water sectors have not recognized or specifically integrated ecosystem-based adaptation approaches.

42. All activities of the White Nile state's most recent 5 year sector plan for the agriculture and water sector relate *indirectly* to the maintenance of ecosystem services such as provision of water for agriculture and rangelands. The critical role of ecosystems has yet to be comprehensively and consistently considered in national and state level planning and policies.

43. At the community level, there is generally very little awareness and understanding of climate impacts. State authorities and agricultural extension services do not have sufficient human capacity to support local adaptation processes. In particular there is, both at institutional and farming levels, a clear lack of understanding and consideration of the interrelation between environmental degradation (soil degradation, deforestation, loss of grassland biodiversity etc.) and climate change vulnerability.

Lack of financing to pilot proven adaptation technologies

44. With very limited public resources for support of rural development at both national and state levels and with generally low investment capacity of local communities (due to widespread poverty), investments in agricultural development in the White Nile State remains chronically insufficient. The Agricultural Research Cooperation (ARC, See Section 2.5) has been developing numerous adaptation technologies which can be tailored to specific sites (e.g. rainwater harvesting equipment, improved ploughs and agricultural implements). The ARC has developed some highly innovative and productive systems producing cereals (e.g. wheat), vegetables, oil, crops, fruits and wood for fuel. However, in spite of the fact that the technologies undergo rigorous field testing and approval mechanisms before they are released, actual applications are limited due to a lack of financing. As a result, adaptation technologies have yet to receive widespread recognition as a viable (and potentially climate resilient) option for land use and have not been sufficiently promoted to farmers via existing extension services.

Lack of demonstration/proof of concept of EbA interventions and related protocols/tools

45. Currently, there are no EbA-focused projects being implemented in Sudan. As a result, the benefits and cost-effectiveness of EbA interventions have not been sufficiently demonstrated to policy- and decision-makers and agro-pastoral communities. Without sufficient demonstration it is unlikely that: i) an EbA approach will be integrated into local, state and national policies, plans and legislation for rural areas; or that ii) agro-pastoral communities will support and contribute to EbA projects. To enhance adaptation to climate change and promote the development of additional livelihoods, EbA will need to be tailored to particular ecosystems. However, technical protocols for EbA in ecosystems in rain-fed regions have not yet been produced. This is mostly due to lack of financing (see previous barrier). Therefore, institutions and ministries engaging in ecosystem restoration – such as HCENR – have limited access to nationally-appropriate tools or documents to guide them to implement EbA.

Overcoming barriers to implementation of the preferred solution

The LDCF3 project will contribute toward overcoming the identified barriers by:

Improving coordination between government institutions involved in climate change adaptation

46. The LDCF3 project will work directly with the secretariat of HCENR to provide coordination support. It will also create a White Nile State Technical Committee to strengthen linkages for EbA and to promote EbA across ministries. Given that the Technical Committee will operate at an inter-ministerial level (such as the former NAPs committee), targeted operational support for the Committee will improve coordination between government institutions directly involved in climate change. Additionally, training will be undertaken to strengthen the technical capacity of HCENR, the White Nile State Technical Committee and the White Nile Environment Committee (existing) to: i) interpret the economic assessments of climate change adaptation generated under Outcome 3; and ii) include consideration of the economic impacts of climate change relative to the costs of adaptation in future planning and decision-making. Consequently, training under this output will provide ministry and committee members with information and technical guidance to mainstream adaptation into state, national and sectoral development plans.

Demonstrating the benefits and cost effectiveness of EbA interventions in pilot areas with view to upscaling across Sudan

47. The LDCF3 project will demonstrate EbA interventions for the restoration of agro-ecological zones at the four target sites, namely Tundalti, El Dweim, Gulli, Alsallam. Sites have been selected due to their extreme vulnerability and great potential for increases in socio-economic and environmental benefits. These EbA interventions, detailed under Outcome 3, will demonstrate the multiple benefits and cost-effectiveness of EbA to policy- and decision-makers in Sudan. In addition to this, protocols for EbA will be undertaken for rain-fed ecosystems in which on-the-ground activities will take place. Such protocols will be tailored by combining scientific knowledge/best practices (such as from the ARC) with traditional knowledge of agro-pastoral communities and will support the upscaling of EbA in similar rain-fed ecosystems across Sudan.

Improving awareness and understanding of EbA and climate change at national and local levels

48. The interventions of the LDCF3 project will: i) increase knowledge on EbA in national/local government and agro-pastoral communities; ii) raise national and local level awareness of EbA and climate change; and iii) improve and facilitate the dissemination of relevant information on climate change and EbA. This will be achieved through a variety of activities under Outcomes 2 and 3. The project includes an awareness-raising programme targeting communities living within the rain-fed regions of the White Nile State as well as other local stakeholders, including NGOs and representatives of the private sector (Component 3). The awareness programme will focus on the following topics: i) current and future effects of climate change; ii) the role of ecosystems in reducing vulnerability; iii) the principles of EbA; and iv) promotion of climate-resilient livelihoods, including alternative livelihoods, with an emphasis on the sustainable use of natural resources. Additionally, an existing cloud-based knowledge management platform will be improved and expanded in Component 3 to disseminate lessons learned and knowledge gained to various stakeholders on EbA. This will serve to further strengthen awareness and understanding of climate change and EbA at national and local levels in Sudan.

Development of guidelines/tools for adaptation in the rain-fed farming and pastoral sectors

49. The LDCF3 project will promote a sectoral approach to adaptation in various ways. Firstly, under Outcome 2, detailed vulnerability analyses of climate impacts on rain-fed farmers and pastoralists will be conducted. A vulnerability map for planners and policy makers will be produced that will highlight the vulnerabilities of both the pastoral and agricultural sectors. Secondly, the LDCF3 project will create opportunities for sectors to invest directly in EbA, such as through sales of drought and flood resilient seedlings.

50. Furthermore, a study will be undertaken to establish: i) the costs of current and future climate change on important sectors operating in the agro-ecological zones; and ii) the costs of various sectoral adaptation responses, relative to no adaptation response in the White Nile State. This study will be

disaggregated by sector and develop the economic rationale for integrating climate change adaptation into sectoral plans and related budgets. To complement this study, guidelines will be produced to inform the execution of recommended adaptation activities.

2.4. Institutional, sectoral and policy context

51. Within Sudan, HCENR is responsible for coordinating all natural resources and environment-related projects, including the first two LDCF-financed projects.

52. The Ministry of Agriculture (Rain-fed Agriculture Department), the Ministry of Animal Wealth (Range and Pasture Administration) and the Forest National Corporation mandate includes inter alia: i) promoting agricultural, pastoral and forestry production; ii) protecting local communities, animals and plants against plagues and diseases; iii) preparing policy that support conservation and the sustainable management of forest resources; and iv) ensuring compliance with commitments made in international agreements.

Policy context

53. The Government of Sudan became a signatory to the United Nations Framework Convention on Climate Change (UNFCCC) in 1993. **Sudan's Initial National Communication (INC)** was submitted to the UNFCCC in July 2003 and provided an assessment of the likely impacts of climate change on several sectors, highlighting the importance of adaptation measures for rain-fed farming and pastoral systems. The INC identified agriculture, water and health as the highest priority sectors. The INC concluded that climate change, including decreasing annual rainfall, increasing rainfall variability and increasing average annual temperatures, was causing challenges such as a reduction in ecosystem integrity, a decrease in biodiversity, a decline in crop yields and an increase in disease outbreaks and insect infestations. These challenges have led to increased risks of food shortage and famine, in addition to an increase in poverty.

54. The proposed project is also consistent with **Sudan's Second National Communication (SNC)** (January 2013) which details "increasing ecosystem resilience and reducing the risk of climate-related disasters" as one of the three major goals detailed in the Sudanese strategy for adaptation to climate change. The SNC also emphasizes how the impacts of climate change are expected to adversely impact ecosystems, existing infrastructure, and future developments.

55. During 2005 – 2007, the Government of Sudan, with support from GEF/LDCF and the United Nations Development Programme, prepared its **National Adaptation Programme of Action (NAPA, 2007)**. Submitted to the UNFCCC in July 2007, the NAPA identified urgent adaptation initiatives to reduce the increasing vulnerability of the rural communities to current and future climatic risks. Consistent with guidance for the LDCF (GEF/C.28/18, 2006), the NAPA process also yielded a consensus that the highest priority NAPA follow-up interventions should be a programme of adaptation interventions in 5 representative ecological zones of Sudan (the Southern Sudan zone is no longer applicable due to the separation of South Sudan), with a major focus on the enhancement of food security by building the adaptive capacities of the rural population, particularly of rain-fed farming and pastoral communities. The NAPA specifically prioritises adaptation support to rain-fed farmers and pastoralists, as it states that "In many parts of Sudan, rain-fed farmers and pastoralists have devised numerous kinds of coping strategies to deal with agricultural production in the face of climatic variability. With the advent of changes in climatic patterns in recent decades, many of these strategies are proving to be no longer effective."

56. Consistent with the NAPA, the LCDF3 project will implement a programme of adaptation-focused interventions that will reduce vulnerability of rural communities, in particular the smallholder rain-fed farmers and pastoralists (SRFP) communities which the NAPA identified as the most vulnerable groups in Sudan.

57. Furthermore, the project is aligned with **Sudan's National Adaptation Plan (NAP)** that was recently developed as part of a multilateral environmental agreement (MEA) to combat desertification and to preserve biological diversity. The NAP process, funded by DFID and implemented by UNEP Sudan through its Sudan Integrated Environment Project (SIEP), identified mid- and long term adaptation needs in various sectors (e.g., agriculture, water and health) for all states of Sudan. In the White Nile State, recommended adaptation programmes for the agriculture sector include i) provision of improved seeds to small-scale farmers, ii) application of rainwater harvesting technologies and iii) support for agricultural extension services and field demonstration sites to train farmers. For the range and pasture sector, recommended adaptation programmes include i) provision of water, ii) introduction of high nutrient fodder, iii) construction of fences to fix sand dunes and prevent desert creeping and iv) activation of the rangeland protection act. The LDCF3 project is completely aligned with NAP Programme A, "Modernization of agricultural production systems, natural resource conservation and rehabilitation of the livestock sector." Relevant Programme components to which the LDCF3 project is contributing towards include 1. Using suitable agricultural technology and best practices to cope with climate change and 2. Rehabilitation of the rangeland.

58. In the White Nile State, the NAP process established a technical committee to deal with climate change adaptation issues at the state level. The LDCF3 project will build on this committee and use the previous experts where possible to form a permanent White Nile State Technical Committee. Similar to the NAP committee, the proposed White Nile State Technical Committee will consist of experts from the Ministry of Agriculture, the Ministry of Livestock, the Ministry of Physical Development, the Ministry of Health, the Agricultural Research Corporation, a Women NGO, Extension services, CBOs/NGOs associated with the Famers Union and Pastoralist production groups, the State Environment Committee and representatives from the sugar factories.

59. Furthermore, the LDCF3 project will build on the Vulnerability and Adaptation (V&A) assessment of the water, agriculture and food security, and health sectors in the White Nile State. The LDCF3 project will also build on outputs from the NAP process including adaptation programmes and projects interventions identified in addition to recommendations on polices and institutional reforms for implementation and integration of adaptation into development planning at the state level.

60. Overall, the Project is fully consistent with the NAP process in Sudan in terms of both reducing vulnerability of most affected communities and also defining options and modalities for integration of adaptation into national development planning for water, agriculture and food security. Furthermore, the proposed project, being built on the outcome of consultations and vulnerability assessments in White Nile State, is fully consistent with the NAP process at the state level. The project also complements the NAP in the sense that, being a NAPA project, it focuses on addressing urgent and immediate adaptation needs while the NAP is also covering medium and long term adaptation needs.

61. Furthermore, the LDCF3 project is also consistent with the following strategies, plans and assessments:

62. **Technology Needs Assessment (TNA)**. The TNA is a national programme funded by GEF, UNEP and UNEP Risoe Centre that identifies technology priorities to promote mitigation and adaptation activities in line with the country's sustainable development goals and strategies. The TNA includes Technology Action Plans outlining technology barriers and developing plans to facilitate the transfer, adoption and diffusion of the selected priority technologies. Most activities focus on 'engineering type' adaptation measures, and to a less extent on ecosystem based adaptation (EbA). The advantages of EbA are increasingly recognised in the TNA process though such measures as environmental protection, biodiversity conservation and cost-effectiveness.

63. **25 Year Strategic National Development Plan.** The LDCF3 project is consistent with the 25 years Strategic National Development Plan, which is being implemented through 5-year state and sectoral

plans. The current 5 year plan is for the period (2012-2016) includes activities on water, agriculture and food security and is thereby consistent with the activities described in the LDCF3 project.

64. The **Sudanese government's Five-Year Plan (2012-2016)** is aligned with the outcomes of the LDCF3 project namely, (a) public investment in infrastructure; (b) focusing on small-scale farmers in rain-fed farming areas; (c) development of crop insurance programs; (d) research; (e) continued institutional reforms such as land policy; and (f) increased involvement of the private sector in developments. The Plan includes activities such as establishment of 8 agricultural service centres, raising the percentage of use of improved seeds by 80% for a number of crops, establishment of centres for training of rural women, establishment of grazing allotments, water harvesting, demarcation of animal routes, marketing and veterinary services. The LDCF3 project is also rooted in Sudan's priority needs and challenges identified in the Plan by focusing on the cross-cutting issues of gender, environment and climate change, emergency preparedness and Disaster Risk Management. It also draws on the Comprehensive Peace Agreement (CPA) and Darfur Peace Agreement (DPA).

65. **Action Plan for Agricultural Revival (APAR).** The project is also consistent with the national Action Plan for Agriculture Revival (APAR), launched in 2008, which aims to develop the agricultural sector and improve its contribution to state and national income (especially after the separation of South Sudan and the loss of oil revenues), through increasing crop and livestock productivity, reducing poverty and promoting sustainable management of natural resources. At the state level, the APAR is integrated in the 5-year development plan for the agriculture and water sector, which include state specific activities that contribute to the overall of objectives of APAR. This Plan is now facing financial difficulties in its implementation from year to year.

66. **Sudan's Medium-Term Strategy** also calls for reviving agricultural development with a significant shift in emphasis and policies in favour of traditional agriculture. The main elements of the strategy relevant to the LDCF3 project include: (i) land tenure reform `and (ii) technological package development and outreach (research and extension).

67. The project is also in-line with the **Interim Poverty Reduction Strategy Paper (IPRSP, 2011)** which emphasizes the promotion of economic growth and employment creation as the first pillar of the Government of Sudan's development strategy. Due to the secession of South Sudan in 2011, the IPRSP stresses diversification in the agricultural sector to relieve losses attributed to decreases in oil export earnings. Consequently, Sudan's growth strategy will focus on expanding private sector investment and pro-poor and broad based growth in addition to the following areas listed below:

- Targeted support for the agricultural sector (for diversification in particular);
- Adopting policy and institutional frameworks that support growth and poverty reduction;
- Pursuing human development efforts that build a skilled labor force; and
- Development of economic services for agriculture and knowledge related services.

68. By promoting alternative livelihoods supporting EbA, the Project is also aligned with **UNDAF Pillar 1 Outcome 1**: People in Sudan, with special attention to youth, women and populations in need, have improved opportunities for decent work and sustainable livelihoods and are better protected from external shocks, thereby reducing poverty. Furthermore, by improving ecosystem services and promoting Natural Resources Management to reduce the impact of climate shocks to SRFP, the Project is linked to **UNDAF Pillar 1 Outcome 2**: Populations vulnerable to environmental risks and climate change become more resilient, and relevant institutions are more effective in the sustainable management of natural resources.

Legal Framework

69. Relevant legislative provisions and existing frameworks relevant to NAPA priorities, the environment and climate change impacts include:

- Environment Protection Act 2001: This act defines general policies and directives for protection of the environment. As such, it specifies that an environmental feasibility study (equivalent to an Environmental Impact Assessment) is required when any project, person or programme shall affect the environment and natural resources negatively. Evaluation of the study is conducted by the Higher Council for Environment and Natural Resources. Chapter III of the Act specifies what contents are required in the study including an analysis of available alternatives. Chapter 5 of the Act lists the environmental degradation acts which are penalized including air/water/soil pollution, desertification of vegetation and changing the natural pathways of water flow.
- Environment and Natural Resource Article 11: (1) The people of Sudan shall have the right to a healthy and diverse environment, (2) The State shall not pursue any policy, or take or permit any action, which may adversely affect the existence of any animal or vegetation species their natural or selected habitat, (3) The State shall promote, through legislation, sustainable utilization of natural resources and best management practices.
- Decentralized System of Governance (Levels of Government, Article 24): Sudan is a decentralized State with the following government levels, (a) national level which shall exercise authority with a view to protection of national sovereignty and territorial integrity of Sudan as well as promoting the welfare of its people, (b) state level which shall render public services, and (c) local level of the government which is concerned with community level activities.
- Right to Own Property Article 43: Every citizen shall have the right to acquire or own property as regulated by law.
- Land Regulation Article 186: Rights in land owned by the Government of Sudan shall be exercised through the appropriate or designated level of Government.
- National Land Commission Article 187: There shall be established a National Land Commission that shall have the following functions, (a) arbitrate over land, (b) entertain claims, (c) enforce the law applicable to the locality where the land is situated, (f) advise different levels of government on how to coordinate policies on national projects affecting land or land rights, (g) conduct studies and recorded land use practices in areas where natural resource development occurs.
- National Water Policy 1992 Updated 2000, in addition to the Water Sanitation Policy, North Sudan 2010
- Sudan Nation Forestry Policy Statement 2006 (FAO: TCP/SUD/2903(A)
- Civil Transaction Act (CTA) (Section 565) identifies pasture land 'by subtraction' from other uses (namely agriculture and forests). Furthermore, the CTA empowers State authorities to impose restrictions on grazing as to time and place, and also allocate land for grazing for the benefit of the whole community and the protection of animals resources (ibid).

70. Therefore, it should be noted that there is a lack of policies which support pastoralism.[28] In Sudan, there is little or no consideration of pastoralism as a well-defined, legitimate livelihood system. According to the Feinstein study (2013), the lack of a specific policy on pastoralism is partly a result of a lack of understanding on the importance of strategic livestock mobility, which has exacerbated the explicit bias in favour of sedentary farmers.

Multilateral agreements

71. Sudan has ratified, among others, the following international conventions:

- United Nations Convention to Combat Desertification (UNCCD) (2006);

[28] Feinstein International Center, Tufts University and UNEP Study, *Standing Wealth: Pastoralism Livestock Production and Local Livelihoods in Sudan*, 2013

- United Nations Convention on Biological Diversity (1995);
- United Nations Framework Convention on Climate Change (UNFCCC) (1993); and
- Kyoto Protocol to the United Nations Convention on Climate Change (2007)
- Millennium Development Goals
- Sustainable Development Goals

2.5. Stakeholder mapping and analysis

72. The` LDCF3 project design was formulated as a result of extensive bilateral and multilateral stakeholder consultations, including in the communities as well as an inception and validation workshop in the White Nile's capital representing various sectors (see Appendices 16 and 17 for further details on the inception mission, validation workshop and stakeholder consultations). The purpose of the stakeholder consultations was to identify: i) appropriate EbA and climate change adaptation interventions, based on the vulnerabilities and needs of rain-fed farming and pastoral communities; ii) on-going projects relevant to the activities of the LDCF3 project; iii) national and local government authorities who will be involved in the activities of the project; iv) relevant national policies and legislation with which the project is aligned; and v) additional information on the baseline context in Sudan. As a result of these consultations, the LDCF3 project will be feasible in the local context whilst being aligned to national policy.

73. Stakeholder participation and validation of key processes is expected for all activities. Key stakeholders in this project include the following:

74. Stakeholders consist of the State's Range and Pasture Administration, Animal Wealth Administration, Water Corporation, Forest National Corporation (a state office), Rain-fed and Irrigated Agriculture Adminstration and the State's Environment Committee. At the federal level key stakeholders include: HCNER, and Minstries of Agriculture, Animal Wealth, Water Resources and Electricity. Descriptions on the key stakeholders is provided below:

75. The **Higher Council for Environment and Natural Resources (HCENR)**: HCENR was established in 1991 to coordinate and advise on making effective policies, laws, plans and institutions that solve problems of natural resources degradation in Sudan. The HCENR is affiliated to the Ministry of Environment, Natural Resources and Physical Development (MoENRPD), and represents Sudan as a focal point for most of the global environmental conventions. The HCENR has branches in different States (including White Nile State) in order to monitor the implementation of development programs related to natural resources and collect data.

76. The **Ministry of Agriculture and Irrigation's state** presence with extension services. The MoENRPD acts at the state level through State Ministers, the Forest National Corporation (FNC, see below) and HCENR.

77. The State's **Forest National Corporation (FNC) is** a semi-autonomous institution under the MoENRPD. It was created in 1989 with the responsibility of coordinating the forestry sector, formulating and following up the implementation of policies, planning and undertaking administrative tasks for forests and woodland management. It has technical branches.

78. The State's **Range and Pasture Administration (RPA)**, a decentralized authority under the Ministry of Animal Resources, Fishery and Rangeland (MoARFR), has responsibility for planning, conservation and development of rangeland programs, protection of rangelands against bushfires, rehabilitation of degraded rangelands and execution of national and internationally assisted projects.

79. The **White Nile Environment Committee** is a technical committee that is the product of the NAPs process.

80. The **Agricultural Research Corporation (ARC)** is the principal research arm of the government on agriculture that tests and spreads adaptation technologies, particularly for dry-land adaptation applications for pastoralists. including on-the-farm training and will support. ARC has been in existence for over 100 years, has approximately 450 staff and has 10 research centers, 3 research units, 25 research stations and 54 laboratories in all the states of Sudan. For the LDCF2 project, ARC is being supported to develop numerous adaptation technologies which can be tailored to specific sites (e.g. rainwater harvesting equipment). The LDCF2 project is also supporting ARC to provide weather/agricultural advisories by SMS to SRFPs and to prepare technical manuals detailing sustainable agricultural and pastoral activities for year round cultivation and production of milk/meat products to be distributed to rain-fed farmers and pastoralists.

81. The **White Nile State's Women Union** represents the leading and facilitating body for rural women in addressing lending and financing institutions (e.g. Saving and Credit Bank, Bhar Abiad – White Nile State's MFI, El Amal for Microfianicng, and Zakat). The union activities are:

- Provision of support to rural and pastoral women in crop, animal production and livelihood activities
- Establishment and rehabilitation of training centers for rural women capacity building in the areas of agricultural, animal production, handcrafts, processing and sewing
- Empowerment of women in other women related activities (e.g., alternative energy sources, home gardens, poultry raising)
- Illiteracy campaigns

82. The project will also create active partnerships with NGOs at the local and national level. At the **local level**, the project will implicate the following groups: Local Farmer's and Pastoralist's Producers Groups and grassroots groups involved with natural resources management, such as the village councils, agricultural cooperatives, women's union (see above), youth groups, vocational training centers, market vendors, livestock producer associations and service providers.

83. The Project will also work as well as with **private sector** partners in the project sites. Private sector stakeholders include the State Water Corporation as well as companies investing in fodder production, improved seeds, improved stoves and solar powered pumps.

Gender mainstreaming

84. Most importantly, this Project will target the most vulnerable groups living in rural areas, with a strong emphasis on addressing vulnerabilities faced by women, who are highly vulnerable to climate hazards and climate change, in order to support adaptation to current climate impacts and increase future resilience. Moreover, in accordance with findings of recent NAP assessment reports, women will be considered as one of the most vulnerable groups to climate change impacts and will be involved in stakeholder consultations during project development and especially in the implementation of project outcomes. A key objective of the PPG phase was thus be to assure, through community level consultations, that the needs and priorities of all vulnerable community members, and in particular women, are fully considered in the selection of pilot EbA activities.

85. Sudanese women, just as women in general, have been considered in project development and will continue to be implicated in project implementation. Women are an important target group because they are more dependent on natural resources for their livelihoods. Climate change has a strong impact on the expected women beneficiaries who are living in rural regions and have limited mobility. In addition, women may be excluded from some activities due to cultural norms, or due to lack of capital and ownership arrangements that confer all rights to men in the family (Buhl 2005; Eriksen et al. 2005, Eriksen et al. 2007). This inequality is compounded by a lack of opportunities arising from limited access to education and information services which prohibit participation in decision-making. Due to all of these reasons, this project is targeting women as potential beneficiaries gender-specific adaptation technologies

and livelihood diversification methods. In accordance with the NAP process, they will be heavily implicated in project design and implementation through the support of women-based NGOs.

86. The Agricultural Research Corporation has developed certain adaptation technologies targeted to women. These technologies enable women to improve their cultivation / livestock husbandry and feeding practices. The LDCF3 project will exploit and pilot these technologies in order to build the resilience of women in the rain-fed regions of Sudan.

87. The Technical Committee to be created to manage the project on the State level (See Section 4 Institutional Arrangement) will each have a female representative to promote gender awareness and gender assessments. Also, the Village Development Committees and Water User Associations to be created under the LDCF3 project will have at least 30% representation by women.

Stakeholder consultations

88. Stakeholder consultations (with participation from both local stakeholders and relevant state officials and experts) were organized around the community vulnerability assessments and selection of pilot activities to be implemented. Field visits and surveys were conducted in the White Nile State during August and September of 2015. National experts had focused meetings with the Range and Pasture Locality Office, the Rainfed Sector Administration, and the Field Range and Pasture Administration during October and November 2015. They also met with Wad Gabur and Hilba Villages during October 2015. The Inception workshop was held at Kosti town during November 2015 with 110 participants (50% women). The validation workshop was held in Khartoum during March 2016 with 51 participants (37% women). Consultations were also held with representatives of key baseline and related projects such as CRFP and Plan Sudan.

89. The following Table 1 shows the list of consultations which have taken place to develop the LDCF3 project document. The project outcomes, outputs and activities are based upon the recommendations of the Stakeholders given the technical, operational and financial constraints of the project. The role and participation of each agency is indicated by the column headings described in the legend.

Table 1: Stakeholder Matrix

Stakeholder	Inception Consultations	Involvement in Baseline Assessment	Role Identification	Risk/Barrier Analysis	Policy/ Strategic alignment to priorities	Co-financing Identification	Gender representation	Upscale / Sustainability planning	Validation Workshop	Document Endorsement
Federal Sector										
Ministry of Environment, Natural Resources and Physical Development					✓	✓		✓	✓	
Higher Council for Environment and Natural Resources (HCENR)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rain-fed Agriculture Department		✓	✓			✓			✓	
Ministry of Animal Resources, Fishery and Rangeland		✓	✓		✓	✓	✓	✓	✓	
Agricultural Research Corporation (ARC)		✓						✓	✓	
State Sector										
Ministry of Agriculture, Animal Resources, Irrigation and Forestry of the White Nile State	✓	✓	✓		✓	✓		✓	✓	
State Ministry of Physical Resources (State Water Corporation)	✓	✓	✓		✓	✓		✓	✓	
Range and Pasture administration of the White Nile State	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Forest National Corporation of the White Nile State	✓	✓	✓		✓	✓		✓	✓	
Animal Wealth Administration of the White Nile State	✓	✓			✓			✓	✓	
Technical Research Institutions / Universities										

Sudanese Environmental Conservation Society	**									
University of Bahri	**								✓	
Private Sector										
Sugar Factories										
NGOs/CBOs/CSOs										
Farmer's Producers Groups in White Nile State *	✓	✓	✓							
Pastoralist's Producers Groups in White Nile State *	✓	✓	✓							
Plan Sudan	✓	✓	✓						✓	
White Nile State Women Union	✓	✓	✓				✓		✓	
SOS Sahel	✓	✓	✓							
Donor Partners										
UNEP	✓	✓	✓	✓	✓	✓		✓	✓	
UNDP	✓	✓	✓	✓	✓	✓		✓	✓	
IFAD	***									

Column Heading Legend
National Inception Consultations – A workshop was held on the national level and target populations in the 4 pilot communities within the White Nile State were consulted
Involvement in Baseline Assessment – consulted during project development
Role Identification – involved in identifying institutional arrangement partners
Risk/Barrier Analysis – consulted on their specific institutional risks or barriers
Policy/ Strategic alignment to priorities – institution has policies/strategies which are aligned with project
Co-financing Identification – other projects to support and be supported by the project financially
Gender representation – organization which is concerned with promoting the involvement of rural women in project development
Upscale / Sustainability planning – consulted on how to maintain and duplicate the project
Validation Workshop participation – involved in the verification of the project details during the validation workshop
Document Endorsement – signatures obtained from government and the UNEP Country Office

1. * Farmers and Pastoralists Trade Unions were both dissolved by a government act (2015) to be replaced by Producers Groups
2. ** All of the above listed organizations did not have visible activities, or contributions during consultations
3. *** IFAD is the process of recruiting personnel for implementing the Cattle Routes Project

2.6. Baseline analysis and gaps

Baseline situation

90. While underfunded, a number of development initiatives are currently ongoing in the White Nile State and in the four target localities of Al Dwaim, Tandelti, Alsalam, and Gulli addressing a number of development issues for the agriculture and pastoral sector. These include investments in water supply infrastructure, improved livestock and crop management programmes, rangeland rehabilitation and dissemination of improved seeds. None, however, are taking account of longer term climate change impacts and potential adaptation options. With a general lack of presence and funding from bilateral and multilateral institutions in the White Nile State (due to the long standing political sanctions on Sudan, which has also affected the contributions and support programmes of UN organizations, and greatly reduced the opportunities for Sudan to access development support from bilateral sources), the majority of development activities in the water and agriculture sector are funded through regular national and state funding.

91. The White Nile State development planning follows the national approach, which is based on the 25 Year Strategic Plan to be implemented through the White Nile State's 5-year sectoral plan, with the current sector plan covering the period 2012-2016. The total annual financing allocation to these plans is in the order of 800,000 USD, divided into regular budget for maintaining ongoing activities and services, and an additional small allocation for meeting some of the new and urgent development needs within these sectors (e.g. approximately 300,000 USD). The regular budget covers the implementation of the ongoing programmes such as the support to rain-fed agriculture, plant protection, animal wealth, seeds production, infrastructure, administration, etc. The small development component, on the other hand, includes activities such as infrastructure for water harvesting, range gages, opening and demarcation of animal routes, nurseries, extension centres, seeds storage etc.

92. The baseline situation, as it relates to each component of the LDCF3 project and the associated baseline projects, is further described below.

Component 1: Capacity Development for Ecosystems based Adaptation (EbA) and policy mainstreaming

93. All activities of the State's most recent 5 year sector plan for the agriculture and water sector (see below) relate indirectly to the maintenance of ecosystem services such as water provision for agriculture and support for productive rangelands for livestock. There is a growing understanding of the significant role ecosystem services play in maintaining and improving rural livelihoods in the state. However, the critical role of ecosystems, have yet to be comprehensively and consistently considered in national and state level planning.

94. While not currently aligned with adaptation needs and priorities, a number of non-climate focused planning frameworks and policies for environmental protection are currently active in Sudan including: the Forest Act (2000), the Forest Policy and the Five Year Plan for the forest, rangeland, agriculture and water sectors. (See also the Legal Frameworks discussion in Section 2.4.) Similarly, Sudan is implementing policies/frameworks for sustainable rural development through its 25 Year Strategic Plan, which is being implemented through the Five Year Sector plans. Furthermore, Sudan is in the process of mainstreaming adaptation into its general planning and policy making at both the national and state level through the LDCF1, the LDCF2 and the planned ADAPT initiatives. However, the synergies between ecosystem protection, sustainable development and adaptation needs have yet to be fully explored and mainstreamed into general thinking for regular ecosystem protection and sustainable development policy and planning.

Component 2: Implementation of EbA measures to build adaptive capacities of vulnerable communities

95. Farmers and pastoralists in the White Nile State are likely to be continually impacted by climate hazards, in particular related to increasing frequency and severity of droughts (and floods). This is likely to cause crop failure, low productivity, death of livestock, and abandonment of pastures and fields due to desertification. This in turn will exacerbate already existing social and environmental stressors in the state, and therefore affect general socio-economic development in the area. While some limited public support is available from the Sudanese government and through the White Nile State Five Year sector plans (see Section 2.1), these programmes are chronically underfunded and only barely able to help communities overcome current climate variability, let alone deal with future climate change impacts. Furthermore, with limited awareness among state and community decision makers and extension staff on the potential benefits and cost-effectiveness of EbA, ecosystems and their crucial role in providing ecosystem services and adaptation benefits to agriculture and water are rarely considered in ongoing investments. Without LDCF support this situation is likely to remain unchanged.

96. In spite of water supply interventions by the White Nile State Water Corporation, there is no focus on increasing the climate resilience and sustainability of water infrastructure. The White Nile State Water Corporation also lacks required financial resources and technical knowledge to climate proof water supply interventions. Consequently, rain-fed farmers and pastoralists, particularly those on the west side of the White Nile River, do not have sufficient water for drinking and irrigation. They are subject to loss of crops and livestock due to the fact that water storage mechanisms are inefficient and wells and reservoirs are in need of maintenance and repair. As identified in the NAP, there is a need to construct micro-dams, water wells outfitted with solar pumps, boreholes and water points.

97. Due to poor land management and significant tree removal for Gum Arabic (acacia gum) production, agro-pastoralists and pastoralists are losing their forests and rangelands. EbA approaches are not considered for existing interventions. Furthermore, other than some small investments by the Range and Pasture Administration and the Animal Wealth Administration of the White Nile State (on the order of USD 600,000 annually), there are limited activities to address climate risks in the livestock sector. Such interventions are focusing on current pastoralist issues by establishing grazing enclosures, reseeding and promoting the livestock value chain. However, such programmes have less than 50% of the required financing to meet annual targets. Similarly, the Forest National Corporation is a self-financed institution that lacks adequate funding to implement the NAP target of implementing agro-forestry on 10% on rain-fed agricultural lands.

98. The Rainfed Agriculture Department has a programme to provide improved seeds, to implement water harvesting and to improve extension services. However, the budget allocation and coverage of this programme is inadequate to reduce the vulnerability of the 4 target localities on the western side of the White Nile River. Similarly, the Agricultural Research Corporation (ARC) has developed a range of gender-sensitive technologies/methodologies to improve agroforestry, particularly for rain-fed farmers (e.g., pumps for Rainwater Harvesting, high yield cereals). Although some of these technologies/methodologies were successfully piloted in the LDCF1 project in other states, such technologies/methodologies have yet to be promoted and tested by farmers in the White Nile State.

99. Currently, rain-fed farmers and pastoralists are particularly vulnerable to climate shocks due to their dependence on natural resources. Most have no other option than to farm with traditional, ineffective methods (due to lack of knowledge on sustainable EbA practices) or to continue grazing livestock in spite of recurring drought. Diversification of livelihoods is required to ensure that the target populations, which are already in poverty, have other livelihood options to create an asset base making them more resilient to climate shocks. 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 unsustainable industries.[29] 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.[30]

Component 3: Knowledge management for appropriate EbA design

100. Knowledge and awareness of appropriate EbA strategies is non-existant at both national, state and communtiy levels. A system for compiling, storing and communicating best practices, specific to EbA, is required. Currently, a cloud-based knowledge base is being developed with LDCF2 funds. The database contains project data, climate projections and ARC innovation data on climate adaptation technologies. However, the database does not detail information on the use of biodiversity and ecosystem services as part of an overall adaptation strategy. By not exploiting this existing platform, practical data and lessons mainstreaming of EbA approaches that consider climate change impacts will not be possible for policy development, planning and decision-making.

Baseline projects

Component 1

101. **Adapt for Environmental and Climate Resistance in Sudan, ADAPT!** (total estimated budget for 2016-2019 is USD 15 million, with USD 1.4 million currently secured). The project's goal is to increase understanding and integration of climate resilience and environmental management into programme delivery, plans and policy in Sudan. It is the second phase of Sudan's integrated Environment Programme (SIEP 1). Relevant aspects of ADAPT! to the LDCF3 project include:

- Component 1: coordinating environmental programming to promote linkages across government sectors, building institutional capacities to address climate issues in the long-term, and promoting best environmental practices;
- Component 2: supporting socio-economic analysis of climate constraints and promoting the use of environmental information; and
- Component 3: informing and influencing national policy and planning so as to improve environmental governance.

102. Component 1 of ADAPT is linked with the LDCF3 project's Component 1 by increasing the awareness that environment dimensions are essential in humanitarian and transitional responses and by building institutional capacity within humanitarian and development operations to address the environment and climate issues in the longer term. Similarly, Component 2 of ADAPT links with Component 3 of LDCF3 by demonstrating the economic and social value of environmental action. Component 2 of ADAPT links with Component 3 of LDCF3 by focusing on baseline environmental data collection. LDCF3 will house such information in the Cloud database to be supported with Component 3.

103. The LDCF3 project will build on the expected capacity-building interventions of ADAPT, which are aimed at improving governance in the environment sector. Under Component 1 of the LDCF3 project, approximately 30 representatives from the environment sector will be trained on: i) how to interpret EbA and climate change adaptation investment appraisals; ii) how to use cost effectiveness rationales for the planning and decision-making process; and iii) the importance of

[29] Feinstein International Center, Tufts University and UNEP Study, *Standing Wealth: Pastoralism Livestock Production and Local Livelihoods in Sudan*, 2013

[30] The nomadic groups in the East and West of the country make up 9.1% of the population; they move seasonally across very long distances and have the least access to basic services and the poorest health and education indicators, reflecting their historic marginalization.

mainstreaming EbA and climate change adaptation into state, national and sectoral development plans for the environment sector. Without LDCF resources, ADAPT will not have the priority and capacity to mainstream EbA into planning and decision-making processes and will not be able to encourage private sector investments into proven climate-resilient, cost effective EbA measures.

Component 2

104. **Programme for Construction of Water Stations, Ponds (hafirs) and Wells funded by the White Nile State Water Cooperation** (total annual budget 2016-2020, USD 2.4 million). The purpose of this programme is to provide water supply (from the Nile river) to remote communities facing severe water stress. This is done through investments in basic water supply infrastructure which have a capacity ranging from 1500 m^3 up to 11000 m^3. This programme started in 2011 and continues to be under implementation to date, however lack of the required financial resources and know-how have limited the annual average achievement of the progrmme to 40-50% of annual planned tragets. The main sources of the available finance are from national and state contributions. The LDCF3 project will build on these ongoing activities by providing top up funding to increase climate resilience of water infrastructure in the communities, and by creating awareness and knowledge that will enable more efficient management of water resources looking at upstream contributions by the watershed and entire ecosystem.

105. Without LDCF resources, the White Nile State Water Corporation will continue to develop water infrastructure without an understanding of climate change vulnerabilities of the water sector – and associated costs. Consequently, water infrastructure will not be 'climate-proofed' and take into account future drought/flood predictions, erratic rainfall and temperature increases. To enhance the water sector's understanding of adaptation, economic assessments will be undertaken under Outcome 3 of the LDCF3 project. These assessments will build on the sectoral vulnerability assessments and will demonstrate: i) the economic cost of current and future climate change to the water sector; and ii) the relative costs of different EbA and adaptation alternatives. Additionally, the establishment of the White Nile State Technical Committee – supported under Outcome 1 – will assist in the long-term climate-proofing of the water sector through improved inter-sectoral coordination for budget planning and adaptation.

106. **Project for Promotion of Animal Wealth and Management Funded by the Animal Wealth Administration at the White Nile State** (total annual budget 2016-2020, USD 2 million). This programme also receives support from the Federal Ministry of Animal Wealth. The objective of this project is to promote a shift from traditional grazing systems to more economic livestock production models, including rangeland rehabilitation through establishment of grazing enclosures, to improve meet and milk production, to promote fish production, to improve veterinary and extension services to lessen the impacts of animal diseases and to generally improve capacity and awareness of livestock producers. This is a continuous programme, however, lack of adequate financial resources limit the implementation of the programme to less than 50% of its annual targets. While underfunded, activities currently ongoing under this project can be used as a foundation from which to scale up and address climate risks in the livestock production sector through the LDCF3 project. However, the LDCF3 project will promote a more integrated EbA approach without the need for enclosures.

107. **Improved Rangeland Management Programme funded by the Range and Pasture Administration at the White Nile State** (total annual budget 2016-2020, USD 0.5 million). This programme represents core activities implemented by the State's Range and Pasture administration in support of the 5 Year Plan. It will include a number of activities and investments focused on improving rangeland and pasture management in the State, including: rangeland rehabilitation, conservation and promotion (through seed collection and reseeding) of valuable grazing species, measures to prevent rangeland fires, sand dune fixation, facilitation of animal movements to prevent conflicts with farmers etc. These investments, though insufficient, provide a valuable baseline on

which to build to LDCF3 project activities. The LDCF3 project will add an EbA-centric approach to demonstrate how to sustainably manage livestock and pastures while improving ecosystem services.

108. The **Integrated Solutions Project (ISP)** (USD 22 m, USD 1.6 million provided in cofinancing by the White Nile State to LDCF3) being implemented by the Ministry of Agriculture and funded by the Federal Government supports training for the rain-fed sector using extension farms and pilot sites in all states of Sudan with emphasis on rainfed agricultural areas. The Project is designating pioneer farmers in a targeted area of 1,480 ha (3,700 feddan) and providing agricultural technology packages to increase productivity. States are also contributing funds to support local components. It is being implemented in the White Nile State in the communities of Tendalti, Edweim, Gulli and Rabak. The project is adopting a package of water harvesting, improved seed, fertilizers and Integrated Pest Management (IPM) as well as planting trees in 10% of the cultivated areas. Objectives of the project are to improve agriculture and water harvesting productivity. The Agricultural Research Corporation is heavily implicated in the project to support the transfer of adaptation technologies while the Government provides agricultural machinery. The LDCF3 project will exploit the lessons learned on adaptation technology transfer gained through the ISP. In return, the Ministry of Agriculture and its umbrella organization in the White Nile State will gain training on how to integrate EbA and successful, cost-effective adaptation measures into its planning and budgets.

Component 3

109. Component 2 of the **ADAPT** project aforementioned focuses on baseline information gathering to improve knowledge management of adaptation in Sudan. However, without LDCF resources, ADAPT will not include ecosystem-centric thinking in the existing Cloud database. By continuing support for the existing Cloud database, it will become the central storage mechanism for environmental information, forecasts, predictions, lessons learned and costs. Incorporation of successful EbA demonstrations will enable EbA to be integrated and scaled-up in other environmental-related plans and strategies.

110. Relative to adaptation technologies, a baseline project is the **Seed Development Project** (2011 – 2017, USD 17.5 million supported by IFAD, not providing cofinancing because already providing to LDCF2). 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. The LDCF3 project will i) build on the experiences of the SEED project by adopting the most effective means of collaborating with the private sector and ii) contribute to the proliferation of improved seeds.

2.7. Linkages with other GEF and non-GEF interventions

111. Numerous GEF and non-GEF projects that focus on adaption to climate change are currently being implemented in Sudan. These initiatives provide opportunities for synergies and knowledge exchange with the LDCF3 project. The Project Coordination Working Group (See Section 4, Institutional Framework) will coordinate efforts and establish linkages with these projects. The related projects are described below.

GEF Initiatives

112. The proposed third LDCF project (LDCF3) will build strategically on the LDCF1 and LDCF2 (NAPA follow-ups) projects that are currently under implementation. The LDCF3 project will focus on adaptation activities in a complimentary region not yet supported, the White Nile State.

113. Descriptions of both LDCF-financed projects are provided below:

114. **LDCF1: Implementing NAPA Priority Interventions to Build Resilience in the Agriculture and Water Sectors to the Adverse Impacts of Climate Change in Sudan, supported by the LDCF and implemented by UNDP (2009-2013, US$3.3 million).** This project implemented a number of adaptation pilot measures aimed at improving the climate change resilience and food insecurity of small-scale farmers and pastoralists in 4 states in Sudan (River Nile State, Northern Kardofan State, Gedarif State, and South Dafur State). The LDCF1 project implemented measures of share-cropping, water harvesting, sand stabilization and tillage adjustments, rangeland and farm crop diversification, strengthening local leadership for adaptation and communal revolving funds for gas stoves and irrigation pumps. While there are some degrees of overlap in the types of measures implemented, the LDCF3 project will be implemented in a different state and will be novel in having EbA as a guiding principle. Close links will be sought with this project and the results of the LDCF1 to benefit from successful adaptation technology practices so that they can be replicated in the White Nile State.

115. According to the final 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 LDCF3 project has been developed along these lines and has incorporated the following lessons learned provided by the final evaluation of the LDCF1 project:

- Construction of living shelter belts to combat desertification on a large scale to be effective;
- Development of Village Development Committees (VDCs) to initiate and manage EbA activities;
- Use of a Technical Committee structure at the state level to discuss technical issues, set priorities, prepare work plans, resolve conflicts and supervise activities;
- Application of revolving funds for purchase of EbA-focused technologies and practices such as for solar irrigation pumps or gas stoves/cylinders (the latter to reduce pressure on biomass resources)
- Ensuring transfer of knowledge from outside Sudan to the Sudanese experts at either national or state level;

116. As such, the LDCF3 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:

- Bringing additional expertise on EbA aspects of agricultural production/water management/climate change to the sites and promoting diversification of Income Generating Activities (IGAs);
- Bringing additional resources for knowledge management, lesson learning, and participatory planning brought to the state and the sites; and
- Engaging with existing Stakeholders on how to improve their resilience to CC by facilitating and coordinating EbA measures within the newly formed State Technical Committee.

117. **LDCF2: Climate Risk Finance Project (also called CRFP) for sustainable and climate resilient rain-fed farming and pastoral systems (2014-2017, US$5.7million, funded by the LDCF and being implemented by UNDP).** This project is aimed at increasing the climate resilience of rainfed farmer and pastoral communities in communities of 6 states with high rainfall variability through climate risk financing (Kassala, White Nile, Nile State, Northern Kordofan, Gedarif, and

Southern Darfur). The LDCF2 project covers the Tendalti and Edweim Localities in the White Nile State. This project is improving national and decentralized capacities to provide timely forecasts and early warnings, as well as to develop complementary micro-finance and weather-based index insurance services for rain-fed farmers and pastoralists to improve their ability to manage and adapt to climate risks. The White Nile State is one of the beneficiaries of the LDCF2 project. It is expected that the LDCF3 project will be able to benefit from the improved modelling, climate predictions and weather forecasting capacities the LDCF2 project will provide. Such climate predictions will be used for EbA planning. Since the LDCF3 project will address residual effects of climate change after adaptation measures are implemented, successful experiences with climate risk insurance pilots will be progressively integrated into overall strategies developed for adaptation and EbA in the White Nile State and targeted communities.

118. The LDCF2 project is linked with Component 2 of LDCF3 by building on NAPA good practices such as promotion of proven adaptation crop and livestock production technology packages to be linked with Microfinance. It is also promoting pioneer farmers, support for women and youth in agriculture and linking with agricultural research. Without LDCF resources, the broad based approach of EbA, where actions rely on ensuring improvements to ecosystem services in the long-term, will continue to be ignored. For instance, the LDCF3 project will assist the LDCF2 project in improving water storage and retrieval mechanisms by looking at how much rainwater can be captured and infiltrated in using a catchment based approach.

119. The LDCF3 project will have a strong collaboration with the LDCF2 by linking knowledge management activities under Component 3 to the Cloud database being developed under LDCF2. The cloud database is operated jointly by HCENR and the ARC. It contains project information, climate projections and data on ARC's technologies for adaptation. The LDCF3 project will make use of the Cloud database for knowledge management specific to EbA and will document lessons learned and good practices on EbA. In such a way, the database will be able to integrate EbA into the planned MFI/WII products to be generated under LDCF2. Also, Farmer/Pastoral Producer's groups will also be able to exploit such knowledge.

120. Other key ways in which the LDCF3 project will support integration of EbA into the LDCF2 activities include the following:

- Promoting adaptation technology packages that support EbA
- Incorporation of EbA into the designs of micro-credit, loan products for SRFP

121. By incorporating EbA into the design of technologies and the climate risk finance (MF/WII) products to be developed, the LDCF2 project will be able to more effectively address residual impacts after adaptation measures are integrated into SRFP livelihoods. Also, because the MF/WII products are expected to proliferate throughout Sudan so that more vulnerable SRFP communities can have insurance against residual climate risks thanks to the support of established MFIs, the applications of EbA will also spread to other communities.

122. The **Rural Livelihoods' Adaptation to Climate Change in the Horn of Africa (phase II) programme (RLACC** - AfDB, USD 7.08 million, 2016-2019) is a child project of AfDB's Drought Resilience and Sustainable Livelihoods Program (DRSLP) and will be implemented in Sudan and Somalia. The programme is focused on supporting pastoral livelihoods in the Arid and Semi-Arid Land (ASAL) regions of Sudan. In Sudan, the programme will be implemented in the White Nile State, Gedaref State and Kassala State (activities will be implemented in another region of the White Nile State, specifically the Al Baja Reserve Pasture Area). Component 1 supports updates to sectoral policies and local development planning on climate-sensitive, ASAL-focused pastoral and agro-pastoral development. Component 2 is concerned with providing water harvesting infrastructure and supply networks and supports the diversification of supply-chain income-generating adaptive activities. Component 3 concerns general knowledge management. The LDCF3 project and the

RLACC project will both strengthen communities to conduct adaptation activities such as afforestation and shelterbelt development. The LDCF3 project will support RLACC to take an EbA-centric approach to its adaptation activities. Similarly, the cost-benefit analyses from the LDCF3 project can strengthen the acceptance and mainstreaming of adaptation activities in ASALs. Furthermore, although the RLACC is not planning on using the cloud database centre, the LDCF3 project can support RLACC to incorporate its lessons learned into the existing cloud-based database to centralize all adaptation-related information.

123. The **IFAD Livestock Marketing and Resilience Programme (LMRP)** (USD 120 million, funded by the GoS, World Bank, and GEF with a GEF contribution of USD 7.73 million) is a joint effort between IFAD and the Government of Sudan/ Ministry of Livestock Fisheries and Rangelands (MoLFR). The LMRP overall objective is to revive the livestock industry, optimize the use of a seriously impacted natural resource base under threat from climate change and address rural poverty in five States (White Nile, Sinnar, Blue Nile, North Kordofan and South Kordofan). The programme features small-scale livestock and income diversification elements, combined with an innovative Pro-Poor Public Private Partnership approach that aims at addressing the challenges facing many of the livestock dependent rural communities. The programme focuses on the modernization and expansion of all aspects of the livestock main value chains as the key to reducing rural poverty. The programme's primary target population comprises poor households residing in pastoralist and agro-pastoralist communities. In particular, it will target rural poor women and men, common interest groups, and village development structures. Poor households in 1,000 villages in five States (North Kordofan; West Kordofan; White Nile; Sennar and Blue Nile) will be eligible to participate in project activities, with a target outreach of 100,000 households.

124. The three components of the LMRP Programme include the following:

- Component 1: Livestock business development - This Component will improve value addition and market access for small-scale pastoralists and agro-pastoralists by addressing constraints on live animal, skins and hides, and red meat value chains
- Component 2: Community-led natural resource management and enhanced adaptive capacities – This Component will support a community-led visioning process to prioritize NRM investments and will facilitate activities for discussing policies and arrangements that can reduce conflicts
- Component 3: Rural enterprise and social development – This Component promotes the scaling up of viable business plans through further technical support and access to affordable loans from microfinance institutions.

125. Although the LMRP focuses on NRM, the interventions do not consider the use of biodiversity and ecosystem services as part of an overall adaptation strategy. The LDCF3 project will provide examples of sustainable NRM using EbA as a core design principle. Lessons learned on EbA stored in the Cloud database through Component 3 of the proposed LDCF3 project will be useful for LMRP. In return, LMRP will provide valuable experiences on exploiting value chains and enabling SRFP to access credit through Microfinance.

126. The **Sudan Sustainable Natural Resources Management Project (SSNRMP)** (financed by GEF and the WB, 2014-2019, USD 8.35 million) aims to increase adoption of sustainable land and water management practices. The project contains the following three components: 1) institutional and policy framework; 2) community based sustainable management of rangelands, forests and biodiversity; and 3) project management, monitoring and evaluation. The first component supports key institutions involved in natural resources management by strengthening their capacity to formulate,

implement and monitor programs and projects geared towards the sustainable management of natural resources and biodiversity conservation, based on a capacity enhancement plan. The second component supports the preparation of integrated land management plans for specified reserves and rangelands, while the third component deals with procurement, financial management, environmental and social safeguards, annual work plans and organization of supervision missions.

127. Specifics on the three components which are complimentary to the 3 components of the LDCF3 project are provided below:

- Component 1 addresses the lack of effective comprehensive policies and legislative frameworks that deal with sustainable forest and land use management in an integrated, multisectoral way. A strategy will be developed for effective cooperation at center-state-local and community levels for the protection and conservation of the natural resource base. The project will work with HCENR to strengthen policy framework and legislation for Sustainable Land and Water Management (SLWM) and biodiversity conservation.

- Component 2 involves preparation of integrated land management plans for Al Baja and Um Jara in the White Nile State. Activities also include establishment of shelter belts for sand dune fixation, demarcation of animal migration routes and grazing land rotations, establishment of nurseries for rangeland rehabilitation and clearing and opening of fire lines to protect rangelands.

- Component 3 provides support for operating a M&E system that will track the project results, including those registered in the GEF tracking tools for Biodiversity, Land Degradation and Sustainable Forest Management.

128. Due to the great complementarities between the SSNRMP and LDCF3, the projects will be well-aligned to avoid redundancies. LDCF3 will focus on policies related to EbA while SSNRMP will focus on SLWP. Both will benefit from the LDCF support for ministries to understand the cost-benefits of EbA and to be able to integrate EbA into planning and budgeting.

129. Also, SSNRMP will be influenced by the site specific vulnerability analyses for the target regions in the White Nile State. Also, lessons learned from the adaptation interventions and M&E under Component 3 of the SSNRMP can be stored in the cloud database under Component 3 of the LDCF3 project so that more knowledge to build the resilience of SRFP can be disseminated throughout Sudan.

Non-GEF-projects

130. **Programme for Protection of Forest Resources in White Nile State funded by the Forest National Corporation (FNC) at the White Nile State** This programme is focused on maintaining forest resources, improving forest management and land conservation and includes activities such as establishment shelter belts to protect agricultural land, improved extension services, establishment of village woodlots, implementation of agroforestry on 5% of the irrigated lands and 10% of rainfed agricultural lands, creation of 'women forests' (i.e. woodlots established and managed by women with support by Forest National Corporation - FNC), rehabilitation of Gum Arabic belt and awareness raising. The programme lacks adequate funding because it is mainly financed through the FNC which is self-financed institution with limited resources. While the programme has limited funding, the activities implemented will provide an important baseline from which LDCF3 EbA activities related to forests can be scaled up in the target communities.

131. **Programme for Provision of Improved Seeds, Water Harvesting and Improved Extension Services funded by the Rainfed Agriculture Department** The objective of this programme is to improve food security, increase farmer income and promote better utilization of water resources in the agriculture sector. Activities include dissemination of improved seeds, investments in water harvesting and improvements in extension services. While not specifically targeted to adaptation, there is a high degree of overlap between adaptation priorities and the basic sustainable development interventions promoted by this programme in poor rural communities. This is a continuing programme for this department, but the level of annual activities being implemented and coverage in terms of areas and number of beneficiaries is very much dependent on the actual budget allocations, which in general is inadequate to reduce the vulnerability of all the affected communities, especially in the 4 localities of the western side of the While Nile river. It is expected, that the LDCF3 will be able to build on and scale up successful activities implemented in this programme while incorporating additional climate change resilience measures.

132. **Natural Resources and Peacebuilding in Darfur and Kordofan project** (implemented by UNEP partnered with SOS Sahel and the Darfur Development and Reconstruction Agency, Aug 2015 – 2018, $US3.4m, fully funded through the European Union's **Instrument Contributing to Stability and Peace, ISP**) has the objective to improve local and state capacity to resolve resource conflicts and to manage natural resources for peace and sustainable development. Due to the absence of inclusive dispute resolution and decision-making mechanisms involving all relevant livelihood groups on natural resource use, access rights and management, tensions have exacerbated over natural resources in the Greater Kordofan and the Darfur states in Sudan. The ISP project will contribute to four interrelated outputs: 1) NRM interventions carried out in 5 project localities, 2) Livelihood trainings and services delivered to vulnerable natural resource user groups, 3) Training and capacity building on advocacy and mediation to local administration and civil society and 4) Knowledge products and best practices on improving relationships and trust using natural resources. Key activities will include i) construction and rehabilitation of water infrastructure, ii) support for tree nurseries and seedling production, iii) reseeding of rangeland and community forests, iv) demarcation of range lands and migratory routes, iv) livelihood support provided to farming and pastoral communities and v) monthly peace and natural resource management forums. The project will ultimately contribute to a more participatory system of local governance and dispute resolution. The LDCF3 project will build off lessons learned on livelihood support for farming and pastoral communities, community reforestation and EbA-related NRM practices. In return, the LDCF3 project will collaborate with the ISP project to ensure mainstreaming of EbA with the support of the PCWG.

133. **Plan Sudan** is an NGO focusing on child-related issues, education, health, water and livelihood activities. They have a good reputation involving communities in their work and requiring community participation. Due to their success in supporting rural communities in the White Nile State since the 1980s, they will be implicated to assist with coordination for the LDCF3 project. In return, the LDCF3 project will build Plan Sudan's capacity to understand and be able to implement and monitor EbA activities.

SECTION 3: INTERVENTION STRATEGY (ALTERNATIVE)

3.1. Project rationale, policy conformity and expected global environmental benefits

134. The LDCF3 project will increase the resilience of vulnerable rain-fed farming and pastoral communities in the White Nile State to the observed and predicted effects of climate change. The project will emphasise the demonstration of cost-effective, low-regret options for adaptation – including the demonstration of climate-resilient practices such as EbA and climate-resilient land and water management. By promoting alternative livelihoods, it will benefit impoverished rural communities. The objectives of the proposed project will be achieved through multiple

complementary measures that will include: i) supporting the mainstreaming of climate change adaptation at inter-ministerial, policy and sectoral levels; ii) increasing the technical capacity of national, state and local-level government staff to deliver EbA measures; and iii) demonstrating the cost-effectiveness and sustainability of EbA and climate-resilient land / water management practices in participation with communities.

135. In the long-term, the investments of the LDCF3 project will generate sustained benefits for the vulnerable SRFP communities beyond the lifespan of the project. Vulnerability assessments in the target communities of the White Nile State and economic assessments of EbA measures at a national level will support mainstreaming of cost-effective adaptation measures into sectoral budgets and plans that will support medium- and long-term adaptation to climate change. Also, the EbA project concept notes undertaken under Outcome 3 will catalyse private sector investment in the upscaling of project interventions and lessons learned from EbA and climate-resilient land and water management interventions will be collected and stored through Component 3.

Policy conformity

136. The LDCF3 project is aligned with the GEF VI programming strategy for LDCF/SCCF projects. Therefore, the project activities will complement and build on the achievements of the existing GEF projects being planned and implemented in Sudan. It will also build on relevant non-GEF projects, as outlined in Section 2.7. The following GEF Focal Area Objectives are addressed in the project:

- CCA-1, Outcome 1.1: Institutions on national, state and local levels will be given the capacities to mainstream adaptation (particularly EbA) into development frameworks.
- CCA-1, Outcome 1.2: The LDCF3 project will reduce the vulnerability of rain-fed farmers and pastoralists by improving ecosystem services and supporting sustainable land / water management practices.
- CCA-1, Outcome 1.3: Diversified and strengthened livelihoods. The LDCF3 project will train rain-fed farming and pastoral communities to have alternate sources of livelihoods such as backyard gardening and poultry raising. This will reduce the impacts of climate change on the SRFP.
- CCA-2, Outcome 2.1: Increased awareness of climate change impacts, vulnerability and adaptation. The climate change awareness-raising programme to be implemented by the LDCF3 project will contribute to this CCA-2 outcome. Furthermore, the project will conduct vulnerability assessments and demonstrate adaptation interventions, which will further contribute to an increased awareness about vulnerability and adaptation.

137. The LDCF3 project is aligned with Sudan's policies and strategies on development and environmental management. These are communicated in the following documents: i) Sudan's 25 Year Strategic National Development Plan; ii) Sudan's Five-Year plan; iii) Sudan's Action Plan for Agricultural Revival (APAR); iv) Sudan's NAP; and v) Sudan's NAPA.

LDCF conformity

138. As Sudan is a non-Annex I party to the UNFCCC and has already submitted the NAPA to the UNFCCC Secretariat, the project meets the LDCF's eligibility criteria. Furthermore, the project conforms to the strategic objectives of the LDCF, as described below.

139. *Participatory approach:* the project's activities and proposed intervention sites were selected through extensive stakeholder consultations at both local and national levels. Please see Section 2.5 for a full breakdown of stakeholders consulted during the PPG process and Appendices 7 and 16 for consultation notes

140. *Implementing NAPA Priorities:* The LDCF3 project supports the implementation of the NAPAs. The LDCF project has therefore been developed in alignment with priority activities outlined in Sudan's NAPA (2007) for the water and agricultural sectors through the following:

- Promotion of Natural Resources Management (NRM)
- Rehabilitation of water facilities
- Participation of women in climate change projects
- Afforestation
- Use of improved cookstoves
- Use of environmentally sound technologies in all agricultural and NRM practices

141. *Learning-by-doing approach*: The LDCF3 project will demonstrate innovative climate-resilient land and water management interventions as well as EbA techniques to strengthen rain-fed farmers and pastoralists resilience to climate change. The lessons learned at the national and state levels will be documented and disseminated to inform national and sub-national development plans in Sudan (Output 3.1), providing future projects with lessons learned from LDCF3 project interventions.

142. *Multi-disciplinary approach:* The interventions of the LDCF3 project require expertise from multiple sectors, including water, agriculture and livestock. Consequently, the development of appropriate interventions in rain-fed farming and pastoral communities will be undertaken under the guidance of technical experts from all of these sectors, including through multi-sectoral committees such as White Nile State Technical Committee to be established under Component 1 of the LDCF3 project. In addition, the interventions demonstrated by the project will have a cross-sectoral approach that will include methodologies and techniques from fields related to rangeland restoration and integrated water resources management.

143. *Gender equality:* In Sudan, the adaptive capacity of both men and women is compromised by challenges such as to: i) limited access to natural resources such as water; and ii) limited participation in social networks that provide resources or technical support to adapt to the observed and predicted effects of climate change. However, Sudanese women are considered to be particularly sensitive to the effects of climate change because they tend to be responsible for domestic responsibilities such as cooking and collection of fuel and water for household use. Currently, most women in rural parts of Sudan have insufficient access to relevant information and skills to manage the negative effects of climate change on food, fuel and water security. A reduction in access to natural resources therefore has detrimental implications for women and families in terms of i) food security; and ii) livelihood income.

144. The LDCF3 project will address the vulnerability and low adaptive capacity of women to climate change by mainstreaming gender considerations into the design and implementation of EbA activities. For example, the project will work directly with women-focused cooperatives and associations, for livelihood diversification activities such as backyard gardening. To integrate gender into relevant activities, the LDCF3 project will collaborate with the White Nile State's Women Union for all activities supporting women within the state (See Section 2.5). Under Component 2, gender specific indicators and targets will be developed to monitor the progress of gender mainstreaming into EbA activities and the development of alternative livelihoods. Also, the Water User Associations and Village Development Committees will have at least 30% women representation. Under all Components, gender sensitivity will be incorporated into trainings so that female participants are empowered to participate fully in the training sessions and related EbA activities. Trainers will be required to have the skills and experience necessary to plan and facilitate gender-sensitive training. Finally, the project results framework has used gender-disaggregated targets to ensure gender is mainstreamed throughout.

145. The project will also significantly benefit women. In rural Sudan, women as household members or heads of households contribute appreciably to the household economy and food security in diversified ways with differences among regions. Beside their routine household duties, women participate in household farming by contributing to crops cultivation in back yard farms (Jubrakas), which provide households with early income and food prior to the harvest of field crops; feeding and watering of the household herd when at home, collection of water and firewood, and milling of grains. In many rural areas women also undertake non-farm enterprises like traditional food processing, petty trading, poultry rearing, and traditional apiculture etc, where most of their earnings are dedicated to family well-being.

146. The LDCF3 project plans to provide water and increase the uptake of adaptation technology uptake by women. Approximately, 50% women will be targeted. The project will also ensure that women are more involved with decision-making from state to local levels. This goal seems feasible due to Sudan's demonstrated progress in achieving the MDGs. According to the Arab States report, Sudan has taken the lead with overcoming barriers to women's political representation by introducing gender quotas.[31]

147. *Complementary approach:* The LDCF3 project will work in conjunction with relevant ongoing adaptation projects in Sudan such as ADAPT (Section 2.6). It will build on the activities of the identified baseline projects, climate-proofing their interventions to promote the achievement of their objectives. The project will also coordinate with other ecosystem management projects to share valuable lessons and prevent duplication of efforts. In addition, trainings will build on adaptation funding received in the past (LDCF1 and LDCF2) to continue to proliferate climate change adaptation throughout Sudan.

3.2. Project goal and objective

The project objective is to increase the climate change resilience of livelihoods and integrated productive agricultural systems in the White Nile State through Ecosystem Based Adaptation approaches.

148. The LDCF3 project will ensure that baseline investments, such as with on-going programmes and projects within the White Nile State under the 5 Year Plan umbrella and the ADAPT project, are made resilient under future climate change conditions and that successful activities are scaled up to provide adaptation benefits to an increased number of vulnerable communities and farmers.

149. The LDCF3 project's investments will be further strengthened by building the capacity of rain-fed farming and pastoral communities to design and implement climate-smart practices such as EbA, climate-resilient agriculture and pastoralism, thereby strengthening the capacity of communities to adapt to climate change while increasing household income through diversification of livelihoods. At a central/national level, the project will enhance institutional capacity and improve coordination for adaptation at an inter-ministerial level, including through investments in training and increased availability of knowledge (such as cost-effective EbA measures) to inform adaptation planning. The objectives of the project will be achieved through three complementary outcomes (please refer to Section 3.3 for more details).

3.3. Project components and expected results

150. The LDCF3 project will contribute to the long-term sustainability of baseline projects under conditions of climate change, as described in Sections 2.6 and 3.8. The three components and associated activities of the LDCF3 project are detailed below.

[31] United Nations and League of Arab States 2013. The Arab Millennium Development Goals Report Facing Challenges and Looking Beyond 2015 League.

Adaptation alternative

151. As described in Section 2.6, baseline problems of the White Nile State include *inter alia*: i) drought and rainfall fluctuations; ii) food and livelihood insecurity; and iii) insufficient access to water. Various national projects have been initiated to address these baseline issues. Specifically, the Rainfed Agriculture Department is providing improved seeds and extension services while the Range and Pasture Administration is focusing on rangeland rehabilitation in the White Nile State. More details on the baseline projects are provided in Section 2.6.

152. The current and predicted effects of climate change – including inter alia increases in the frequency of drought events, delays in the rainy season, increasing desertification – are likely to reduce the efficacy of the baseline projects. For example, the State Water Authorities will continue to develop water infrastructure such as the Wad Gabur earthen dam without an understanding of climate change vulnerabilities of the water sector – and associated costs. Similarly, without LDCF3 project interventions the Animal Wealth Administration will focus solely on improving the productivity of livestock without the benefit of restoring healthy ecosystems to buffer rangelands from decreasing fodder, increasing soil infertility and creeping desertification. The additional cost reasoning of the LDCF3 project is presented in more detail in Section 3.7.

153. In order to enhance the capacity of national and state government members and agro-pastoral communities to adapt to climate change in the White Nile State and to build on the outcomes of baseline projects, the LDCF3 project will undertake a range of adaptation interventions. Under Component 1, the technical capacity of government staff at local, state and national levels to adapt to climate change in Sudan will be increased with enhanced knowledge of EbA. This will be achieved by promoting EbA through training programmes and integrating EbA into national strategies and budgets in addition to state and locality development plans. Under Component 2, EbA technologies and climate-resilient land and water management techniques will be transferred to agro-pastoral communities in the White Nile State to reduce their vulnerability to droughts, rainfall variability, and extreme events. Similarly, alternative livelihoods supporting EbA will be promoted. Finally, under Component 3, Sudan's EbA information base, monitoring capacities and knowledge management systems will be strengthened. Additionally, an upscaling strategy for the expansion of EbA practices will be developed based on evidence from cost-benefit analyses for both the public and private sectors. These interventions are described in further detail below.

Component 1: Capacity Development for Ecosystems based Adaptation (EbA) and policy mainstreaming

Outcome 1: *Improved and strengthened technical capacity of local, state and national institutions to plan, implement and upscale EbA*

154. Through LDCF resources, the project will support the creation of policy frameworks, capacity and awareness on the benefits and practical possibilities for EbA at the national, state and community levels. At present, the cost of climate change at a sectoral level is not well understood and the economic rationale for climate change adaptation in agro-ecological zones has not been developed. Consequently, climate change is not adequately integrated into national policies / strategies or into state and locality plans. To change this, the project will facilitate a dialogue process (to investigate the potential for EbA as a strategy for climate change adaptation in Sudan) at both the national and state levels. HCENR will be reinforced to promote EbA at the national level while a White Nile State Technical committee will be established to facilitate dialogue and to coordinate EbA measure planning at the state level. The dialogue will take place with participation of a broad range of stakeholders

including government institutions, community based organizations (CBOs) and Non-Governmental Organizations (NGOs).

155. Furthermore, the project will facilitate a review of existing policies for entry points of EbA into practical legislation and planning, and will provide technical support such as policy briefs, guidelines etc. Finally, LDCF funds will be spent to provide targeted training of stakeholders, including, when relevant, study missions to pilot implementation sites of component 2. On the state/locality level (based on vulnerability assessments and practical experiences from pilot implementation of EbA in component 2) LDCF funds will be used to facilitate a policy process to mainstream adaptation into regular state/locality planning and budgeting.

156. These activities will build upon baseline activities of the ADAPT project whose costs are estimated at USD 704,000 (with an additional USD 35,200 contribution to PM costs). The additional costs sought from LDCF resources are estimated at USD 500,000.

Output 1.1 A multi-disciplinary White Nile State Technical Committee established and strengthening of HCENR in order to facilitate cross cutting dialogue at the state and national levels of climate change adaptation and EbA and coordination of EbA measure planning in vulnerable sectors

157. Output 1.1 will support the establishment of a cross-sectoral White Nile State Technical Committee to facilitate dialogue on climate change adaptation and EbA at the state level. In addition, the Committee will support climate-informed adaptation planning to reduce potential risks for vulnerable, agro-pastoralists to predicted impacts of climate change. To ensure continuity beyond the project implementation, the State Technical Committee will be comprised of the members of the state's Environment Committee, which was formed under the NAPs process, in addition to other relevant institutions. The State Technical Committee will deal with all technical aspects of state environmental projects such as extension and community farms, monitoring of activities, technical backstopping for different project activities and advising on upscaling and knowledge sharing. This output will also strengthen HCENR's capacities and other cross-sectoral ministry representatives to facilitate information sharing and EbA measure coordination at the national level. HCENR will provide support for climate-informed decision-making at the national level due to its long-experience in working on climate change-related projects. All planning will take into account climate predictions provided by the Sudanese Meteorological Authority (SMA). SMA is being supported by the LDCF2 Climate Risk Finance project to enhance prediction and forecasting capacities.

158. Both HCENR and the State Technical Committee will be supported to ensure complementarities and programmatic synergies between the LDCF3, ADAPT and LDCF2 projects in developing national and state level capacities for climate change adaptation. The LDCF3 project will ensure that EbA is mainstreamed into the capacity building activities provided by both the ADAPT and LDCF2 projects.

The activities to be implemented under Output 1.1 are:

1.1.1 Establish a State Technical Committee to operationalise a state dialogue on climate change adaptation and EbA and support climate-informed adaptation planning with strong links to relevant state institutions.
1.1.2 Enhance the technical capacity of HCENR, relevant ministries and the State Technical Committee for i) information-sharing on EbA; ii) coordinating climate change adaptation measures; and iii) integrating future climate risks into decision-making
1.1.3 Support cross-sectoral meetings for a Project Coordination Working Group (PCWG) at the State level along with HCENR to integrate EbA across sectors and promote programmatic synergies at the state level

Output 1.2 A stocktaking exercise undertaken and revisions of existing national and White Nile State policies and strategies identifying entry points for EbA and cost-effective up-scaling strategies for climate-risk informed EbA planning and budgeting.

159. Output 1.2 will provide a stocktaking exercise for policy- and decision-makers on how they can update existing policies and strategies to incorporate EbA in the context of future climate risks. Climate predictions will be provided by the Sudanese Meteorological Authority who is being supported to enhance their prediction capacities through the LDCF2 Climate Risk Finance project. This Output will be supported by HCENR at the national level and the State Technical Committee at the state level. The exercise will highlight what is required to plan, implement and finance climate change adaptation interventions – including EbA. National and White Nile State government officials from important sectors – including *inter alia* agriculture, pastoral, and water – will be provided with training on how to integrate different adaptation options per sector based on the most cost effective adaptation options highlighted through Component 3's upscaling strategy (Output 3.3). Updates to the state policies and strategies for the White Nile State will serve as a model for the other states across Sudan.

The activities to be implemented under Output 1.2 are:

1.2.1 Conduct stocktaking exercise for national and White Nile State policy- and decision-makers on how they can update existing policies, strategies and budgets to incorporate EbA in the context of future climate risks
1.2.2 Revise policies, strategies and budgets to integrate EbA accordingly

Output 1.3 Policy briefs and technical guidelines developed and distributed for policy – and decision makers on increasing the resilience of local community livelihoods to current and future climate change risks using appropriate ecosystem based adaptation and knowledge gained from demonstration activities in Component 2.

160. Through Output 1.3, policy briefs will be produced to guide the integration of climate change adaptation interventions – including EbA – into cross-sectoral plans. Moreover, technical guidelines and training will be provided to the State Technical Committee and technical staff of HCENR and other relevant ministries on mainstreaming adaptation and EbA into national and sectoral development plans.

1.3.1 Develop and distribute technical guidelines for policy- and decision-makers on best practices of EbA based on lessons learned from demonstration activities (best practices will be documented through Component 3)
1.3.2 Develop and distribute policy briefs that identify entry points at the national and state levels for the integration of climate change adaptation interventions, including EbA, into relevant national and sectoral development plans
1.3.3 Provide operational and technical support to HCENR, the State Technical Committee and relevant ministry representatives on how to mainstream adaptation and EbA into national and sectoral development plans

Output 1.4 Targeted CC adaptation and EbA planning/implementation training programmes for stakeholders completed, including field visits to learn from successful adaptation implementation.

161. The LDCF3 project will exploit lessons learned from interventions to improve the technical functioning of the State Technical Committee, HCENR and other relevant ministries on implementing EbA and CC adaptation. Operational and technical support will include how to: i) implement EbA measures; and ii) raise awareness about climate change effects in agro-pastoral areas.

162. The training sessions conducted under Output 1.4 will be informed by site visits highlighting successful EbA measures.

The activities to be implemented under Output 1.4 are:

1.4.1 Site visits to gather lessons learned on best EbA practices
1.4.2 Training sessions for HCENR, relevant ministry members and the State Technical Committee on successful EbA measures

Output 1.5 Facilitation of a local policy dialogue (based on vulnerability assessments and practical experiences from pilot implementation of EbA in component 2) on mainstreaming of adaptation into state and locality development plans

163. Training under Output 1.5 will support the White Nile State Technical Committee with information and technical guidance to mainstream adaptation into state and locality development plans. There is currently limited public awareness of climate change and adaptation in the White Nile State. Although HCENR authorities have implemented education campaigns on climate change adaptation in the country, dissemination of information on this topic is still limited. In particular, there is limited public knowledge on: i) the current and predicted effects of climate change on agro-pastoralists; ii) potential adaptation interventions to manage these effects; and iii) the benefits of EbA for increasing the resilience of communities to climate change. Through the LDCF3 project, awareness-raising campaigns will be designed and implemented for the target communities. Training will be on successful EbA implementations and mainstreaming of adaptation into state and local development plans.

The activities to be implemented under Output 1.5 are:

1.5.1 Provide awareness raising campaigns for State authorities and local communities on the benefits of EbA for increasing the resilience of communities to current and predicted climate change impacts
1.5.2 Develop and/or adapt technical guidelines in Arabic on how to assess, plan and finance climate change adaptation interventions
1.5.3 Provide training to the State Technical Committee and relevant local representatives on how to integrate EbA into the state and local planning

Component 2: Implementation of EbA measures to build adaptive capacities of vulnerable communities

Outcome 2: *Reduced vulnerability of local communities to climate change impacts in the White Nile State*

164. Presently, a more detailed assessment is necessary for the design, planning and construction of specific EbA measures. This component will provide targeted assessments to direct investments for EbA in the four pilot localities on the western side of the White Nile River (Edwaim, Tendalti, Alsallam, and Gulli). All localities were identified through the Sudan NAP and NAPA processes as particularly vulnerable to climate change. They were also confirmed to be vulnerable during stakeholder consultations as indicated in Appendix 7 which describes the site selection process. Concrete interventions in these localities will be implemented in three phases.

165. First, a comprehensive Vulnerability and Adaptation (V&A) assessment detailing specific climate change vulnerabilities for current and projected climate change risks in each of the target communities will be conducted to identify entry points and guide identification of specific priority EbA measures to be pursued. This assessment will also analyse existing indigenous practices for dealing with current drought and flood risks and how these can be considered in the development of local adaptation measures. Examples of indigenous practices include water harvesting, sorghum and millet grains storage, drying of vegetables like okra and tomatoes and small ruminants feeding. The V&A assessment will be conducted with the support of a V&A expert including support from experts from the previous NAP V&A assessment for the White Nile State.

166. Second, the project will implement concrete adaptation investments that integrate EbA for the agriculture, pastoral and water sectors in each of the 4 target SRFP communities. Designs for the concrete investments will take into account climate predictions provided by the Sudanese Meteorological Authority in terms of rainfall and temperatures expected seasonally. Based on the integration of present and future climate risks, the EbA approach will be piloted through targeted restoration of degraded ecosystems such as rangelands, forests and riparian zones. Climate-resilient, drought-tolerant plant species will be prioritised in these restoration activities. Furthermore the project will prioritize native species which generate multiple goods and services (for example fruit trees) for the benefit of local communities. Such restoration and climate-resilient management of the agro-ecological regions will provide protection against desertification as well as enhance ecosystems goods and services.

167. Concrete EbA measures to be implemented include 1) establishment and strengthening of extension farms with improved seeds and rainwater harvesting, 2) establishment of 2,000 local farms (4 ha each) demonstrating adaptation technologies and EbA practices, and 3) water reservoir rehabilitation. By strengthening extension services of the ministries of Agriculture, Range and Pasture and Forestry under 1) mentioned above, this will ensure sustainability of project interventions and easier integration of EbA into state development planning. Importantly, the EbA measures will involve communities at pilot sites in the site selection and implementation of the project's activities through the support of Village Development Committees (VDCs) and Water User Associations (WUAs) to be established with the support of the project. VDCs had much success in supporting climate-resilient initiatives for the LDCF1 project and will therefore be replicated in these localities.

168. Investments will provide both real benefits, in terms of reduced vulnerability in the beneficiary communities, but also a large number of good practical examples that can scaled up and used for inspiration in other communities across the White Nile State and the country. The final list of pilot investments to be made will be selected through the participatory assessment from phase one, and based on the NAPA and NAP processes, best practices of other ongoing adaptation projects in Sudan and careful consideration of gender implications.

169. Thirdly, LDCF funds will be used to provide targeted training of local farmer/pastoral producer groups, CBOs/NGOs and the Women Union on appropriate adaptation strategies for making community livelihoods more resilient to current and future climate change impacts. This will include promoting women to farm in their backyards with appropriate, efficient farming implements and

practices and promoting alternative livelihoods based on indigenous practices such as poultry breeding with local races and small ruminant feeding.

The related activities will build upon state-run baseline activities by the State's Water Corporation, the Range and Pasture Administration, the Animal Wealth Administration and the Ministry of Agriculture, Irrigation and Forests, which are estimated to cost USD 6,204,500 (with an additional USD 310,100 contribution to PM costs) for this component. The additional costs sought from LDCF resources are estimated to cost USD 3,080,000.

Output 2.1 Current and future climate change vulnerability and risks for the selected vulnerable sites are identified to guide EbA interventions in pilot sites in the White Nile State

170. Under Output 2.1, Village Development Committees (VDCs) and Water User Associations (WUAs) will be established to manage community-based EbA measures following intensive environmental awareness campaigns, and community mobilization. VDCs and WUAs will be elected by community members and will have at least 30% representation by women. Committees will build on existing structures to form the VDCs / WUAs including inter alia poultry cooperatives, NGO groups and/or religious organisations. Subsequently, with the support of a Vulnerability and Adaptation (V&A) expert, the VDCs and WUAs will conduct a comprehensive V&A assessment of specific climate change vulnerabilities in each of the target communities to identify entry points and guide identification of specific priority EbA measures, emphasizing gender mainstreaming. The V&A assessment will guide the implementation and monitoring of EbA interventions.

The activities to be implemented under Output 2.1 are:

2.1.1 Establish Village Development Committees (VDCs) to manage community-based EbA measures with at least a 30% women representation
2.1.2 Establish Water User Associations (WUAs) in each pilot area with at least a 30% women representation to facilitate community water resources management
2.1.3 Based on the NAP conclusions for the White Nile State, Village Development Committees (VDCs) conduct comprehensive participatory V&A assessments, including gender tracking, of specific climate change vulnerabilities, both existing and predicted, in each of the target communities to identify entry points and guide identification of specific priority EbA measures, emphasizing gender mainstreaming
2.1.4 Define cost effective strategies for rangeland regeneration, increasing water infiltration and improving agricultural and pastoral yields using EbA in consultation with the VDCs and WUAs
2.1.5 Develop protocols to guide the implementation of EbA interventions based on CC predictions (including those generated under LDCF2)
2.1.6 Develop and implement community-based EbA intervention management and monitoring plans by the VDCs to ensure the long-term sustainability of interventions

Output 2.2 Regeneration of critical ecosystem services to restore degraded rangelands, increase water infiltration and improve resilience of rain fed agriculture and pastoralism under increasing drought conditions and dry seasons

171. Under Output 2.2, ecosystem services will be restored to improve natural resources in participation with communities in Al Dwaim, Tandelti, Alsalam, and Gulli. Demonstration plots will be established at each of these sites to showcase examples of rangeland regeneration, afforestation and

riparian zone replanting. Designs for such measures will be based on climate predictions provided by the Sudanese Meteorological Authority that will provide details such as mean rainfall and temperatures expected seasonally.

172. Additionally, management plans for the implementation of community-based EbA activities will be developed and implemented by the VDCs. The management plans will identify sites to carry out EbA and will include a strategy for the long-term sustainability and maintenance of the project's EbA activities. Sub-committees of the VDCs will be established to focus on specific elements of the management plan to improve ecosystem service provision such as *inter alia*: i) rangeland management; ii) land and water management; and iii) establishment of patrols to prevent activities such as illegal felling and illegal uses of tractors.

173. Output 2.2 will also support land use and soil quality mapping in consultation with the community. Land use maps clearly indicating agricultural uses versus pastoral uses will be endorsed by the State legislation council to avoid conflict and gain political commitment and support.

The activities to be implemented under Output 2.2 are:

2.2.1 Establish sub-committees of VDCs to focus on: i) rangeland management; ii) land and water management; and iii) establishment of patrols to prevent activities such as illegal felling and illegal uses of tractors
2.2.2 Document successful experiences by North Kordofan State in limiting the use of tractors
2.2.3 Collaborate with VDCs to identify/verify sites and pilot families to carry out EbA interventions specifics (size, function, personnel required) and to develop a strategy for the long-term sustainability and maintenance of the project's EbA activities
2.2.4 Rehabilitate 1600 ha of rangeland reserves in collaboration with the Range and Pasture Administration
2.2.5 Implement afforestation on approximately 1,500 hectares in collaboration with the National Forest Corporation
2.2.6 Replant and protect trees along riparian zones
2.2.7 Develop large-scale shelter belts to prevent desertification
2.2.8 Map current land use and soil quality using community involvement with endorsement by the State legislation Council.

Output 2.3 A number of EBA support measures are piloted and integrated into existing local community livelihood activities, including *in situ* rainwater harvesting and drought/flood resilient eco-agriculture.

174. The main source of income and sustenance for women is subsistence agriculture from community farms which provide fruit and vegetables. However, the productivity of agriculture is inadequate to meet the needs of the community as a result of poor soil quality and the widespread reliance on unsustainable agricultural techniques. The project's concrete interventions will include the demonstration of climate-resilient land management practices such as introduction of native, drought-tolerant fruits and vegetables and Integrated Pest Management.

175. Increased variability of rainfall, drought and desertification under climate change scenarios are also reducing agricultural yields. Such impacts, both present and future, as predicted by the Sudanese Meteorological Authority will be integrated into water management interventions such as rainwater harvesting and well rehabilitation. Training on the management of water-borne diseases and proper hygiene will be provided to the WUAs in addition to medical kits with prophylactics to prevent the spread of water-borne diseases such as malaria.

The activities to be implemented under Output 2.3 are:

2.3.1 Prepare 2,000 community farms (4 ha each) in total for the four target localities
2.3.2 Implement rainwater harvesting techniques on the community farms with support of WUAs
2.3.3 Introduce best agricultural practices and technologies with the support of ARC
2.3.4 Implement seed broadcasting on rangelands and Integrated Pest Management techniques for farms with capacity building by ARC
2.3.5 Design and rehabilitate water reservoirs and wells with the support of WUAs
2.3.6 Provide water hand pumps and introduce solar pumps for surface wells
2.3.7 Training for the Water User Associations (WUAs) in each target locality on water-borne diseases and proper hygiene including provision of medical kits with prophylactics

Output 2.4 Pilot implementation of alternative livelihood activities based on indigenous practices, including, *inter alia*, poultry breeding, home garden farming, and small ruminant strategic feeding as well as alternative energy use strategies to enhance community resilience to current and predicted climate change impacts

176. Smallholder farmers and pastoralists lack a sufficient earnings and capital base to make their livelihood systems more resilient to highly variable climate risks. LCDF funds will be used to promote alternative, proactive approaches to diversify and increase the income and livelihoods support systems of farmers and pastoralists, so that they can become more resilient to climate-related risks.

177. The Project will support the indigenous practices of poultry-raising, small ruminant feeding and backyard gardening. Poultry-raising and small ruminant feeding are not "climate-resilient" activities in and of themselves. Such activities will improve rural community nutrition (particularly women and children) and empower them to become more resilient to climate shocks due to the fact that they support livelihood diversification. Small ruminant fattening and poultry-raising are both considered adaptation activities by building resilience and capacity of rural women and youth in view of a deteriorated natural resource base. Furthermore, these activities will support the use of local, productive animals decreasing grazing pressure on the already deteriorated rangelands. Feed will be locally sourced: Kenana Sugar Co. in the White Nile State has an operating feed mill. Byproducts of sugar industries in the White Nile State (sugarcane tops, molasses, bagasse) will be used together with browse trees, shrubs foliage, pods and fodder to improve feed quality.

178. Such adaptation activities have already had success in the context of climate change. For instance, NAPA interventions in North Kordofan by the IFAD Natural Resource Management Program implemented small ruminant fattening by rural women between 2000 and 2007.[32] Each woman was provided with a loan from a revolving fund to buy two lambs or kids (young male goats), feed them for 45 days, and sell them in village markets. The activity could accrue as much as SDG 250 per 45 days per lamb. Most importantly, these activities are being sustained and have been shown to be climate-resilient having withstood dry periods, increasing temperatures and spreading desertification.

179. It is estimated that 65-70% of the Sudan energy budget is made up of predominantly biomass which is mostly used to provide domestic energy.[33] A family has been estimated to use about 52 trees per year in arid and semiarid areas in spite of the fact that tree cover is being rapidly depleted. Introduction of gas cook stoves and using alternative building materials will reduce tree cutting. Use

[32] IFAD. Enabling the rural poor to overcome poverty in Sudan. North Kordofan Rural Development Project. 2007.
[33] National Biodiversity Strategy and Action Plan 2015 Produced by HCENR and UNDP

of alternative building materials will also be promoted including the use of 90% sand and 10% cement and/or limestone (CaCO3), found naturally in some locations. Reducing the demand and pressure on forests will result in improved ecosystem services and increased resilience to climate change.

180. Component 2 also includes the creation of revolving funds, or small seed money, to enable communities to purchase appropriate farming and husbandry implements and technologies that improve the productivity and resilience of SRFP such as:

- Animal drawn ploughs
- Drought-tolerant seeds
- Solar pumps for shallow wells
- Animal feed supplements like seed cakes and saltlick
- Gas stoves and improved stoves
- Poultry units
- Alternative building materials
- Veterinarian care

Also, Community Animal Health Workers (CAHW) will be able to access the revolving funds to provide veterinarian care. Veterinarian assistance is necessary due to the fact that animal health and hygiene is crucial to sustain diversified livelihoods for farmers and pastoralists.

181. Revolving funds for solar-powered irrigation pumps and cook stoves had much success in the LDCF1 project and continue to be used after project completion. As documented in Sudan by Osman-Elasha et al., 2008, rural finance enables adaptive response and is also used by women for resilience-building activities.[34] The LDCF3 project will build off the successes of the revolving funds by administering and managing them with the support of VDCs and WUAs. The same successful modalities used by LDCF1's revolving fund will be applied to those of LDCF3. The revolving funds will be provided as a loan or 'seed money' that will be expected to be borrowed and paid back.

182. Under LDCF1, 28 revolving funds were established, providing similar services suggested here (e.g., solar pumps, butane gas units for improved stoves) for approximately 4,311 vulnerable people in rural areas and supervised by the VDCs. In the LDCF1 project, funds were used to strengthen the 'Sandug' structure for small-scale, financing for resilience.[35] A 'Sandug', which literally means a box for holding money, traditionally consisted of a group of 10 to 20 women who contributed an agreed upon amount of money or commodity to a group fund, at regular periods of time. The collected funds are then handed over to one member of the group on a rotating basis, until each one in the group has received the same service. The LDCF1 project engaged the communities in a dialogue to determine how to maximize the benefits from the adaptation measures. The communities agreed that the use of the 'Sandug' was valuable for this purpose. Following a series of initial sensitization campaigns, the project supported the establishment of Village Development Committees (VDCs) in each participating village. These VDCs were elected by the villagers and provided the overall managerial role of the Sandug, while in most cases women from the VDCs took the responsibility of the day to day running of the fund. The revenues obtained from the newly introduced adaptation activities under the project

[34] Christensen, J.H., K. Krishna Kumar, E. Aldrian, S.-I. An, I.F.A. Cavalcanti, M. de Castro, W. Dong, P. Goswami, A. Hall, J.K. Kanyanga, A. Kitoh, J. Kossin, N.-C. Lau, J. Renwick, D.B. Stephenson, S.-P. Xie and T. Zhou, 2013: Climate Phenomena and their Relevance for Future Regional Climate Change. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, USA. Ch 14.

[35] Canada-UNDP Climate Change Adaptation Facility – Case Study: Using a Rural Financing Mechanism – Sandug – to scale up Climate Change Adaptation in Sudan.

interventions were used to get the initial capital to start up the 'Sandug'. Two successful examples were i) using the Sandug to purchase water pumps for agricultural crop irrigation. Each pump served 15 farmers and paid back the cost of the pump in installments over three years. And ii), the LDCF1 project also provided 1,685 butane gas units (cylinder and stove) to households who adopted adaptation technologies and could pay back the cost in installments. The 'Sandug' procured an additional 520 units and as a result, all of the households in three villages have acquired butane gas units and shifted from biomass to butane gas energy.

183. Currently, 'Sandugs' are now being used as essential tools to scale up a variety of adaptation interventions introduced under the project across the different states of the country. The VDCs established by the project are now officially registered as civil society organizations and linked to a local micro-credit institution to expand the 'Sandug' activities to other areas. Two primary lessons learned through the LDCF1 project include i) the empowerment of women through training and provision of additional sources of income ensures their active participation in the adaptation initiatives and ii) if the 'Sandug' system is linked to micro finance institutions, it can more effectively achieve sustainable livelihoods.

184. The revolving fund will be designed to be in compliance with the Operational Policies and Guidance for the Use of Non-Grant Instrument outlined in the paper GEF/C.33/12, given that LDCF resources will be used as seed resources for the fund. Also, the management structure of the funds will be made clear during the first year of the project. To prohibit the use of funds for purposes other than designated above, funds will only be dispersed to legally approved Village Development Committees (VDCs) and Water User Associations (WUAs) (rather than to direct beneficiaries) who will be provided training on accessing and managing the fund.

The activities to be implemented under Output 2.4 are:

2.4.1 Provide alternative livelihood support: home poultry production and small ruminant strategic feeding including training for Community Animal Health Workers (CAWH) at the village level on controlling animal hazards
2.4.2 Support other livelihoods for women in the context of present and predicted climate change impacts: backyard gardens, post harvesting, establishing community-led nurseries for climate-resilient plant species and tree seedlings
2.4.3 Promote alternative building materials to reduce dependencies on trees as biomass fuel
2.4.4 Purchase and provide training for improved cook stoves (butane gas stoves) to reduce need for tree felling and resulting pressure on forests. Training will include necessary safety measures with butane gas.
2.4.5 Establish a revolving fund to support purchase of animal drawn ploughs, drought-resistant seeds, animal feed supplements, solar pumps for wells, veterinarian kits for CAWH and improved cookstoves
2.4.6 Provide training to VDCs and WUAs on accessing and managing the revolving fund, (e.g., book keeping)
2.4.7 Provide training to VDCs on post-harvest activities (dry/processing and storage vegetables, etc.)
2.4.8 Provide training to WUAs on the operation and maintenance of surface wells and solar pumps as well as on the use of spare parts

Output 2.5 Local authorities, communities, committees and user groups trained on adapting community livelihoods to climate change through the use of EbA and on monitoring of EbA measures

185. Under Output 2.5, agro-pastoral communities will be trained on: i) implementing, monitoring and maintaining EbA to generate long-term benefits; and ii) techniques and practices for climate-resilient land management. This training will include providing information about EbA-related measures such as responsible backyard gardening for subsistence.[36] Training will target women and youth.

186. EbA training materials will be developed in consultation with an EbA Specialist. EbA training programmes will be informed by protocols developed under Output 2.1. Furthermore, activities under Output 2.5 will include hosting experience-sharing events where people from nearby communities are brought to demonstration plots and trained on climate-resilient land and water management techniques that support EbA. Representatives of local government will also be provided with training on the implementation and maintenance of investments in EbA. These training activities will promote replication of project interventions in other nearby communities.

The activities to be implemented under Output 2.5 are:

2.5.1 Develop and/or adapt training programmes for local communities on: i) the benefits of EbA in the context of current and predicted climate change; and on ii) implementing, maintaining and monitoring both EbA interventions and climate-resilient agricultural and pastoral techniques
2.5.2 Provide training to communities on the establishment and management of farmer and pastoralist production groups
2.5.3 Establish extension farms: such farms will be established in areas of 2-4 ha for each village for demonstration
2.5.4 Train local government representatives on EbA and climate-resilient land/water management techniques
2.5.5 Train community VDCs and WUAs to oversee, monitor and coordinate local community involvement in the implementation of EbA and climate-resilient land/water management interventions
2.5.6 Train local communities at each project intervention site on the implementation and maintenance of EbA interventions and climate-resilient land management techniques
2.5.7 Host four experience-sharing events where people from nearby communities are brought to the demonstration plots and trained on climate-resilient land management techniques
2.5.8 Design and implement a nationally-based monitoring strategy designed in Activity 2.5.1 to assess the impacts of EbA to provide lessons learned and best practices for upscaling EbA for use in Component 3

Component 3: Knowledge management for appropriate EbA design
Outcome 3: *Strengthened information base and knowledge on EbA and its cost-effectiveness are readily available for various uses*

187. Component 3 will support knowledge management for EbA based on the lessons learned through the implementation of project interventions in Component 2. Content produced and lessons learned from education activities will be shared with both the public and private sector to facilitate upscaling the project's awareness-raising activities and to encourage private sector investment in EbA similar to the SEED project discussed in Section 2.6.

[36] This section of the training will be developed with support from Artisanal Fisheries Institute (IPA) and the Forest Development Institute and in partnership with the patrolling and monitoring sub-committee of the community management committee.

188. Best practices on EbA will be documented in Component 3 and will guide technical guidelines to be developed and distributed to policy and decision makers (Output 3.1). Where practical, upscaling of project interventions will be focused on areas around the target regions in order to make use of the implementation capacity of local communities developed under this outcome.

189. These activities will build upon baseline activities from ADAPT, SEED and LDCF2 whose costs (excluding SEED and LDCF2 that are already financed by GEF or providing cofinancing to GEF) are estimated at USD 629,900 (with an additional USD 31,500 contribution to PM costs). The additional costs sought from LDCF resources are estimated at USD 500,000.

Output 3.1 Information, lessons learnt from project interventions and knowledge on climate change adaptation and resilient livelihoods using EbA are captured, stored and widely disseminated among stakeholders at all levels

190. Due to the fact that there is limited awareness about climate change impacts and adaptation across sectors at national, state and local levels,[37] Output 3.1 will collate all lessons learned from the demonstration sites established in Component 2. The information on successful EbA measures will be captured, stored and widely disseminated through workshops. Additionally, findings from research that is undertaken by national experts to inform LDCF interventions ─ including results of the vulnerability and economic assessments ─ will be presented at the workshops.

191. An education programme will also be established in local schools in and around the four project sites to increase awareness of the benefits of EbA by improving school habitat via planting trees and establishing farms. Additionally, a short film documenting the restoration process will be shown to public and private Stakeholders to promote investment in the EbA concepts.

3.1.1 Collate lessons learned on EbA interventions by the VDCs and WUAs
3.1.2 Collate lessons learned and best practices from other national/international projects on: i) EbA interventions; ii) climate-resilient land/water management techniques; iii) the social and environmental benefits of these approaches; and iv) community management structures for the implementation, monitoring and maintenance of these interventions.
3.1.3 Hold workshops to share the results of the vulnerability assessment of Output 2.1 and the economic analysis of Output 3.3 with relevant Stakeholders.
3.1.4 Establish an education programme in local schools on the benefits of EbA with farm establishment and tree planting
3.1.5 Prepare a short-film demonstrating successful EbA measures for agro-pastoralists

Output 3.2 A central information base of data on EbA lessons learned and cost-effectiveness of interventions established within the existing Cloud operated jointly by HCENR and the ARC (through the LDCF2 project)

192. Under Output 3.2, information-sharing mechanisms – in the form of an e-library – will be established to promote sharing of cost-effective EbA practices. The e-library will be established in the cloud database currently being developed under the LDCF2 project. Data management is by ARC and

[37] NAPA Best Practices Documentation Study, 2012, UNEP Wadi ElKu Project in Northern Darfur

HCENR. The data to be placed in the cloud currently consists of project information, ARC innovation data and climate projections.[38]

193. Lessons learned from the LDCF3 project and other national and international adaptation projects will also be shared through this e-library. HCENR will establish and maintain the climate change e-library. It will include open-source adaptation materials, including *inter alia*: i) lessons learned and publications of the LDCF3 project; ii) academic research and papers on EbA produced by national universities; and iii) other relevant publications. In addition to specific documents, there will be a section with different links to other online libraries of NGOs and other LDCs. The e-library will support information sharing between members and other government ministries. Additionally, it will be accessible to the general public, including students from national universities and members of the private sector. Consequently, the e-library will promote information sharing and public/private collaboration on climate change and adaptation in Sudan.

194. In addition, the lessons learned and knowledge generated through the LDCF3 project will be disseminated through, but not limited to, appropriate web-based platforms – such as Africa Adaptation Knowledge Network (AAKNET) – to promote national and regional knowledge-sharing.

The activities to be implemented under Output 3.2 are:

3.2.1 Create a link with and store all EbA information from Output 3.1 on the existing Cloud environmental database jointly operated by HCENR and ARC
3.2.2 Disseminate lessons learned on other web-based platforms to appropriate national and regional networks, such as Africa Adaptation Knowledge Network

Output 3.3 An upscaling strategy for EbA across Sudan by both the public and private sectors is developed based on an economic cost-benefits assessment

195. Component 3 will develop an economic assessment of the proposed EbA measures outlined in the vulnerability assessments of Component 2. The assessment will quantify the economic impacts of climate change on agro-pastoral zones, disaggregated by sector and quantify the cost of current and future climate change to the agriculture, water, and pastoral sectors. The assessment will report on activities interesting to the private sector including seed production, water harvesting implements, solar pumping,[39] fodder production, dairy processing, fattening and finishing small ruminants, poultry production, etc. This cost-effectiveness assessment will then provide costs of the various potential adaptation options relative to no adaptation response. Specifically, these studies will demonstrate the cost-effectiveness of adaptation by establishing the relative cost of various adaptation responses. Based on the economic study, an upscaling plan for cost-effective adaptation interventions for agro-pastoral areas will be recommended. The results of the economic assessment will be disseminated to government members and the public and private sector in order to promote the establishment of Public Private Partnerships (PPPs) such as under the SEED project. Policy briefs in Component 1 will be developed with the results of the cost-effectiveness assessment and will support other baseline projects such as ADAPT.

[38] Currently, ARC is approaching telecommunication companies for space provision at their servers. The major telecommunication company; the Sudan Telecommunication Co. has promised to provide the space free of charge.
[39] Promotion by the private sector on the use and maintenance of solar pumps must be done in coordination with the State Water Authority

196. Results from the economic assessments will be presented to public and private representatives at workshops on cost-effective adaptation. At these workshops, community members from the project sites will be invited to report on their experiences of EbA and climate-resilient land, water and natural resource management. As an example, results from the LDCF1 project indicated that animal feeding using local ingredients increased milk production from 0.3 liters/day/goat to 3.0 liters/day/goat. Such positive results encouraged the private sector to invest in nutritional supplies - placing mills at the village level to supply improved feeding ingredients for the animals.

The activities to be implemented under Output 3.3 are:

3.3.1 Develop an economic cost-benefit assessment for EbA measures
3.3.2 Develop an upscaling plan for EbA measures based on the cost-benefit assessments
3.3.3 Provide workshops with the public and private sectors to disseminate EbA project concepts and raise awareness about the cost-benefits of such projects
3.3.4 Provide training sessions for HCENR, relevant ministry members and the State Technical Committee on: i) interpreting climate change adaptation economic assessments, ii) using a cost effectiveness argument in planning and decision making process and iii) financing CCA interventions

3.4. Intervention logic and key assumptions

197. The activities of the LDCF3 project will i) increase the operational and technical capacities of national and local government staff to plan and budget adaptation measures, ii) reduce the vulnerability of rain-fed farmers and pastoralists to climate-related changes – including increased rainfall variability –through pilot EbA and sustainable agriculture and livestock interventions; and iii) promote mainstreaming of adaptation into sectors and related budgets. Importantly, project interventions align with: i) the UNEP Programme of Work; and ii) the priorities identified in Sudan's 25 Year Strategic National Development Plan.

198. The project was designed in consultation with multiple local stakeholders. This participation of rural communities and government institutions (Section 2.5) has promoted buy-in and ownership of relevant stakeholders at a national and local level during the PPG phase. This local support – which will be fostered throughout implementation – will enhance the long-term sustainability of the LDCF3 project.

199. The LDCF3 project interventions are considered "low-regret" or "no-regret" options. This is because they will benefit both government and farming/pastoral communities regardless of the severity of climate change. For example, design and implementation of EbA and sustainable agriculture and livestock interventions at LDCF3 project sites (Outcome 2) will improve human well-being by: i) increasing local food and water production; ii) increasing fodder through re-vegetation and afforestation; and iii) increasing the amount of alternative livelihood options available.

200. The assumptions listed below underlie the LDCF3 project design.

- Project activities are unlikely to be undermined by extreme climate events during implementation.
- Farming and pastoral communities at intervention sites will take ownership of activities on-the-ground with the support of VDCs and WUAs
- Infrastructure constructed will be safe from theft and vandalism.
- Farming and pastoral communities participating in the development and implementation of project interventions will accept additional livelihoods and land-uses proposed by the project.
- Governmental institutions on the national and state levels will have sufficient capacity to support the project's activities.

- There is sufficient technical capacity to undertake the preliminary studies and to design the implementation of activities.
- Baseline project activities will be implemented as planned.

3.5. Risk analysis and risk management measures

201. A participatory approach was adopted during the PPG phase of the LDCF3 project. This included the consultation of various stakeholders, national workshops and meeting with the relevant White Nile State agencies such as the Range and Pasture Administration as well as the 4 target local communities (see Appendix 16 for details). This approach will be continued throughout project implementation. The LDCF3 project will therefore engender strong support from rain-fed farming and pastoral communities and local governments. Monitoring, re-assessing and updating the project risks will be an important task throughout project implementation. Table 2 below describes the risks that have been identified, their associated impacts and countermeasures.

Table 2. Risk matrix

	Description of risk	Potential consequences	Risk rating	Mitigation measures/proposed interventions	Risk category	Probability & Impact (1=low, 5=high)
National level risks						
1	Lack of institutional capacity and coordination on EbA could lead to inappropriate or deficient implementation of EbA measures and policy frameworks	Multi-sectoral adaptation interventions are compromised and interventions are confined to those sectors willing to engage in cross-sectoral dialogue. The vulnerability of certain sectors and Sudan as a whole to climate change is not fully addressed. Lack of institutional coordination and capacity on EbA could lead to inappropriate or deficient implementation of EbA measures and policy frameworks.	Medium	• Implicate ministers across sectors so that in the case that one ministry's mandate changes, the overall goal of integrating EbA measures in the context of CC into development plans and budgets will still be upheld • Produce and distribute cost-benefit analyses of EbA measures to attract cross-sectoral support • Develop technical capacity of the White Nile State Technical Committee to support inter-ministerial coordination and planning around climate change adaptation at the state level • Ensure technical representatives from all line ministries are included in the trainings provided. This will increase institutional capacity within, and facilitate coordination between different ministries. • Produce sectoral vulnerability assessments for different line ministries to promote support for the LDCF3 project activities. • Establish the mandate of the White Nile State Technical Committee to facilitate cross-cutting dialogue by including a broad range of representatives from relevant ministries and NGOs • Design the Technical Committee so that it can grow into a more permanent	Institutional	P= 3 I= 4

	Description of risk	Potential consequences	Risk rating	Mitigation measures/proposed interventions	Risk category	Probability & Impact (1=low, 5=high)
				body for coordination of adaptation and EbA planning and mainstreaming at the state level		
2	Volatile political situation in Sudan could lead to government shifts or disruption of project activities.	Project activities are interrupted. Natural and financial capital is lost.	Medium	• The White Nile State is generally peaceful and not considered a zone of conflict. In the White Nile State there are already number of UN and other internationally funded projects being implemented without any security hazard or negative interference at the state level. • The PC will keep abreast of national events and politics to ensure knowledge of any potential disruption to project activities at intervention sites. This will allow for the timely implementation of contingency plans.	Social, Environmental	P= 1 I= 4
3	National financial instability	Climate integration into national budgets are undermined by several cuttings in national budgets The government will not have funds to sustain the national arrangements once the project ends.	High	• Strengthen advocacy efforts focused on long- and medium-term economic benefits on integration of adaptation options into national budgets and communicate these to policymakers throughout. • Engage with the private-sector through EbA project concept notes to promote investments outside of the national budget to sustain and upscale climate change adaptation interventions. • In Component 3 develop and institutionalize a strategy to upscale, sustain and replicate resilient agriculture practices using the EbA approach based on cost-benefit analyses and the knowledge management system to be developed	Economic, Political	I = 4 P = 4

	Description of risk	Potential consequences	Risk rating	Mitigation measures/proposed interventions	Risk category	Probability & Impact (1=low, 5=high)
				• Provide awareness-raising among the decision-makers • Embed EbA in policies / legislation		
4	Trained, qualified engineers/technicians leave for more lucrative positions ("brain drain") resulting in limited sustainability of requisite human resources and technical/operational capacities.	National expertise on EbA is lacking after project completion	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. • National experts will be reinforced because results from the LDCF1 project indicated that there was limited transfer of knowledge from international experts to both national and state levels;	Technical	P = 3 I = 3
Local level risks						
5	Current climate and seasonal variability and/or hazard events prevent implementation of planned activities.	Economic loss or physical damage to infrastructure (e.g., reservoirs) delays implementation of project activities.	Medium	• Intervention sites will be mapped to establish the extent to which they are vulnerable to specific natural hazards. The vulnerability assessments from Component 2 will be based on NAP and NAPA analyses. This mapping will be used to inform restoration practices and techniques.	Economic	P= 3 I= 3
6	Communities do not support interventions and do not adopt ecosystem management activities for adaptation during or after the LDCF3 project because of limited immediate	Unsustainable use of natural resources continues, leading to further degradation of ecosystems. Climate-resilient land and water management techniques are not	Medium	• Actively involve SRFP communities in project implementation through *inter alia: i)* establishing VDCs / WUAs; ii) liaising with the community management committees and other community members to identify intervention sites for EbA interventions; and iii) developing and implement community-based EbA intervention management plans.	Social, Environmental	P= 2 I= 3

	Description of risk	Potential consequences	Risk rating	Mitigation measures/proposed interventions	Risk category	Probability & Impact (1=low, 5=high)
	benefits of EbA.	implemented in the long term. Consequently, communities continue to be vulnerable to climate-induced natural hazards.		• Implement alternative livelihoods that have been deemed financially, technically and socially viable/feasible to reduce reliance on intensive land us (e.g., poultry breeding) • Engage community stakeholders in the implementation and impact monitoring of on-the-ground adaptation measures to strengthen their continued buy-in into the LDCF3 project as per the Stakeholder Participation Plan (See Section 5) • Raise awareness on the capacity of the restored ecosystems to increase community resilience to climate change through communication campaigns, via radio and television programmes • Improve capacity building and training of the communities to improve their understanding of the adaptation benefits of the EbA activities • Implement activities that have direct benefits in addition to the ecosystem restoration interventions		
7	Priority interventions implemented are not found to be cost effective	Project interventions are not upscaled for large-scale EbA programmes.	Low	• Develop a cost-benefit assessment in Component 3 to demonstrate cost-effectiveness of EbA measures • Record detailed information on cost effectiveness. Such information will be widely disseminated for use by future projects and research through Component 3	Economic	P= 1 I= 3
8	Conflicts between farmers and	The restoration activities are	High	• Clearly establish land use plans identifying specific areas for	Social, Environmental	P= 4 I= 4

	Description of risk	Potential consequences	Risk rating	Mitigation measures/proposed interventions	Risk category	Probability & Impact (1=low, 5=high)
	pastoralists such as uncontrolled nomadic settlements, continuous cultivation and illegal tractor use due to non-transparent, unequitable and unjust resource allocation	unsustainable and violence breaks out between farmers and pastoralists		rangelands and cultivation establishment • Raise awareness of communities on the benefits of restored natural ecosystems for adaptation and their livelihoods • Implicate traditional leaders in decision-making processes • Rehabilitate rangelands along the migration routes of nomadic pastoralists. • Forbid enclosures of farmlands • Mandate the Village Development Committees to mediate and ensure equitable distribution of ecosystem services for both farmers and pastoralists • Include detailed analyses of how to avoid natural resource-induced conflicts in the Vulnerability Assessments to be conducted in each locality prior to design and implementation • Maximise the economic benefits from sustainable natural resource management • Build on successful tractor prohibition measures from the North Kordofan State		
9	Use of the revolving fund for purposes other than those supporting EbA	Actions contribute to mal-adaptation and resources are wasted.	Low	• A clear management plan will be developed during the second year of the project • Funds will only be able to be legally dispersed to approved Village Development Committees (VDCs) • A revolving fund expert will be hired	Economic	P= 1 I= 3

	Description of risk	Potential consequences	Risk rating	Mitigation measures/proposed interventions	Risk category	Probability & Impact (1=low, 5=high)
				to ensure that appropriate monitoring mechanisms are in place. He/she will provide training to VDCs on accessing and managing the fund (e.g., book-keeping)		
10	Health and safety risks due to water mobilization, care for animals, cookstove use	Open water sources (rainwater harvesting pits, wells, reservoirs) may become breeding grounds for mosquitoes and other insects that may transmit malaria and other vector-borne diseases. Communities may not use safe practices with butane gas powered stoves. Animal-borne diseases might spread with livelihood diversification activities.	Low	• The Water User Associations (WUAs) in each target locality will be provided with medical kits that will contain medicines such as prophylactics to address these issues. The WUAs will also be trained in water-borne diseases and proper hygiene. • Farmers and pastoralists will also be provided capacity building on Integrated Pest Management by ARC. • Any community members that purchase cook stoves (butane gas powered) will be trained on safety measures. • Veterinarians will be supported to come to training sessions so that animal-borne diseases from small ruminants, lamb and poultry will not become rampant. The revolving fund will also support Community Animal Health Workers (CAHW) to provide veterinarian care due to the fact that animal health and hygiene is crucial to sustain diversified livelihoods for farmers and pastoralists.	Operational	P= 2 I=3

3.6. Consistency with national priorities or plans

202. The project is well-aligned with a wide range of national policies, strategies and legislation. Stock-taking and consultations during the PPG highlighted additional policies, strategies and plans of relevance that have been added to the project documents. For a complete list of these plans and strategies see Section 2.4 of the UNEP Project Document. The LDCF3 project will promote the inclusion of adaptation in both national plans and budgets through the development of technical guidelines and policy briefs under Component 1. A brief description of the main policies, strategies and plans leading development in Sudan and how they relate to the proposed project were presented in Section 2.4.

203. The **National Adaptation Programme of Action (NAPA)**: the LDCF3 project has been developed to address and implement priority activities outlined in Sudan's NAPA (2007), as discussed in Section 3 under LDCF conformity.

3.7. Additional cost reasoning and socio-economic benefits

204. The current and predicted effects of climate change will have negative effects on the already degraded rangelands and farming systems for SRFP in the White Nile State. Local and national government staff (such as from the Animal Wealth Administration and the State Water Corporation) do not currently have the financial resources to improve the adaptive capacity of rain-fed farmers and pastoralists to climate change. In particular, these institutions have limited technical capacity to implement appropriate responses and interventions for adaptation.

205. The LDCF3 project will increase the adaptive capacity of the government and SRFP communities in the White Nile State to climate change. This will be achieved by i) promoting the integration of adaptation into relevant policies, plans and budgets; ii) implementing adaptation interventions supporting EbA in the 4 target communities; and iii) strengthening technical and institutional capacity of SRFP communities at intervention sites and national stakeholders for EbA and climate change adaptation.

206. Numerous socio-economic benefits are expected from the project including:

- At least 1600 women (160 backyard gardens) practicing backyard gardening and/or post-harvesting
- At least 320 women (20 women per village) using improved cook stoves
- At least 3200 men/women (at least four villages) with new access to solar powered hand pumps for wells
- At least 160 men/women (10 from each of the 16 villages) supported with feed supplements for small ruminants
- At least 480 men/women using revolving funds established by the project

207. In addition, the project will support upscaling of the successful EbA measures by promoting successful, cost-effective EbA measures to the public and private sectors, thereby increasing the sustainability of Sudan's economic development. Private sector implication will be important for the long-term. It is foreseen that the private sector will be implicated in the following manner:

- Water sector: Private sector contractors will be initiated by the State Water Corporation.
- Fodder production involves several private sector companies.
- The production and sales of improved seeds and agricultural implements such as ploughs are activities that involve the private sector.
- Alternative energy products such as improved stoves (butane gas stoves and cylinders) and solar powered pumps are provided by the private sector.

208. A summary of the adaptation alternative and the business-as-usual scenario is represented in Table 3 below.

Table 3: A summary of the adaptation alternative and the business-as-usual scenario

Business-As-Usual		**Adaptation alternative scenario**
Overall		
Rapid population growth – coupled with poor water and land use planning – and associated environmental degradation has resulted in food and livelihood insecurity. Climate change impacts, including increased variability in rainfall and temperature and increased frequency and severity of droughts, are exacerbating these problems. While various national projects have been initiated to address these baseline problems (such as by increasing the productivity of livestock), limited technical capacity has been built to integrate EbA measures as a means to reducing the vulnerability of local communities to these impacts. Furthermore, climate change adaptation is not integrated into the budgets and plans of sectors responsible for addressing these problems (e.g. water, agriculture and livestock), and currently inter-ministerial capacity to respond to climate change remains limited by operational and technical gaps. At a local level, as indicated by the NAP, communities living on the western side of the White Nile State (the 4 target localities in particular) are currently vulnerable to non-climate related threats such as ecosystem degradation, which is exacerbated by climate change. Under the business-as-usual scenario, these communities do not have the technical capacity to improve natural resource management in a manner that integrates EbA so that they can increase their resilience to climate change.		To address this problem the GoS – with support from UNEP– will implement a climate change adaptation project in the White Nile State funded from LDCF resources. The interventions of the LDCF3 project will strengthen the technical capacity of local and national government staff to understand and become resilient to the effects of climate change. In addition, the capacity of smallholder rain-fed farmers and pastoralists (SRFP) to implement adaptation interventions – including EbA – will be strengthened. At a national level, inter-ministerial coordination and institutional capacity for adaptation will be supported through technical support and training as well as establishment of a State Technical Committee that will focus on EbA and adaptation integration and coordination for the White Nile State. Moreover, public awareness of the effects of climate change – and appropriate adaptation interventions – will be improved by targeting NGOs and relevant private and public sectors to support cost-effective EbA measures.
Outcome 1		
• Lack of a technical committee well-versed in EbA will result in poor coordination of activities that promote EbA and inadequate follow up of actions and delegation of responsible parties to mainstream EbA into decision-making. • There is limited understanding of the effects of climate change by sectoral ministries hence climate change adaptation is not prioritised into sectoral plans and budgets. • Ministries and agencies are not coordinating water infrastructure, rangeland and farming projects well. None of the existing projects focus specifically on integrating EbA measures and on improving ecosystem services for the White Nile State		The LDCF3 project will strengthen the technical capacity of HCENR at the national level to promote dialogue on EbA across sectors and to coordinate adaptation measures. HCENR will be responsible for advocating for the inclusion of climate change considerations into relevant policies, strategies and sectoral budgets. Similarly, the establishment of a White Nile State Technical Committee will increase inter-ministerial coordination of EbA measures across sectors in the state. LDCF funds will be used to strengthen the technical capacity of staff in the White Nile State to understand, interpret and replicate locality-specific, climate change vulnerability assessments.
		Cost: US$500,000
Outcome 2		
• Sudan's rain-fed farmers and pastoralists (SRFP) are vulnerable to future climate		First, Component 2 will develop vulnerability assessments to enable the government to

change impacts. These impacts include *inter alia* increased: i) drought; ii) soil erosion; and iii) rangeland deterioration. • Only a broad scale V&A assessment was carried out through the NAPs process. • Rangelands and forests are being degraded through unsustainable land use practices (e.g. clearing for agricultural land) and tree-felling for fuel. These degraded ecosystems are less able to provide the goods and services upon which SRFP communities and sectors depend. These services include food security, water provision and livelihood services. This degradation will continue to be exacerbated by the effects of climate change, which are predicted to worsen. Such effects include *inter alia* climate-related changes to hydrology and soil quality which will further degrade the functioning and health of Arid and Semi-Arid Land ASAL ecosystems as a result of increased desertification and erosion. • Communities lack the capacity to restore rangeland, farmland and forest ecosystems and to implement climate-resilient land and water management techniques. These communities will therefore remain vulnerable to climate change. • Ongoing efforts by the Range and Pasture Administration and the National Forestry Group promote rangeland rehabilitation and afforestation. However, no previous or ongoing initiatives implement EbA, and therefore the approach is not demonstrated in the White Nile State. As a result, an understanding of the benefits of EbA among SRFP communities – including those living in the 4 target communities – is very limited.		prioritise vulnerable areas and identify appropriate adaptation options. The LDCF3 project will then implement a suite of EbA interventions to restore rangeland, forests and farmland ecosystems to increase the adaptive capacity of SRFP communities. These EbA interventions will be complimented by the demonstration of climate-resilient land and water management techniques which will reduce human pressure on ecosystems by improving the existing livelihood options of local communities. This outcome will be achieved through the activities below. • Developing protocols/strategies to guide the implementation of EbA interventions. • Improving local institutional capacity to adapt to climate change by establishing VDCs and WUAs in pilot communities. These committees will oversee and coordinate community involvement in LDCF3 interventions. • Enhancing the functioning of ecosystems in the four pilot communities by implementing appropriate EbA and climate-resilient agriculture and husbandry interventions. • Strengthening the adaptive capacity of communities at intervention sites by: i) demonstrating climate-resilient land and water management techniques; and ii) training local government representatives on EbA and climate-resilient agriculture at extension farms. • Promoting sustainability of adaptation interventions by developing and implementing community-based EbA intervention management and monitoring plans. • Promoting upscaling and replication of EbA by demonstrating the cost-effectiveness of EbA measures based on cost benefit analyses and EbA project concept notes. These will be disseminated to the public and private sectors in Component 3.
		Cost: US$3,080,000
Outcome 3		
• Ministries for animal resources, agriculture, and water have a limited understanding of the effects of climate change on SRFP, despite the vulnerability of these economic sectors. • Vulnerable communities and the public have limited awareness and understanding of the effects of climate change and adaptation – including EbA. • There is no knowledge management system in Sudan specifically dedicated to EbA • Plan Sudan and SOS Sahel have initiated campaigns on climate change awareness.		• Cost benefit analyses from Component 3 will identify cost-effective adaptation interventions for SRFP • The LDCF3 project will improve national and local awareness on climate change effects and adaptation by storing knowledge on lessons learned and best practices of EbA in the existing Cloud database managed by the ARC and HCENR. The cloud-based knowledge base contains climate data and forecasts, together with information on climate adaptation technologies. However, the database does not detail information on sustainable agro-pastoral practices in Sudan.

However, there is insufficient information available on the most effective and appropriate adaptation techniques. • Without cost-benefit analyses and the sharing of successful EbA practices, national and state government representatives will continue to have limited knowledge of: i) appropriate adaptation interventions for the SRFP and ii) the cost-effectiveness of these interventions relative to each other and to no adaptation. This will result in limited upscaling of EbA interventions.		EbA data will be shared with NGOs and public and private sector stakeholders and with national and regional networks, such as AAKNET.
		Cost: US$500,000

3.8. Sustainability

209. This project represents an effort to upscale priorities identified in Sudan's NAPA for the White Nile State. Considering the scale of the foreseen climate zone shifts predicted for the White Nile State, establishment of a sustainable livelihood system is unlikely to be successful without the consideration of an innovative approach and solution such as EbA. If implemented appropriately, EbA, working with nature, can be selfsustaining and replicating without the need for external input or technology, thus increasing the chances of locals taking ownership and sustaining activities beyond the life of the project. The project will ensure sustainability by: 1. Selecting pilots areas that take local needs, priorities and culture into consideration, 2. Selecting pilots that show clear and demonstrable benefits (both adaptation and general livelihood improvements) within the project lifetime, 3. Providing successful awareness raising on CC issues and training on the benefits of EbA, and by 4. Contributing to the expanding Cloud knowledge base of good practices. At the national level, beyond the measures included in component 1 and 3 which are directly targeted at mainstreaming EbA into future development and investment planning and facilitating upscaling through creation of a national knowledge base, successful practical examples from communities in Component 2 shared via hosting and pilot demonstration sites will enable successful replication and long term sustainability of EbA adoption throughout Sudan.

210. The project makes the maximum use of LDCF funds to ensure sustainability by collaborating with ARC who has significant experiences supporting the LDCF1 and LDCF2 projects to implement adaptation technologies. It is thus a strategic next step to the first two NAPA projects by piloting adaptation measures for SRFP that have already been tested in other states with similar climatic conditions.

211. Furthermore, successful strategies from the LDCF1 project based on the mid-term and final evaluations will be duplicated here to ensure sustainability. Former measures which will be adapted include:

i. Using a White Nile State Technical Committee for project management on the state level

ii. Piloting the successful farming/pastoral adaptation technologies which worked in the LDCF1 states when similar climate and livelihood conditions exist in the White Nile state

212. LDCF funds will also be used to increase the involvement of the private sector by demonstrating the cost-effectiveness of EbA measures. Similar to the SEED project being implemented, cost-benefit analyses for multiple sectors will encourage investments across sectors (water, agriculture, etc).

213. Various other activities support the project's sustainability after the support of the LDCF3 project ends including:

- Staggered approach to training;
- Knowledge management;
- Building capacity for local focal points and VDCs/WUAs at the village level to better understand EbA and to lead community-based EbA

214. Furthermore, the LDCF3 project was developed through consultation with various stakeholders, including: i) central and local government representatives; ii) agriculture and pastoral groups; iii) NGO's; and iv) SRFP communities (see site reports in Appendices 7 and 16 of the UNEP project document). Stakeholder consultations that were undertaken during the PPG phase and that will be undertaken during project implementation will support the sustainability of interventions beyond the duration of the project by prioritising the long-term needs of the SRFP.

215. Most significantly, under Component 1, the strengthening of national capacities at the highest level of decision- policy-makers for the integration of climate change adaptation into relevant policies and plans will be the cornerstone for the sustainability. Also, the activities of the project include a strong emphasis on capacity-building, training and institutional strengthening, particularly with respect to climate change adaptation. Stakeholders that are targeted for inclusion in the project's capacity-building activities include representatives of local (e.g., WUAs, VDCs), state and national government, the private sector and NGOs. It is anticipated that the LDCF investments in strengthening the capacity of these stakeholders will support the sustainability and effectiveness of similar ongoing and future projects.

216. The proposed project will also strengthen national expertise on climate change adaptation interventions and EbA by prioritising the appointment of national consultants (e.g., ARC). National experts will be emphasized because the LDCF1 project noted that knowledge was not easily transferred from international to national experts. International consultants will be appointed only where local expertise is limited. In such instances, national and international consultants will work together. As a result of the collaboration between international and national consultants, the knowledge and capacity of the national consultants on international best practice for EbA will be developed and strengthened. This enhanced knowledge will promote national ownership of the project outcomes, thereby contributing to the overall sustainability of the project's benefits.

217. The four SRFP communities will be trained on planning, implementing, monitoring and maintaining EbA and climate-resilient land/water management with the assistance of VDCs and WUAs to be formed. VDCs helped greatly with successful implementation of the LDCF1 project. As a result, local stakeholders will have the capacity to sustain on-the-ground interventions after project completion and will have ownership over the activities. Improved awareness of EbA and climate-resilient land management and benefits of the demonstrations that will be implemented within Component 2 will promote sustainability of these interventions.

218. Under Component 2, within the LDCF3 project, research will be undertaken to inform, and strengthen the evidence base for, adaptation options. This research will include: i) vulnerability assessments under Outcome 2 for the project sites; and ii) cost-benefit analyses on EbA measures supporting climate resilience under Outcome 3. The knowledge that is generated through this project will be stored in a Cloud KM platform being developed under the LDCF2 project and will pave the way for new projects to build on successful EbA measures. Moreover, this knowledge will inform the design of future adaptation interventions in Sudan.

219. A particularly important aspect of the LDCF3 project's activities which will support long-term sustainability is the cost-benefit analysis that will highlight the socio-economic and environmental benefits of EbA for the interest of the private sector. Private sector representatives will include the State Water Corporation and alternative energy product suppliers.

220. Importantly, the LDCF3 project will benefit from the UNEP's previous experiences in Sudan, particularly through the SIEP 1 project and water management interventions in Darfur. The LDCF3 project will build on the lessons learned from these projects and the previous LDCF projects as well

as other initiatives for water management, rangeland restoration and shelterbelt establishment to avoid pitfalls that have been experienced (See Section 2.6).

3.9. Replication

221. Considering that the White Nile State is representative of 3 of the 4 ecological zones in the country, lessons learned and good practices on implementation of EbA gained here, would have immediate replication potential in a large part of the country. Importantly, the project design is also aligned with national policies, strategies, and legislation for Sudan (see Section 3.6), which will further facilitate replication.

222. The project has also focused on building on the successes of the LDCF1 and LDCF2 projects to benefit the vast number of vulnerable SRFP in the country. This will increase the likelihood EbA applications will succeed and can be scaled-up. For instance, similar to the LDCF1 project, the LDCF3 project supports various mechanisms of knowledge transfer including on-the-farm training with extension farm establishment.

223. Under Component 1, this project has focused on updating regulatory and legal frameworks so as to support the integration of EbA measures in the context of climate change. Moreover, Component 1 will support the integration of cost-effective adaptation interventions into: i) local planning; and ii) sectoral strategies, budgets and plans.

224. Subsequently, in Component 2, protocols will be developed to facilitate EbA replication from: i) other ecosystem restoration projects in Sudan; and ii) other EbA projects in Africa. Importantly, these protocols will contribute to the technical knowledge based on EbA, thereby facilitating replication. These protocols will be designed for particular ecosystems (i.e. rangelands, Arid and Semi-Arid Lands - ASALs) so that they can be used in similar landscapes throughout Sudan in the future. Furthermore, the cost-effectiveness of EbA and climate-resilient land/water management activities under Component 2 will promote replication of these approaches amongst: i) vulnerable SRFP communities who do not have access to financial capital; and ii) surrounding farmers and pastoralists that will benefit from improved ecosystem services.

225. To facilitate effective replication by Ministries, Component 3 will document and disseminate lessons learned and knowledge generated during the project implementation through an existing Cloud database managed by the ARC and HCENR. The database and awareness-raising under all components will promote replication of interventions outside of project sites.

226. Finally, cost-benefit analyses under Component 3 will support an enabling environment for the private sector to make investments in cost-effective and lucrative investments (e.g., drought-tolerant seedlings). Such investments will simultaneously generate multiple social and ecological benefits.

3.10. Public awareness, communications and mainstreaming strategy

227. The limited adaptive capacity of SRFP communities in Sudan to climate change is a result of inadequate: i) knowledge and awareness of climate change; and ii) implementation of adaptation strategies. Outcomes 2 and 3 will address this limited awareness by undertaking workshops for local communities, NGOs and the private sector. Awareness-raising activities will include provision of information on: i) current and future effects of climate change in the area; ii) the role of ecosystems for adapting to this change; and iii) the principles and long-term benefits of EbA and climate-resilient agriculture and pastoralism. Information on these topics will be disseminated rapidly by working with schools. Children will be educated on farm establishment and tree planting. Also, a short film on successful EbA measures will be prepared and distributed to local communities. Importantly, such awareness building activities will use gender-targeted messaging.

228. Public awareness of EbA will also be improved by: i) training national and local government to plan and implement EbA and climate-resilient agriculture and pastoralism, afforestation, rangeland

rehabilitation; and ii) demonstrating the benefits of these interventions, particularly for women and youth.

3.11. Environmental and social safeguards

229. The interventions to be implemented by the LDCF3 project will have positive environmental impacts. This is because these interventions improve natural biodiversity and ecosystem services as part of an overall adaptation strategy to help SRFP communities adapt to the negative effects of climate change. These interventions will include: i) implementing pilot EbA and climate-resilient agriculture and husbandry interventions in collaboration with SRFP communities; and ii) enhancing the institutional coordination for proactive adaptation in Sudan. The activities implemented by the project will be designed to improve environmental conditions in the short- to long-term.

230. The UNEP checklist for Environment and Social Safeguards (Appendix 9) reflects the positive environmental and social impacts of the project. The Project Coordinator (PC), Chief Technical Advisor (CTA), and UNEP Task Manager (TM) will be responsible for overseeing adherence to this checklist throughout the implementation of the project. This checklist will be reviewed and updated annually by the PC in conjunction with the UNEP TM.

231. All activities implemented by the project will be designed to improve environmental conditions in the short- to long-term. Consequently, none of the project activities should trigger EIAs, as verified in the PPG phase through stakeholder consultations. Nevertheless, environmental legislation will be reassessed during project inception to verify this. If necessary, assessments will be undertaken to determine the environmental effects generated by the project's interventions. In addition, mitigation measures will be undertaken to ameliorate any related negative social or environmental effects.

232. Furthermore, the project will support gender-equality. The local Vulnerability Assessments will use gender tracking in its baseline analyses in order to feed into UNEP's initiative on financial resource tracking for gender. The project also focuses on improving the livelihoods of women and integrating them into decision-making processes. Any committees/associations such as the Village Development Committees (VDC) and Water User Associations (WUAs) to be formed under the Project will have at least 30% women representation.

233. Also, awareness-raising and other activities are designed to target women. Women will be behind most of the community water management initiatives and will be beneficiaries of revolving funds. Furthermore, the adaptation technologies that ARC will promote account for gender. Additionally, the activities that concern the diversification of livelihoods are gender-specific and target women. Stakeholder consultations indicated that women's role is major in alternative energy sources, small ruminants, poultry raising, vegetable gardens, post-harvesting activities, dairy processing.

234. Finally, the Women's Union of the White Nile State will continue to be implicated as indicated in Section 5. Also, the Ministry of Gender, Child and Social Welfare will receive capacity reinforcement on integrating CC and EbA into policies and strategies.

SECTION 4: INSTITUTIONAL FRAMEWORK AND IMPLEMENTATION ARRANGEMENTS

Overview

235. The LDCF3 project will be implemented over a four-year period (2017–2020). UNEP will be the GEF Implementing Agency (IA) for the project. UNEP will provide oversight for all components of the project. The project will be nationally executed by the HCENR.

236. Through all three components, the LDCF3 project will be building capacity for adaptation planning, undertaking pilot EbA interventions and developing climate change outreach and awareness-raising. All of these interventions correspond with the current UNEP Programme of Work

(PoW 2016–17) Subprogamme 1 on Climate Change, Output (a) which promotes adaptation approaches, including an ecosystem-based approach, to be implemented and integrated into key sectoral and national development strategies to reduce vulnerability and strengthen resilience to climate change impacts. This Subprogramme promotes implementing pilot adaptation activities and integrating climate change adaptation into national development strategies, as well as ensuring that participating countries have full access to knowledge networks and climate change tools and methodologies, are all mechanisms that are likely to bring about policymaker understanding of and support for ecosystem-based adaptation.

Management structure

Implementing and Executing Agencies

237. UNEP will be the **Implementing Agency (IA)** for this proposed project and will be responsible for over-seeing and monitoring the project implementation process as per its rules and procedures, including technical back stopping. It will work in close collaboration with the Higher Council on Environment and Natural Resources, who acts as the **Executing Agency (EA)** for the project. The Executing Agency will be responsible for the achievement of project outputs and outcomes, day to day management and coordination of project activities and inputs, as well as for the reporting on achievement of project objectives. The Executing Agency will be responsible for entering into agreements with other partners, as well as for ensuring that co-financing contributions from the Government of Sudan, the White Nile State and external sources materialize as planned. The EA will report technically and financially to UNEP.

National Project Director (NPD)

238. A designated official within HCENR will serve as the **National Project Director (NPD)**. The NPD will ensure a continued cohesion between the project and the mandate of the HCENR and provide additional linkages and interactions with high level policy components within the Government. He/she will follow up on, supervise and coordinate the contributions of the Government of Sudan.

Project Coordinating Unit (PCU)

239. Project execution will be ensured by a **Project Coordination Unit (PCU)** comprised of a Project Coordinator, a Financial and Administrative Assistant and a Chief Technical Advisor. At the state level, the PCU will be assisted by a State Technical Committee delegated by HCENR, who will be responsible for state-level technical implementation of the project.

Project Coordinator (PC)

240. The project will hire a full time **Project Coordinator (PC)** who will lead and direct the PCU and will accountable to the PSC and its Chair. The PC will bring in administrative experience and a general technical knowledge in climate change adaptation and will be responsible for the day to day execution and management including the financial management of the project and the preparation of all due reports. He/she will be provided with administrative/logistical support staff assistance. The PC will carry out all of the above functions under the direct supervision of the NPD. In addition, the PC will report to the UNEP Task Manager on progress and challenges during execution.

Chief Technical Advisor (CTA)

241. A **Chief Technical Advisor (CTA)** will be hired by the project and will function as a member of the PCU. The CTA will provide the following services: i) quality assurance and technical review of project outputs (e.g. studies and assessments); ii) assist in drafting TORs for technical consultancies and supervision of consultants work; iii) assist in monitoring the technical quality of project M&E systems, including annual work plans, indicators and targets; iv) advise on best suitable approaches and methodologies for achieving project targets and objectives; v) provide a technical supervisory function to the work carried out by other technical assistance consultants hired by the project; and vi) assist in knowledge management, communications and awareness raising. The CTA will report to the NPD and will participate in the meetings of the PSC as a resource person.

Project Steering Committee (PSC)

242. A **Project Steering Committee (PSC)** will be appointed at the beginning of the project, and will be chaired by the Secretary General of HCENR. The PSC will play an oversight role, and provide support, policy guidance and supervision for the project. Specifically, it will consider, approve and validate the project's annual work plans, budgets and procurement plans, as well as all progress, monitoring, evaluation and final reports. It should be multi-disciplinary and multi stakeholder in its composition to include membership relevant to the project objectives and components, including representatives of NGOs/CBOs, the private sector, and government institutions and departments. The PSC will include representatives from both national and state levels, relevant institutions, including at the national level, the Ministry of Agriculture (MoAg) and Forests, the Ministry of Livestock (MoL), Rangeland and Fisheries, the Ministry of Health of Social Affairs, the Ministry of International Cooperation (MIC), the Ministry of Foreign Affairs, the Agriculture Research Corporation and the Sudanese Environment Conservation Society. From the state level the PSC will include the Ministry of Health (as chair of the State Environment Committee), the Ministry of Agriculture and Forestry, the Ministry of Animal Wealth and Rangelands and the Ministry of Urban Planning. UNEP will be a full-fledged member of the PSC. Specific roles of the PSC are outlined in Appendix 11 of the UNEP project document.

243. The expected contribution of the PSC members is to facilitate the implementation of the project activities in their respective agencies as appropriate, and ensure that activities are implemented in a timely manner and to facilitate the integration of project inspired activities into existing programmes and practices. The PSC will meet at least twice annually and will be expected to review implementation progress and to address any challenges or major changes in implementation plans.

244. The NPD and the Secretary General of HCENR will be members of the PSC with the latter serving as its chair, while the PC will serve as its secretary. During the project implementation, the Executing Agency (HCENR) will enter on behalf of the project into agreements with other relevant ministries in order to delegate the delivery of sector specific activities, and to ensure the integration of project activities into the program of work of different ministries. HCENR will remain responsible for the use of resources, and for the application of adequate social and environmental safeguards, including the application of environmental impact assessment requirements.

245. A national **Project Administrative and Finance Assistant (AFA)** will be hired by HCENR to directly support the National Project Manager on all financial and administrative issues. He/she will be recruited to: i) administer the finances of the LDCF3 project; and ii) produce the necessary financial reports. In addition, a driver for the project will be recruited by HCENR.

State Technical Committee (TC)

246. The **State Technical Committee (TC)** will support the PCU at the state level. It will build off the State Environment Committee (SEC) formed during NAP preparation. Other than the SEC, it will be comprised of state representatives from the White Nile State Ministries of Agriculture / Livestock, Ministry of Physical Development, Ministry of Health, and Plan Sudan (an international NGO), Farmer/Pastoral Producer's Groups (2), the Agricultural Extension and Technology Transfer Administration (AETTA) (1), the Agricultural Research Corporation, the White Nile State's Women's Union and representatives from the sugar factories in the state and the Village Development Committees (VDCs). The VDCs will be continuously involved in decision-making processes, both planning and execution, Chaired by the PC, the TC will be responsible for discussing technical issues, setting priorities, preparing work plans, resolving conflicts and supervising site-level activities in order to ensure local level coordination and linkages. The Village Development Committees (VDCs) will assist the TC to liaison with the larger communities. Costs for the TC will be covered by both the State Ministry and the Project.

Project Coordination Working Group (PCWG)

247. A **Project Coordination Working Group (PCWG)** will be established to improve the coordination and dialogue between the ongoing projects at the state level including the LDCF2 project

(UNDP), the proposed RLACC programme (AfDB), the ADAPT! project (UNEP), the current State CRFP project, the IFAD Project coordinator, the Sudan Sustainable NRM Project (SSNRMP). The PCWG will provide a support role to the TC to ensure coordination, coherence and complementarity in terms of other adaptation-related initiatives and targeted areas. The PCWG will also ensure that overall impacts and interventions are in line with the development priorities of the state. The PCWG will be established by the state government, coordinated by an appropriate government institution and will include HCENR, the managers of baseline projects and representatives of other aligned projects (see Section 2.6 and 2.7) as well as a representative from Plan Sudan, an NGO who is active in White Nile State as members. Meetings for the PCWG will be held twice a year. They will work towards: i) promoting synergy between projects; ii) preventing the duplication of activities; iii) optimizing the effects of the project interventions; and iv) sharing lessons learned.

Project Assurance

248. The UNEP Task Manager will monitor the project's implementation and achievement of the project outcomes and outputs – and ensure the proper use of GEF funds. UNEP will be responsible for the recruitment of mid-term and terminal evaluators and the required follow-up.

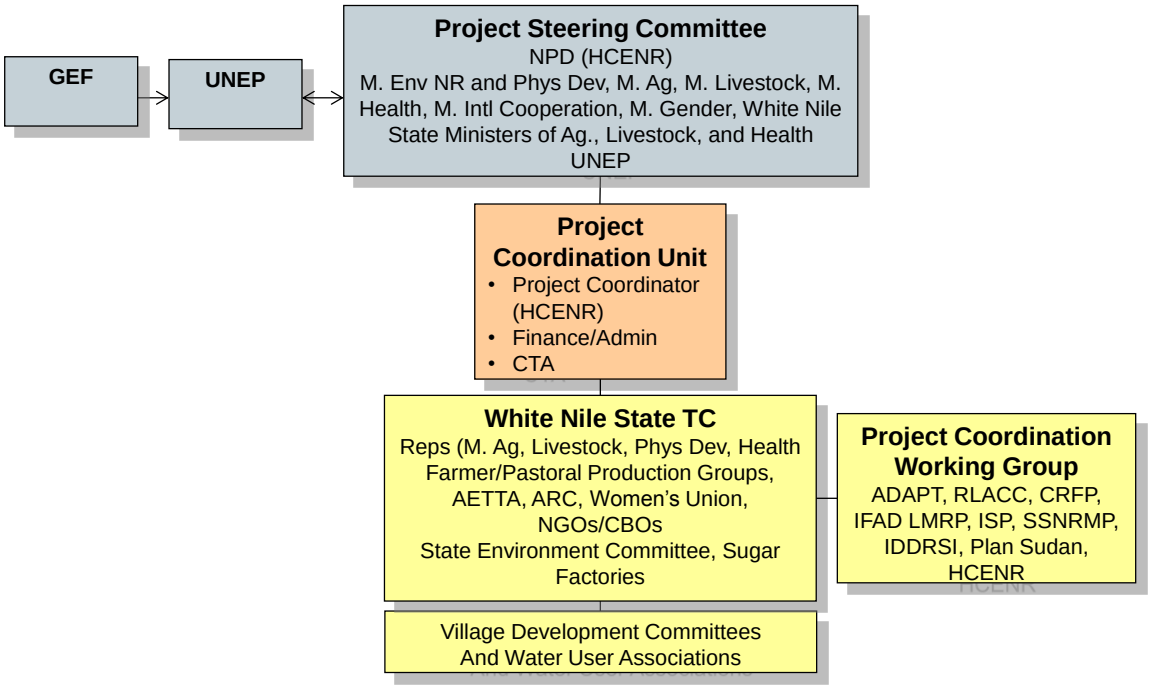

Figure 3: LDCF3 Management Arrangements

SECTION 5: STAKEHOLDER PARTICIPATION

249. The implementation strategy for the LDCF-financed project includes extensive stakeholder participation. Details of the stakeholder participation during the PPG phase are provided in Section 2.5 and Appendix 7 and 16 of the UNEP PD. Stakeholder engagement will be continuous throughout the project implementation phase, beginning with the project inception workshop. Stakeholders will be consulted throughout the implementation phase to: i) promote community understanding of the project's outcomes; ii) promote local community ownership of the project through engaging in planning, implementing and monitoring of the interventions; iii) communicate to the public in a consistent, supportive and effective manner; and iv) maximize complementation with other ongoing projects. The multi-disciplinary White Nile State Technical Committee will be established to foster dialogue on EbA and mainstreaming the concept into state development plans and adaptation strategies. HCENR will be focusing on facilitation dialogue on EbA at the national level. Similarly a

Project Coordination Working Group will coordinate dialogue among the project managers from baseline projects and other ongoing initiatives to discuss and develop synergies between these projects and the LDCF3 project. The participation of stakeholders per outcome is detailed in the table below.

Table 4. Stakeholder participation per outcome.

Outcome	**Output**	**Lead or coordinating institutions**	**Important stakeholders/ partners**	**Key responsibilities**
1.Improved and strengthened technical capacity of local, state and national institutions to plan, implement and upscale EbA	1.1 A multi-disciplinary national committee established that facilitates cross cutting national dialogue on climate change adaptation and EbA in vulnerable sectors	HCENR	• National Ministry of Agriculture • National Ministry of Animal Resources • National Ministry of Gender	• Establish a State Technical Committee • Enhance the technical capacity of HCENR, relevant ministries and the State Technical Committee • Support cross-sectoral meetings
	1.2 A stocktaking exercise undertaken and revisions of existing policies and strategies produced to identify entry points for promoting EbA and up-scaling EbA into national strategies including budget allocations	HCENR	• National Ministry of Agriculture • National Ministry of Animal Resources • National Ministry of Gender	• Conduct stocktaking exercise for policy- and decision-makers on incorporating EbA • Provide operational and technical support to HCENR, the State Technical Committee and relevant ministries on how to include climate change considerations in relevant strategies, plans and budgets
	1.3 Policy briefs and technical guidelines developed and distributed for policy – and decision makers on increasing the resilience of local community livelihoods to climate change using appropriate ecosystem based adaptation and knowledge gained from demonstration activities in Component 2	HCENR	• National Ministry of Agriculture • National Ministry of Animal Resources • National Ministry of Gender	• Develop and distribute policy briefs detailing the economic impacts of climate change for rain-fed farmers and pastoralists as well as potential adaptation interventions • Develop and distribute technical guidelines for policy- and decision-makers on best practices of EbA
	1.4 Targeted CC adaptation and	HCENR	• State Ministry of Agriculture	• Site visits to gather lessons learned on best EbA

Outcome	Output	Lead or coordinating institutions	Important stakeholders/ partners	Key responsibilities
	EbA planning/implementation training programmes for stakeholders completed, including field visits to learn from successful adaptation implementation		• State Range and Pasture Administration • State Ministry of Animal Resources • ARC	practices • Conduct training sessions for HCENR, relevant ministry members and the State Technical Committee on: i) interpreting the climate change adaptation economic assessment produced under Component 3 and ii) using a cost effectiveness argument in the planning and decision making process
	1.5 Facilitation of a local policy dialogue (based on vulnerability assessments and practical experiences from pilot implementation of EbA in component 2) on mainstreaming of adaptation into state and locality development plans	State Technical Committee	• ARC • VDCs	• Provide awareness raising campaigns for State authorities and local communities on the benefits of EbA for increasing the resilience of communities to climate change • Develop and/or adapt technical guidelines in Arabic on how to assess, plan and finance climate change adaptation interventions • Provide training to the State Technical Committee and relevant local representatives on how to integrate EbA into the state and local planning
2. Reduced vulnerability of local communities to climate change impacts, in the White Nile State	2.1 Climate change vulnerability and risks for the selected vulnerable sites are identified to guide EbA interventions in pilot sites in the White Nile State	State Technical Committee	• VDCs • ARC • White Nile State's Women's Union	• Climate change vulnerability assessment and sector specific vulnerability assessments • Define cost effective strategies for rangeland regeneration, increasing water infiltration and improving agricultural yields in consultation with the VDCs • Develop protocols to guide the implementation of EbA interventions • Develop and implement community-based EbA intervention management and monitoring plans
	2.2 Regeneration of critical ecosystem services to restore degraded	State Technical Committee	• Range and Pasture Administration • National Forest Corporation	• Establish Village Development Committees (VDCs) • Establish Water User Associations (WUAs)

Outcome	Output	Lead or coordinating institutions	Important stakeholders/ partners	Key responsibilities
	rangelands, increase water infiltration and improve resilience of rain fed agriculture under increasing drought conditions and dry seasons		• Ministry of Agriculture (state department) • ARC	• Establish sub-committees of VDCs • Document successful experiences by North Kordofan State in limiting the use of tractors • Appoint technical service providers to implement the EbA measures • Rehabilitate rangeland reserves in collaboration with the Range and Pasture Administration • Implement reforestation • Replant and protect trees along riparian zones • Develop large-scale shelter belts to prevent desertification • Establish demonstration plots
	2.3 A number of EBA support measures are piloted and integrated into existing local community livelihood activities, including *in situ* rainwater harvesting and drought/flood resilient eco-agriculture	State Technical Committee	• State legislation Council • VDCs • Range and Pasture Administration • Ministry of Agriculture (state department) • Extension services • ARC • WUAs • White Nile State's Women's Union	• Implement rainwater harvesting techniques • Introduce ploughs and agricultural implements • Conduct seed broadcasting • Design and rehabilitate reservoirs and wells • Repair water hand pumps and introduce solar pumps for surface wells in conjunction with UNICEF • Map current land use and soil quality using community involvement
	2.4 Pilot implementation of alternative livelihood activities, including, *inter alia*, backyard gardening, poultry breeding, small ruminant feeding and alternative energy sources to enhance community resilience to	State Technical Committee	• VDCs • White Nile State's Women's Union • Range and Pasture Administration • Ministry of Agriculture (state department) • Extension services • ARC • WUAs	• Provide alternative livelihood support: home poultry production and small ruminant strategic feeding • Establish community-led nurseries for climate-resilient plant species and tree seedlings • Promote alternative building materials to reduce dependencies on trees as biomass fuel • Purchase improved cook stoves • Establish a revolving fund

Outcome	Output	Lead or coordinating institutions	Important stakeholders/ partners	Key responsibilities
	climate change impacts			to support purchase of animal drawn ploughs, drought-resistant seeds, animal feed supplements, solar pumps for wells, improved cookstoves and alternative building materials • Provide training to the VDCs on accessing and managing of the revolving fund • Provide training to extension services on post-harvest activities (dry/processing and storage vegetables, finishing and fattening lambs, etc.) • Provide training to WUAs on the maintenance of surface wells and the use of spare parts
	2.5 Local authorities, communities, committees and user groups trained on adapting community livelihoods to climate change through the use of EbA	State Technical Committee	• VDCs • WUAs • White Nile State's Women's Union • Range and Pasture Administration • Ministry of Agriculture (state department) • Extension services • ARC	• Develop and/or adapt training programmes for local communities on EbA • Provide training to communities • Establish extension farms • Train local government representatives on EbA • Train community management committees to oversee, monitor and coordinate local community involvement in EbA • Train local communities at each project intervention site on the implementation and maintenance of EbA interventions • Host experience-sharing events
3. Strengthened information base and knowledge on EbA and climate change are readily available for various uses.	3.1 Information, lessons learnt from project interventions and knowledge on climate change adaptation and resilient livelihoods using EbA are captured, stored and widely disseminated among	HCENR, State Technical Committee	• ARC • Range and Pasture Administration • Schools • State television • State radio • VDCs • WUAs • White Nile State's Women's Union	• Collate and disseminate lessons learned and knowledge generated through the project through appropriate national networks • Hold workshops to share the results of the vulnerability assessment • Establish an education programme in local schools on the benefits of EbA • Prepare a short-film demonstrating successful

Outcome	Output	Lead or coordinating institutions	Important stakeholders/ partners	Key responsibilities
	stakeholders at all levels.			EbA measures for agro-pastoralists
	3.2 A central information base of data on EbA lessons learned and cost-effectiveness of interventions established in appropriate government entity.	HCENR, State Technical Committee	• ARC • Range and Pasture Administration	• Create a link with the existing iCloud environmental database jointly operated by HCENR and ARC • Disseminate lessons learned on other web-based platforms to appropriate national and regional networks, such as the Africa Adaptation Knowledge Network
	3.3 An upscaling strategy for EbA across Sudan developed, based on cost-benefit analyses for both public and private sectors.	HCENR, State Technical Committee	• ARC • Range and Pasture Administration • Public and private sector representatives	• Develop an economic cost-benefit assessments for EbA measures • Develop an upscaling plan for EbA measures based on the cost-benefit assessment • Provide workshops with the public and private sectors to disseminate EbA project concepts and raise awareness about the cost-benefits of such projects

SECTION 6: MONITORING AND EVALUATION PLAN

250. All activities implemented by the project will be designed to improve environmental conditions in the short- to long-term. Consequently, none of the project activities should trigger EIAs, as verified in the PPG phase through stakeholder consultations. Nevertheless, environmental legislation will be reassessed during project inception to verify this. If necessary, assessments will be undertaken to determine the environmental effects generated by the project's interventions. In addition, mitigation measures will be undertaken to ameliorate any related negative social or environmental effects. Furthermore, the project will focus on improving the livelihoods of women and integrating them into decision-making processes.

251. The project will be monitored through the following Monitoring & Evaluation (M&E) activities. The M& E budget is provided in Appendix 5. The project M&E plan is consistent with the GEF Monitoring and Evaluation policy. The Project Results Framework presented in Appendix 3 includes SMART indicators for each expected outcome and output as well as mid-term and end of project targets. These indicators, when necessary along with the key deliverables and benchmarks, could be developed in some more detail and fine-tuned during the inception phase of the project and will be the main tools for assessing project implementation progress and whether project results are being achieved. The means of verification and the costs associated with obtaining the information to track the indicators are summarized in Appendix 5. Other M&E related costs are also presented in the costed M&E Plan and are fully integrated in the overall project budget.

252. The M&E plan will be reviewed and revised as necessary during the project inception workshop to ensure project stakeholders understand their roles and responsibilities vis-à-vis project monitoring and evaluation. At the time of project approval, baseline data for most of the indicators established in the Results Framework was available. Baseline data gaps will be addressed during the first year of project implementation.

253. Day-to-day project monitoring is the responsibility of the project coordinating unit but other project partners will have responsibilities to collect specific information to track the indicators. It is the responsibility of the Project Coordinator to inform the PSC of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely fashion.

254. The Project Steering Committee will receive periodic reports on progress and will make recommendations concerning the need to revise any aspects of the Results Framework or the M&E Plan. Project oversight is the responsibility of the Task Manager of UNEP. The Task Manager will review the quality of draft project outputs, provide feedback to the project partners, and establish peer review procedures to ensure adequate quality of scientific and technical outputs and publications.

255. Project supervision will take an adaptive management approach. The UNEP Task Manager will develop a project supervision plan at the inception of the project which will be communicated to the project partners during the inception workshop, which will be held within the first 2 months of project commencement with those with assigned roles in the project organization structure, UNEP staff and where appropriate/feasible other 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. The Inception Workshop should address a number of key issues including:

i) Assisting all partners to fully understand and take ownership of the project.

ii) Discussion on the roles, support services and complementary responsibilities of UNEP staff vis-à-vis the project team.

iii) Discussion on the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms.

iv) Discussion on the Terms of Reference for project staff if required.

v) Finalize the annual work plan (AWP), based on the project results framework and the relevant SOF (e.g. GEF) Tracking Tool if appropriate.

vi) Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.

vii) Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements.

viii) Agreement and scheduling of the Monitoring and Evaluation work plan and budget.

ix) Discussion of financial reporting procedures and obligations, and arrangements for annual audit.

x) Plan and schedule Project Committee meetings.

xi) Clarification of the roles and responsibilities of all project organization structures and planning of meetings.

256. The first Project Steering Committee meeting should be held within the first 10 months following the inception workshop.

257. 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. Progress made shall be monitored in the UNEP system.

258. Project Implementation Reports (PIR): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period (June 30th to July 1st). The PIR combines UNEP and GEF reporting requirements. The PIR includes, but is not limited to, reporting on the following:

i) Progress made toward project objective and project outcomes each with indicators, baseline data and end of project targets (cumulative).

ii) Project outputs delivered per project outcome (annual).

iii) Lesson learned/good practices.

iv) AWP and other expenditure reports.

v) Risk and adaptive management.

vi) Portfolio level indicators (i.e. GEF focal area tracking tools) are used by most focal areas on an annual basis as well.

259. Periodic Monitoring through site visits: Relevant staff from UNEP 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 Steering Committee may also join these visits. A Field Visit Report/BTOR will be prepared by the UNEP no less than one month after the visit to the project team and Project Steering Committee members.

260. Mid-term of project cycle: The project will undergo an independent Mid-Term Evaluation or Mid Term Review at the mid-point of project implementation. Also, if the proposed project is rated as being at risk, a Mid-Term Evaluation will be conducted by the Evaluation Office (EOU). UNEP will be responsible for managing the mid-term review/evaluation and the terminal evaluation. The Project Manager and partners will participate actively in the process. The project will be reviewed or evaluated at mid-term (tentatively in 09/2018 as indicated in the project milestones). The purpose of the Mid-Term Review (MTR) or Mid-Term Evaluation (MTE) is to provide an independent assessment of project performance at mid-term, to analyze whether the project is on track, what problems and challenges the project is encountering, and which corrective actions are required so that the project can achieve its intended outcomes by project completion in the most efficient and sustainable way. In addition, it will verify information gathered through the GEF tracking tools. The project Steering Committee will participate in the MTR or MTE and develop a management response

to the evaluation recommendations along with an implementation plan. It is the responsibility of the UNEP Task Manager to monitor whether the agreed recommendations are being implemented. An MTR is managed by the UNEP Task Manager. An MTE is managed by the Evaluation Office (EOU) of UNEP. The EOU will determine whether an MTE is required or an MTR is sufficient.

261. *End of Project*: An independent Terminal Evaluation (TE) will be initiated no earlier than six months prior to the operational completion of project activities and, if a follow-on phase of the project is envisaged, should be completed prior to completion of the project and the submission of the follow-on proposal. Terminal Evaluations must be initiated no later than six months after operational completion. The EOU will be responsible for the TE and liaise with the UNEP Task Manager throughout the process. The TE will provide an independent assessment of project performance (in terms of relevance, effectiveness and efficiency), and determine the likelihood of impact and sustainability. It will have two primary purposes:

i) to provide evidence of results to meet accountability requirements, and

ii) to promote learning, feedback, and knowledge sharing through results and lessons learned among UNEP and executing partners.

262. While a TE should review use of project funds against budget, it would be the role of a financial audit to assess probity (i.e. correctness, integrity etc.) of expenditure and transactions.

263. The TE report will be sent to project stakeholders for comments. Formal comments on the report will be shared by the EOU in an open and transparent manner. The project performance will be assessed against standard evaluation criteria using a six point rating scheme. The final determination of project ratings will be made by the EOU when the report is finalised. The evaluation report will be publically disclosed and will be followed by a recommendation compliance process. The direct costs of reviews and evaluations will be charged against the project evaluation budget.

264. The project Steering Committee will receive periodic reports on progress and will make recommendations to UNEP concerning the need to revise any aspects of the Results Framework or the M&E Plan. Project oversight to ensure that the project meets UNEP and GEF policies and procedures is the responsibility of the Task Manager in UNEP/GEF. The Task Manager will also review the quality of draft project outputs, provide feedback to the project partners, and establish peer-reviewed procedures to ensure adequate quality of scientific and technical outputs and publications.

265. Project supervision will take an adaptive management approach. The Task Manager will develop a project supervision plan at the inception of the project which will be communicated to the project partners during the inception workshop. The emphasis of the Task Manager supervision will be on outcome monitoring but without neglecting project financial management and implementation monitoring. Progress vis-à-vis delivering the agreed project global environmental benefits will be assessed with the Steering Committee at agreed intervals. Project risks and assumptions will be regularly monitored both by project partners and UNEP. Risk assessment and rating is an integral part of the Project Implementation Review (PIR). The quality of project monitoring and evaluation will also be reviewed and rated as part of the PIR. Key financial parameters will be monitored quarterly to ensure cost effective use of financial resources.

266. The tracking tools (Appendix 14) will be validated/updated at inception, mid-term and at the end of the project and will be made available to the GEF Secretariat along with the project PIR report. As mentioned above the mid-term and terminal evaluation will verify the information of the tracking tool.

SECTION 7: PROJECT FINANCING AND BUDGET

7.1. Overall project budget

Table 5. A breakdown of total project financing.

	LDCF Funds	Co-Financing	Total Costs
Total project cost (US$)	US$4,284,000	US$7,915,200	**US$12,199,200**

7.2. Project co-financing

Table 6. Breakdown of project financing by funder.

	US$	%
LDCF Funds	4,284,000	35
Co-financing		
White Nile State's Water Corporation	2,415,200	20
Animal wealth administration at the White Nile State	2,000,000	16
Range and Pasture administration at the White Nile State	500,000	4
White Nile State Ministry of Agriculture, Irrigation and Forests	1,600,000	13
UNEP ADAPT	1,400,000	11
Total	**12,199,200**	**100**

The total project co financing is USD 7,915,200 with USD 1,400,000 provided in grant, and USD 6,515,200 in kind.

7.3. Project cost-effectiveness

267. The LDCF3 project has been designed with an inherently cost-effective approach. In particular, the project objective will: i) promote integration of climate change adaptation into development planning; and ii) enhance the resilience of communities to climate change. Cost-effective interventions that have been selected during the PPG include *inter alia*: i) piloting EbA measures in 4 target localities; ii) creating EbA project concept notes to promote upscaling of EbA by the private sector; and iii) conducting a range of training and awareness-raising activities for relevant stakeholders. During the process of selecting these interventions, alternative approaches for reducing climate vulnerability of local communities at project intervention sites in Sudan were considered. An evaluation of their cost-effectiveness vis-à-vis that of the interventions proposed in Section 3.3 is described below.

268. Importantly, the LDCF3 project includes technical training for VDCs, WUAs and technical focal points within each of the 4 target communities on implementing, maintaining and monitoring project interventions. This approach will reduce the overall cost for monitoring project activities. Moreover, it will promote sustainability of the interventions beyond the lifespan of the project

Table 7: Analysis of project cost-effectiveness of adaptation alternatives

LDCF3 project interventions	**Alternative 1**	**Alternative 2**

are implemented		
Outcome 1: Improved and strengthened technical capacity of local, state and national institutions to plan, implement and upscale EbA		
A multi-disciplinary State Technical Committee established in order to facilitate cross cutting dialogue on climate change adaptation and EbA in vulnerable sectors and to coordinate EbA measure planning	Create a new nationally-based inter-ministerial committee for CCA/EbA HCENR's role is to coordinate all environmental activities related to CCA and EbA on a national level. Also, within the White Nile State, thanks to the NAP process, there are already EbA experts and a State Environment Committee. Therefore, this option would be redundant and would waste financial and human resources. Furthermore, a new independent, nationally-based cross-sectoral committee would entail that knowledge remains isolated within a particular group of people at a high government level. This would not be a cost-effective and sustainable approach to climate change adaptation on the local level in Sudan where adaptation must take place.	Facilitate cross cutting dialogue on climate change adaptation by relying on the motivation of existing ministries Ministries do not have the mandate to consider EbA, particularly at the detailed state levels where interventions take place. Therefore, a state-based technical committee which is multi-disciplinary is the only effective option to facilitate cross-cutting dialogue in a manner which will make a difference on-the-ground. Moreover, a multi-disciplinary committee will continue to support an integrated approach to adaptation and will have the technical skills to understand and disseminate cost-benefit analysis results demonstrating EbA measure cost-effectiveness
Targeted CC adaptation and EbA planning/implementation training programmes to build the capacities of line ministries and other relevant Stakeholders, including field visits to learn from successful adaptation implementation Strengthened institutional and technical capacities of climate-vulnerable line sectors will promote sustained adaptation to climate change in Sudan. In particular, through training government officials from a number of relevant line ministries, a "diffusion" effect will be promoted within these ministries, whereby knowledge and skills for climate change adaptation will be transferred	Bring in national experts to promote EbA planning/implementation Due to the fact that trained experts in Sudan are often lured to more lucrative, outside opportunities, it is best to keep knowledge within the existing ministries so that expertise can be stored and passed down. Furthermore, the cost of hiring new national experts would be greater than training government representatives that would remain within – and transfer knowledge and skills to – existing ministries. Most importantly, the common insufficiency of existing baseline projects has been	Training of line ministries by reading technical guidelines Visits to pilot sites and seeing EbA measures in the field is the cost effective approach to strengthening national and inter-ministerial motivations as well as to increase understanding to implement adaption measures.

to staff members outside of the training sessions.	inadequate budget lines for financing EbA activities. Ministries must be trained to be able to budget for the most cost-effective EbA options.	
<u>Facilitation of a local policy dialogue for mainstreaming of adaptation into state and locality development plans</u> At the state and local level, there is limited public knowledge on: i) the effects of climate change on agro-pastoralists; ii) potential adaptation interventions to manage these effects; and iii) the benefits of EbA for increasing the resilience of communities to climate change. Through the LDCF3 project, awareness-raising campaigns will be designed and implemented for the target communities. Training will be on successful EbA implementations and how to integrate them into planning.	<u>Provide training on national levels to mainstream adaptation</u> LDCF funds will be used to support the national level to integrate EbA into policies, strategies and budgets. However, it is also critical to update state and locality development plans to incorporate EbA in order to fully mainstream adaptation principles into local livelihoods.	
Outcome 2: Reduced vulnerability of local communities to climate change impacts, in the White Nile State		
<u>Regeneration of critical ecosystem services to restore degraded rangelands, increase water infiltration and improve resilience of rain fed agriculture under increasing drought conditions and dry seasons.</u> Ecosystems – including rangelands and forests – act as buffers to increasing climate change impacts such as floods	<u>Using solely hard infrastructure water management techniques for drought and flood risk management</u> Some initiatives by the State Water Corporation have focused on constructing hard infrastructure to divert water and protect local communities from flooding or to build dams to divert water for storage. Although these items provide	<u>Relocation of pastoralists in low productive rangeland areas</u> There is a risk that economic, environmental and social costs could be incurred through relocating semi-nomadic communities. For example, relocation to new sites could result in lost livelihoods, lost sense of community and social capital, cultural alienation. Furthermore, relocation could

and droughts and provide services[40]. Moreover, these ecosystems are capable of undergoing "autonomous" adaptation because of their natural nature. In addition, rangeland restoration and afforestation provide multiple social and ecological benefits including: i) maintenance of soil fertility; ii) carbon sequestration; and iii) biodiversity and habitat restoration. In the long-term, these benefits will contribute to climate change mitigation. Therefore, EbA is a 'soft' proactive rather than reactive approach for addressing climate change. A growing body of scientific research indicates that increasing numbers of EbA projects will deliver favourable cost-benefit ratios in comparison with projects that use only hard interventions to facilitate adaptation to climate change.[41]	physical barriers against climate-related hazards, they can often lead to erosion or siltation. Furthermore, the cost of construction of this infrastructure is much greater than EbA. For example, the unit cost of constructing an earth dam is on the order of 500,000 USD. EbA measures take a holistic approach and look more upstream to prevent adverse environmental impacts such as siltation and erosion. Afforestation and tree planting along riparian zones will assist with reducing erosion and desertification. At the same time, they will provide more ecosystem services to the population.	exacerbate the already existing clashes between farmers and pastoralists over arable land. The situations of drought, desertification and scarce resources have been factors behind prolonged stays of nomads in areas of agricultural production ("Talq"), which has caused clashes between nomads and farmers.[42] Clashes are worsening with climate change, because it has caused farmers to intensify continuous cultivation (limit fallow periods), expand land use, construct more fencing and abandon previous mutual interdependencies between cultivation and pastoralism (e.g., manurism, sharing of crop residues, animal transport of crops)[43].
<u>Establish Village Development Committees (VDCs)</u> <u>Establish Water User Associations (WUAs) in each pilot area</u> Both VDCs and WUAs will facilitate community-based EbA. They will also promote gender mainstreaming by mandating at least a 30% women representation. The	<u>Rely on the State Technical and Environment Committees to support EbA measures</u> The State committees will be working at a higher level and will not be able to resolve traditional quarrels over water and land management. Communities and their traditional leaders (which will be reinforced by both the VDCs and the WUAs) will be	<u>N/A</u>

[40] Jones et al. 2012. Harnessing nature to help people adapt to climate change. *Nature*. Published online: 26 June 1012. DOI: 10.1038/nclimate1463

[41] Monroe, R. et al. *Does EbA Work? A review of the evidence on the effectiveness of ecosystem-based approaches to adaptation, International Institute for Environment Development: Research Highlights, Nov 2011.*

[42] *Land Issues and Peace in Sudan*, Sudanese Environmental Conservation Society (SECS) and UNDP November 2006.

[43] Feinstein/UNEP Study, 2013, *Standing Wealth: Pastoralist Livestock Production and Local Livelihoods in Sudan.*

VDCs have proven successful at the LDCF1 pilot sites for SRFP. Also, WUAs have been successful in managing and maintaining community water resources in Darfur[44]	supported to have the technical and operational expertise for EbA management.	
Climate change vulnerability and risks for the selected vulnerable sites are identified to guide EbA interventions in pilot sites in the White Nile State By conducting a site-specific V&A assessments of specific climate change vulnerabilities in each of the target communities, it will identify specific entry points and guide identification of specific priority EbA measures, emphasizing gender mainstreaming	Rely on NAP V&A Assessment The NAP V&A assessment was generalized to describe the White Nile State as a whole.	
Establish a revolving fund to support Village Development Committees in purchasing animal drawn ploughs, drought-resistant seeds, solar powered water pumps, animal feed supplements and improved cookstoves (2.4.9) Provide training to VDCs on accessing and managing of the revolving fund, (e.g., book keeping) The LDCF3 project will build off the successes of the revolving funds in the LDCF1 project by administering and managing them with the support of legally recognized VDCs and WUAs. In the	Direct price subsidies for clean cookstoves Past experiences show that the deployment of fully subsidized clean cookstoves through development aid projects has had limited effects on long-term adoption. Direct price subsidies may, in fact, increase barriers for commercialisation as they reduce the intrinsic value of clean cookstoves which lowers customers' willingness to pay.[45]	N/A

[44] The ***Wadi El Ku Catchment programme*** (financed by UNEP, USD 7.6 million) in North Darfur, currently implemented by UNEP in partnership with Practical Action (2014 – 2017), is facilitating reforms to environmental governance that enable an end to chronic cycles of conflict over natural resources.

[45] DifferGroup, *Light Our Fire: Commercializing Clean Cookstove*, 7 November 2012.

LDCF1 project the revolving funds were used to purchase solar powered water pumps and gas cookstoves.		
Outcome 3: Strengthened information base and knowledge on EbA and climate change are readily available for various uses.		
A central information base of data on EbA lessons learned and cost-effectiveness of interventions established By exploiting the existing iCloud database jointly operated by HCENR and ARC, it will be the most cost-effective option to provide EbA information to the greatest number of stakeholders at a range of levels. The adaptation materials will be freely available to all Stakeholders.	A new online platform for adaptation planning in Sudan – including EbA – is developed Creating a new platform would be redundant and a waste of financial resources. Furthermore, the target stakeholders have familiarity with this platform. Moreover, maintaining another platform would be costly and require additional technical expertise.	N/A
An upscaling strategy for EbA across Sudan is developed, based on EbA concept notes for both public and private sectors By developing and presenting EbA concepts to the private sector, upscaling and replication of this approach will be promoted. Recently, it has been acknowledged that public- and donor-funded adaptation is not sufficient to meet the pressing needs of climate-vulnerable communities and sectors[46]. Therefore, a mix of funding sources for adaptation – including the private – is the most cost-effective solution in the long term.	EbA interventions are upscaled through public-sector or international donor funding In line with the National Adaptation Planning (NAP) process that was initiated at COP-16 (Cancun), there is a need for countries to move from immediate, isolated and project-driven adaptation to a more integrated approach that supports long-term, sustainable economic development. To advance this process, the GoS should promote innovative financing mechanisms for adaptation. By only implementing public-sector or donor-funded adaptation, this process will be undermined.	N/A

[46] SEI. 2008. Private sector finance and climate change adaptation policy brief. Available online at: http://www.sei-international.org/mediamanager/documents/Publications/Climate-mitigation-adaptation/policybrief-privatesectorfinance-adaptation.pdf. Accessed on 5 April 2015.

Appendix 1: Budget by project components and UNEP budget lines

ANNEX F: PROJECT BUDGET														Notes
Project title:			Enhancing the resilience of communities living in climate change vulnerable areas of Sudan using Ecosystem Based approaches to Adaptation (EbA)											
Project number:														
Project executing partner:			Higher Council on the Environment and Natural Resources (HCENR)											
Project implementation period:			Expenditure by project component/activity						Expenditure by calendar year					
From:	2016													
To:	2020		Outcome 1	Outcome 2	Outcome 3	PM	M&E	Total	Year 1	Year 2	Year 3	Year 4	Total	
UNEP Budget Line														
10	**PERSONNEL COMPONENT**													
	1100	**Project personnel**												
	1101	National Project Manager				120,000		120,000	30,000	30,000	30,000	30,000	120,000	1
	1102	Chief Technical Advisor				144,000		144,000	36,000	36,000	36,000	36,000	144,000	2
	1103	Project driver	2,000	12,500	1,900			16,400	4,100	4,100	4,100	4,100	16,400	3
	1199	**Sub-total**	**2,000**	**12,500**	**1,900**	**264,000**	**-**	**280,400**	**70,100**	**70,100**	**70,100**	**70,100**	**280,400**	
	1200	**Consultants**												
	1201	International EbA Expert	-	75,000	-			75,000	10,000	43,000	12,000	10,000	75,000	4
	1202	National Community-based NRM Expert	-	139,000	-			139,000	9,250	31,500	90,250	8,000	139,000	5
	1203	National Rural Alternative Energy Expert	-	11,000	-			11,000	-	-	11,000	-	11,000	6
	1204	Adaptation Expert	95,000	17,000	-			112,000	85,000	5,500	5,500	16,000	112,000	7
	1205	International Adaptation economics/ Policy Expert	37,800	-	48,000			85,800	20,000	20,800	45,000	-	85,800	8
	1206	National Revolving Fund Expert	-	20,000	-			20,000	-	20,000	-	-	20,000	9
	1299	**Sub-total**												

			132,800	**262,000**	**48,000**			**442,800**	**124,250**	**120,800**	**163,750**	**34,000**	**442,800**	
	1300	**Administrative Support**												
	1301	Admin / Finance Asst	8,600	54,800	8,600			72,000	18,000	18,000	18,000	18,000	72,000	10
	1399	**Sub-total**	**8,600**	**54,800**	**8,600**			**72,000**	**18,000**	**18,000**	**18,000**	**18,000**	**72,000**	
	1600	**Travel on official business**												
	1601	Travel site visits Comp1	30,000	-	-			30,000	-	-	-	30,000	30,000	11
	1602	PM Travel	20,000	20,000	20,000			60,000	15,000	15,000	15,000	15,000	60,000	12
	1603	Travel for V&A	-	10,000	-			10,000	10,000	-	-	-	10,000	13
	1604	Travel to validate sites	-	5,000	-			5,000	5,000	-	-	-	5,000	14
	1605	Travel for experience sharing events	-	10,000	-			10,000	-	-	-	10,000	10,000	15
	1699	**Sub-total**	**50,000**	**45,000**	**20,000**			**115,000**	**30,000**	**15,000**	**15,000**	**55,000**	**115,000**	
1999	**Component total**		**193,400**	**374,300**	**78,500**	**264,000**	**-**	**910,200**	**242,350**	**223,900**	**266,850**	**177,100**	**910,200**	
20	**SUB-CONTRACT COMPONENT**													
	2100	**Sub-contracts (MOUs/LOAs for cooperating agencies)**												
	2101													
	2199	**Sub-total**												
	2200	**Sub-contracts (MOUs/LOAs for supporting organizations)**												

	2201	Subcontract for NGO to implement EbA monitoring plan	-	80,000	-			80,000	-	40,000	-	40,000	80,000	16
	2202	Subcontract for organization to rehabilitate rangelands	-	85,000	-			85,000	-	45,000	40,000	-	85,000	17
	2203	Subcontract for NGO to implement afforestation	-	40,000	-			40,000	-	10,000	20,000	10,000	40,000	18
	2204	NGO subcontract for riparian replanting	-	15,000	-			15,000	-	-	15,000	-	15,000	19
	2205	Subcontract for organization to implement shelter belts	-	52,000	-			52,000	-	16,000	24,000	12,000	52,000	20
	2206	NGO subcontract - community farm preparation	-	60,000	-			60,000	-	40,000	20,000	-	60,000	21
	2207	Subcontract for organization to support RWH	-	128,000	-			128,000	32,000	64,000	32,000	-	128,000	22
	2208	NGO subcontract - IPM	-	40,000	-			40,000	-	40,000	-	-	40,000	23
	2209	Organization subcontract on water management	-	470,000	-			470,000	-	380,000	90,000	-	470,000	24
	2210	Support for NGO to conduct water infrastructure repair	-	40,000	-			40,000	-	40,000	-	-	40,000	25
	2211	Revolving fund	-	80,000	-			80,000	-	80,000	-	-	80,000	26
	2212	Organization subcontract to provide training on water mgt	-	10,000	-			10,000	-	-	10,000	-	10,000	27
	2213	NGO subcontract - training to farming/pastoral groups	-	20,000	-			20,000	-	20,000	-	-	20,000	28
	2214	NGO subcontract - establish extension farms	-	35,000	-			35,000	17,500	17,500	-	-	35,000	29

	2215	VDC / WUA subcontract - collating local EbA lessons learned	-	-	30,000			30,000	-	-	-	30,000	30,000	30
	2216	NGO subcontract - collating national / international lessons learned on EbA	-	-	20,000			20,000	-	-	-	20,000	20,000	31
	2217	NGO subcontract - EbA cost-benefits	-	-	40,000			40,000	40,000	-	-	-	40,000	32
	2218	NGO subcontract - EbA upscaling plan	-	-	22,000			22,000	-	-	22,000	-	22,000	33
	2299	**Sub-total**	**-**	**1,155,000**	**112,000**			**1,267,000**	**89,500**	**792,500**	**273,000**	**112,000**	**1,267,000**	
	2300	**Sub-contracts (for commercial purposes)**												
	2301	Independent subcontract: EbA technical guidelines	33,000	-	-			33,000	-	-	-	33,000	33,000	34
	2302	Independent subcontract: EbA policy briefs	33,000	-	-			33,000	-	-	-	33,000	33,000	35
	2303	Independent subcontract for: V&A Assessment	-	101,000	-			101,000	101,000	-	-	-	101,000	36
	2304	Independent subcontract for EbA protocols	-	8,000	-			8,000	8,000	-	-	-	8,000	37
	2305	Independent subcontract for EbA monitoring strategy	-	30,000	-			30,000	-	-	-	30,000	30,000	38
	2306	Independent subcontract for V&A workshops	-	-	5,000			5,000	5,000	-	-	-	5,000	39
	2307	Subcontract for AV services	-	-	20,000			20,000	-	-	-	20,000	20,000	40
	2308	Subcontract for IT services	-	-	47,800			47,800	-	-	-	47,800	47,800	41

	2309	Subcontract for IT services	-	-	54,000			54,000	-	-	-	54,000	54,000	42
	2399	**Sub-total**	**66,000**	**139,000**	**126,800**	**-**	**-**	**331,800**	**114,000**	**-**	**-**	**217,800**	**331,800**	
2999	**Component total**		**66,000**	**1,294,000**	**238,800**	**-**	**-**	**1,598,800**	**203,500**	**792,500**	**273,000**	**329,800**	**1,598,800**	
30	**TRAINING COMPONENT**													
	3200	**Group training**												
	3201	Govt EbA training	10,000	-	-			10,000	10,000	-	-	-	10,000	43
	3202	Mainstreaming EbA into polices training	21,000	-	-			21,000	21,000	-	-	-	21,000	44
	3203	Technical support EbA	15,000	-	-			15,000	5,000	5,000	5,000	-	15,000	45
	3204	Training EbA cost-effectiveness	39,800	-	-			39,800	39,800	-	-	-	39,800	46
	3205	Awareness raising on EbA	46,000	-	-			46,000	46,000	-	-	-	46,000	47
	3206	Training EbA mainstreaming - local level	48,000	-	-			48,000	48,000	-	-	-	48,000	48
	3207	Training on improving yields with EbA	-	5,000	-			5,000	5,000	-	-	-	5,000	49
	3208	Trainings for WUAs	-	10,000	-			10,000	-	-	10,000	-	10,000	50
	3209	Alternative livelihood training	-	15,000	-			15,000	-	10,000	5,000	-	15,000	51
	3210	Managing revolving fund training	-	14,000	-			14,000	-	14,000	-	-	14,000	52
	3211	Post-harvesting training	-	25,000	-			25,000	-	-	25,000	-	25,000	53
	3212	Training water management	-	10,000	-			10,000	-	-	10,000	-	10,000	54
	3213	EbA monitoring training	-	30,000	-			30,000	-	15,000	15,000	-	30,000	55
	3214	Training for farmer / pastoral groups	-	20,000	-			20,000	-	20,000	-	-	20,000	56

	3215	Training local govt on EbA	-	5,000	-			5,000	-	5,000	-	-	5,000	57
	3216	Training on EbA for VDCs and WUAs	-	10,000	-			10,000	-	-	10,000	-	10,000	58
	3217	Training on EbA interventions for locals	-	20,000	-			20,000	-	10,000	5,000	5,000	20,000	59
	3218	Training at demonstration plots	-	21,900	-			21,900	-	-	-	21,900	21,900	60
	3219	Training on Econ Adapt	-	-	20,000			20,000	-	-	20,000	-	20,000	61
	3299	**Sub-total**	**179,800**	**185,900**	**20,000**	**-**	**-**	**385,700**	**174,800**	**79,000**	**105,000**	**26,900**	**385,700**	
	3300	**Meeting/Conferences**												
	3301	State Technical Committee	20,000	-	-			20,000	20,000	-	-	-	20,000	62
	3302	Cross-sectoral EbA meetings	14,000	-	-			14,000	2,000	4,000	4,000	4,000	14,000	63
	3303	Cost-effectiveness strategy meetings	-	5,000	-			5,000	5,000	-	-	-	5,000	64
	3304	VDC meetings	-	15,000	-			15,000	15,000	-	-	-	15,000	65
	3305	WUA meetings	-	15,000	-			15,000	15,000	-	-	-	15,000	66
	3306	EbA monitoring meetings	-	70,000	-			70,000	-	35,000	-	35,000	70,000	67
	3307	VDC subcommittees	-	10,000	-			10,000	10,000	-	-	-	10,000	68
	3308	Shelter belt meetings	-	20,000	-			20,000	-	5,000	10,000	5,000	20,000	69
	3309	RWH meetings	-	11,000	-			11,000	2,750	5,500	2,750	-	11,000	70
	3310	Collating lessons learned	-	-	20,000			20,000	-	-	-	20,000	20,000	71
	3311	Collating intl lessons learned	-	-	15,000			15,000	-	-	-	15,000	15,000	72
	3312	V&A findings workshops	-	-	10,000			10,000	5,000	-	5,000	-	10,000	73
	3313	EbA education programme meetings	-	-	20,000			20,000	-	-	-	20,000	20,000	74

	3314	Meetings with private and public sector on EbA project concepts	-	-	20,000			20,000	-	-	20,000	-	20,000	75
	3399	**Sub-total**	**34,000**	**146,000**	**85,000**	**-**	**-**	**265,000**	**74,750**	**49,500**	**41,750**	**99,000**	**265,000**	
3999	**Component total**		**213,800**	**331,900**	**105,000**	**-**	**-**	**650,700**	**249,550**	**128,500**	**146,750**	**125,900**	**650,700**	
40	**EQUIPMENT AND PREMISES COMPONENT**													
	4100	**Expendable equipment**												
	4101	EbA protocol report	-	2,000	-			2,000	2,000	-	-	-	2,000	76
	4102	Successful EbA experiences document	-	5,000	-			5,000	-	5,000	-	-	5,000	77
	4103	Afforestation seedlings	-	16,000	-			16,000	-	4,000	8,000	4,000	16,000	78
	4104	Shelter belt seedlings	-	20,000	-			20,000	-	5,000	10,000	5,000	20,000	79
	4105	Mapping land use / soil quality	-	5,000	-			5,000	-	-	5,000	-	5,000	80
	4106	Rangeland seed broadcasting	-	160,000	-			160,000	-	160,000	-	-	160,000	81
	4107	Backyard garden seeds	-	40,000	-			40,000	-	-	40,000	-	40,000	82
	4108	Office rental	-	-	-	15,000		15,000	15,000				15,000	83
	4109	Office equipment	-	-	-	5,000		5,000	5,000				5,000	84
	4110	Telecommunication cost	-	-	-	2,000		2,000	2,000				2,000	85
	4199	**Sub-total**	**-**	**248,000**	**-**	**22,000**	**-**	**270,000**	**24,000**	**174,000**	**63,000**	**9,000**	**270,000**	
	4200	**Non-expendable equipment**												
	4201	RWH tanks	-	141,000	-			141,000	36,000	70,000	35,000	-	141,000	86

	4202	Ploughs, ag implements	-	50,000	-			50,000	30,000	20,000	-	-	50,000	87
	4203	Medical kits	-	8,000	-			8,000	-	-	8,000	-	8,000	88
	4204	Small ruminant feedstock	-	120,000	-			120,000	-	60,000	60,000	-	120,000	89
	4205	Alt building materials	-	71,000	-			71,000	-	-	71,000	-	71,000	90
	4206	Cook stoves	-	104,000	-			104,000	-	-	104,000	-	104,000	91
	4207	Extension farms	-	25,000	-			25,000	12,500	12,500	-	-	25,000	92
	4208	School trees / farms	-	-	39,900			39,900	-	-	-	39,900	39,900	93
	4209	Project vehicle	-	45,400	-			45,400	11,350	11,350	11,350	11,350	45,400	94
	4299	**Sub-total**	**-**	**564,400**	**39,900**	**-**	**-**	**604,300**	**89,850**	**173,850**	**289,350**	**51,250**	**604,300**	
4999	**Component total**		**-**	**812,400**	**39,900**	**22,000**	**-**	**874,300**	**113,850**	**347,850**	**352,350**	**60,250**	**874,300**	
50	**MISCELLANEOUS COMPONENT**													
	5100	**Operation and maintenance of equipment**												
	5101	Land mgt O&M		15,000				15,000	15,000	-	-	-	15,000	95
	5102	Water reservoir and well O&M		30,000				30,000	-	30,000	-	-	30,000	96
	5103	Hand pump O&M		50,000				50,000	-	50,000	-	-	50,000	97
	5104	Surface well O&M		5,000				5,000	-	-	5,000	-	5,000	98
	5105	Vehicle maintenance		8,000				8,000	2,000	2,000	2,000	2,000	8,000	99
	5199	**Sub-total**		**108,000**				**108,000**	**17,000**	**82,000**	**7,000**	**2,000**	**108,000**	
	5200	**Reporting costs**												
	5201	Project Steering Committee Meetings					8,000	8,000	2,000	2,000	2,000	2,000	8,000	100

	5202	Inception and closure workshop					7,000	7,000	3,500	-	-	3,500	7,000	101
	5299	**Sub-total**					**15,000**	**15,000**		**2,000**	**2,000**	**5,500**	**15,000**	
	5300	**Sundry**												
	5301	Miscellaneous				2,000		2,000	500	500	500	500	2,000	102
	5399	**Sub-total**				**2,000**		**2,000**	**500**	**500**	**500**	**500**	**2,000**	
	5400	**Hospitality and entertainment**												
	5401							-					-	
	5499	**Sub-total**												
	5500	**Evaluation**												
	5501	Baseline evaluation					35,000	35,000	35,000		-	-	35,000	
	5502	Mid-term evaluation					35,000	35,000		35,000	-	-	35,000	
	5503	Final evaluation					35,000	35,000			-	35,000	35,000	
	5504	Audit					20,000	20,000	5,000	5,000	5,000	5,000	20,000	
	5599	**Sub-total**					**125,000**	**125,000**		**40,000**	**5,000**	**40,000**	**125,000**	
5999	**Component total**		**-**	**108,000**	**-**	**2,000**	**140,000**	**250,000**	**17,500**	**124,500**	**14,500**	**48,000**	**250,000**	
99	**GRAND TOTAL**		**473,200**	**2,920,600**	**462,200**	**288,000**	**140,000**	**4,284,000**	**826,750**	**1,617,250**	**1,053,450**	**741,050**	**4,284,000**	

Budget notes

Budget notes		
#	**Description**	**Activities and Notes**
1	National Project Coordinator	See TORs in Project Document Appendix 11
2	Chief Technical Advisor	See TORs in Project Document Appendix 11
3	Project Driver	The project driver will be responsible for chauffering the Project National Director and member of the Project Coordination Unit as well as guests
4	International EbA Expert tasks	2.1.5 Support development of protocols to guide the implementation of EbA interventions
		2.1.6 Support development and implementation of community-based EbA intervention management and monitoring plans
		2.2.3 Collaborate with VDCs to identify/verify sites and pilot families to carry out EbA interventions specifics
		2.5.4 Train local government representatives on EbA
		2.5.5 Train community VDCs and WUAs to oversee, monitor and coordinate local community involvement in the implementation of EbA and
		2.5.6 Train local communities at each project intervention site on the implementation and maintenance of EbA interventions and climate-
5	National Community-based NRM Expert tasks	2.2.4 Provide guidance and technical expertise on rangeland rehabilitation
		2.2.5 Provide guidance and technical expertise on afforestation in collaboration with the National Forest Corporation
		2.2.6 Provide guidance and technical expertise on replanting and protecting trees along riparian zones
		2.2.7 Provide guidance and technical expertise on development of large-scale shelter belts to prevent desertification
		2.2.8 Assist with mapping of current land use and soil quality
		2.3.2 Assist with implementing rainwater harvesting on community farms
6	National Rural Alt Energy Expert tasks	2.4.3 Promote alternative building materials
		2.4.4 Provide training for improved cook stoves (butane gas stoves)
7	International Adaptation and EbA Policy Expert tasks	1.2.2 Revising strategies and policies to incorporate EbA
		1.3.1 Develop and distribute technical guidelines for policy- and decision-makers on best practices of EbA
		1.3.2 Develop and distribute policy briefs that identify entry points at the national and state levels for the integration of CCA
		1.3.3 Provide operational and technical support to ministries on mainstreaming EbA into national and sectoral development plans
		2.5.8 Design and implement a monitoring strategy at the national level to assess the impacts of EbA
8	Intl Adaptation Economics Expert tasks	3.1.3 Hold workshops to share results of the economic analysis
		3.3.1 Develop an economic cost-benefit assessment for EbA measures
		3.3.2 Develop an upscaling plan for EbA measures based on the cost-benefit assessments
		3.3.4 Provide training on the economics of adaptation
9	National Revolving Fund Expert tasks	2.4.5 Support the establishment of a revolving fund
		2.4.6 Provide training to WUAs and VDCs on accessing and managing the revolving fund, (e.g., book keeping)
10	Administrative and Finance Assistant (AFA)	See TORs in Project Document Appendix 11
11	Travel site visits Comp1	1.4.1 Cost for traveling to sites to gather lessons learned on best EbA practices
12	PM Travel	Travel for PCU from / to Khartoum and the White Nile State throughout the project
13	Travel for V&A	2.1.1 Travel costs to conduct V&A assessment in the field
14	Travel to validate sites	2.2.3 Travel costs to identify/verify sites and pilot families to carry out EbA interventions
15	Travel for experience sharing events	2.5.7 Travel costs for four experience-sharing events on climate-resilient land management techniques
16	NGO subcontract for	2.1.6 Developing and implementing community based EbA management and monitoring

17	Organization subcontract for	2.2.4	Rehabilitating 6,600 ha of rangeland reserves in collaboration with the Range and Pasture Administration
18	NGO subcontract for	2.2.5	Afforestation on approximately 1,500 hectares in collaboration with the National Forest Corporation
19	NGO subcontract for	2.2.6	Replanting and protecting trees along riparian zones
20	Organization subcontract for	2.2.7	Developing large-scale shelter belts to prevent desertification
21	NGO subcontract for	2.3.1	Preparing 2,000 community farms (4 ha each) in total for the four target localities
22	Organization subcontract for	2.3.2	Implementing rainwater harvesting tanks on the community farms
23	NGO subcontract for	2.3.4	Conducting drought-tolerant seed broadcasting and Integrated Pest Management techniques
24	Organization subcontract for	2.3.5	Designing and rehabilitating water reservoirs and wells with the support of WUAs
25	NGO subcontract for	2.3.6	Repairing water hand pumps and introducing solar pumps for surface wells
26	Revolving fund	2.4.5	Establishing a revolving fund to support purchases supporting climate resilience
27	Organization subcontract for	2.4.8	Providing training to WUAs on the maintenance of surface wells and the use of spare parts. (2.4.8) and Provide training to WUAs on water borne diseases and proper hygiene (2.3.7)
28	NGO subcontract for	2.5.2	Providing training to communities on the establishment of farmer and pastoral production groups
29	NGO subcontract for	2.5.3	Establishing extension farms: such farms will be established in areas of 2-4 ha for each village for demonstration
30	Organization subcontract	3.1.1	Supporting VDCs and WUAs to collate lessons learned on EbA implementation, monitoring and maintenance
31	NGO subcontract for	3.1.2	Collating lessons learned and best practices from other national / international projects on EbA
32	NGO subcontract for	3.3.1	Supporting Economics Adaptation Expert in developing an economic cost-benefit assessment for EbA measures
33	NGO subcontract for	3.3.2	Supporting Economics Adaptation Expert in developing an upscaling plan for EbA measures based on the cost-benefit assessments
34	Independent subcontract for:	1.3.1	Developing and distributing technical guidelines for policy- and decision-makers on best practices of EbA
35	Independent subcontract for:	1.3.2	Developing and distributing policy briefs that identify entry points at the national and local levels for the integration of CCA into budgets
36	Independent subcontract for:	2.1.1	Conducting a comprehensive participatory V&A assessment of specific CC vulnerabilities in each of the target community
37	Independent subcontract for:	2.1.3	Developing protocols to guide the implementation of EbA interventions based on CC predictions (generated under LDCF2)
38	Independent subcontract for:	2.5.8	Designing and implementing a monitoring strategy on EbA
39	Independent subcontract for:	3.1.3	Holding workshops to share the results of the V&A
40	Subcontract for AV services:	3.1.5	Preparing a short-film demonstrating successful EbA measures for agro-pastoralists
41	Subcontract for IT services:	3.2.1	Creating a link with and store all information from 3.2.1 on the existing iCloud environmental database
42	Subcontract for IT services:	3.2.2	Disseminating lessons learned on other web-based platforms
43	Training:	1.1.2	Training on enhancing the technical capacity of HCENR, relevant ministries for i) information-sharing; and ii) coordinating the climate c
44	Training:	1.2.1	Conducting a stocktaking exercise on how to update existing policies and strategies to incorporate EbA
45	Training:	1.2.2	Providing operational and technical support on how to include climate change considerations in relevant strategies, plans and budgets
46	Training:	1.4.2	Training sessions on: i) interpreting climate change adaptation economic assessments, ii) using a cost effectiveness argument in planning
47	Training:	1.5.1	Providing awareness raising campaigns for State authorities and local communities on the benefits of EbA for CCA
48	Training:	1.5.2	Training to local representatives on how to integrate EbA into the state and local planning
49	Training:	2.1.2	Training on cost effective strategies for rangeland regeneration and improving agricultural and pastoral yields using EbA
50	Training:	2.3.7	Training for the Water User Associations (WUAs) in each target locality on water-borne diseases and proper hygiene
51	Training:	2.4.1	Training on alternative livelihood support, including training for Community Animal Health Workers (CAWH) at the village level

52	Training:	2.4.6 Training to WUAs and VDCs on accessing and managing the revolving fund, (e.g., book keeping)
53	Training:	2.4.7 Training to VDCs on post-harvest activities (dry/processing and storage vegetables, finishing and fattening lambs, etc.)
54	Training:	2.4.8 Training to WUAs on the maintenance of surface wells and the use of spare parts
55	Training:	2.5.1 Training for local communities on the benefits of EbA and on monitoring
56	Training:	2.5.2 Training to communities on the establishment and management of farmer and pastoralist production groups
57	Training:	2.5.4 Training for local government representatives on EbA and climate-resilient land/water management techniques
58	Training:	2.5.5 Training for community VDCs and WUAs to oversee, monitor and coordinate local community involvement
59	Training:	2.5.6 Training for local communities at each project intervention site on the implementation and maintenance of EbA interventions and climate-resilient land management techniques
60	Training:	2.5.7 Training at experience-sharing events at demonstration plots
61	Training:	3.3.4 Training by Econ Adapt Expert on i) interpreting economic assessments, ii) using a cost effectiveness argument and iii) financing CCA interventions
62	Meetings:	1.1.1 Meetings for State Technical Committee to operationalise a national dialogue on climate change adaptation and EbA
63	Meetings:	1.1.3 Cross-sectoral meetings to integrate EbA across sectors and promote programmatic synergies
64	Meetings:	2.1.2 Meetings to define cost effective strategies
65	Meetings:	2.2.1 Community meetings to establish Village Development Committees (VDCs)
66	Meetings:	2.2.2 Community meetings to establish Water User Associations (WUAs)
67	Meetings:	2.1.4 Meetings to assist with developing and implementing community-based EbA intervention management and monitoring plans
68	Meetings:	2.2.3 Meetings to establish sub-committees of VDCs
69	Meetings:	2.2.9 Informational meetings on how to develop large-scale shelter belts to prevent desertification
70	Meetings:	2.3.2 Informational meetings on implementing rainwater harvesting techniques on the community farms with support of WUAs
71	Meetings:	3.1.1 Meetings to collate lessons learned on EbA interventions by the VDCs and WUAs
72	Meetings:	3.1.2 Meetings to collate lessons learned and best practices from other national/international projects
73	Meetings:	3.1.3 Workshops to share the results of the vulnerability assessment of Output 2.1 and the economic analysis of Output 3.3
74	Meetings:	3.1.4 Meetings to establish an education programme in local schools on the benefits of EbA with farm establishment and tree planting
75	Meetings:	3.3.3 Workshops with the public and private sectors to disseminate EbA project concepts and raise awareness about cost-benefits
76	Printing costs for:	2.1.5 Developing protocols to guide the implementation of EbA interventions based on CC predictions (generated under LDCF2)
77	Printing costs for:	2.2.2 Documenting successful experiences by North Kordofan State in limiting the use of tractors
78	Non-expendable equipment for:	2.2.7 Afforestation on approximately 1,500 hectares in collaboration with the National Forest Corporation
79	Non-expendable equipment for:	2.2.9 Large-scale shelter belts to prevent desertification
80	Printing costs for:	2.3.8 Map current land use and soil quality
81	Non-expendable equipment for:	2.3.4 Drought-tolerant seed broadcasting and Integrated Pest Management techniques with capacity building from ARC
82	Non-expendable equipment for:	2.4.2 Backyard gardens, post harvesting, establishing community-led nurseries for climate-resilient plant species and tree seedlings
83	Office rental	Office space

84	Office equipment	Printers, computers, telephones
85	Telecommunication cost	Mobile phone subscriptions
86	Expendable quipment for:	2.3.2 Rainwater harvesting techniques on the community farms with support of WUAs
87	Expendable quipment for:	2.3.3 Introducing ploughs and agricultural implements with the support of ARC
88	Expendable quipment for:	2.3.7 Medical kits with prophylactics for the Water User Associations (WUAs)
89	Expendable quipment for:	2.4.1 Alternative livelihood support: small ruminant strategic feeding and poultry raising
90	Expendable quipment for:	2.4.3 Alternative building materials
91	Expendable quipment for:	2.4.4 Improved cook stoves (butane gas stoves)
92	Expendable quipment for:	2.5.3 Extension farms
93	Expendable quipment for:	3.1.4 Education programmes in local schools on the benefits of EbA with farm establishment and tree planting
94	Project vehicle and field transport	Project vehicle, cost of importing from Saudia Arabia
95	O&M for Activity:	2.2.5 Climate-resilient land management techniques
96	O&M for Activity:	2.3.5 Water reservoirs and wells with the support of WUAs
97	O&M for Activity:	2.3.6 Repairing water hand pumps and introducing solar pumps for surface wells in conjunction with UNICEF
98	O&M for Activity:	2.4.8 Maintaining of surface wells and the use of spare parts
99	Vehical Maintenance	Vehicle Maintenance of project vehicle throughout lifetime of the project
100	Project Steering Committee Meetings	Funds to support PSC bi-annual meetings
101	Miscellaneous supplies for Project Coordination Unit	

Appendix 2: Co-financing by source and UNEP budget lines

ANNEX F-1 - RECONCILIATION BETWEEN GEF ACTIVITY BASED BUDGET AND UNEP BUDGET LINE (GEF FUNDS ONLY US$)									
Project title:			Enhancing the resilience of communities living in climate change vulnerable areas of Sudan using Ecosystem Based approaches to Adaptation (EbA)						
Project number:									
Project executing partner:			Higher Council on the Environment and Natural Resources (HCENR)						
Project implementation period:									
From:			GEF	White Nile State's Water Corporation	Animal wealth administration at the White Nile State	Range and Pasture administration at the White Nile State	White Nile State Ministry of Agriculture, Irrigation and Forests	ADAPT	
To:			Cash	In-kind	In-kind	In-kind	In-kind	Grant	**Total**
UNEP Budget Line									
10	**PERSONNEL COMPONENT**								
	1100	**Project personnel**							
	1101	National Project Manager	120,000						120,000
	1102	Chief Technical Advisor	144,000						144,000
	1103	Project driver	16,400						16,400
	1199	**Sub-total**	**280,400**						**280,400**
	1200	**Consultants**							
	1201	International EbA Expert	75,000						75,000
	1202	National Community-based NRM Expert	139,000						139,000
	1203	National Rural Alternative Energy Expert	11,000						11,000
	1204	Adaptation Expert	112,000						112,000
	1205	International Adaptation economics/ Policy Expert	85,800						85,800
	1206	National Revolving Fund Expert	20,000						20,000
	1299	**Sub-total**	**442,800**						**442,800**
	1300	**Administrative Support**							
	1301	Admin / Finance Asst	72,000						72,000
	1399	**Sub-total**	**72,000**						**72,000**
	1600	**Travel on official business**							
	1601	Travel site visits Comp1	30,000						30,000
	1602	PM Travel	60,000						60,000
	1603	Travel for V&A	10,000						10,000
	1604	Travel to validate sites	5,000						5,000

	1605	Travel for experience sharing events	10,000						10,000
	1699	**Sub-total**	**115,000**						**115,000**
1999	**Component total**		**910,200**						**910,200**
20	**SUB-CONTRACT COMPONEI**								
	2100	**Sub-contracts (MOUs/LOAs for cooperating agencies)**							
	2101								
	2199	**Sub-total**							
	2200	**Sub-contracts (MOUs/LOAs for supporting organizations)**							
	2201	Subcontract for NGO to implement EbA monitoring plan	80,000						80,000
	2202	Subcontract for organization to rehabilitate rangelands	85,000		576,500	184,800			846,300
	2203	Subcontract for NGO to implement afforestation	40,000				100,700		140,700
	2204	NGO subcontract for riparian replanting	15,000						15,000
	2205	Subcontract for organization to implement shelter belts	52,000						52,000
	2206	NGO subcontract - community farm preparation	60,000				151,000		211,000
	2207	Subcontract for organization to support RWH	128,000	325,100					453,100
	2208	NGO subcontract - IPM	40,000						40,000
	2209	Organization subcontract on water management	470,000	1,193,600					1,663,600
	2210	Support for NGO to conduct water infrastructure repair	40,000	101,600					141,600
	2211	Revolving fund	80,000						80,000
	2212	Organization subcontract to provide training on water mgt	10,000	25,400					35,400
	2213	NGO subcontract - training to farming/pastoral groups	20,000		135,600				155,600
	2214	NGO subcontract - establish extension farms	35,000				88,100		123,100

	2215	VDC / WUA subcontract - collating local EbA lessons learned	30,000						30,000
	2216	NGO subcontract - collating national / international lessons learned on EbA	20,000					102,900	122,900
	2217	NGO subcontract - EbA cost-benefits	40,000						40,000
	2218	NGO subcontract - EbA upscaling plan	22,000						22,000
	2299	**Sub-total**	**1,267,000**						**4,252,300**
	2300	**Sub-contracts (for commercial purposes)**							
	2301	Independent subcontract: EbA technical guidelines	33,000						33,000
	2302	Independent subcontract: EbA policy briefs	33,000					169,900	202,900
	2303	Independent subcontract for: V&A Assessment	101,000	256,500	685,000		254,200		1,296,700
	2304	Independent subcontract for EbA protocols	8,000						8,000
	2305	Independent subcontract for EbA monitoring strategy	30,000						30,000
	2306	Independent subcontract for V&A workshops	5,000						5,000
	2307	Subcontract for AV services	20,000						20,000
	2308	Subcontract for IT services	47,800						47,800
	2309	Subcontract for IT services	54,000					277,900	331,900
	2399	**Sub-total**	**331,800**						**1,975,300**
2999	**Component total**		**1,598,800**						**6,227,600**
30	**TRAINING COMPONENT**								
	3200	**Group training**							
	3201	Govt EbA training	10,000					51,500	61,500
	3202	Mainstreaming EbA into polices training	21,000						21,000
	3203	Technical support EbA	15,000					77,200	92,200
	3204	Training EbA cost-effectiveness	39,800						39,800
	3205	Awareness raising on EbA	46,000						46,000

	3206	Training EbA mainstreaming - local level	27,000						27,000
	3207	Training on improving yields with EbA	5,000		33,900	10,900			49,800
	3208	Trainings for WUAs	10,000	25,400					35,400
	3209	Alternative livelihood training	15,000		101,700				116,700
	3210	Managing revolving fund training	14,000						14,000
	3211	Post-harvesting training	25,000						25,000
	3212	Training water management	10,000	25,400					35,400
	3213	EbA monitoring training	30,000						30,000
	3214	Training for farmer / pastoral groups	20,000		135,600		50,300		205,900
	3215	Training local govt on EbA	5,000						5,000
	3216	Training on EbA for VDCs and WUAs	10,000						10,000
	3217	Training on EbA interventions for locals	20,000						20,000
	3218	Training at demonstration plots	21,900		148,500		55,100		225,500
	3219	Training on Econ Adapt	20,000						20,000
	3299	**Sub-total**	**364,700**						**1,080,200**
	3300	**Meetings/Conferences**							-
	3301	State Technical Committee	20,000						20,000
	3302	Cross-sectoral EbA meetings	35,000					180,100	215,100
	3303	Cost-effectiveness strategy meetings	5,000						5,000
	3304	VDC meetings	15,000						15,000
	3305	WUA meetings	15,000						15,000
	3306	EbA monitoring meetings	70,000					360,300	430,300
	3307	VDC subcommittees	10,000						10,000
	3308	Shelter belt meetings	20,000						20,000
	3309	RWH meetings	11,000	27,900					38,900
	3310	Collating lessons learned	20,000						20,000
	3311	Collating intl lessons learned	15,000					77,200	92,200
	3312	V&A findings workshops	10,000						10,000
	3313	EbA education programme meetings	20,000						20,000

	3314	Meetings with private and public sector on EbA project concepts	20,000					103,000	123,000
	3399	**Sub-total**	**286,000**						**1,034,500**
3999	**Component total**		**650,700**						**2,114,700**
40	**EQUIPMENT AND PREMISES**								
	4100	**Expendable equipment**							
	4101	EbA protocol report	2,000						2,000
	4102	Succesful EbA experiences document	5,000						5,000
	4103	Afforestation seedlings	16,000				40,300		56,300
	4104	Shelter belt seedlings	20,000			43,500			63,500
	4105	Mapping land use / soil quality	5,000		33,900		12,600		51,500
	4106	Rangeland seed broadcasting	160,000				402,600		562,600
	4107	Backyard garden seeds	40,000				100,700		140,700
	4108	Office rental	15,000	38,100	101,700		37,700		192,500
	4109	Office equipment	5,000	12,700	33,900		12,600		64,200
	4110	Telecommunication cost	2,000	5,100	13,700		5,000		25,800
	4199	**Sub-total**	**270,000**						**1,164,100**
	4200	**Non-expendable equipment**							-
	4201	RWH tanks	141,000	358,100					499,100
	4202	Ploughs, ag implements	50,000				125,800		175,800
	4203	Medical kits	8,000	20,300					28,300
	4204	Small ruminent feedstock	120,000			260,800			380,800
	4205	Alt building materials	71,000						71,000
	4206	Cook stoves	104,000						104,000
	4207	Extension farms	25,000				62,900		87,900
	4208	School trees / farms	39,900				100,400		140,300
	4209	Project vehicle	45,400						45,400
	4299	**Sub-total**	**604,300**						**1,532,600**
4999	**Component total**		**874,300**						**2,696,700**

50	**MISCELLANEOUS COMPON**								
	5100	**Operation and maintenance of equipment**							
	5101	Land mgt O&M	15,000						15,000
	5102	Water reservoir and well O&M	30,000						30,000
	5103	Hand pump O&M	50,000						50,000
	5104	Surface well O&M	5,000						5,000
	5105	Vehicle maintenance	8,000						8,000
	5199	**Sub-total**	**108,000**						**108,000**
	5200	**Reporting costs**							-
	5201	Project Steering Committee Meetings	8,000						8,000
	5202	Inception and closure workshop	7,000						7,000
	5299	**Sub-total**	**15,000**						**15,000**
	5300	**Sundry**							
	5301	Miscellaneous	2,000						2,000
	5399	**Sub-total**	**2,000**						**2,000**
	5400	**Hospitality and entertainment**							
	5401		-						
	5499	**Sub-total**							-
	5500	**Evaluation**							
	5501	Baseline evaluation	35,000						35,000
	5502	Mid-term evaluation	35,000						35,000
	5503	Final evaluation	35,000						35,000
	5504	Audit	20,000						20,000
	5599	**Sub-total**	**125,000**						**125,000**
5999	**Component total**		**250,000**						**250,000**
99	**GRAND TOTAL**		**4,284,000**	**2,415,200**	**2,000,000**	**500,000**	**1,600,000**	**1,400,000**	**12,199,200**

Appendix 3: Results Framework

Primary Applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one): Promote climate change adaptation					
Applicable GEF Strategic Objective and Program: OBJECTIVE 2: Increase adaptive capacity to respond to the impacts of climate change, including variability, at local, national, regional and global level					
Applicable GEF Expected Outcomes: Outcome 1.1: Mainstreamed adaptation in broader development frameworks at country level and in targeted vulnerable areas Outcome 1.2: Reduced vulnerability in development sectors Outcome 1.3: Diversified and strengthened livelihoods and sources of income for vulnerable people in the target areas Outcome 2.1: Increased knowledge and understanding of climate variability and change-induced risks' at country level and in targeted vulnerable areas					
	INDICATOR	**BASELINE**	**END OF PROJECT TARGETS**	**SOURCE OF INFORMATION**	**RISKS AND ASSUMPTIONS**
Project Objective[47] Increase the climate change resilience of livelihoods and integrated productive agricultural systems in the White Nile State through Ecosystem Based Adaptation approaches	Percentage of targeted HHs (head of HH disaggregated by gender) that have adopted EbA measures which improve access to climate change resilient food / water sources for improved agricultural productivity	BASELINE 1: 0% of the targeted HHs have adopted EbA measures to improve their access to food and water.	TARGET: 100% of all targeted 6,800[48] HHs (head of HH disaggregated by gender) have access to climate change resilient food / water sources for improved agricultural productivity	Vulnerability Assessment baseline disaggregated survey and final evaluation surveys on food / water security	ASSUMPTION: Local communities are incentivized to implement climate resilience-building measures to improve their productivity due to sufficient sensitization on climate change impacts.

[47] Objective (Atlas output) monitored quarterly ERBM and annually in APR/PIR.
[48] 6,800 households have been estimated based on local consultations during the PPG phase

Outcome 1 Improved and strengthened technical capacity of local, state and national institutions to plan, implement and upscale EbA	Number of national and state development frameworks that have integrated EbA planning and budgeting for implementation and upscaling	BASELINE: All activities of the White Nile State's most recent Five Year Sector Plan (2012 – 2016) for the agriculture and water sector, within which the Action Plan for Agricultural Revival (2008) has been integrated, relate indirectly to the maintenance of ecosystem services. Total annual financing for both sectors is limited and on the order of USD 800,000 only.	TARGET: At least 1 national development framework and 1 state Five Year Sector Plan are updated with a budget of at least USD 30,000 to implement and upscale gender-sensitive EbA measures	- Review of the uptake of adaptation measures to climate change in existing plans/frameworks - Review of budget lines for EbA within the planning of the Ministry of Agriculture, Irrigation and Forestry, the Ministry of Animal Wealth and the Rain-fed Agriculture Department	ASSUMPTION: There is sufficient political support and capacity (including capacity building activities) within the agencies dealing with adaptation for successful execution and implementation of the project. RISK: Lack of institutional coordination and capacity on EbA could lead to inappropriate or deficient implementation of EbA measures and policy frameworks RISK: Financial instability and lack of financial resources
Output 1.1 A multi-disciplinary White Nile State Technical Committee established and strengthening of HCENR in order to facilitate cross cutting dialogue at the state and national levels of climate change adaptation and EbA and coordination of EbA measure planning in vulnerable sectors	Development of a White Nile State Technical Committee with a clear mandate to promote and coordinate climate change and resilience building projects and activities in the State	BASELINE: While underfunded, a number of development initiatives are currently ongoing in the White Nile State addressing the agriculture and pastoral sectors. There is NO coordinating body at the state level to make such initiatives coherent and efficient.	TARGET: Development of a White Nile State Technical Committee with a clear mandate to coordinate actors involved in cross-cutting adaptation activities for the State. The Committee will be responsible for identifying points of entry for promoting Ecosystem based Adaptation (EbA)	- Government authorization for the White Nile State Technical Committee - White Nile State Technical Committee meeting minutes - Awareness raising sessions on EbA by the Technical Committee	
Output 1.2 A stocktaking exercise undertaken and revisions	Number of policies revised that account for EbA	BASELINE: EbA has not been integrated into any policies throughout Sudan.	TARGET: 1 National level policy and 1 state level policy revised to account	Review of updated policies/strategies	

of existing national and White Nile State policies and strategies identifying entry points for EbA and cost-effective up-scaling strategies for climate-risk informed EbA planning and budgeting			for gender-sensitive EbA		
Output 1.3 Policy briefs and technical guidelines developed and distributed for policy – and decision makers on increasing the resilience of local community livelihoods to current and future climate change risks using appropriate ecosystem based adaptation and knowledge gained from demonstration activities	Number of policy briefs and technical guidelines developed for decision-makers on using EbA	BASELINE: Decision-makers are unaware of how to build the resilience of local communities to climate change using EbA approaches.	TARGET: 2 gender-sensitive policy briefs / technical guidelines developed for decision-makers on using EbA	Review of policy briefs / technical guidelines	
Output 1.4 Targeted CC adaptation and EbA planning/implementation training programmes for stakeholders completed, including field visits to learn from successful adaptation implementation	Number of field visits conducted to provide lessons learned on adaptation / EbA implementation with a focus on gender	BASELINE: Both national and state government representatives are unaware on how to use biodiversity and ecosystem services as part of an overall adaptation strategy to help communities adapt to the negative effects of climate change.	TARGET: One site visit by at least 4 government and 4 state ministry members conducted in each of the localities to document lessons learned on adaptation/EbA implementation (numbers to be confirmed by baseline study)	PC field visit logs	
Output 1.5 Facilitation of a local policy dialogue (based on vulnerability assessments and practical experiences from pilot implementation of EbA in	Number of state/locality development plans that have mainstreamed gender-sensitive EbA	BASELINE: State and locality development plans have not mainstreamed EbA into planning and budgets due to a lack of awareness on the benefits and cost-effectiveness of EbA.	TARGET: At least 4 state/locality development plans have mainstreamed gender-sensitive EbA	Review of state / locality development plans	

component 2) on mainstreaming of adaptation into state and locality development plans					
Outcome 2 Reduced vulnerability of local communities to climate change impacts in the White Nile State	Percentage of targeted HHs (head of HH disaggregated by gender) that have adopted EbA measures which improve access to climate change resilient food / water sources and improved ecosystem services (e.g., via reforestation and rangeland regeneration)	BASELINE 1: 0% of the targeted HHs have adopted EbA measures to improve their access to food, water and ecosystem services. Farmers and pastoralists are unable to mobilize water with physical infrastructure for use during the dry season (e.g., using rainwater harvesting, boreholes, etc). Also, ecosystem services are poor due to forest and rangeland destruction and unsustainable land use practices. Farmers and pastoralists do not have technical and applied knowledge on soil and water conservation methods and other sustainable practices to ensure that they can continually make use of productive ecosystem services.	TARGET: 100% of all targeted 6,800[49] HHs (head of HH disaggregated by gender) have access to climate change resilient food / water sources and improved ecosystem services relative to the baseline	Vulnerability Assessment baseline gender disaggregated survey and final evaluation surveys on food / water security and strengthened ecosystem services	ASSUMPTION: Initial hydrogeological studies and technical assessments are accurate in their predictions of water capture and storage capacities. ASSUMPTION: Local populations, including nomadic pastoralists, will not trespass into protected reforestation and re-vegetation areas due to being informed of the purpose of these areas to restore the natural environment and reduce erosion. Also, illegal tractor use will be successfully banned in the targeted localities. RISK: Communities do not support interventions and do not adopt ecosystem management activities for adaptation during or after the LDCF3 project because of limited immediate benefits of
Output 2.1 Current and future climate change vulnerability and risks for the selected vulnerable sites are identified to guide EbA interventions in pilot sites in the White Nile State	Risk and vulnerability assessments conducted for selected vulnerable sites in the White Nile State to guide EbA interventions	BASELINE: A team of experts was established in the White Nile State to conduct a general Vulnerability and Adaptation assessment for the agriculture, range and pasture, water and forestry sectors under the NAPs process. Presently, a more detailed assessment is necessary for the design, planning and construction of specific EbA measures in each locality.	TARGET: Detailed gender-sensitive risk and vulnerability assessments conducted for each of the 4 selected vulnerable sites in the White Nile State to guide EbA interventions	Independent review of the risk and vulnerability assessments for each target locality by an EbA expert	
Output 2.2 Regeneration of critical ecosystem services to	Number of hectares of land reforested and rangelands protected and regenerated to restore	BASELINE: Due to poor land management and significant tree removal for Gum Arabic (acacia gum) production, agro-pastoralists and	TARGET: - 1,500 ha reforested with CC resilient species - 6,600 ha of rangeland	Reforestation/ afforestation, and rangeland restoration records	

[49] 6,800 households have been estimated based on local consultations during the PPG phase

restore degraded rangelands, increase water infiltration and improve resilience of rain fed agriculture and pastoralism under increasing drought conditions and dry seasons	critical ecosystem services	pastoralists are losing their forests and rangelands. Other than some small investments by the Range and Pasture Administration and the Animal Wealth Administration of the White Nile State (on the order of USD 120,000 annually), there are limited activities to address climate risks in the livestock sector. Such interventions are focusing on current pastoralist issues by establishing grazing enclosures, reseeding and promoting the livestock value chain. None of these interventions consider EbA approaches. A baseline study is required to confirm the number of hectares requiring reforestation and rangeland regeneration with Climate Change (CC) resilient species.	regenerated with CC resilient species - Shelterbelts established on 10% of cultivated areas[50]	kept by the Range and Pasture Administration, the Animal Wealth Administration and the Forest National Corporation	EbA. RISK: Current climate and seasonal variability and/or hazard events (floods, droughts) prevent implementation of project activities. RISK: Volatile political situation in Sudan could lead to government shifts or disruption of project activities.
Output 2.3 A number of EBA support measures are piloted and integrated into existing local community livelihood activities, including *in situ* rainwater harvesting and drought/flood resilient eco-agriculture	Number and type of sustainable water management and farming practices introduced to increase access to irrigation and water supply and improved food supplies under existing and predicted climate change	BASELINE: In spite of water supply interventions by the White Nile State Water Corporation, there is no focus on increasing the climate resilience and sustainability of water infrastructure. The White Nile State Water Corporation also lacks required financial resources and technical knowledge to climate proof water supply interventions. Consequently, rain-fed farmers and pastoralists, particularly those on the west side of the White Nile river, do not have sufficient water for drinking and irrigation. Also, water storage mechanisms are inefficient because of high evaporation rates. As identified in the NAP, there is a need to construct/rehabilitate reservoirs and wells. The baseline study will confirm	TARGET: -Design and rehabilitation/construction of approximately 10 water reservoirs and wells with the support of WUAs - 200 rainwater harvesting pits installed on 2,000 community farms (4 ha each) with support of WUAs - 2 successful harvests with improved seeds for 90% of targeted farmers (gender disaggregated, men vs. women farmers)	Construction log of the Rain-fed Agriculture Department and the Ministry of Animal Wealth	

[50] A national law dictates that shelterbelt establishment should be on 10.0% in rainfed cultivated areas and on 5.0% on irrigated areas.

		the number of wells and reservoirs required to serve the targeted population. The Rainfed Agriculture Department has a programme to provide improved seeds, to implement water harvesting and to improve extension services. However, the budget allocation and coverage of this programme is inadequate to reduce the vulnerability of the 4 target localities. A baseline study is required to confirm the percentage of farmers requiring improved seeds.			
Output 2.4 Pilot implementation of alternative livelihood activities based on indigenous practices, including, *inter alia*, poultry breeding, home garden farming, and small ruminant strategic feeding as well as alternative energy use strategies to enhance community resilience to current and predicted climate change impacts	- Number of women practicing backyard gardening and/or post-harvesting in each locality - Number of women using improved cookstoves - Number of men/women with new access to solar powered hand pumps for wells - Number of men/women supported with feed supplements for small ruminants - Number of men/women using revolving funds established by the project - % of men/women revolving fund recipients who have successfully repaid loans	<u>BASELINE:</u> Currently, the populations have no (0) access to diversified livelihood assets and revolving funds. Diversification of livelihoods is required to ensure that the target populations, which are already in poverty, have other livelihood options to create an asset base making them more resilient to climate shocks. 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 unsustainable industries.[51]	<u>TARGET:</u> - At least 1600 women (160 backyard gardens) practicing backyard gardening and/or post-harvesting - At least 320 women (20 women per village) using improved cook stoves - At least 3200 men/women (at least four villages) with new access to solar powered hand pumps for wells - At least 160 men/women (10 from each of the 16 villages) supported with feed supplements for small ruminants - At least 480 men/women using revolving funds established by the project - At least 90% of revolving fund recipients have	- Baseline and final socio-economic surveys supported by the White Nile State Women Union - Review of bookkeeping by Village Development Committees (VDCs) and Water User Associations (WUAs) on revolving funds	

[51] Feinstein International Center, Tufts University and UNEP Study, *Standing Wealth: Pastoralism Livestock Production and Local Livelihoods in Sudan,* 2013

			successfully repaid loans		
Output 2.5 Local authorities, communities, committees and user groups trained on adapting community livelihoods to climate change through the use of EbA and on monitoring of EbA measures	Percentage of targeted local authorities, community members, VDCs and WUAs trained on implementing, maintaining and monitoring EbA interventions	BASELINE: Currently, community members are unaware of how the use of biodiversity can be used as part of an overall adaptation strategy to help them adapt to adverse impacts of climate change.	- 50% of local authorities, community members, VDCs and WUAs trained on implementing, maintaining and monitoring EbA interventions (30% of those trained must be women) [52] - Establishment of an extension farm in each of the 4 target localities with access to improved seeds	Training logs kept by PC	
Outcome 3 Strengthened information base and knowledge on EbA and climate change are readily available for various uses	Number of lessons learned, demonstrations of intervention cost-effectiveness and upscaling strategies on EbA integrated into the existing Cloud database	BASELINE: An existing cloud database contains climate data and forecasts, together with information on climate adaptation technologies. It is currently managed by ARC and HCENR under the CRFP project. However, the database does not detail information on sustainable agro-pastoral best practices in Sudan and there is no information specifically on EbA activities.	TARGET: At least 10 lessons learned, 10 demonstrations of intervention cost-effectiveness and 1 upscaling strategy on EbA integrated into the existing Cloud database	Review of database managed by HCENR and ARC for incorporation of baseline and final socio-economic survey information, lessons learned and costs	ASSUMPTION: In spite of political and financial instability, the adaptation database will be able to be continually maintained by HCENR RISK: Priority interventions implemented are not found to be cost effective.
Output 3.1 Information, lessons learnt from project interventions and knowledge on climate change adaptation and resilient livelihoods using EbA are	Number of workshops held in local communities to disseminate lessons learned on using EbA	BASELINE: As EbA is a new concept in Sudan, there have been no trainings or workshops held to disseminate knowledge on this topic.	TARGET: 2 workshops held to disseminate gender-sensitive lessons learned on using EbA	Review of training logs by PC	

[52] Note that the WUAs and VDCs have a 30% women representation.

captured, stored and widely disseminated among stakeholders at all levels					
Output 3.2 A central information base of data on EbA lessons learned and cost-effectiveness of interventions established within the existing Cloud operated jointly by HCENR and the ARC	Number of links between the Cloud database and regional adaptation databases such as the African Adaptation Knowledge Network in order to disseminate lessons learned on EbA from Sudan experiences	BASELINE: There is currently no data on EbA in Sudan. Also, the cloud database has not been linked with regional knowledge sharing systems.	TARGET: At least one link between the Cloud database and a regional adaptation database in order to disseminate gender-sensitive lessons learned on EbA from Sudan experiences	Review of cloud database platform and regional links	
Output 3.3 An upscaling strategy for EbA across Sudan by both the public and private sectors is developed based on an economic cost-benefits assessment	Upscaling strategy developed for EbA based on a cost-benefit assessment	BASELINE: There is currently no strategy to support EbA in Sudan. Although Economics of Adaptation (Global Water Partnership)[53] and adaptation cost-benefit[54] tools and trainings exist to guide replication of adaptation activities and investments by the public and private sector, none of these have been applied in Sudan.	TARGET: Development of an upscaling strategy for EbA based on a cost-benefit assessment	Review of the cost-benefit assessment	

[53] Capacity Development on Economics of Adaptation, Water Security and Climate Resilient Development in Africa (2013-2014)

[54] New York State Energy Research and Development Authority (NYSERDA) (2011) *An Economic Analysis of Climate Change Impacts and Adaptations in New York State*: Annex III to the ClimAID Inegrated Assessment for Effective Climate Change Adaptation Strategies in New York State. Available online at: http://www.nyserda.ny.gov/climaid

Appendix 4: Workplan and timetable

Activity	YR1	YR2	YR3	YR4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
OUTCOME 1																				
1.1.1																				
1.1.2																				
1.1.3																				
1.2.1																				
1.2.2																				
1.3.1																				
1.3.2																				
1.3.3																				
1.4.1																				
1.4.2																				
1.5.1																				
1.5.2																				
M&E																				
PSC																				
PM																				
OUTCOME 2																				
2.1.1																				
2.1.2																				
2.1.3																				
2.1.4																				
2.2.1																				
2.2.2																				
2.2.3																				
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2.5.3																			
2.5.4																			
2.5.5																			
2.5.6																			
2.5.7																			
2.5.8																			
M&E																			
PM																			

OUTCOME 3:																				
3.1.1																				
3.1.2																				
3.1.3																				
3.1.4																				
3.1.5																				
3.2.1																				
3.2.2																				
3.3.1																				
3.3.2																				
3.3.3																				
3.3.4																				
M&E																				
PM																				

Appendix 5: Costed M&E plan

M&E activity	**Responsibility**	**Budget US$** *Excluding project team staff time*	**Time frame**
Inception Workshop	• Project Coordinator • UNEP • CTA	Indicative cost: 7,000	Two months after project approval
Inception Report	• Project Coordinator • CTA	None	One month after Inception Workshop
Steering Committee Meetings	• National Project Director (NPD)	Indicative cost: 8,000	Twice annually
Baseline study	• Project Coordinator • UNEP • CTA	Indicative cost: 35,000	No more than 6 months after project start.
Measurement of Means of Verification for Project Progress on output and implementation	• Oversight by Project Coordinator • Project team	To be determined as part of the annual work plan preparation	Annually prior to PIR and to the definition of annual work plans
Periodic monitoring of implementation progress	• Project Coordinator	None	Quarterly
Periodic Progress reports	• Project coordinator	None	Quarterly
Project Implementation Review (PIR)	• PC • CTA • UNEP	None	Annually
Mid-term Review / Evaluation (MTR/MTE)	• UNEP TM / UNEP evaluation office • External consultant • Project Coordinator	Indicative cost: 35,000	At the mid-point of project implementation
Terminal Evaluation	• UNEP Evaluation Office	Indicative cost: 35,000	Close to the end of project implementation
Project Terminal Report	• Project Coordinator	None	At least three months before the end of the project
Audit	• Government • Project Coordinator	Indicative cost: 20,000	Yearly
Visits to field sites	• UNEP • Government representatives	For UNEP Task Manager, paid from IA fees and operational budget	Yearly
TOTAL indicative COST Excluding project team staff time		US$ 140,000 (+/- 2% of total GEF budget)	

Appendix 6: Summary of reporting requirements and responsibilities

Reporting requirements	Due date	Responsibility
Inception Workshop Report	One month after Project Inception Workshop.	PC CTA
Expenditure report accompanied by explanatory notes		PC CTA Admin and Finance Assistant (AFA)
Cash Advance request and details of anticipated disbursements		PC
Progress report	Half yearly	PC
Audited report for expenditures for year ending 31 December	Yearly on or before 30 June	Executing partner(s)
Inventory of non-expendable equipment	Yearly on or before 31 January	PC AFA
Co-financing report	Yearly on or before 31 July	PC
PIR	Yearly	PC UNEP
Minutes of PSC meetings	Twice a year (or as relevant)	PC
Final report	Within six months of project completion date.	PC, CTA, M&E Officer UNEP TM
Final inventory of non-expendable equipment		PC, AFA
Equipment transfer letter		PC, AFA
Final expenditure statement	Within three months of project completion date	PC, AFA UNEP
Mid-term evaluation/Review	Midway through project	PC UNEP
Final audited report for expenditures of project	Within six months of project completion date.	AFA

Appendix 7: Site Selection

The vulnerability assessment conducted by the White Nile Technical Team during the NAPs process indicted that all communities on the western side of the White Nile River are vulnerable to the impacts of climate change. To choose among these communities, the following criteria, in prioritized order, were used. Selected sites were confirmed during site visits and during the inception workshop attended by the stakeholders (See Appendices 15 and 16).

Criteria for Site Selection:

1. NAPA, NAP, list of districts
2. Level of land degradation, water scarcity, human development index
3. Vulnerable in terms of environmental and socio-economic factors which can be mitigated by adaptation to CC and the adoption of EbA measures
4. Number of beneficiaries, greatest number of socio-economic and environmental benefits
5. Hot spots according to socio-economic indicators
6. Strong needs highlighted
7. Ability to show environmental, socio-economic benefits
8. Previous work done in region; previous success with adaptation, water mobilization, etc, that can be replicated
9. Good local NGO/CBO support
10. District can be easily accessed, not in a contested state
11. At least 1 area for pastoralists, 1 area for farmers, 1 area for livelihood diversification
12. District where existing development projects are taking place (cofinancing)

Chosen Localities:

Locality	**Community (Site)**	**Estimated no. of beneficiaries**	**Vulnerability level**	**Initial recommendations for adaptation measures as per Inception workshop findings**
Tendalti	Wad ElBelabli village	302 HH	High	- Food security in terms of improved crop productivity, improved milk yield of goats - Water harvesting and drilling of wells (the nearest water source is a well at 5 km from the village) - Improved tillage (introduce appropriate agricultural implements [Kharbash plough, intermediate technology to replace tractors] and water harvesting techniques to counteract soil degradation. - IPM to control crop bests - Range improvement and reseeding (3000 feddan) - Protection against sand dune movement through tree planting - Gum Arabic production through rehabilitation of gum belt at village level - 10% Shelterbelt to cover all cultivated area (1000 feddan)
				- Energy alternatives (Improved stoves, gas stoves 300) - Income generation through

				improved sheep productivity - Restocking (sheep and goats) - Improved HH nutrition through "jubrakas" for vegetable production [local cucumber, okra, watermelon] and fruit trees (lemon and guava) planting at HH level, together with family poultry production. - Establishing VDCs and the revolving fund
	Um Niam village	600 HH	High	- Food security in terms of improved crop productivity, improved milk yield of goats - Improved tillage and water harvesting techniques to counteract soil degradation. - Protection against sand dune movement through tree planting - Gum Arabic production through rehabilitation of gum belt at village level - Rehabilitation of rangelands (1500 feddan) - Energy alternatives (Improved stoves, gas stoves 300 unit) - Income generation through improved sheep productivity - Sheep and goat restocking (200 HH) - Improved HH nutrition through "jubrakas" for vegetable production [local cucumber, okra, watermelon, lubia, etc) and fruit trees (lemon and guava) planting at HH level, together with family poultry production. - Establishing a new well high depth, current water wells saline water. - Rehabilitation and expansion of the current Hafir together with improved water management. - Establishing VDC and strengthening the existing women saving society.
	Um Zuraiba	800 HH	High	- Cultivated area 2000 feddan - Range improvement 2000 feddan - 300 gas stoves - 200 sheep and goat restocking - Improved HH nutrition through "jubrakas" for vegetable production and fruit trees (lemon and guava) planting at HH levels, together with family poultry production.
				- Building materials substitutes - Water improvement and water management system (the area has a

				number of water resources) - Shelterbelts (10% of cultivated area)
	Sallaima	900 HH	High	- About 350 farmers (targeting 4000 feddan) - 10% afforestation - Establishing a new well at high depth (shallow wells have saline water not suitable for human consumption) - Extension farm (5 feddan) - Gas stoves 300 - 200 HH sheep and goats restocking - Establishing Jubraka for vegetable production together with family poultry production - 300 trees at schools
Alsallam	Al Rawat villages (a cluster of 33 villages)	2,800 HH	High	- Opening stock routes and corridors - Rangelands rehabilitation - Afforestation - Improving water resources management - Home gardens "Jubrakas" - Energy substitutes - Women and youth activities (revolving fund, poultry production)
Gulli	Abareeg villages (Abareeg Agab, Abareeg Shenn, Abareeg Elballa)	600 HH	High	- Water improvement and management - Improve irrigated areas - Better management for the existing community forest and its expansion - Support women jubrakas and gas stoves (300 HH) - Water harvesting, improved crop varieties under rainfed conditions - Fruit trees (lemon and guava at HH level (300 HH)
Edweim	Wad Gabur (a cluster of three villages (Wad Gabur, Helba, Agaidat el Tair)	800 HH	High	- Improved crop production (improved seeds, improved cultural practices, IMP, water harvesting) 5000 feddan millet, 2500 feddan sesame, 2000 feddan watermelon, 500 feddan Hibiscus - Extension farms (three; one at each village, 10 feddan each) - Appropriate agricultural implements [Kharbash] to replace the tractor and heavy ploughs - Energy sources (gas stoves for HH and Gas for community bakeries) - Alternative building materials (sand + 10 cement or calcium carbonate blocks)
				- Jubraka (community jubrakas 2, starting with the already exiting one)

				- Rehabilitation of rangelands 10,000 feddan - Protection of Acacia nilotica along Wad Gabur Khor. - Establishing community nurseries - Encourage tree planting (both fruit trees and others) in schools and houses. - Community poultry production - Improving milk production in goats for HH consumption

Appendix 8: Standard Terminal Evaluation TOR

Below are the standard Terminal Evaluation TORs of UNEP.

Objective and Scope of the Evaluation

The objective of the terminal evaluation is to: i) examine the extent and magnitude of any project impacts to date; and ii) determine the likelihood of future impacts. The evaluation will also assess project performance and the implementation of planned project activities and planned outputs against actual results.

Methods

This terminal evaluation will be conducted as an in-depth evaluation using a participatory approach whereby the UNEP Task Manager, key representatives of the executing agencies and other relevant staff are kept informed and consulted throughout the evaluation. The consultant will liaise with UNEP and the UNEP Task Manager on any logistic and/or methodological issues that can compromise an independent review. The draft report will be circulated to the UNEP Task Manager, main representatives of the executing agencies and UNEP. Any comments or responses to the draft report will be sent to UNEP for collation and the consultant will be advised of any necessary or suggested revisions.

Key Evaluation principles

In attempting to evaluate any outcomes and impacts of the project, evaluators must remember that the project's performance should be assessed by considering the difference between the answers to two simple questions ***"what happened?***" and ***"what would have happened anyway?"***. These questions imply that there should be consideration of the baseline conditions and trends in relation to the intended project outcomes and impacts. In addition, it implies that there should be plausible evidence to **attribute** such outcomes and impacts **to the actions of the project**.

Sometimes, adequate information on baseline conditions and trends is lacking. In such cases, this should be clearly highlighted by the evaluator, along with any simplifying assumptions that were taken to enable the evaluator to make informed judgments about project performance.

Appendix 9: Checklist for Environmental and Social Safeguards

Environmental and Social Safeguards Checklist

As part of the GEFs evolving Fiduciary Standards that Implementing Agencies have to address 'Environmental and Social Safeguards'. To fill this checklist:

- STEP 1: Initially assess E&S Safeguards as part of PIF development. The checklist is to be submitted for the CRC.
- STEP 2: Check list is reviewed during PPG project preparation phase and updated as required.
- STEP 3 : Final check list submitted for PRC showing what activities are being undertaken to address issues identified

UNEP/GEF Environmental and Social Safeguards Checklist

Project Title:	Enhancing the resilience of communities living in climate change vulnerable areas of Sudan using Ecosystem Based approaches to Adaptation (EbA)		
GEF project ID and UNEP ID/IMIS Number		***Version of checklist***	One
Project status (preparation, implementation, MTE/MTR, TE)	Preparation	***Date of this version:***	31 January 2016
Checklist prepared by (Name, Title, and Institution)	Lars Christiansen, Task Manager		

In completing the checklist both short- and long-term impact shall be considered.

Section A: Project location
If negative impact is identified or anticipated the Comment/Explanation field needs to include: Project stage for addressing the issue; Responsibility for addressing the issue; Budget implications, and other comments.

	Yes/No/N.A.	*Comment/explanation*
Is the project area in or close to:		
densely populated area	No	
cultural heritage site	No	

protected area	No	
wetland	No	
mangrove	No	
estuarine	Yes	The target sites are located on the western side of the White Nile River. According to the Sudan NAP finalized in 2015, almost all localities in the western side of White Nile River were found to be among the most vulnerable to droughts and other impacts of climate change. These impacts have already been manifested in declining crop productivity, loss of grazing resources and rangeland valuable species, land degradation, increased frequency of diseases crops, livestock and population, loss of livelihoods and human migration in search for jobs and alternative livelihoods.
buffer zone of protected area	No	
special area for protection of biodiversity	No	
will project require temporary or permanent support facilities?	No	
If the project is anticipated to impact any of the above areas an Environmental Survey will be needed to determine if the project is in conflict with the protection of the area or if it will cause significant disturbance to the area.		

Section B: Environmental impacts

If negative impact is identified or anticipated the Comment/Explanation field needs to include: Project stage for addressing the issue; Responsibility for addressing the issue; Budget implications, and other comments.

	Yes/No/N. A.	*Comment/explanation*
Are ecosystems related to project fragile or degraded?	Yes	Yes, the target sites require significant rangeland rehabilitation and afforestation in order to restore ecosystem services.
Will project cause any loss of precious ecology, ecological, and	No	

economic functions due to construction of infrastructure?		
Will project cause impairment of ecological opportunities?	No	
Will project cause increase in peak and flood flows? (including from temporary or permanent waste waters)	No	Project activities such as ecological restoration will reduce the likelihood of flooding and will regulate the flow of water. No temporary wastewater will be generated by project activities. Therefore, the resilience of local communities to floods will be increased.
Will project cause air, soil or water pollution?	No	No pollution will be generated by the project activities.
Will project cause soil erosion and siltation?	No	Soil stability and water infiltration will be enhanced through reforestation and vegetation at pilot sites. This will reduce erosion and sedimentation.
Will project cause increased waste production?	No	No pollution will be generated by the project activities.
Will project cause Hazardous Waste production?	No	No pollution will be generated by the project activities.
Will project cause threat to local ecosystems due to invasive	No	The project will focus on the control of invasive species. It will promote planting indigenous and/or non-invasive tree species instead of exotic tree species.

species?		
Will project cause Greenhouse Gas Emissions?	No	Project activities are likely to reduce the emissions of greenhouse gases in identified pilot sites through the restoration of degraded ecosystems – native forests – thereby increasing soil and plant carbon sequestration.
Other environmental issues, e.g. noise and traffic.	No	The project might result in a temporary increase in traffic because of the transport of materials to sites.
Only if it can be carefully justified that any negative impact from the project can be avoided or mitigated satisfactorily both in the short and long-term, can the project go ahead.		

Section C: Social impacts

If negative impact is identified or anticipated the Comment/Explanation field needs to include: Project stage for addressing the issue; Responsibility for addressing the issue; Budget implications, and other comments.

	Yes/No/N.A.	*Comment/explanation*
Does the project respect internationally proclaimed human rights including dignity, cultural property and uniqueness and rights of indigenous people?	Yes	All project interventions have been developed in accordance with internationally proclaimed human rights, in conformity with UN guidelines. In addition, all activities were developed together with various stakeholders to ensure that no rights or laws are infringed by the proposed activities.
Are property rights on resources such as land tenure recognized by the existing laws in affected countries?	Yes	The project facilitates participatory approaches for avoiding any conflicts. In addition, the project will adhere to national and local laws on land rights and land tenure.
Will the project cause social problems and conflicts related to land tenure and access to resources?	No	The project will promote a community-based natural resources management approach. Consultations with community members will be continued throughout the implementation phase to avoid any problems or conflicts. The project will adhere to national and local laws on land rights and land tenure.
Does the project incorporate measures to allow affected stakeholders' information and consultation?	Yes	The project seeks to reduce the vulnerability of stakeholders by promoting participatory practices in the rehabilitation of ecosystems. This occurred during the PPG and will occur throughout all implementation phases. Additionally, all on-the-ground activity implementation will be supported by local communities through Village Development Committees (VDCs) and Water User Associations (WUAs), and are preceded by and include stakeholder consultations together with training

		and information workshops. Technical briefs will be prepared to ensure that all stakeholders are fully informed.
Will the project affect the state of the targeted country's (-ies') institutional context?	Yes	The project will be beneficial to Sudan's institutional context as it seeks to enhance the systemic capacity of the country for adaptation to climate change. New institutional mechanisms will be established to respond to climate change during implementation. Local institutions will also be provided with EbA training.
Will the project cause change to beneficial uses of land or resources? (incl. loss of downstream beneficial uses (water supply or fisheries)?	No	
Will the project cause technology or land use modification that may change present social and economic activities?	No	
Will the project cause dislocation or involuntary resettlement of people?	No	
Will the project cause uncontrolled in-migration (short- and long-term) with opening of roads to areas and possible overloading of social infrastructure?	No	
Will the project cause increased local or regional unemployment?	No	The project, through various activities and interventions, will generate employment at local levels. Community members will be employed for short periods to achieve specific project objectives where necessary. Livelihoods of communities in project sites will be enhanced in order to improve community resilience under conditions of climate change.
Does the project include measures to avoid forced or child labour?	Yes	The project conforms to all national and international guidelines and laws regarding forced labour. Extensive community engagement will prevent the use of forced labour, and all required labour (short term employment only for establishing specific objectives) will be provided through community engagement and remunerated in accordance with national law.
Does the project include measures to ensure a safe and healthy	Yes	The project will conform to all national and international guidelines and laws regarding health and safety for workers employed as part of the project.

working environment for workers employed as part of the project?		Community training for Community Health Workers will ensure that health and safety regulations are understood. Also, Community Animal Health Workers (CAHW) will be supported to ensure that SRFP practice good animal hygiene with diversification activities. Also, with water being mobilized for communities, Water User Associations will be equipped with medical kits containing prophylactics against malaria.
Will the project cause impairment of recreational opportunities?	No	The project aims to increase the ecological opportunities and ecosystem services despite the negative impacts of climate change. Short-, medium- and long-term impacts will be beneficial for local ecosystems. As such, it is expected that the project will create improved recreational opportunities.
Will the project cause impairment of indigenous people's livelihoods or belief systems?	No	All project implementation will be carried out after stakeholder consultation and in accordance with local belief systems. Livelihoods of people in project sites will be improved through the project activities. In addition, the project will enhance understanding of the climate system, thereby allowing local communities to adapt to climate change effectively.
Will the project cause disproportionate impact to women or other disadvantaged or vulnerable groups?	No	Women's rights will be promoted in accordance with national legislation, appropriate strategies and UN guidelines for interaction within Sudan. The LDCF3 project will uphold the current practice in Sudan of upholding 30% women representation in decision-making bodies. Gender has been taken into account throughout the project design and document including. Gender disaggregated indicators have also been incorporated. Additionally, the involvement of women in the project is considered in the results based management framework. Additionally, the project will help reduce the exposure of climate vulnerable groups including women, youth, farmers and pastoralists.
Will the project involve and or be complicit in the alteration, damage or removal of any critical cultural heritage?	No	No cultural heritage will be impacted through project operations.
Does the project include measures to avoid corruption?	Yes	As per UNEP's norms and standards, all project disbursements will be monitored by UNEP administrative structures. Regular reporting by the project management team will promote financial and transparency throughout the project. Corruption within the selected EA is limited due to strong internal governance and stringent protection measures.
Only if it can be carefully justified that any negative impact from the project can be avoided or mitigated satisfactorily both in the short and long-term, can the project go ahead.		

Section D: Other considerations

If negative impact is identified or anticipated the Comment/Explanation field needs to include: Project stage for addressing the issue; Responsibility for addressing the issue; Budget implications, and other comments.

	Yes/No/N.A.	*Comment/explanation*
Does national regulation in affected country (-ies) require EIA and/or ESIA for this type of activity?	No	During the PPG, national stakeholders have stated that EIAs are not necessary for project interventions.
Is there national capacity to ensure a sound implementation of EIA and/or SIA requirements present in affected country (-ies)?	N/A	
Is the project addressing issues, which are already addressed by other alternative approaches and projects?	No	The project will implement activities that are additional to baseline activities.
Will the project components generate or contribute to cumulative or long-term environmental or social impacts?	No	The project will promote only positive, cumulative environmental and social impacts through EbA and climate-resilient land management.
Is it possible to isolate the impact from this project to monitor E&S impact?	N/A	

Appendix 10: UNEP Comparative Advantage

UNEP has experience in implementing approximately 80 projects on adaptation at global, regional and national levels worldwide. These projects develop innovative solutions for national governments and local communities to adapt to the predicted effects of climate change in an environmentally sound manner. This is achieved by: i) providing methods and tools to support decision making; ii) addressing barriers to implementation; iii) testing and demonstrating proposed solutions; and iv) enhancing climate resilience by restoring valuable ecosystems that are vulnerable to climate change. UNEP has accumulated plentiful significant body of knowledge and experience from its implementation of previous and ongoing projects. The agency will draw upon this experience during the implementation of this LDCF3 project. Furthermore, UNEP has a proven international and national record. In particular, UNEP has become known for its strong technical and scientific background in the field of climate change. Finally, UNEP's experience in community-based projects and natural resource management is well recognized worldwide. As such, it is an appropriate agency for providing implementation support and capacity development for enhancing EbA within Sudan.

UNEP's work on climate change adaptation focuses on three main areas: i) science and assessments; ii) knowledge and policy support; and iii) building the resilience of ecosystems for adaptation. UNEP's Flagship Programme, EbA, represents a ground-breaking shift in focus in the realm of climate change adaptation. In 2011, this programme was commended at the 17th meeting of the Conference of the Parties to the UNFCCC (CoP17). It has also been endorsed by IUCN, the EC and GEF through the Operational Guidelines on "Ecosystem-Based Approaches to Adaptation" GEF/LDCF.SCCF.13/Inf.06 October 16, 2012. The EbA approach is multidisciplinary in nature. It involves managing ecosystems to enhance their resilience. In addition, it uses ecosystem services to promote climate change adaptation and disaster risk management. Furthermore, it provides a platform for engaging a broad range of stakeholders and sectors in the adaptation process. The adaptation interventions proposed in this LDCF3 project are well within the scope of UNEP's current work on climate change.

The GEF Council paper (C.31/15) outlines the comparative advantages of UNEP. These include providing GEF with the best available science and knowledge upon which to base investments, and provision of expertise on environmental and climate change matters. UNEP also has considerable experience in the piloting of successful innovative approaches and the implementation of adaptive learning. The LDCF3 project builds upon this comparative advantage. In addition, GEF Council paper (C.28/18) mentions UNEP's comparative advantage of "developing and using climate information to effect changes in relevant sectoral policies based on climate science" which is an area that is addressed by the LDCF3 project.

UNEP has undertaken many projects where innovative solutions and methodologies are demonstrated at inter-regional, national and local levels. All such projects comply with the mandate from the UNEP Governing Council, as detailed in the Bali Strategic Plan for Technology Support and Capacity-building.

Collaboration with the UN Country Team in Sudan is desirable during the implementation of the LDCF3 project such as with the ADAPT! project and LDCF2. UNEP's expertise and support will promote the inclusion of the natural environment in the UN Country Team's work. This will increase the long-term benefits of the LDCF3 project to the environment.

UNEP will bring to this project its experience on resource use efficiency gathered by the Division for Industry, Technology and Economics (DTIE). This will be applied to interventions aimed at improving water use efficiency. The LDCF3 project is consistent with UNEP's other

work in the water sector. This work is mandated by the UNEP Governing Council and is based on the UNEP Water Policy and Strategy. It also builds on the achievements of the Environmentally-sound Management of Inland Waters Programme (EMINWA) and other programmes falling under the scope of Integrated Water Resources Management (IWRM). Within this focal area, UNEP draws on its expertise in assessment and monitoring, generation and application of knowledge, and approaches for the better management of water systems. It takes EbA approaches as reference for its water-related activities.

The LDCF3 project will also build on UNEP DEPI's emerging Drylands Strategy as there will be a strong emphasis on promoting innovative techniques for sustainable pastoralism. Furthermore, the majority of the infrastructure and restoration interventions will be linked to and benefit from the Green Economy paradigm led by UNEP. The project will also benefit from ongoing work within UNEP towards analyzing and documenting the ecological foundation of food security. Additionally, the PROVIA programme provides insight into the economic assessment of ecological services and EbA.

Since completing a major environmental assessment of Sudan in 2007, UNEP has established an active country presence in Sudan. UNEP-Sudan is a programme established under the disaster and conflict department in Geneva as one of six major UNEP regional pillars. UNEP-Sudan has since developed the ADAPT project. Through ADAPT, UNEP is working with Sudanese national and state government, local leaders, civil society and the international community to make humanitarian and development work more responsive to environment and climate change. Sudan's Ministry of Environment, Forestry and Physical Development is UNEP's government counterpart. The principal UNEP Sudan donor is UKAID from the Department for International Development.55 UNEP also has a presence in the country implementing various programmes as: environmental governance, climate change, water resources management, environmental mainstreaming, Community Environmental action plan, environment and population, disaster risk reduction, market and trade, these programmes implemented with various governmental and nongovernmental partners. UNEP-Sudan completed its SIEP1 in 2013 and ADAPT will begin in 2016 for a duration of four years (2016-2020), and with capacity of more than 16 advisers and professional staff, UNEP-Sudan will continue its support for the implementation of NAP's capacity building and consultations in 18 states (White Nile will be part of these activities). ADAPT will constitute UNEP co-financing for the project as outlined in Appendix 2.

UNEP is well-positioned to execute environmental work through the evidence-based implementation of applied scientific research to inform policies and guide project activities. The focus of the LDCF3 project to increase rangeland productivity and support community livelihoods is dependent on managing agro ecological systems in a sustainable manner. This technical advisory is UNEP's core business giving it a significant comparative advantage. In particular, UNEP will ensure that scientifically rigorous data and information is generated from the project through a long-term monitoring programme that will provide valuable lessons learned for information sharing and dissemination. UNEP's experience in revising policy will ensure that this information is translated into appropriate policy, strategy and planning documents.

UNEP's Division of Environmental Policy and Implementation is also in the process of developing its strategy on sustainable pastoralism, and creating networks and encouraging innovation in this area, in collaboration with the IUCN coordinated World Initiative on Sustainable Pastoralism (WISP). The

[55] See web site :(http://www.unep.org/disastersandconflicts/CountryOperations/Sudan/SudanIntegratedEnvironmentProgramme/tabid/54259/Default.aspx)

LDCF project will draw upon this and lessons from several other developing or ongoing UNEP projects and activities on sustainable pastoralism.

GEF Council paper C.31/15 outlines the comparative advantages of UNEP through: i) providing GEF with the best available science and knowledge upon which to base investments; ii) expertise on environmental and climate change matters; and iii) considerable experience in the piloting of successful innovative approaches and implementation of adaptive learning. The project builds upon this comparative advantage. In addition, GEF Council paper C.28/18 also details UNEP's comparative advantage areas as including "developing and using climate information to effect changes in relevant sectoral policies based on climate science", an area which is addressed by the LDCF3 project.

Appendix 11: Terms of Reference for key project groups, staff and sub-contractors

A 11.1 Terms of Reference for Project Steering Committee (PSC)

Background

The PSC will be responsible for undertaking management-related and technical decisions for the project in accordance with this ToR and providing guidance and direction for the project on a regular basis.

The PSC will review and approve the Annual Work Plans (AWPs) and reports as well as the six-monthly work plans and reports. Additionally, it is required to authorize any substantive deviation from the agreed AWP and budget lines. The PSC will ensure as well that necessary resources are committed, and will arbitrate on any conflicts within the project or negotiate a solution to any problems between the project and external bodies. Last, the PSC will approve the responsibilities of the PC.

The PSC will comprise the following members:

- Secretary HCENR (Chair);
- Members, including:
    - HCENR;
    - Rain-fed Agriculture Department;
    - Ministry of Animal Wealth
    - White Nile State Technical Committee;
    - Government representatives of the White Nile State;
    - Representatives of the White Nile State Women Union and Plan Sudan; and
    - UNEP TM.

In addition, the PSC will include, as support staff, the PC and the CTA. HCENR will chair the PSC. The PSC will meet at least every six months or as required by the chair of the PSC.

Scope of Work

Specific responsibilities of the PSC are as follows:

- Ensure that project objectives are fulfilled in an effective and efficient manner.
- Approve work plans and budgets, and other reports that may be required.
- Ensure effective quality assurance and financial reporting requirements.
- Ensure institutional coordination and facilitate an effective communication and decision-making process between government, implementation partners, civil society and other key actors.
- Monitor and evaluate project implementation to ensure consistency with the approved work plans and results framework of the project.
- Review, revise and approve ToRs for staff, consultants and contractors required to assist in project implementation, as proposed by the PC.
- Propose policy revisions that would facilitate the mainstreaming of the project activities.
- Facilitate interactions between the PC/project team and the relevant ministries or government agencies, in order to optimize project interactions.

A 11.2 Terms of Reference for National Project Coordinator (PC)

Scope of Work

The PC will lead the project team and provide overall operational management for the successful execution and implementation of the project. This includes the daily responsibility to manage, coordinate, and supervise the implementation of the project and the delivery of results in accordance with the project document and agreed work plans. Furthermore, the PC will be responsible for financial management and disbursements, with accountability to the government and UNEP. The PC will report to the CTA and the PSC.

Further responsibilities of the PC are to:

- Oversee and manage project implementation, monitor work progress, and ensure timely delivery of outputs.
- Report to the PSC regarding project progress.
- Develop and facilitate implementation of a comprehensive monitoring and reporting system.
- Ensure timely preparation of detailed AWPs and budgets for approval by PSC.
- Write ToRs with the Chief Technical Advisor.
- Assist in the identification, selection and recruitment of staff, consultants and other experts as required.
- Supervise, coordinate and facilitate the work of the administrative/technical team (consisting of National Technical Assistants (NTAs), the Admin/Finance assistant and national and international consultants).
- Control expenditures and assure adequate management of resources.
- Provide a quarterly update of the expenses of the previous three months and the expenses expected for the next three months.
- Establish linkages and networks with the on-going activities of other government and non-government agencies.
- Provide input to management and technical reports and other documents as described in the M&E plan for the overall project. Reports should contain detailed assessments of progress in implementing activities, including reasons for delays, if any, and recommendations on necessary improvements.
- Inform the PSC, without delay, of any issue or risk which might jeopardize the success of the project.
- Liaise and coordinate with UNEP Task Manager (TM) on a regular basis.

Qualifications

- Master's degree in environment, natural resources management, agriculture or a closely related field.
- A minimum of 10 years relevant work experience including at least 6 years' experience in project management in relevant sectors.
- Demonstrated solid knowledge of adaptation to climate change, ecological restoration and sustainable exploitation of natural resources.
- Experience in the public participation development process associated with environment and sustainable development is an asset.
- Experience in working and collaborating within governments is an asset as well as experience in GEF projects.
- Excellent knowledge of English including writing and communication skills. Working knowledge of Arabic is an asset.

Reporting

During the project implementation phase, the PC will be a staff member of HCENR and will report to the PSC. The PC will work closely with the PSC, CTA and TM to ensure the availability of information on progress and performance regarding the implementation of the project.

A 11.3 Terms of Reference for the Chief Technical Adviser (CTA)

Scope of Work

The CTA will provide technical guidance on the implementation of the project to the PC.

Responsibilities

i) Provide quality assurance and technical review of project outputs.
ii) Undertake technical review of project outputs (e.g. studies and assessments).
iii) Write ToRs for technical consultancies with the PC (including policy revisions when necessary).
iv) Supervise the work of national and international consultants.
v) Assist in monitoring the technical quality of project M&E systems (including AWPs, indicators and targets).
vi) Conduct the financial administrative reporting and the PIR.
vii) Provide advice on best suitable approaches and methodologies for achieving project targets and objectives.
viii) Provide a technical supervisory function to the work carried out by NTAs, and national and international consultants hired by the project.
ix) Assist in knowledge management, communications and awareness-raising.
x) Facilitate the development of strategic regional and international partnerships for the exchange of skills and information related to climate change adaptation.

Qualifications

- At least an advanced post-graduate at or above M.Sc. level in climate change adaptation or a related discipline such as disaster risk reduction, environmental management, natural resources management, agriculture, water resources management.
- A minimum of 5 years' experience in a senior technical lead position with planning and management of environmental and/or natural resources management programmes in developing countries.
- A minimum of 5 years in a senior technical position involved in institutional strengthening and capacity building.
- Previous similar experiences in provision of technical support to complex projects.
- Experience from East African region would be an advantage.
- Good communication and computer skills.
- Fluent in spoken and written English. Working knowledge of Arabic is an asset.

Reporting

The CTA will report to the chair of the PSC. The CTA will cooperate with the PC to ensure the availability of information on progress and performance in the implementation of the project. In the performance of his/her duties, the CTA will work in close collaboration with TM, and update him/her on the project's progress. Additionally, in consultation with the TM, the CTA will take responsibility for decision-making and implementation of the project.

A 11.4 Terms of Reference of the Administrative and Financial Assistant (AFA)

An administrative and financial assistant will report to the PC.

Responsibilities

- Standardize the finance and accounting systems of the project while maintaining compatibility with the government and UNEP financial accounting procedures.
- Prepare revisions of the budget and assist in the preparation of the AWPs.
- Comply and verify budget and accounting data by researching files, calculating costs and estimating anticipated expenditures from readily available information sources.
- Prepare status reports, progress reports and other financial reports.
- Process all types of payment requests for settlement purposes including quarterly advances to the partners upon joint review.
- Prepare periodic accounting records by recording receipts, disbursements (ledgers, cash books, vouchers, etc) and reconciling data for recurring or financial reports and assist in preparation of annual procurement plans.
- Undertake project financial closure formalities including submission of terminal reports, transfer and disposal of equipment, processing of semi-final revisions, and support professional staff in preparing the terminal assessment reports.
- Assist in the timely issuance of contracts and assurance of other eligible entitlements of the project personnel, experts, and consultants by preparing annual recruitment plans.

A 11.5 Terms of Reference of the White Nile State Technical Committee

269. The **State Technical Committee (TC)** will support the PCU at the state level. It will build off the State Environment Committee (SEC) formed during NAP preparation. Other than the SEC, it will be comprised of state representatives from the White Nile State Ministries of Agriculture / Livestock, Ministry of Physical Development, Ministry of Health, and Plan Sudan (an international NGO), Farmer/Pastoral Producer's Groups (2), the Agricultural Extension and Technology Transfer Administration (1), the Agricultural Research Corporation and the White Nile State's Women's Union. Chaired by the PC, the TC will be responsible for discussing technical issues, setting priorities, preparing work plans, resolving conflicts and supervising site-level activities in order to ensure local level coordination and linkages. The Village Development Committees (VDCs) will assist the TC to liaison with the larger communities. Costs for the TC will be covered by both the State Ministry and the Project.

A 11.6 General Terms of Reference for International Consultants (See A 11.8 for specific TORs below)

The types of international consultants required by the project are included after the project budget in Appendix 1. These consultants will be hired to perform the following tasks:

- Collect data.
- Provide advice relevant to their field.
- Monitor interventions.

- Additionally, the international consultants must be experts in their field, with experience in climate change, capacity building, and research and information development. The international consultants should have good knowledge and understanding of Sudan's climate change risks. They should have an appropriate M.Sc. degree and a minimum of 5 years' experience or an appropriate bachelor's degree and 10 years' experience in their field of expertise. Fluency in spoken and written English is required. Working knowledge of Arabic is an asset.

A 11.7 General Terms of Reference for National Consultants (See A 11.8 for specific TORs below)

Local expertise will be sourced where possible in place of international expertise in order to strengthen in-country capacity. National consultants will be hired by the project to:

- Collect data.
- Provide advice relevant to their field.
- Monitor interventions.

Additionally, the national consultants must be experts in their field, ideally with experience in climate change, capacity building, and research and information development. Additionally, they should have good knowledge and understanding of Sudan's climate change risks and an appropriate M.Sc. degree and a minimum of 5 years' experience or an appropriate bachelor's degree and 10 years' experience in their field of expertise. National consultants need to be fluent in spoken and written Arabic and English.

The hiring procedures to be followed for both international and national consultants must include a transparent and competitive process based on normal UNEP procedures.

A 11.8 Specific Terms of Reference for the Support Team

Ecosystem based Adaptation (EbA) Expert (International)

Project: Enhancing the resilience of communities living in climate change vulnerable areas of Sudan using Ecosystem Based approaches to Adaptation (EbA)

Introduction: The Project "Enhancing the resilience of communities living in climate change vulnerable areas of Sudan using Ecosystem Based approaches to Adaptation (EbA)" is implemented in the White Nile State of Sudan. White Nile State is located in Southern Sudan and is delimited by the republic of South Sudan in the south and North Kordofan State in the west, Sinnar and Gezira States in the east and Khartoum State in the north. The total land area of the White Nile State is about 39,701 square kilometers, mostly flat areas traversed by the White Nile River from south to north. Administratively the State is divided into 8 localities. The total population is more than 1.7 million inhabitants, with almost 70% of the population living in the rural areas depending on traditional rainfed agriculture and livestock rearing for their livelihoods. The White Nile State's animal resources are estimated at 7.9 million heads. Three different ecological zones share the land area of the White Nile State. The larger area falls within the semi-arid zone (semi dry and dry), which is also known as the Savannah zone (to the west on sandy soils and to the east on clay soils). The northern area of the State is part of the semi desert zone while a small area in southern boarder lies within the sub-humid zone. Accordingly the annual rainfall is ranging between 300 mm in the north and up to more than 600 mm in the south.

Climate change is amplifying and increasing the frequency of many of the climate related hazards already affecting Sudan (NAPA, 2007). Most notably, increasing temperatures, decreasing trends of annual precipitation as well as increased variability, is causing a gradual shift of climate end ecological zones from north to south. E.g. formerly semiarid ecological zones, such as the majority of the White Nile State, is gradually moving southward as climate gets increasingly arid and hot, thus taking on characteristics similar to the arid zones found further north today. This in turn has significant implications for water availability and agricultural potential, through increased frequency of climate events such as droughts, dust storms and heat waves. Another impact of climate change is an increasing frequency of extreme flooding events caused by an increase in intensity of rainfall both during the rainy season (seasonal flooding) and in rainstorms (flash flooding). These climate trends and risks are exacerbated by a number of non-climate issues such as: decreased vegetation cover due to overgrazing and deforestation, and inefficient management of water resources – thus further increasing trends of ecological zone shift and desertification.

The groups that are the most vulnerable to climate risks are traditional rain-fed farmers and pastoralists (NAPA, 2007). During past droughts, there has been large-scale human suffering from hunger among these groups, including forced out migration from rural areas and the death of their livestock herds. Flooding also causes widespread damage in the form of destruction of property and the death of livestock herds. There is ample evidence of past climatic shocks generating a chain of events that led to the disintegration of community and the discontinuity of human habitation. In general, this has been due primarily to a combination of their extreme poverty levels and lack of alternative non-agricultural income-generating activities.

As one of Sudan's most vulnerable regions, the White Nile State is severely impacted by the climate change induced droughts and floods described above. Almost all localities in the western side of White Nile River were found to be among the most vulnerable to droughts and other impacts of climate change (including localities of Al Dwaim, Tandelti, Alsalam, and Gulli, which will be the pilot communities of this project). These impacts have already been manifested in declining crop productivity, loss of grazing resources and rangeland valuable species, land degradation, increased frequency of diseases crops, livestock and population, loss of livelihoods and human migration in search for jobs and alternative livelihoods. While climate impacts are severe across the state, the communities on the western bank of the White Nile River were particularly vulnerable because of their low capacity for dealing with impacts due to the following factors: low general awareness of

climate change, lack of knowledge about water harvesting, lack of access to improved seeds and other agriculture inputs, presence of overgrazing and severe deforestation, high poverty levels and lack of alternative livelihood systems, lack of technology and know-how for better agricultural practices, and high frequency of rangeland fires.

Project Objectives: The proposed project thus aims to increase the climate change resilience of livelihoods and integrated productive agricultural systems in the White Nile State through Ecosystem Based Adaptation approaches.

Project components
Component 1: Capacity Development for Ecosystems based Adaptation (EbA) and policy mainstreaming.
Component 2: Implementation of EbA measures to build adaptive capacities of vulnerable communities
Component 3: Knowledge management for appropriate EbA design.

Terms of the Consultancy
Suggested Duration of Consultancy: Sixteen weeks
An ecosystem based Adaptation (EbA) International Consultant will be invited periodically during the first three years of project implementation to visit project site, meet with PMU and TC and develop guidance towards EbA with the following:

- Providing an Ecosystem based Adaptation approach for overall adaptation to help communities to adapt to the negative impacts of climate change at local, State and National levels.
- Assisting the PMU and TC in the following aspects:
  - Identification of ecosystems, their boundaries and characteristics
  - Addressing wider ecosystem approach not based on target species or factors
  - Larger term management objectives to identify indicators for sustainability
  - Consider decentralized regional approach
  - Suggest adaptive management and precautionary principles given the degree of uncertainty and dynamics of ecosystem.
  - Paravet (community animal health workers) training
  - Enhancing small ruminants productivity

Specific activity support includes the following:

- Developing protocols to guide the implementation of EbA interventions
- Developing and implementing community-based EbA intervention management and monitoring plans by the VDCs to ensure the long-term sustainability of interventions
- Appointing technical service providers to implement the EbA measures
- Training local government representatives on EbA and climate-resilient land/water management techniques
- Training community Village Development Committees and Water User Associations to oversee, monitor and coordinate local community involvement in the implementation of EbA and climate-resilient land/water management interventions.
- Training local communities at each project intervention site on the implementation and maintenance of EbA interventions and climate-resilient land management techniques

Expected qualifications:

- Advanced university degree in Natural Resource Management and at least 15 years of professional experience in EbA related issues.
- Experience in working in arid and semiarid ecosystems
- Good analytical problem solving skills
- Fluency in English (Arabic an advantage)

Terms of Reference

Community Based Natural Resource Management Expert (National)

Introduction: The Project "Enhancing the resilience of communities living in climate change vulnerable areas of Sudan using Ecosystem Based approaches to Adaptation (EbA)" is implemented in the White Nile State of Sudan. White Nile State is located in Southern Sudan and is delimited by the republic of South Sudan in the south and North Kordofan State in the west, Sinnar and Gezira States in the east and Khartoum State in the north. The total land area of the White Nile State is about 39,701 square kilometers, mostly flat areas traversed by the White Nile River from south to north. Administratively the State is divided into 8 localities. The total population is more than 1.7 million inhabitants, with almost 70% of the population living in the rural areas depending on traditional rainfed agriculture and livestock rearing for their livelihoods. The White Nile State's animal resources are estimated at 7.9 million heads. Three different ecological zones share the land area of the White Nile State. The larger area falls within the semi-arid zone (semi dry and dry), which is also known as the Savannah zone (to the west on sandy soils and to the east on clay soils). The northern area of the State is part of the semi desert zone while a small area in southern boarder lies within the sub-humid zone. Accordingly the annual rainfall is ranging between 300 mm in the north and up to more than 600 mm in the south.
Climate change is amplifying and increasing the frequency of many of the climate related hazards already affecting Sudan (NAPA, 2007). Most notably, increasing temperatures, decreasing trends of annual precipitation as well as increased variability, is causing a gradual shift of climate end ecological zones from north to south. E.g. formerly semiarid ecological zones, such as the majority of the White Nile State, is gradually moving southward as climate gets increasingly arid and hot, thus taking on characteristics similar to the arid zones found further north today. This in turn has significant implications for water availability and agricultural potential, through increased frequency of climate events such as droughts, dust storms and heat waves. Another impact of climate change is an increasing frequency of extreme flooding events caused by an increase in intensity of rainfall both during the rainy season (seasonal flooding) and in rainstorms (flash flooding). These climate trends and risks are exacerbated by a number of non-climate issues such as: decreased vegetation cover due to overgrazing and deforestation, and inefficient management of water resources – thus further increasing trends of ecological zone shift and desertification.

The groups that are the most vulnerable to climate risks are traditional rain-fed farmers and pastoralists (NAPA, 2007). During past droughts, there has been large-scale human suffering from hunger among these groups, including forced out migration from rural areas and the death of their livestock herds. Flooding also causes widespread damage in the form of destruction of property and the death of livestock herds. There is ample evidence of past climatic shocks generating a chain of events that led to the disintegration of community and the discontinuity of human habitation. In general, this has been due primarily to a combination of their extreme poverty levels and lack of alternative non-agricultural income-generating activities.

As one of Sudan's most vulnerable regions, the White Nile State is severely impacted by the climate change induced droughts and floods described above. Almost all localities in the western side of White Nile River were found to be among the most vulnerable to droughts and other impacts of climate change (including localities of Al Dwaim, Tandelti, Alsalam, and Gulli, which will be the pilot communities of this project). These impacts have already been manifested in declining crop productivity, loss of grazing resources and rangeland valuable species, land degradation, increased frequency of diseases crops, livestock and population, loss of livelihoods and human migration in search for jobs and alternative livelihoods. While climate impacts are severe across the state, the communities on the western bank of the White Nile River were particularly vulnerable because of their low capacity for dealing with impacts due to the following factors: low general awareness of climate change, lack of knowledge about water harvesting, lack of access to improved seeds and other agriculture inputs, presence of overgrazing and severe deforestation, high poverty levels and lack of

alternative livelihood systems, lack of technology and know-how for better agricultural practices, and high frequency of rangeland fires.

Project Objectives: The proposed project thus aims to increase the climate change resilience of livelihoods and integrated productive agricultural systems in the White Nile State through Ecosystem Based Adaptation approaches.

Project components
Component 1: Capacity Development for Ecosystems based Adaptation (EbA) and policy mainstreaming.
Component 2: Implementation of EbA measures to build adaptive capacities of vulnerable communities
Component 3: Knowledge management for appropriate EbA design.

Terms of the Consultancy
Suggested Duration of Consultancy: 20 months
A nationally-based natural resource professional will be recruited to work with the communities to support community based natural resources management and the implementation of EbA activities on-the-ground. Under the guidance of the Adaptation Interventions Expert and after conducting literature search and consulting other projects, the NRM expert is tasked with suggesting suitable interventions to include the following areas:

- Water harvesting.
- Rangelands rehabilitation
- Tree nurseries and plantation: forestation, community forests, ..etc
- Improved seeds and appropriate agricultural practices for drought conditions
- Mapping natural resources in project area
- Identifying socio-economical profile: populations, land use patterns, conflicts, threats, etc.
- Identifying possible interventions to rehabilitate natural resources in close consultation with communities
- Suggesting community capacity building, environmental awareness and approaches to natural resources management
- Assist villages and communities to plan sustainable resources use
- Identify women roles in natural resources management and empower women to participate in interventions

Specific activity support includes the following:

- Developing protocols to guide the implementation of EbA interventions
- Developing and implementing community-based EbA intervention management and monitoring plans by the VDCs to ensure the long-term sustainability of interventions
- Appointing technical service providers to implement the EbA measures
- Training local government representatives on EbA and climate-resilient land/water management techniques
- Training community Village Development Committees and Water User Associations to oversee, monitor and coordinate local community involvement in the implementation of EbA and climate-resilient land/water management interventions.
- Training local communities at each project intervention site on the implementation and maintenance of EbA interventions and climate-resilient land management techniques
- Collaborating with Village Development Committees to identify/verify sites and pilot families to carry out EbA interventions specifics (size, function, personnel required) for appropriate climate-resilient land management techniques to be implemented in each pilot intervention site
- Assisting with the rehabilitation of 1600 ha of rangeland reserves in collaboration with the Range and Pasture Administration
- Assisting with afforestation on approximately 1,500 hectares in collaboration with the National Forest Corporation

- Assisting with replanting and protecting trees along riparian zones
- Supporting implementation of rainwater harvesting techniques on community farms with support from the Water User Associations
- Mapping current land use and soil quality using community involvement with endorsement by the State legislation Council.

The terms of reference for the study area as follows:

- Interventions should be economically feasible, acceptable to the beneficiaries, and relevant to EbA
- Sustainability of interventions
- Interventions should be based on successful indigenous adaptation, best practices and appropriate technical packages

Suggested qualifications

- Advanced university degree in natural resources management and at least 15 years' experience.
- Experience in working in the region is important
- Experience in community development initiatives

Rural Alternative Energy Expert (National)

Introduction: The Project "Enhancing the resilience of communities living in climate change vulnerable areas of Sudan using Ecosystem Based approaches to Adaptation (EbA)" is implemented in the White Nile State of Sudan. White Nile State is located in Southern Sudan and is delimited by the republic of South Sudan in the south and North Kordofan State in the west, Sinnar and Gezira States in the east and Khartoum State in the north. The total land area of the White Nile State is about 39,701 square kilometers, mostly flat areas traversed by the White Nile River from south to north. Administratively the State is divided into 8 localities. The total population is more than 1.7 million inhabitants, with almost 70% of the population living in the rural areas depending on traditional rainfed agriculture and livestock rearing for their livelihoods. The White Nile State's animal resources are estimated at 7.9 million heads. Three different ecological zones share the land area of the White Nile State. The larger area falls within the semi-arid zone (semi dry and dry), which is also known as the Savannah zone (to the west on sandy soils and to the east on clay soils). The northern area of the State is part of the semi desert zone while a small area in southern boarder lies within the sub-humid zone. Accordingly the annual rainfall is ranging between 300 mm in the north and up to more than 600 mm in the south.
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The groups that are the most vulnerable to climate risks are traditional rain-fed farmers and pastoralists (NAPA, 2007). During past droughts, there has been large-scale human suffering from hunger among these groups, including forced out migration from rural areas and the death of their livestock herds. Flooding also causes widespread damage in the form of destruction of property and the death of livestock herds. There is ample evidence of past climatic shocks generating a chain of events that led to the disintegration of community and the discontinuity of human habitation. In general, this has been due primarily to a combination of their extreme poverty levels and lack of alternative non-agricultural income-generating activities.

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alternative livelihood systems, lack of technology and know-how for better agricultural practices, and high frequency of rangeland fires.

Project Objectives: The proposed project thus aims to increase the climate change resilience of livelihoods and integrated productive agricultural systems in the White Nile State through Ecosystem Based Adaptation approaches.

Project components
Component 1: Capacity Development for Ecosystems based Adaptation (EbA) and policy mainstreaming.
Component 2: Implementation of EbA measures to build adaptive capacities of vulnerable communities
Component 3: Knowledge management for appropriate EbA design.

Terms of the Consultancy
Suggested Consultancy duration: Five weeks
A nationally-based rural alternative energy expert will be recruited to work with PMU and Communities to develop a plan for alternative energy. The following terms of references should be followed:

- To study current energy resources used by the community.
- To identify possible alternative energy opportunities and barriers
- To suggest capacity building activities
- To identify women roles and suggest alternatives for domestic energy

Specific activity support includes the following:

- Supporting the promotion of alternative building materials to reduce dependencies on trees as biomass fuel
- Assisting with the purchase improved cook stoves (butane gas stoves) to reduce need for tree felling and resulting pressure on forests

Suggested Qualifications:

- Advanced university degree in alternative energy and at least 10 years' experience in alternative rural energy
- Fluency in English (Arabic an advantage)

Terms of Reference

Adaptation Interventions Expert (International)

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Project components
Component 1: Capacity Development for Ecosystems based Adaptation (EbA) and policy mainstreaming.
Component 2: Implementation of EbA measures to build adaptive capacities of vulnerable communities
Component 3: Knowledge management for appropriate EbA design.

Terms of the Consultancy
Consultancy Duration: 24 weeks
A competent international expert linked with an appropriate research centre will be invited to visit the project sites, and meet with beneficiaries and stakeholders, to help with the following activities:

Specific activity support includes the following:
- Enhancing the technical capacity of HCENR, relevant ministries and the State Technical and White Nile Environment Committees for i) information-sharing; and ii) coordinating climate change adaptation measures
- Conducting stocktaking exercise for policy- and decision-makers on how they can update existing policies and strategies to incorporate EbA
- Assisting in the development and distribution of technical guidelines for policy- and decision-makers on best practices of EbA based on lessons learned from demonstration activities (best practices will be documented through Component 3)
- Assisting in the development and distribution of policy briefs that identify entry points at the national and local levels for the integration of climate change adaptation interventions, including EbA, into relevant policies and sectoral budgets.
- Support in defining cost effective strategies for rangeland regeneration, increasing water infiltration and improving agricultural and pastoral yields using EbA in consultation with the Village Development Committees and Water User Associations
- Overseeing all EbA implementation activities and provide guidance to the nationally-based Natural Resource Management expert
- Support with designing and implementing a monitoring strategy designed to assess the impacts of EbA to provide lessons learned and best practices for upscaling EbA for use in Component 3

Qualifications
- The expert and associated research centre should submit CVs of competent scientists covering all areas of adaptation interventions
- A technical proposal will be requested to indicate the approaches to be followed

Terms of Reference

Adaptation Economics / Policy Expert (International)

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Project Objectives: The proposed project thus aims to increase the climate change resilience of livelihoods and integrated productive agricultural systems in the White Nile State through Ecosystem Based Adaptation approaches.

Project components
Component 1: Capacity Development for Ecosystems based Adaptation (EbA) and policy mainstreaming.
Component 2: Implementation of EbA measures to build adaptive capacities of vulnerable communities
Component 3: Knowledge management for appropriate EbA design.

Terms of the Consultancy
Consultancy Duration: 11 weeks
An international expert in the field of adaptation economics and policy development will be recruited to support the following periodic tasks throughout the first three years of the project:

Specific activity support includes the following:
- Developing an economic cost-benefit assessment for EbA measures
- Developing an upscaling plan for EbA measures based on the cost-benefit assessments
- Providing operational and technical support to HCENR, the State Technical and Environment Committees and relevant ministry representatives on how to include climate change considerations in relevant strategies, plans and budgets using a cost effectiveness argument
- Conducting training sessions for HCENR, relevant ministry members and the State Technical and Environment Committees on: i) interpreting climate change adaptation economic assessments produced under Component 3, ii) using a cost effectiveness argument in the planning and decision making process and iii) financing CCA

Qualifications
- The expert should have a Master's degree in economics or related field as well as specialized training in the Economics of Adaptation
- Previous experience must be demonstrated on developing cost-benefit analyses and working with the private and public sector with adaptation awareness

Terms of Reference

Vulnerability Assessment Expert (National)

Introduction: The Project "Enhancing the resilience of communities living in climate change vulnerable areas of Sudan using Ecosystem Based approaches to Adaptation (EbA)" is implemented in the White Nile State of Sudan. White Nile State is located in Southern Sudan and is delimited by the republic of South Sudan in the south and North Kordofan State in the west, Sinnar and Gezira States in the east and Khartoum State in the north. The total land area of the White Nile State is about 39,701 square kilometers, mostly flat areas traversed by the White Nile River from south to north. Administratively the State is divided into 8 localities. The total population is more than 1.7 million inhabitants, with almost 70% of the population living in the rural areas depending on traditional rainfed agriculture and livestock rearing for their livelihoods. The White Nile State's animal resources are estimated at 7.9 million heads. Three different ecological zones share the land area of the White Nile State. The larger area falls within the semi-arid zone (semi dry and dry), which is also known as the Savannah zone (to the west on sandy soils and to the east on clay soils). The northern area of the State is part of the semi desert zone while a small area in southern boarder lies within the sub-humid zone. Accordingly the annual rainfall is ranging between 300 mm in the north and up to more than 600 mm in the south.

Climate change is amplifying and increasing the frequency of many of the climate related hazards already affecting Sudan (NAPA, 2007). Most notably, increasing temperatures, decreasing trends of annual precipitation as well as increased variability, is causing a gradual shift of climate end ecological zones from north to south. E.g. formerly semiarid ecological zones, such as the majority of the White Nile State, is gradually moving southward as climate gets increasingly arid and hot, thus taking on characteristics similar to the arid zones found further north today. This in turn has significant implications for water availability and agricultural potential, through increased frequency of climate events such as droughts, dust storms and heat waves. Another impact of climate change is an increasing frequency of extreme flooding events caused by an increase in intensity of rainfall both during the rainy season (seasonal flooding) and in rainstorms (flash flooding). These climate trends and risks are exacerbated by a number of non-climate issues such as: decreased vegetation cover due to overgrazing and deforestation, and inefficient management of water resources – thus further increasing trends of ecological zone shift and desertification.

The groups that are the most vulnerable to climate risks are traditional rain-fed farmers and pastoralists (NAPA, 2007). During past droughts, there has been large-scale human suffering from hunger among these groups, including forced out migration from rural areas and the death of their livestock herds. Flooding also causes widespread damage in the form of destruction of property and the death of livestock herds. There is ample evidence of past climatic shocks generating a chain of events that led to the disintegration of community and the discontinuity of human habitation. In general, this has been due primarily to a combination of their extreme poverty levels and lack of alternative non-agricultural income-generating activities.

As one of Sudan's most vulnerable regions, the White Nile State is severely impacted by the climate change induced droughts and floods described above. Almost all localities in the western side of White Nile River were found to be among the most vulnerable to droughts and other impacts of climate change (including localities of Al Dwaim, Tandelti, Alsalam, and Gulli, which will be the pilot communities of this project). These impacts have already been manifested in declining crop productivity, loss of grazing resources and rangeland valuable species, land degradation, increased frequency of diseases crops, livestock and population, loss of livelihoods and human migration in search for jobs and alternative livelihoods. While climate impacts are severe across the state, the communities on the western bank of the White Nile River were particularly vulnerable because of their low capacity for dealing with impacts due to the following factors: low general awareness of

climate change, lack of knowledge about water harvesting, lack of access to improved seeds and other agriculture inputs, presence of overgrazing and severe deforestation, high poverty levels and lack of alternative livelihood systems, lack of technology and know-how for better agricultural practices, and high frequency of rangeland fires.

Project Objectives: The proposed project thus aims to increase the climate change resilience of livelihoods and integrated productive agricultural systems in the White Nile State through Ecosystem Based Adaptation approaches.

Project components
Component 1: Capacity Development for Ecosystems based Adaptation (EbA) and policy mainstreaming.
Component 2: Implementation of EbA measures to build adaptive capacities of vulnerable communities
Component 3: Knowledge management for appropriate EbA design.

Terms of the Consultancy
Consultancy Duration: 8 weeks
A national expert in the field of climate change Vulnerability Assessments will be recruited to support the following task during the first year of the project based on the NAP conclusions for the White Nile State:

- Support the Village Development Committees (VDCs) in conducting a comprehensive participatory assessment of specific climate change vulnerabilities in each of the target communities to identify entry points and guide identification of specific priority EbA measures, emphasizing gender mainstreaming

Qualifications
- The expert should have a Master's degree in an environmentally-related field
- Previous experience must be demonstrated in developing climate change vulnerability assessments

Terms of Reference

Revolving Fund Expert (National)

Introduction: The Project "Enhancing the resilience of communities living in climate change vulnerable areas of Sudan using Ecosystem Based approaches to Adaptation (EbA)" is implemented in the White Nile State of Sudan. White Nile State is located in Southern Sudan and is delimited by the republic of South Sudan in the south and North Kordofan State in the west, Sinnar and Gezira States in the east and Khartoum State in the north. The total land area of the White Nile State is about 39,701 square kilometers, mostly flat areas traversed by the White Nile River from south to north. Administratively the State is divided into 8 localities. The total population is more than 1.7 million inhabitants, with almost 70% of the population living in the rural areas depending on traditional rainfed agriculture and livestock rearing for their livelihoods. The White Nile State's animal resources are estimated at 7.9 million heads. Three different ecological zones share the land area of the White Nile State. The larger area falls within the semi-arid zone (semi dry and dry), which is also known as the Savannah zone (to the west on sandy soils and to the east on clay soils). The northern area of the State is part of the semi desert zone while a small area in southern boarder lies within the sub-humid zone. Accordingly the annual rainfall is ranging between 300 mm in the north and up to more than 600 mm in the south.

Climate change is amplifying and increasing the frequency of many of the climate related hazards already affecting Sudan (NAPA, 2007). Most notably, increasing temperatures, decreasing trends of annual precipitation as well as increased variability, is causing a gradual shift of climate end ecological zones from north to south. E.g. formerly semiarid ecological zones, such as the majority of the White Nile State, is gradually moving southward as climate gets increasingly arid and hot, thus taking on characteristics similar to the arid zones found further north today. This in turn has significant implications for water availability and agricultural potential, through increased frequency of climate events such as droughts, dust storms and heat waves. Another impact of climate change is an increasing frequency of extreme flooding events caused by an increase in intensity of rainfall both during the rainy season (seasonal flooding) and in rainstorms (flash flooding). These climate trends and risks are exacerbated by a number of non-climate issues such as: decreased vegetation cover due to overgrazing and deforestation, and inefficient management of water resources – thus further increasing trends of ecological zone shift and desertification.

The groups that are the most vulnerable to climate risks are traditional rain-fed farmers and pastoralists (NAPA, 2007). During past droughts, there has been large-scale human suffering from hunger among these groups, including forced out migration from rural areas and the death of their livestock herds. Flooding also causes widespread damage in the form of destruction of property and the death of livestock herds. There is ample evidence of past climatic shocks generating a chain of events that led to the disintegration of community and the discontinuity of human habitation. In general, this has been due primarily to a combination of their extreme poverty levels and lack of alternative non-agricultural income-generating activities.

As one of Sudan's most vulnerable regions, the White Nile State is severely impacted by the climate change induced droughts and floods described above. Almost all localities in the western side of White Nile River were found to be among the most vulnerable to droughts and other impacts of climate change (including localities of Al Dwaim, Tandelti, Alsalam, and Gulli, which will be the pilot communities of this project). These impacts have already been manifested in declining crop productivity, loss of grazing resources and rangeland valuable species, land degradation, increased

frequency of diseases crops, livestock and population, loss of livelihoods and human migration in search for jobs and alternative livelihoods. While climate impacts are severe across the state, the communities on the western bank of the White Nile River were particularly vulnerable because of their low capacity for dealing with impacts due to the following factors: low general awareness of climate change, lack of knowledge about water harvesting, lack of access to improved seeds and other agriculture inputs, presence of overgrazing and severe deforestation, high poverty levels and lack of alternative livelihood systems, lack of technology and know-how for better agricultural practices, and high frequency of rangeland fires.

Project Objectives: The proposed project thus aims to increase the climate change resilience of livelihoods and integrated productive agricultural systems in the White Nile State through Ecosystem Based Adaptation approaches.

Project components

Component 1: Capacity Development for Ecosystems based Adaptation (EbA) and policy mainstreaming.

Component 2: Implementation of EbA measures to build adaptive capacities of vulnerable communities

Component 3: Knowledge management for appropriate EbA design.

Terms of the Consultancy

Consultancy Duration: 10 weeks

A national expert in the field of climate change Vulnerability Assessments will be recruited to support the following task during the third year of the project:

66

- Establish a revolving fund to support purchase of animal drawn ploughs, drought-resistant seeds, animal feed supplements, solar pumps for wells and improved cookstoves
- Provide training to VDCs on accessing and managing the revolving fund, (e.g., book keeping)

Qualifications

- The expert should have a Master's degree in an economics-related field
- Previous experience must be demonstrated in establishing a revolving fund or equivalent in Microfinance

Appendix 12: Endorsement letters of GEF National Focal Points

بسم الله الرحمن الرحيم

Republic of Sudan
جمهورية السودان
Ministry Of Environment, Forestry & Physical Development
وزارة البيئة والغابات والتنمية العمرانية

DATE: .....
NO: .....

مكتب الوكيل
Under Secretary

التاريخ: [17 June 2013]
النمرة: .....

To: Mariam Niamir Fuller
Director, GEF Coordiantion Office
UNEP, Nairobi

Subject: Endorsement for Enhancing the resilience of communities living in climate change vulnerable areas of Sudan using Ecosystem Based approaches to Adaptation (EbA).

In my capacity as GEF Operational Focal Point for Sudan , I confirm that the above project proposal (a) is in accordance with my government's national priorities including the priorities identified in the National Adaptation Plan of Action of Sudan and our commitment to the relevant global environmental conventions; and (b) was discussed with relevant stakeholders, including the global environmental convention focal points.

I am pleased to endorse the preparation of the above project proposal with the support of the GEF Agency(ies) listed below. If approved, the proposal will be prepared and implemented by UNEP and executed by the Higher Council for Environment and Natural Resources. I request the GEF Agency(ies) to provide a copy of the project document before it is submitted to the GEF Secretariat for CEO endorsement.

The total financing (from GEFTF, LDCF and/or SCCF) being requested for this project is US$4,800,480, inclusive of project preparation grant (PPG), if any, and Agency fees for project cycle management services associated with the total GEF grant. The financing requested for Sudan is detailed in the table below.

Source of Funds	GEF Agency	Focal Area	Amount (in US$)			
			Project Preparation	Project	Fee	Total
LDCF	UNEP	CC	100,000	4,284,000	416,480	4,800,480
(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
Total GEF Resources			100,000	4,284,000	416,480	4,800,480

Sincerely,

17/6/2013

[Dr. Babiker Abdalla Ibrahim]
[Undersecretary Ministry of Environment- GEF OFP]

Copy to (delete as necessary): Convention Focal Point for UNFCCC

Ministry of Environment, Forestry & Physical Development
Date: .....
Under Secretary

المقر: مباني رئاسة مجلس الوزراء سابقاً - شارع المك نمر - تلفون ٧٧٤١٣٩ - ٠١٥٧٧٩٤٣١٥ - فاكس ٠١٥٣٩٨٥٦٠٥
Head office: Mek Nimir Avenue, Khartoum, Sudan, Tel:0157794315 - 774139 - Fax:0153985605
E-mail: menviroment.sdn@hotmail.com Webside: www.mepd.gov.sd

Appendix 13: Co-financing commitment letters from project partners

UNITED NATIONS ENVIRONMENT PROGRAMME
Programme des Nations Unies pour l'environnement | Programa de las Naciones Unidas para el Medio Ambiente
Программа Организации Объединенных Наций по окружающей среде | برنامج الأمم المتحدة للبيئة
联合国环境规划署
UNEP

Ms. Brennan Van Dyke
Chief, Resource Mobilization and Global Funds Coordination
UNEP/Office of Operations and Corporate Services
Nairobi.

3 March 2016

Subject : Co-financing for the UNEP LDCF project "Enhancing the resilience of communities living in climate change vulnerable areas of Sudan using Ecosystem Based approaches to Adaptation (EbA)"

Dear Brennan,

This letter is to confirm the support and commitment of Post Conflict and Disaster Management Branch (PCDMB) of the UNEP Division of Environmental Policy and Implementation (DEPI) for the Least Developed Country Fund (LDCF) project ***Enhancing the resilience of communities living in climate change vulnerable areas of Sudan using Ecosystem Based approaches to Adaptation (EbA).*** Through PCDMB's Adapt for Environmental and Climate Resilience in Sudan (ADAPT) Project, UNEP has the following activities under its three components that are complementary to the LDCF project:

Component 1: coordinating environmental programming to promote linkages across government sectors, building institutional capacities to address climate issues in the long-term, and promoting best environmental practices;

Component 2: supporting socio-economic analysis of climate constraints and promoting the use of environmental information; and

Component 3: informing and influencing national policy and planning so as to improve environmental governance.

Post Conflict & Disaster Management Branch
15 chemin des Anémones, 1219 Châtelaine, Geneva - Switzerland
Tel : +41 (0)22 917 85 30 - Fax : +41 (0)22 917 80 64

The approximate total value of the UNEP ADAPT project resources for this co-financing will amount to USD 1.4 million to support all three Outcomes of the LDCF project over the period 2017-2019. ADAPT project is being implemented directly by UNEP.

I thank you for your assistance and look forward to a fruitful collaboration in the future.

Best regards,

UNITED NATIONS ENVIRONMENT PROGRAMME
Post-Conflict and Disaster Management Branch (PCDMB)
UNEP
Geneva, Switzerland

Henrik Slotte

Chief

Post-Conflict Disaster and Management Branch

بسم الله الرحمن الرحيم

Range and Pasture General Directorate Khartoum East, E.L Tegani El Mahi Street P.O. Box: 2513 00249 83 775231 E-mail: rpafed@gmail.com

الادارة العامة للمراعي والعلف الاخادية
الخرطوم شرق
شارع التيجاني الماحي

Sunday, November 29, 2015

Letter of co-financing

I Sawsan Khair Elsied Abdel Rhim in my capacity as General Director: Range and Pasture General Directorate ،Ministry of Livestock, Fisheries and Rangelands, hereby attest that our institution will contribute an amount of 500000 US$ to project entitled "***Enhancing the resilience of communities living in climate change vulnerable areas of Sudan using Ecosystem Based approaches to Adaptation (EbA)"***

This amount represents rangelands rehabilitation within the framework of Range and Pasture General Directorate interventions already identified and planned and which contribute to the achievement of the results of EbA project.

Regards

Ministry of Livestock, Fisheries and Rangelands
Range and Pasture
General Directorate

Dr.Sawsan Khair Elsied Abdel Rhim Mustafa
General Director
Range and Pasture General Directorate,
Ministry of Livestock, Fisheries and Rangelands
Khartoum, Sudan
249 83 775231, mob: 00249 912559438
sawsanatkh@yahoo.com

بسم الله الرحمن الرحيم

White Nile State
Ministry of Agriculture
Irrigation& Forests
G. M. Office

ولاية النيل الابيض
وزارة الزراعة والري والغابات
مكتب المدير العام

Date:11/1/2016 NO:WNS/MARF/GMO

To: Secretary General,
Higher Council for Environment and Natural Resources,
Khartoum, Sudan

From: Eng. Ahmed Mohamed Yousif,
Director General,
White Nile State Ministry of Agriculture and Forestry,
White Nile State, Kosti, Sudan

Subject: Co-financing of the White Nile State EbA Project

Reference to the above subject, we hereby confirm that the budget allotted for development initiatives for the Rainfed Agriculture and Forestry sectors for the period 2016-2020 is:

Sector	Budget (USD)
Traditional Rainfed Agriculture (smallholder)	1,200,000
Forestry	400,000
Total	**1,600,000**
(Only one million six hundred US dollars)	

This sum is a co-financing for the above project.

Thank you and best regards

بسم الله الرحمن الرحيم

ولايـة النيـل الأبيـض

وزارة الثروة الحيوانية والسمكية والمراعي

Minstry of Animal Resources & Fisheries & Pasture

مكتب المدير العام General Director Office

No:m o a r fp/68/a/1

Date/11/1/2016

To: Secretary General,
Higher Council for Environment and Natural Resources,
Khartoum, Sudan

From: Dr. Adil Hassan Hussein,
Director General,
White Nile State Ministry of Animal Resources, Fisheries and Rangelands
Kosti, White Nile State, Sudan

Subject: Co-financing of the White Nile State EbA Project

The White Nile State Ministry of Animal Resources, Fisheries and Rangelands development initiatives confirms the support of the White Nile State EbA project in areas of livestock and rangelands.

We herein assure a co-fiancing sum of USD 2,000,000 (only two million US dollars) as a budget for the period 2016-2020 alloted for the Localities of Edweim, Gulli, Tendalti and Alsallam, in the White Nile State.

Thank You and Best Regards

وزارة الثروة الحيوانية والسمكية والمراعي
ولاية النيل الأبيض
مكتب المدير العام

Fax :0571822081 - E.mail:gdarwnsk_123@yahoo.com

White Nile State
Ministry of Planning & Public Utilties
WATER CORPORATION

ولاية النيل الأبيض
وزارة التخطيط العمراني والمرافق العامة
هيئـــة ميـاه الشـــرب

مكتب المدير العام
General Manager Office

No:70/A/3

Date:7 December 2015

To: Secretary General,
Higher Council for Environment and Natural Resources,
Khartoum, Sudan

From: Eng. Mohamed Yahya Mohamed Elmam,
Director General,
Water Corporation
White Nile State Ministry of Planning and Public Utilities,
Kosti, White Nile State, Sudan

Subject: Co-financing of the White Nile State EbA Project

Reference to the above subject, we hereby confirm that the budget allocated for development initiatives for the period 2016-2020 is:

Locality	Activity	Budget (USD)
Edweim	Wad Gabur Earthen Dam	833,300
Tendalti	Wafraa Earthern Dam	833,300
Gulli	Gulli town water network	815,300
Alsallam	El Akaf Earthen Dam	533,300
Total(Only two million four hundred and fifteen thousand and two hundred US dollars)		2,415,200

This sum is a co-financing for the above project.

Thank you and best regards

Tel: 0571822149 - Fax : 0571822149

ت : ٠٥٧١٨ ٢٢١٤٩ – فاكس : ٠٥٧١٨ ٢٢١٤٩

Appendix 14: Tracking Tools

Tracking Tool for Climate Change Adaptation Projects

Project Identification			
Project title:	Enhancing the resilience of communities living in climate change vulnerable areas of Sudan using Ecosystem Based approaches to Adaptation (EbA)		
Country:	Sudan	GEF Project ID:	
GEF Agency	UNEP	Agency Project ID:	
Executing Partners:	HCENR	Council/CEO Approval date	
Project status at submission		Tool submission date:	

Project baselines, targets and outcomes						
Objective 1: Reduce the vulnerability of people, livelihoods, physical assets and natural systems to the adverse effects of climate change						
Indicator	**Unit of measurement**	**Baseline at CEO Endorsement**	**Target at CEO Endorsement**	**Actual at mid-term**	**Actual at completion**	**Comments (e.g. specify unit of measurement**
Indicator 1: Number of direct beneficiaries	number of Households (HH)	0	6,800 HHs			
	% female	0	50%			
	% of targeted population	To be determined from site reports	~5%			

Outcome 1.1: Vulnerability of physical assets and natural systems reduced						
Indicator	**Unit of measurement**	**Baseline at CEO Endorsement**	**Target at CEO Endorsement**	**Actual at mid-term**	**Actual at completion**	**Comments (e.g. specify unit of measurement**

Indicator 2: Type and extent of assets strengthened and/or better managed to withstand the effects of climate change	Ha of land	0	8,000			

Outcome 1.2: Livelihoods and sources of income of vulnerable populations diversified and strengthened						
Indicator	**Unit of measurement**	**Baseline at CEO Endorsement**	**Target at CEO Endorsement**	**Actual at mid-term**	**Actual at completion**	**Comments (e.g. specify unit of measurement**
Indicator 3: Population benefiting from the adoption of diversified, climate-resilient livelihood options	number of Households (HH)	0	6,800 HHs			
	% female	0	50%			
	% of targeted population	To be determined from site reports	~5%			

Objective 2: Strengthen institutional and technical capacities for effective climate change adaptation						
Outcome 2.1: Increased awareness of climate change impacts vulnerability and adaptation						
Indicator	**Unit of measurement**	**Baseline at CEO Endorsement**	**Target at CEO Endorsement**	**Actual at mid-term**	**Actual at completion**	**Comments (e.g. specify unit of measurement**
Indicator 5: Public awareness activities carried out and population reached	Yes/No	No	Yes			
	number of people	0	1,000			
	% female	0	50			

Outcome 2.2: Access to improved climate information and early-warning systems enhanced at regional, national, sub-national and local level						
Indicator	**Unit of measurement**	**Baseline at CEO Endorsement**	**Target at CEO Endorsement**	**Actual at mid-term**	**Actual at completion**	**Comments (e.g. specify unit of measurement**

Indicator 6: Risk and vulnerability assessments, and other relevant scientific and technical assessments carried out and updated	Number of relevant assessments / knowledge products	0	4			

Outcome 2.3: Institutional and technical capacities and human skills strengthened to identify, prioritize, implement, monitor and evaluate adaptation strategies and measures						
Indicator	**Unit of measurement**	**Baseline at CEO Endorsement**	**Target at CEO Endorsement**	**Actual at mid-term**	**Actual at completion**	**Comments (e.g. specify unit of measurement**
Indicator 9: Number of people trained to identify, prioritize, implement, monitor and evaluate adaptation strategies and measures	Number of people	0	365			
	% female	0	30			

Objective 3: Integrate climate change adaptation into relevant policies, plans and associated processes						
Outcome 3.2: Policies, plans and associated processes developed and strengthened to identify, prioritize and integrate adaptation strategies and measures						
Indicator	**Unit of measurement**	**Baseline at CEO Endorsement**	**Target at CEO Endorsement**	**Actual at mid-term**	**Actual at completion**	**Comments (e.g. specify unit of measurement**
Indicator 12: Regional, national and sector-wide policies, plans and processes	Number of policies / plans / processes	Zero (0) national policies or frameworks have integrated EbA	At least 1 national development framework and 1 state Five Year Sector			

developed and strengthened to identify, prioritize and integrate adaptation strategies and measures			Plan have mainstreamed EbA			
	score					(if the scoring methodology is different from the recommended [see Sheet 2], please describe)

Appendix 15: Site reports by National Experts

The visit of the National Consultants to the White Nile State (31.8.2015-5.9.2015)

The visit was made by:

Prof. Faisal Mohammed Ahmed El Hag

Dr. Mutasim Bashir Nimir

Ms. Rehab Abdel Mageed Osan (HCENR)

Mr. Younis Abubaker Nemarir (HCENR)

31.8.2015

Departure Khartoum to Kosti 7:30 Am.

Arrival Kosti 11:30 Am.

Meeting the Ministry of Health Ms. Safeira Alhag Abbaker Mohamed. The meeting was attended by Hanna ElTayeib Omer, Alhag Abdel Moula Hadeed of the state Environment Committee, which is headed by the minister of health. The meeting was also attended by Mr. Elgizouli Hashim Elgizouli and Bashir Adam Humida from the Ministry of Health.

The minister indicated that most of the state could be considered as vulnerable. The state has three sugar factories, one cement factory and one power station with some emission and impact on the environment (considerable pollution problems).

The State Environment Committee is a coordinating body.

There is a considerable problem of expired pesticides storage in the state (chemicals and containers).

The state is also included in the Risk Insurance and Finance Project.

The state is also included in the GGWI (Great Green Wall Initiative) which is implemented in the northern part of the state.

The Minister indicated that Alsalam Locality is also experiencing problems due to refugees from Southern Sudan who are now arriving in large numbers and also due to Pastoralists with 5 million head of livestock who used to graze their animals in Southern Sudan during the dry season and have to restrict their movement within limited areas of Alsalam Locality. The minister expressed her worries about contagious diseases and stated that health services are strengthened along the border line.

Alsalam Locality

Meeting the commissioner: He stated that the locality is addressing refugees and pastoralists' problems (5 million heads of livestock, 70-80,000 families).

He explained that there are conflicts between pastoralists and farmers.

The state organized a workshop on Pastoralists law – the importance of opening the livestock migration routes was discussed (The width of the route to be 4 Km. Starting from the boundary line). Unfortunately, the route was already cultivated and opening the cattle route is suspended for this year.

The locality is distributing improved seeds to the farmers.

Gulli Locality

The commissioner Ahmed AlSadig Safouri, Basheer Adam, Executive Director and Mr Sharaf. The commissioner explained that Gulli locality includes also irrigated schemes and that they have coordinated efforts in Natural Resources Rehabilitation (NGOs, Government and Communities). This season there is evident decrease in rainfall which will increase the vulnerability of rainfed farmers. He explained that most of state is not having ground water due to the Basement Complex and depend on surface water. He indicated that water harvesting is essential for agriculture, human and livestock drinking. Khor Abu Habil flows into this locality and its water could be used (One Barrel of water sold for SDG 35.0)

- Irrigated schemes 36.000 acres (not fully utilized due to burial of irrigation canals by sands and other problems such as lack of credit).
- He commended the efforts of Plan Sudan Plan; an NGO, which is doing excellent work in support of the communities.
- Plan Sudan has established a water pipe line 60 km long to provide water for the communities in west of the White Nile.

September 1st, 2015: Plan Sudan Organization

Meeting with Mr. El Tayeb Izzeldeen, director of Kosti and Gulli programme, Bashir Humaida and Salih, Forest Inspector, Hana El Tayeb and Elhag Hadeed.

The use of tractors in Qoz Soil resulted in destruction of vegetation cover.

In the good rainy seasons farmers are encouraged to use tractors and expand cultivation of sesame and a farmer can cultivate 400-500 acres of range land.

The state Walli issued an order forbidding tractor cultivation in El Bagga Area (a rich rangeland area). However, the state cannot enforce this law due to lack of resources.

Mr. Eltayeb stated that Plan Sudan is working in the White Nile State in 105 villages in 3 localities assisting vulnerable communities in emergency situation. Plan Sudan work mainly in construction of haffirs, in few places drilling wells where ground water is available. Also assisting villages in case of seasonal floods of Abu Habil (during October). Plan Sudan activities are:

- Cultivation of Qoz with sorghum and sesame enhanced sand encroachment/ Plan is encouraging cultivation of Gerdoud Soil (a sandy loamy soil lying between two sand dunes) and establishment of Tree belts and community forests.
- Plan Sudan established a water station equipped with filter for Shargga village in Gulli locality costing SDG 220 million. The station produce 1200 barrel/ day and reduce salinity. Plan Sudan built an earth dam to protect villages from Khor Abu Habil. Also range plants reseeding, forest plantations project supervised by (Abdel Aziz Karm Allah).
- In Gulli and AlDuiem opening fire lines to protect rangeland.
- Gulli-Shargga village 60 km pipe line from White Nile and water pits.
- In Taweila Villages weather forecast, Rain gauge and mobile telephones in 66 villages.
- Establishment of Risk and Emergency Management Committees.
- First Aid in 40 villages.
- Plan Sudan supports Education and Health, small farmers (improved seeds and finance). Community participation is requested 7.5% of cost of any project.
- Back yard home gardens cultivation (Gubarka) for vegetable cultivation.
- Improved stoves/ Communal stoves shared by (5-6 families) using crop residues- with chimney/ 60% effeicient.
- Water harvesting and agriculture extension assisted by research station.
- Famers Schools Education/ Wad Nimir.
- In irrigated farms (seed production).
- Revolving fund for veterinary medicine with para-vet services .
- Veterinary services training, poultry.
- Annual Budget for education and Risk Management USD 1,200,000 USD and USD 600-700,000, respectively.
- Capacity Building in 38 villages.
- USD 400,000 for education, USD 240,000 grants for small animals provision, USD 7000 range improvement (seeds), USD 7000 fire lines. All activities are conducted with participation of communities.
- Sand dune fixation is also practiced.

September 1st, 2015: The State Environment Committee

Mr. Ali Salih, Forest Corporation (FNC), Rahma Hamid, Water, Zelal Ali Alsaid, Amira Mousa, Women Union, Massad Youisf, Range and Pasture Adminstration, Ibrahim Al Massad AlBalaa, Pastoralists Union, Ahmed Farag, Mechanized Famring.?

Major issues discussed:

- Late and low rainfall for this season.
- Pastoralists under increasing pressure as access to rangelands in Southern Sudan during the dry season is closed due to security reasons.
- Capacity building is essential for adaptation, new skills and initiatives.
- Women Union are having a revolving fund for micro-finance.
- FNC several activities in shelter belt and tree plantation, The Council of Ministers decree to ban any permits for felling trees, production or transport of charcoal.
- Small farmers cultivated limited areas 5 acres or less.
- The mechanized rain fed farming should grow shelter belts in 10% of their areas. Already being enforced in Megganis.
- To ban using tractors in sandy soils which result in removing natural vegetation and result in soil erosion.

- Improved seeds could increase productivity.
- Water harvesting, ploughing and terraces to make full use of rainwater, supplementary irrigation could be used in areas close to the White Nile.
- Vertical expansion, reduce horizontal expansion Zero tillage (improved seeds, pesticides, fertilization and herbicides could increase productivity up to 16 sacks per acre).
- Sorghum stalks could be used as fodder with added molasses from sugar factories.
- Pastoralists need to adapt to the new situation through modify their herd composition, depend on agriculture residue.
- Depredation of birds *Quela quela* on sorghum is behind the reluctance of some famer to establish shelterbelts, however, 1000 agriculture schemes will establish their shelterbelts on 10% of the farm area.
- Megainus Area, 265.000 feddan with no forest.
- Wad Jubr also practice rain fed cultivation and removed most of the natural cover leaving the soil for erosion.
- In Duweim area cultivation of sugar can increase rainfall??
- El Baga area although tractors are not allowed, however, there is no enforcement.
- Hafirs life is limited; it is proposed to change to dams.
- Pumping water from the White Nile is a possible alternative. Mugainus dam collapsed last year.

September 2nd, 2015: Travel to Tundalti

El Hag Hadeed; the Environment Committee Coordinator: *Leptadanic pyrotechnica* and *Panican turgidum* should be broad coasted in deteriorated rangeland. *Acacia senegal* could be reestablished South of Tundalti.

There is expansion in watermelon cultivation instead of millet (better prices).

Dehaisera is a good range plant could be broadcasted.

Abdallah Mohamed Ahmed, agricultural officer, Tundalti locality explained that the locality is suffering from increased vulnerability and low productivity. The locality is encouraging rain fed cultivation, forestry. The locality is having one agriculture extension officer, animal production officer. The locality distributed crop seeds.

There is no integrated approach.

The native ad ministration should be consulted.

Short term projects are not sustainable.

Um Belabli Village, Tundalti Locality

The village is 10 km from Tundalti, cultivating sesame, sorghum (Wad Fahal) variety. Delayed rainfall. Meeting with Sheikh Muhamdani El Sheikh Babkair and Said Hamid Al Sheikh.

The first rain shower was received on 12 August 2015 and followed by more showers.

About 302 families (farmers and few animals raised- small ruminants).

Sorghum sesame, peanut, hibiscus, lupine, millet

Several varieties of sorghum: Wad Fahal, Nagad, Fetereeta,. Tractors are widely used there is no labour or it is very expensive. However, with subsequent use of tractors productivity decline.

The small tractor AlKhurbash is much better. The family cultivated less than 15 Mukhamas for all crops with productivity of 15 sacks.

4-5 years ago the farmer cultivates one sack as seeds and harvest 30 sacks. Manual agriculture Salooka is better than tractors.

There is early maturing pea-nut.

They raise goats, sheep, poultry limited.

There are several pests, like Um Shumaila (worm), rats, bugs on watermelon.

Mesquite trees increasing.

Acaci Senegal.

Calotrpois procera is used as domestic fuel although it is harmful.

Forestry Corporation is encouraging the reestablishment of Acacia senegal belt, and 10% of tree plantation of farms is mandatory. However, camels destroy Acacia plantations.

- Backyard cultivation of local cucumber (Teebish), Okra and watermelon.
- Depend on Duanki for water all year round. The trip to get water 2 hours by donkey.
- They established a village development committee (recently established) made up of 6-7 persons.
- The village population 600-700.
- No milk for the children. Goats are only possessed by few people.
- The school is 5 km away.
- Gas stoves are owned by 2-3 persons.
- Health Center is at Tundalti (10 km away).
- No latrines.
- Prevailing diseases: Night blindness, Malaria
- **Women activities:** growing peanuts, sesame, chickpeas, limited poultry, back yard farming, Teebish, okra, raising goats.
- Revolving fund small scale projects, Family Bank.
- There is one mid-wife.

Persons met at the village and their contacts:

Abd Allah Mohamed Ahed Adam Agriculture officer Tundalti: 0919832226, 0122302434

Muhmedani Almedani Ali Yahia 0912541524

Gabir Ali Ahmed 091380129

Mustafa Mohd AlSheikh 0919050692

Al Tayeb Mohamed Osman 0911976163

Waleed Khalifa Hamid 0910325758

Al Sadig Medani Ali 0919086120

Mustafa Medani Ali 0912744180

Um Zuraiba Village

We could not visit Um Zuraiba. Abda Allah Mohamed Ahmed stated that problems there are similar to Um Belabli. However, he added that water there is more saline. Um Zuraiba is the first village to introduce tractors so soil erosion is worse. There are more camel herders and more conflicts between pastoralists and farmers.

Um Niam Village

They had some rainfall but no vegetation is growing yet. They started cultivating sesame and sorghum. Complaining about increased production cost.

The village named Um Niam as Niam (*Ostrich*) were seen close by. This is no longer happening.

They received some rainfall and the hafir (water reservoir is filled- could last till March) if the hafir expanded could hold enough water to last till the coming season. The hafir is linked to several watercourses with large catchment area.

The nearest ground water wells are 3-4 km.

Um Atroun on western side 3-4 km soil is sandy and difficult to use donkeys to transport water as they keep falling down.

They are building houses using bricks and clay.

Health center is built- no staff.

Mid- wife and teachers are present.

During the 1960s, Mukhamas used to produce 35 sacks now only 12 sacks. They think using tractors give good result on the first year then productivity decline.

They used to have *Acacia senegal* trees and Arabic gum was plenty. They agreed that they need to reestablish *Acacia senegal*. Today they have no wood for domestic energy.

They used to have local variety of cucumber Ajour Miliet (one creeper of the variety could produce a donkey load of cucumbers)

- Because of the tractor we are losing range plants. We cultivate sorghum Wad Fahal (Zinari), millet, sesame Harier, and Balwa as it gives no product under low rainfall.
- They received improved seeds. We cultivate more land and get less harvest than what we used to get. We need to get back to the rotation system to reestablish *Acacia sengal* belt.
- Al Khurbash could be better than the tractor.
- They are establishing producers' societies every 50 member form a committee.
- Lubia (ein elgazelle "deer eye")
- They have cattle, goats and sheep.
- Population 1300-1500 one sheikh tribal leader.
- Minor conflicts.
- They get assistance from micro-credit organization, through Women Union with guarantee from Sheikh.
- Jubrka cultivation is practiced.
- Women saving society.
- Only 20% of the population drink milk, the rest are having no goats.
- Gas stoves are used as there is wood and charcoal prices are SDG 150-160 per sack.
- Gas stoves are availed through micro finance.
- Poultry raising is limited.
- No reported cases of night blindness.

Partial List of names and telephones of villagers met at Abu Niam

Hago Habeeb Allah Awad Allah 0914763681

Ismail Adam Hamid 0914812118

Sheikh Mousa Ali Adam (village sheikh) 0911824879

Nagi Mohamed Toum Awad Allah 091018688804

Abdel Rahaman Awad Allah Imam 0915733359

Fatima Hussien Ibrahim 0902717943

Marriam Godda Alshafie Yousif 091041310

Yahia Mohd Ahmed ElHilu, Director of Gulli Integrated Society, Gulli Locality

Mobile No: 012148735

Activist (Environment Awareness) weekely Radio programme/ White Nile State

3/9/2015: White Nile Agriculture Research Station

Omer Hassab Al Rasoul Ibrahim. Agronomist, the ex- director of the station is chosen to be director of Risk Management project unit of the state. The research station is represented in technical committee of the project.

3.9.2015: Meeting the Physical Development

Minister Mr. Hassan Mohamed Koskos

The Ministry is responsible for water development projects and represented in the state Environment Committee. They developed a state water plan emphasizing good distribution of livestock according to range carrying capacity.

4.9.2015: El Rawat Village

Meeting at the girls school- established by Petroleum Companies. Rainfall was late but continued through the last week of August. El Rawat is 60 km from boundaries with South Sudan. Meeting attended by 12 Men, 24 women. **Major features:**

- The Rawat residents are agro pastoralists.
- Agriculture land varies 5-10-20 feddan.
- Raised animals (goat-sheep-cattle). Gas stoves are provided by some NGOs as there is no wood for domestic energy. Forests are destroyed.
- Water problems- Hafir water used by people and livestock. Water born diseases. Limited number of educated people.
- Rawat villages 500 families population 1500 / surrounded by 33 villages populated up to 14,500
- Two basic schools; one for girls and the other for boys and one mixed secondary school
- Most families own goats, gas cylinders.
- Poultry limited. No vegetable farming.
- Night blindness. Hafir is not protected from animals (no fence). Revolving fund for women. The area is basement complex area with no accessible ground water.
- Improved seeds distributed, but failed.

5 Sept.2015: Alabareeg villages

Alabareeg is made up of 3 villages, Alabreeg Alagab, Alabareg Aulad Shan, and Alabareeg Al Balla.

- There is a community forest well protected by the community/ 3000 trees / only dead branches used. Plan Sudan is having education / health programs and animals provision for some families
- Goat and sheep limited people have animals – cattle owners about 1% most people work as agriculture labour, 25% of the population own land.
- Water wells developed by a charitable man and also the road to Kosti.
- This year rain fall is very limited.
- Gas stoves owned by only 25% of the villagers while the rest use crop residue and dung.
- They grow early maturing sorghum Geshaish
- Also cucumber. The forest area 11 feddan
- Low lands, about 100 feddan not suitable for agriculture and left as rangeland.
- Khor Gawa (Frogs), Good rangeland
- Range Plants: Koraig, Molait, Demblab, Hantoot, Haskaneet, Tugtage, Tibra.
- Molaita natural vegetation used as salad vegetable and could be taken to the market in Kosti after the road is completed.

- Need literacy campaign
- Some night blindness cases.
- The worm dabossa (pin) ?
- No women programs, although several organization are working in the area such as (rural women development) and Zakat.
- Adam Hassan a wealthy trader, contributed the cost of digging the surface wells, depth 3 meters – during the dry season the water is less and the well needs deepening work.
- Abu Raya a neighboring village (less vulnerable) they have cattle.

Appendix 16: Inception Mission Report for PPG Phase

"Enhancing the Resilience of Communities Living in Climate Change Vulnerable Areas of White Nile State, Sudan using Ecosystem Based Approaches to Adaptation (EbA)"

A report on National Consultations at ElDwiem Locality, with Government Departments, NGOs and on the Inception Workshop

Mutasim B. Nimer and Faisal M. El-Hag

(National Consultants)

Meeting with the Range and Pasture Locality Office: (Wednesday, 21 October 2015)

- Attendance: Sakeina Abu el Gassim , EDwiem Locality Range and Pasture Director, Ahmed Alnour Ahmed Bakhiet, Range Officer, Al Hag Abdel Moula Hadeed and Hanan Eltayeb Omer from the State Environment Committee.
- The EDwiem Locality Range and Pasture office is having a range nursery that could produce 12,000 seedlings. The office also owns a tractor in good condition equipped with chisel plough.
- The office is also having two trucks
- Office staff is made up of the director (MSc Holder), two senior officers (BSc holders).
- The office work plan includes opening fire lines, sand dunes fixation and pastoralists' extension. The plan also includes collection of range plants seeds such as *Leptedina protechnica.* The plan includes registration and demarcation of range reserves and implementation of range rehabilitation activities: water harvesting and seed broadcasting.
- Due to reduced rainfall and rain variability, range productivity decreased. Also El Bagga and ElDwiem areas experience deforestation activities and desertification. Men are migrating to urban centres seeking jobs. Several families are women-headed. Crops pests are increasing. Children (7-15 years old) are responsible for water bringing from water sources to households from wells and Hafirs "reservoirs". This results in high percentage of school dropout.
- The Range and Pasture Office at EDwiem does not get adequate budgets to implement the work plan.
- Proposed fire lines extend for 300 km at a cost of sdg 100/kg.
- FAO provided funds for seed collection
- Due to low rainfall, there is a feed gap.
- The current plans include establishing an observation tower to monitor fires.
- El Bagga; semiarid area, is about 500,000 feddan (210,084 ha; 1 ha = 2.38 feddan), 266,000 feddan in the White Nile State and the rest in North Kordofan State. The area is having few seasonal watercourses and vegetation is mainly *Leptadenia pyrotechnica, Panicum trugidum* and associated range grasses and forbs. The area is the main rainy season grazing range for *"Hawaweer"* and *"Kawahla"* tribes from the White Nile, Gezira and Kordofan

States. Water availability is limiting use of the area. Pastoral groups move out by November due to lack of water resources. Lately, some nomads are using water piters and large plastic water bags to provide water for their animals. Goz sandy soil movement is destroying the natural range and causing soil erosion.

- Observed plastic water bags – capacity 12,000 litres; 200 x 800 x 75 – cost of 30 barrels of water = sdg 1,500 – 3,000.

Wad Gabur Village (21-23 October 2015)

- The Wad Gabur village is having a seasonal watercourse, surface wells named locally as *"Temids",* while deep wells are named as *"Sawani"*. The *"Temids"* are equipped with hand pumps. Unfortunately, more than 10 hand pumps are not operating and need repair (Mohamed Salah improved the hand pump to be operated by feet by pedals like bicycles).
- Camels, sheep and goats are watered directly from the Khor Wad Gabur. The Khor needs to be deepened so as to increase its capacity. Generally, water in the Khor dries up by Jan-Feb.
- Water is pumped from the Khor by piters to nomads grazing their animals at El Bagga.
- Clay bricks are made along the Khor and burned using *Leptadenia* stems.
- Famers cultivate *Cassia sinus* and *citrullus* which are cash crops. The *Cassia* is sold at sdg 2-4 per pound.
- A dam is recommended for Khor Wad Gabur to increase water storage. In years 2006-2007, floods resulted in losses of lives, houses and animals.
- Cultivation of vegetables was practiced along the Khor. In addition, there is limited tree (*Acacia tortillis*) cover.
- Women Jubraka established by a group of women in 1989 and continued to produce until 2013. However, interviewed women were dissatisfied with the manager and accused him for running the farm for his own interest (the project was initially started by Plan Sudan Organization). The farm, which is fenced and is having a well, is not functioning now. Interviewed women stated that their disinterest in group farming and they requested to be assisted in individual projects. They stated that cultivated crops in Jubraka include "Dardago"; a native variety of cucumber, Okra and hibiscus.
- Several children (school dropouts) were operating donkey-drawn carts equipped with 2-3 barrels pits. Water is provided for homes at sdg 20-40 per barrel. The interviewed farmers stated that their soils is not suitable for fruits trees. Lemon and Guava trees do not survive more than two years.
- The meeting at Wad Gabur, 22 October 2015, attended by 19 persons (13 men and 6 women).

Main discussion points:

- Rainfall shortage last season will result in gaps in crops and fodder productivity.
- Men will migrate to seek jobs elsewhere
- Due to increased cost of agricultural labour, farmers are using tractors in spite of knowing the negative impact on Qoz soils.

- Poverty rate is increasing and this is causing children to drop out of school and seek casual jobs.
- There is serious feed gap. Pastoralists are spending much money in purchasing and transporting water to their herds.
- Teachers are quitting their jobs because of low salaries. Traditional gold mining is attracting most of the men power and even the children – without the consent of their families – they go and join the gold mining groups.
- The government is forbidding the use of tractors on El Bagga sandy Qoz land, but this is not enforced. The use of tractor is destroying the vegetation cover and causing soil erosion. Valuable rangeland at El Bagga is being destroyed.
- The Ex-Wali promised the people to extend electricity supply to their village, but this is not implemented yet.
- The State Government also announced a plan to establish an earthen dam at Khor Wad Gabur watercourse and nobody knows when it will be constructed.
- Range rehabilitation is among the priorities of the community.
- The 2010 population census estimated Wad Gabur population as 8,000 inhabitants.
- There are now civil societies operating at Wad Gabur recently. Plan Sudan used to operate until 2012.

Meeting at Hilba Village

Attendance were 5 men.

Main discussion points:

- The water reservoir at Khor Um Kariba requires rehabilitation
- *"Temid"* and *"Sawani"* wells recharging depend on khor and reservoir
- *Acacia nilotica* trees along the water course should be protected
- Introduction of solar pumps to equip wells will greatly facilitate provision of water for people and livestock drinking (Water pits).
- Ground water is available at Gerainat – 10 km from Helba – also at Shigaig and Akhair Laina where there is good ground water that last all the year round.
- Plan Sudan projects support schools and agricultural activities – community grain mill and shop for essential food items.
- The population from *"Sheewayhat"* tribe agro-pastoralists. Helba is having a market on Monday
- On years of good rainfall, tractors are used to cultivate field watermelon for production of watermelon seeds. Although, people know the harmful impact of tractors and that is against the law, they keep using it!
- Women are active in farming and animal raising
- Improved seeds are not known
- Gas stoves are limited, improved stoves are introduced and made by women
- Charcoal price sdg 120-130 per sack.
- Alternative building materials are known – Sand and 10% cement blocks.

- A water pit is needed.
- Improved ploughs and agricultural implements
- Water harvesting
- Population 40,000-65,000
- There is no livestock census – large numbers of animals from Kordofan and White Nile States seasonally visit the area.
- Refilling of gas cylinders is costing more time and more money sdg 85-120. Bakeries are using fuelwood.
- Land use in El Bagga should be more detailed. This should specify areas for rangelands and areas for cultivation.
- UNICEF vaccination for children is not operating for the last two months. The refrigerator batteries should be replaced.

Visiting the Rainfed Sector Administration (29 October 2015)

- The rainfed sector of the federal Ministry of Agriculture is running a project of Integrated Solutions targeting small farmers (2002-2007).
- The project unit is having Prof. Mekki A. Omer of the Agricultural Research Corporation (ARC) as advisor.
- Training of State Coordinators and selection of pilot sites (5 villages in every State) and extension farms.
- The project is adopting a package of water harvesting, improved seed, fertilizers and IPM (Integrated Pest Management), and planting trees in 10% of the cultivated areas.
- At the White Nile State, the project is implemented at Tendalti, Edweim, Gulli and Rabak.
- Targeted areas = 3,700 feddan.
- The project budget is allocated from the Federal Government sdg 136 million, with States contributing local components.
- Groundnut varieties; Sodari and Gubeish, Sorghum Arfa Gadamak and Wad Ahmed.
- Trained staff = 25 persons.

Project Objectives:

- Improvement of rainfed sector.
- Conservation agriculture and water harvesting - Rainfall 250-350 mm.
- 1st year: Production increased 10 folds, from 1.5-2.0 sacks to 6-9 sacks/feddan.

The Project is implemented in 18 States (the whole country):

- Federal Government provides tractors and other agricultural machinery.
- ARC is involved.
- Extension services.
- 3 million feddan in 2014, increased to 7 million feddan in 2015.
- Extension farms (5-10 feddan)
- Pioneer farmers are selected

- Mohamed Osman M.A. Basha is the White Nile State Coordinator
- Fertilizers triple super phosphate and NPK
- In Kassala, supplementary irrigation is applied.
- Microfinance is to be encouraged
- Training at national and State levels
- Fodder is also included.
- The Private Sector is encouraged to participate.
- Agricultural insurance / to be linked to establishment of producers groups.

Meeting the Range and Pasture Administration (RPA), November 1, 2015

Dr. Sawsan Kheir Elseed Mustafa, DG RPA General Directorate, and Mr. Abdelmoneim, Range and Pasture Officer

- Efforts are made to establish range reserves.
- El Gebelain Locality in the White Nile State (eastern side of the White Nile) is recommended to be added to the project sites because of its importance as a grazing area.
- Nomadic pastoralists are always missed in project preparation because they are mobile – could not be found in villages.
- Um Rimta Locality is covered by Sudan Natural Resources Project – their interventions are very limited.
- IFAD Livestock Marketing Project is another GEF Project as a follow-up for another World Bank Project covering four States including the White Nile State.
- There are 5 development projects within the 5-year plan (2015-2019); El Bagga Development: surveys, vegetation mapping / prohibit the use of tractors.
- Development of range resources for pastoralists who use to graze their animals in Southern Sudan.
- Cattle routes opening.
- Capacity building – jointly with SOS Sahel; a national NGO.

Climate Change Risk Insurance and Microfinance Project (CRFP), November 1, 2015.

Meeting with Dr. Noureldeen Ahmed Abdalla PC

- The project covers Tendalti and Edweim Localities, building on NAPA good practices
- Link with agricultural research
- Improve water-harvesting techniques.
- Interventions completion of NAPA (Upscaling), solar pumping of water.
- Partnership with other projects.
- Microfinance
- Awareness raising.
- Development of appropriate technologies.
- Conservation agriculture (improved seeds, fertilizers).
- Pioneer farmers, grants, and extension posters.

- Livelihoods small-scale interventions.
- Support early warning.
- Women and youth.
- Memo of Understanding on whether the two projects are being implemented to coordinate activities.

Plan Sudan – Khartoum, November 1, 2015

Plan Sudan is working in Kassala, Kordofan, Darfur and the White Nile State.

Meeting with Ms. Intisar Bashasha, Ms. Iman (M&E Officer), Ms. Raya Abbashar Suliman (Admin Assist.)

- Plan Sudan Implements projects in Alsallam, Tendalti, Gulli and Edweim Localities covering education, health, agriculture and water.
- In Gulli Locality, humanitarian aid for refugees from Southern Sudan.
- Agricultural initiatives includes capacity building (small famers) – Farmers Field Schools (FFS), Improved seeds, food security and income generating activities – microfinance.
- Savings and credit for women
- IPM Integrated Pest Management
- Water harvesting - provision of hygienic water for children.
- Primary health care.
- Edweim – Farmers and Pastoralists Initiatives
- Alsallam: Children programmes

Inception Workshop

The workshop was held at Kosti town; the largest town in the White Nile State, on Wednesday, 4th of November 2015.

- The Workshop was attended by over 110 persons (50% women and 50% men) representing main stakeholders; rainfed agriculture, irrigated agriculture, animal resources, range and pasture, water, forestry, Agricultural Research Corporation, ministry of health, women groups, official institutions, members of the State Environment Committee, NGOs and CBOs, farmers and pastoral production groups.
- The workshop was organized under the auspices of the State Governor (Wali) and addressed by the Wali assistant Mr. Abu Tallib; the Ministry of Animal Resources and attended by the State Minister of Agriculture, the Commissioners of Localities and representatives of State Legislation Council.

The Opening Session

- The representative of the State Environmental Council briefly stated the consultations meetings that were held with the targeted communities by the environment committee and the two national consultants. He also briefly listed the activities implemented by the State Environment Committee.
- Dr. Nadia Hassan Omer, the Secretary General of HCENR addressed the workshop. She stated that HCENR is implementing the project in the White Nile State as part of its national climate change activities and that their participation in this workshop to include the State's opinions and ideas in the project plan. She stated that inclusion of the State in HCENR programmes is due to the excellent efforts made by the State Environment Committee and due to the vulnerability of the State to climate change impacts.
- The Wali Representative; Minister of Animal Resources, expressed that the State welcomes this joint intervention by HCENR and UNEP and that they will extend all possible support to make it successful.

Main Workshop Session

The session was chaired by the Director General of the Ministry of Animal Resources; Dr. Adil Hassan Hussein.

- Dr. Ismail El Gizouli, Ex IPCC president, delivered a presentation. He briefly presented causes and impacts of climate change and the national reports and the national projects up to date.
- Ms. Hanan Eltayeb Omer of the State Environment Committee made a detailed presentation on the State participation in the NAP process and presented outlines of vulnerable localities and possible interventions for adaptation.
- The two national consultants made a detailed presentation of the project objectives, basic concepts of ecosystem based adaptation, expected outcomes, and list of projects working in the area.
- The national consultants also presented a detailed list of selected localities and sites, together with a list of suggested interventions.
- Then, the workshop participants were requested to give their views on project concepts, sites and interventions. The following is the summary of the discussions
  - Why is the State Environment Committee included under the Ministry of Health rather than the Ministry of Agriculture?. The question was raised by Mr. Mohamed Nour Ahmed who suggested that the Ministry of Agriculture is more relevant to the interventions included in the NAP. The answer her received is that: the role of the Environment Committee is coordination rather than executive. In addition, that the Ministry of Agriculture will be the main partner in implementation of activities. The establishment of the environment committee within the ministry of health is decided by the State.
  - A suggestion was made to consider including the Department of Soil Conservation among the departments involved in project implementation.
  - A suggestion was made to include better enforcement of punishment for violation of the law prohibiting using tractors on Qoz sandy soil.

- Environmental awareness should be included in the project through using State Radio and TV programmes.
- Area of Mabrouka and Shewaihat of Wad Gabour are the most vulnerable areas and should be included in selected project sites. Also in Alsallam Locality, it was suggested to include sites along the White Nile River Bank where animals could drink.
- State Forestry Programmes should be closely coordinated with the project interventions.
- The Agricultural Research should be involved in the project through conducting research on development of sorghum varieties that are more tolerant to drought conditions.

The workshop approved suggested project sites and activities with minor changes.

Site	Proposed interventions
All sites	▪ Integrated agriculture (Water harvesting, Improved seeds, integrated pest and disease management, Research and extension, shelterbelts and afforestation, rangelands rehabilitation)
All sites	▪ Home gardens "Jubraka", strategic supplementary feeding for small ruminants (goats and sheep), energy substitutes, poultry, revolving funds, postharvest activities, enhanced woman and youth roles
All sites	▪ Water resources: water harvesting for human and livestock use, improving wells and Hafirs, community management of water resources
All sites	▪ Energy: Household energy substitutes (improved stoves, gas stoves), solar energy, building materials substitutes (sandy building blocks), firewood substitutes for local bakery.
All sites	▪ Revolving funds and microfinance
Locality and Communities	**Specific activities and interventions**
Tundalti Locality (Villages of Um Belaibli, Um Niam, Um Zureiba and Salima)	▪ Gum Arabic belt south of Tundalti Locality ▪ Energy substitutes ▪ Rangelands rehabilitation ▪ Alternatives for deep plowing (intermediate technologies) ▪ Small ruminants strategic supplementary feeding ▪ Building materials substitutes
El Dweim Locality (villages of Wad Gabur, Elhelba, Agaidat el tair	▪ Water issues (Hafirs rehabilitation, Wad Gabur earthen dam study approved by Government, Study of shallow and deep wells) ▪ Prohibition of tractor and deep plowing and provision of substitutes ▪ Demarcation of rangelands, registration, organizing use and rehabilitation ▪ Home gardens "Jubarakas" ▪ Small ruminants strategic supplementary feeding , home poultry production ▪ Energy and building materials substitutes
Gulli Locality (Villages of Abareeg Agab, Abareeg Shen	▪ Community forests (establishing community nurseries) ▪ Small ruminants strategic supplementary feeding ▪ Improving water resources management ▪ Women and youth activities (Jubrakas, backyard poultry production, planting fruit trees "lemon and Guava" ▪ Energy substitutes
Alsallam Locality (Al Rawat Villages)	▪ Opening stock routes and corridors ▪ Rangelands rehabilitation ▪ Afforestation ▪ Improving water resources management ▪ Home gardens "Jubrakas" ▪ Energy substitutes ▪ Women and youth activities (revolving funds, poultry production)

Wad Gabur village attendance

1. Awad Allaha Rahib Ahmed	Farmer
2. Al Ghallli Al Fakki	Farmer
3. Mohamed Babiker	Farmer
4. Shams Aldeen Mohamed Zein	Farmer
5. Abdalla Mohamed Gaiballa	Farmer
6. Bahir Mohamed Adam	Farmer
7. Khidir Ahmed Mohamed	Farmer, Butcher
8. Issam Abdalla	Farmer
9. Mohamed Izzeldeen	Farmer/ Trader
10. Shams Fadul	Farmer
11. Eltayeb Issa Ahmed	Student, secondary school
12. Ahmed Kamal Mohamed	Student, secondary school
13. Ahmed Mohamed	Student, secondary school
Women attending the meeting:	
1. Um Alhassein Ahmed Hassen	
2. Madeena Alkungar	
3. Fatima Ahmed Mohamed Issa	
4. Manazil Al Bella Mohamed	
5. Um Al Hussein Saeid	
6. Al Sajid Al Neel	

Helba village attendance

Saeid Khalfalla	0900442937; 0126118007
Gimma Salim Gimma	0126063033
Ballal Al Dau	0913201666
Mousa Salih Mousa	0113307979
Ahmed Tayeb Salih Mousa	0126662420

Appendix 17: Validation report

ENHANCING THE RESILIENCE OF COMMUNITIES LIVING IN CLIMATE CHANGE VULNERABLE AREAS OF SUDAN USING ECOSYSTEM BASED APPROACHES TO ADAPTATION (EbA)

Validation Workshop Report

Wednesday 30 March 2016

Preamble

The validation workshop for the project "Enhancing the resilience of communities living in climate change vulnerable areas of Sudan using Ecosystem Based approaches to Adaptation (EbA)" was held on Wednesday, 30 March 2016 at the Banks Union Conference Hall, Khartoum, Sudan. The workshop was attended by about 51 participants (19 females and 32 males). These were the SG HCENR, White Nile State Ministers of Agriculture and Forestry, Animal Resources, and Health, Women Representative in the White Nile State Legislative Council. Other participants included members of Environment Unit of the White Nile State (formally the NAP committee), DG of Range and Pasture Directorate of the Federal Ministry of Animal Resources, Rangelands and Fisheries, Representatives of Federal ministries of Water Resources and Electricity, Agriculture and Forests, Desertification Unit, representatives of UNEP-Sudan Project (ADAPT), FAO, IFAD, Forest National Corporation. Agricultural Research Corporation (ARC), Projects representatives, NGOs, etc (Annex 1).

Opening session

The workshop was addressed by **Dr. Khitma Elawad, Acting SG, HCENR.** She stated that:

- HCENR as a National Designated Authority (NDA) is highly keen and responsible on issues related to the environment and sustainable use of natural resources.
- The impact of climate change on agriculture, water and health necessitates implementing new concepts and priorities targeting ecosystems and the environment interactions.
- Sudan is signatory to UN convention on the environment and pro Paris agreement
- The project is a direct interaction between HCENR and the White Nile State and it is the first of its kind in Sudan, funded by an appreciable support from the LDCF\UNEP.
- She thanked the workshop participants urging them to thoroughly scrutinize the project and hoping that the workshop will come up with constructive suggestions and ideas.

Dr. Mohamed Abdalla, White Nile State Ministry of Agriculture in his opening speech stated that:

- This project is targeting important and crucial resources in the White Nile State. Research and development is vitally needed for the ecosystems sustainable use in the State.
- The White Nile State was once very rich in its natural resource base. However, in recent years it has experienced deterioration of its forests, rangelands and water resources with resultant negative impact on people's livelihoods.
- Further, degraded soils as resulting from climatic and human factors has drastically affected productivity and livelihoods.
- He added that the EbA project is anticipated to:
  - Lead to conserving the natural resource base

- Assist resource dependent small farmers and pastoralists to adapt and cope with changing climatic conditions
- Come up with lessons and interventions that could be scaled up in other areas in the state
- A number of projects are working in the State e.g. CRFP, IFAD-Livestock Marketing and Resilience Project, Integrated Solutions Project, IGAD Drought Disaster Resilience and Sustainability Initiative (IDDRSI), Plan Sudan, etc. The minister proposed that a coordinating body among these projects should be established at the State level. This is imperative for coordinating and strengthening their efforts to avoid overlapping and ensures good coverage.

The main session

- The national consultants presented the project. The presentation included
  - A brief background on the LDCF
  - Definitions of EbA
  - EbA project goal and objectives
  - Project area
  - Project components and outcomes
  - Baseline projects
  - Project activities
  - Management arrangements
  - Monitoring and Evaluation
  - Knowledge management and capacity building
  - Project Budget

Discussion Points

- A point was raised by one participant against inclusion of Alsallam Locality as part of areas to be included in project activities. The objection to include Alsallam locality was that it is less vulnerable than Um Rimta which has less rainfall and subjected to serious land degradation. The members of the State Environmental Committee explained that Um Rimta is addressed by the Sudan Sustainable Natural Resources Management Project and that they wanted to avoid overlapping between the two projects, and the Alsallam locality is also vulnerable and experience rainfall variability as well as it is experiencing very high pressure on its rangelands resources because after the separation of South Sudan the majority of pastoralists communities living in the boarder are forced to come back to this Locality with their livestock (white Nile is very rich in livestock it is second or third State in term of livestock number) and this triggered conflicts between farmers and pastoralists. Further it experiences further vulnerability due to migration of thousands of citizens from Southern Sudan. The selection of Alsallam Locality was confirmed by the minister of Agriculture and other participants in the workshop.
- The General Director of the White Nile State Ministry of Livestock, Rangelands and Fisheries expressed reservation against the inclusion of the poultry component in livelihoods activities. He stated that previous experiences were unsuccessful, as usually foreign chickens races introduced do not survive under local conditions. He advised that the EbA project should emphasize on distribution of small ruminants (goats and sheep) and the poultry component to be restricted to local races. However, the inclusion of poultry was based on the need expressed by the communities in the targeted localities during the project consultation visit.
- The Women Representative in the White Nile State Legislative Council indicated that goat restocking is highly needed for household nutritional status improvement particularly for women and children.

- It was expressed by other participants that goats and sheep restocking are good interventions and could be financed by micro-finance projects in the State and could be linked to World Food Program activities in the White Nile State.
- A Question was raised by the DG of the Federal Range and Pasture General Directorate on the need for protection for rehabilitation of range sites. It was agreed that community role is needed to protect rehabilitated rangeland sites. The establishment of exclosures was not accepted as it is very expensive and with questionable results.
- The sugar factories in the White Nile State are to be involved in fodder production activities. It was also suggested that they could be represented in the technical committee.
- Capacity building activities for government officials and community is an area for coordinated efforts between projects and government.
- The White Nile State Ministers of Agriculture, Livestock and Health are to be included in the Project Steering Committee.
- The proposal of CTA was not accepted as ToR for CTA are overlapping with NDA and PCU. It is suggested that technical backstopping for the EbA project could be organized through consultants national or expatriates.
- Several initiatives were suggested such as:
  - Biogas as alternative energy. The produced sludges could be used as natural fertilizers.
  - The mesquite tree (Prosopis sp.) is an invasive tree competing with native species and encroaching on farming land. Using the Mesquite tree wood for charcoal making will check down its spread.
  - Support initiative in coordination with the private sector for production of fodder.

Issues need to be consider in revision of the Prodoc:

Most of the comments made are confirming what is already in the prodoc and commending the efforts and approach followed in the preparation of this project. However, there are few issues need to be addressed before submission.

Management arrangement: 1) inclusion of the relevant state ministries (agriculture, animal resources and health and head of the Environment committee in the steering community). 2) The CTA role to be performed through assigning consultant, national and international, as needed and where appropriate.

3) the coordination committee for all funded projects in the White Nile state should be established by state government and coordinated by the appropriate government institution and HCENR should be a member of this committee. Its mandate should include ensuring coordination, coherence and complementarity of in terms of their activities and targeted areas. Ensure overall impacts inline with the development priorities of the state, etc

Activities: the most important point may be the need for inclusion of the small ruminants (goats and sheep) beside poultry, where needed and appropriate. We understand, it is part of the mandate of technical committee to look into these technical details during implementation and make necessary adjustment as long as within the context of the agreed outputs and objectives of the project. If necessary, this should be mentioned in the Prodoc. The sugar factories in the White Nile State are to be involved in fodder production activities. It was also suggested that they could be represented in the technical committee.

Name	Affiliation	email
1. Dr. Mohamed Abdalla	WNS Minister of Agriculture	
2. Dr. Khitma El Awad	Acting SG, HCENR	
3. Mr. Abou Talib	WNS Minister of Animal Resources	
4. Mr. Tarig Omer M. Beraigi	WNS Minister of Health	

5. Mr. Abdalla Elsofori	WNS Ministry of Social Affairs	
6. Dr. Adil Hussein	DG, WNS Ministry of Animal Resources	
7. Mr. Elnour Abdelhamid Ahmed	WNS MOA	
8. Dr. Adil Yousif Eltyeb	Under secretary, Federal MOA	
9. Mr. Hassan M. A. Hassan	IFAD Projects Coordination Unit	
10. Ms. Alawiya Yousif Mohamed	National Unit for Combating Desertification	
11. Suliman Abdelrahman Elhag	White Nile Forestry	
12. Mr. Ibrahim Rahmtalla Ahmed	Livestock Resilience and Marketing Project	
13. Ms. Intisar Ali Salih	FL Consultant, Former UNDP Sudan Program Officer	
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40. Mr. Ibrahim Rahma Ahmed	Federal Ministry of Animal Resources	
41. Mr. Babiker Elzain Ahmed	HCENR	
42. Mr. Mohamed Tambal	Integrated Solutions Projec	
43. Mr. Mohamed Eltahr Mohmed	HCENR	
44. Mr. Hassan Adam	WNS SMA	
45. Dr. Muna O. M. Ahmed	HCENR	
46. Ms. Marim Ibrahim Taha	HCENR	
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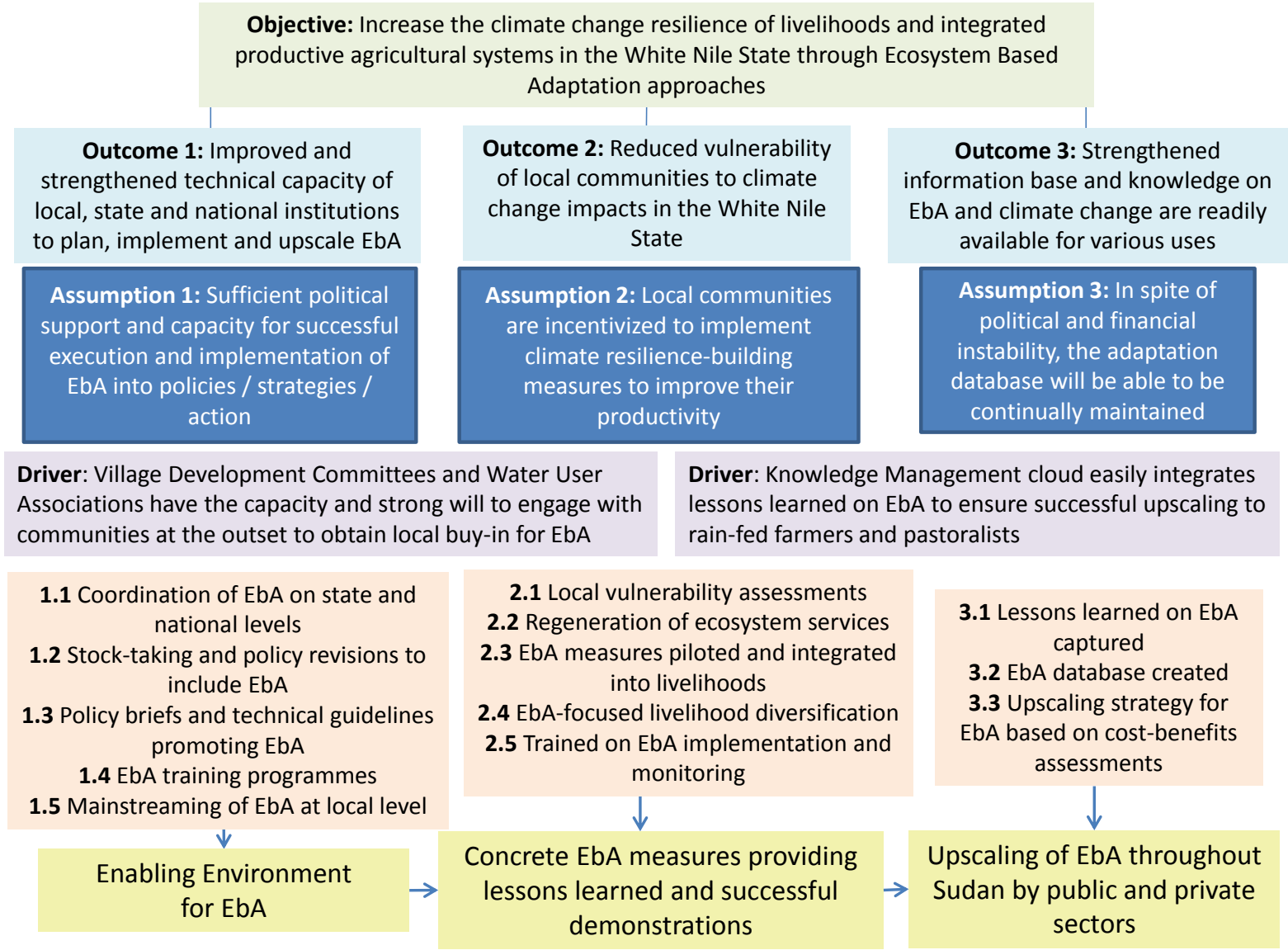
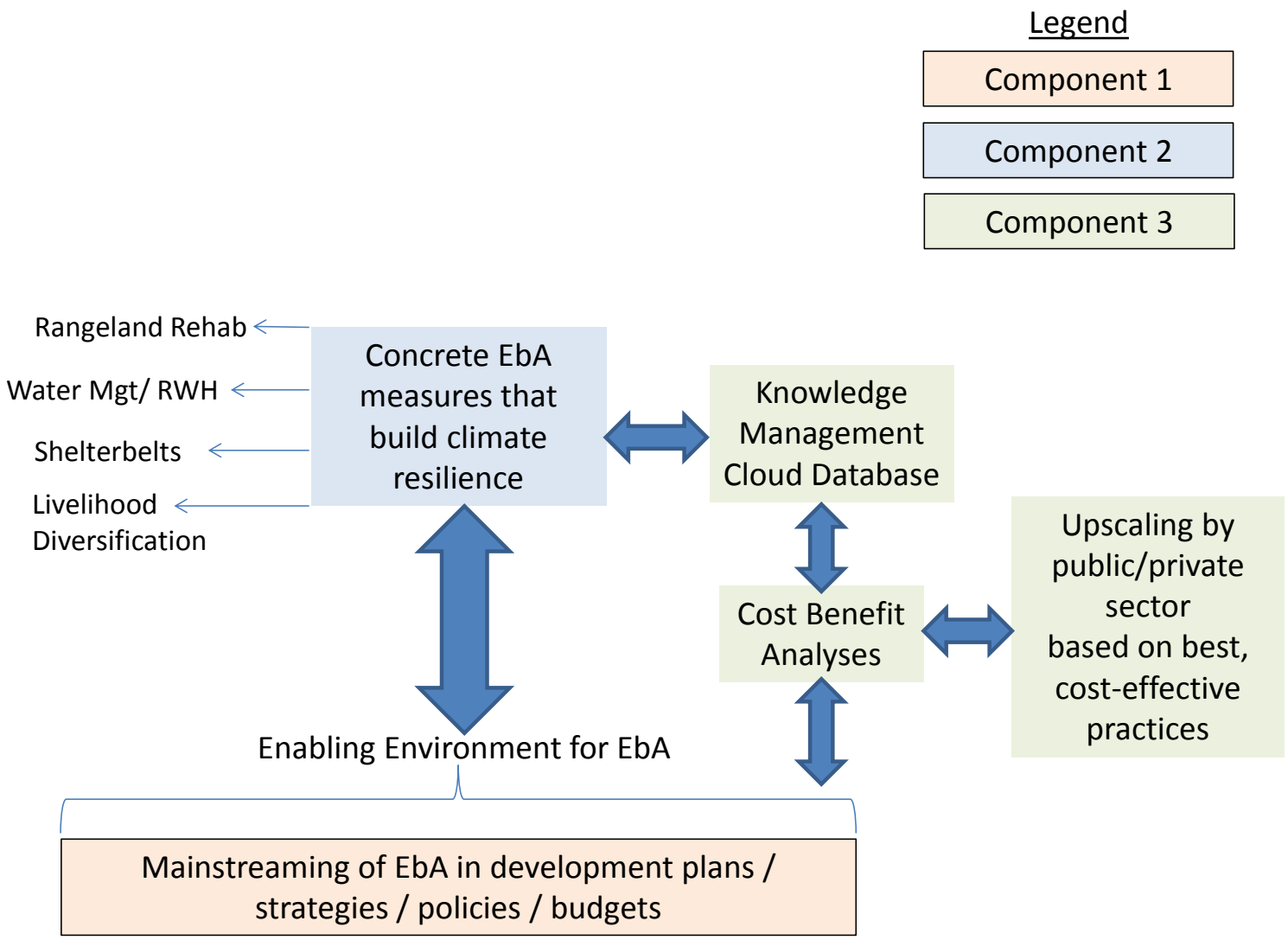
Appendix 18: Theory of Change diagram



Project schematic



Appendix 19: Procurement Plan

UNEP/GEF Project Procurement Plan

Project title: Enhancing the resilience of communities living in climate change vulnerable areas of Sudan using Ecosystem Based approaches to Adaptation (EbA)

UNEP Budget Line		List of Goods and Services required	Budget (in US$)	Year {Note 1}	Brief description of anticipated procurement process {Note 2}
1100	**Project personnel**				
1101	Project Coordinator – See more detailed deliverables in TORs of Appendix 11	This budget will be used to hire a Project Coordinator (PC). Responsibilities of the PC include, *inter alia*: • Heading the Project Coordination Unit (PCU). • Overseeing and managing project implementation, monitor work progress, and ensure timely delivery of outputs in accordance with GEF and UNEP guidelines. • Providing technical support to the project, including measures to address challenges to project implementation. • Supervising, coordinating and facilitating the work of the Administrative and Financial Assistant, the Chief Technical Advisor, and the national and international experts.	120 000	Years 1,2, 3 and 4	The Project Steering Committee (PSC) will publicize the ToRs listed in this Project Document for the position of PC. Applications and CVs of interested PCs will be reviewed by the PSC. The PC will be selected depending upon experience and availability.
1102	Chief Technical Advisor	The CTA will be responsible for providing overall technical backstopping, monitoring and operational support to the above Projects. Among other specific tasks, the CTA will coordinate the provision of the required technical inputs, reviewing and preparing Terms of Reference and reviewing the outputs of consultants and other sub-contractors. He/she will provide technical support to the Project Coordinator on Adaptation issues. The CTA also will lead in gathering information, analysis, and reporting to UNEP. The CTA will have the following responsibilities: i) Provide quality assurance and technical review of project outputs. ii) Undertake technical review of project outputs (e.g. studies and assessments). iii) Assist in the drafting of ToRs for technical consultancies. iv) Supervise the work of national and international consultants.	144 000	Years 1,2, 3 and 4	The Project Coordinator (PC) will publicize the ToRs listed in this Project Document for the position of CTA as required by the project. Applications and CVs of interested CTAs will be reviewed. The CTA will be selected depending upon experience and availability.

		v) Assist in monitoring the technical quality of project M&E systems (including AWPs, indicators and targets). vi) Conduct the financial administrative reporting and the PIR. vii) Provide advice on best suitable approaches and methodologies for achieving project targets and objectives. viii) Provide a technical supervisory function to the work carried out by NTAs, and national and international consultants hired by the project. ix) Assist in knowledge management, communications and awareness-raising. x) Facilitate the development of strategic regional and international partnerships for the exchange of skills and information related to climate change adaptation.			
1103	Project Driver	This budget will be used to hire a project driver. The driver will support the Project Coordination Unit in their day-to-day activities. Under Component 2 the project driver will drive the CTA and PC to the 4 interventions sites, as required.	16 400	Years 1,2,3 and 4	The PC will draw up ToRs and put out an advertisement for the position of Project Driver as required by the project. Applications and CVs of interested drivers will be reviewed. The Project Driver will be selected depending upon experience and availability.
1200	**Consultants {Note 3}**				
1201	International EbA Expert	This consultant will be an expert on developing protocols to implement EbA interventions, developing and implementing community-based EbA management and monitoring plans, and providing training on EbA to all levels of stakeholders (national, state and local).	75 000	Years 1,2,3	The Project Coordinator (PC) will publicize the ToRs listed in this Project Document for the position of International EbA expert as required by the project. Applications and CVs of interested experts will be reviewed. The consultant will be selected depending upon qualification and experience.
1202	National Community-based NRM Expert	This consultant will be an expert on rangeland rehabilitation, afforestation, protecting riparian zones, developing shelter belts, mapping land use / soil quality and implementing community rainwater harvesting.	139 000	Year 1,2,3 and 4	The Project Coordinator (PC) will publicize the ToRs listed in this Project Document for the position of National Community-based NRM expert as required by the project. Applications and CVs of interested experts will be reviewed. The consultant will be selected depending upon qualification and experience.

1203	National Rural Alternative Energy Expert	This consultant will be an expert on using alternative building materials, distributing cook stoves and providing training for both.	11 000	Year 3	The Project Coordinator (PC) will publicize the ToRs listed in this Project Document for the position of Rural Alternative Energy Expert as required by the project. Applications and CVs of interested experts will be reviewed. The consultant will be selected depending upon qualification and experience.
1204	International Adaptation Intervention Expert	This consultant will be an expert on identifying entry points for climate change adaptation at national and state levels and supporting ministries to mainstream EbA into national and sectoral development plans, policies and budgets. They will also support the implementation of adaptation measures/activities.	112 000	Years 1, 3, 4	The Project Coordinator (PC) will publicize the ToRs listed in this Project Document for the position of International Adaptation Interventions Expert as required by the project. Applications and CVs of interested experts will be reviewed. The consultant will be selected depending upon qualification and experience.
1205	International Adaptation Economics Expert	This consultant will be an expert on developing an economic cost-benefit assessment of EbA measures, holding workshops to share results of economic analyses to a multitude of stakeholders, providing training on the economics of adaptation and developing an upscaling plan for EbA measures based on cost-benefit assessments.	85 800	Years 1, 2, 3	The Project Coordinator (PC) will publicize the ToRs listed in this Project Document for the position of International Adaptation Economics Expert as required by the project. Applications and CVs of interested experts will be reviewed. The consultant will be selected depending upon qualification and experience.
1206	National Revolving Fund Expert	This consultant will be an expert on supporting the establishment of a revolving fund and providing training on accessing and managing the revolving fund.	64 000	Year 1 and 2	The Project Coordinator (PC) will publicize the ToRs listed in this Project Document for the position of National Revolving Fund Expert as required by the project. Applications and CVs of interested experts will be reviewed. The specialist will be selected depending upon qualification and experience.
1300	**Administrative support**				
1301	Financial and Administrative	This budget will be used to contract an administrative and finance assistant. The AFA will be familiar with UNEP financial administration procedures and financial reporting requirements. He or she will produce the necessary financial	72 000	Years 1,2,3 and 4	The Project Coordinator (PC) will publicize the ToRs listed in this Project Document for the position of Administrative and Financial Assistant as required by the project.

	Assistant	reports. The AFA will be hired to directly support the Project Coordinator with administrative tasks, under his direct supervision.			Applications and CVs of interested assistants will be reviewed. The assistant will be selected depending upon qualification and experience.
2200	**Sub-contracts (MOUs/LOAs for supporting organizations)**				
2201	Subcontract for NGO to implement EbA monitoring plan	Subcontract for NGO to support the International EbA Expert in developing and implementing a community-based EbA management and monitoring programme	40 000	Years 2, 4	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of interested NGOs will be reviewed. The employees will be selected depending upon qualification and experience.
2202	Subcontract for organization to rehabilitate rangelands	Subcontract for organization to support rehabilitation of 6,600 ha of rangeland reserves along with the NRM Expert (Paid government personnel will not be allowed to apply for this subcontract.)	85 000	Years 2, 3	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of interested organizations will be reviewed. The employees will be selected depending upon qualification and experience.
2203	Subcontract for NGO to implement afforestation	Subcontract for an NGO to support afforestation on 1,500 hectares along with the NRM Expert	40 000	Years 2, 3, 4	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of interested NGOs will be reviewed. The employees will be selected depending upon qualification and experience.
2204	NGO subcontract for riparian replanting	Along with the NRM Expert, this NGO subcontract will support replanting native trees and shrubs along riparian zones	52 000	Years 2, 3, 4	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of interested NGOs will be reviewed. The employees will be selected depending upon qualification and experience.
2205	Subcontract for organization to implement shelter belts	Along with the NRM Expert, this subcontract for an organization will support with developing large-scale shelter belts to prevent desertification (Paid government personnel will not be allowed to apply for this subcontract.)	57 000	Year 3	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of interested organizations will be reviewed. The employees will be selected

					depending upon qualification and experience.
2206	NGO subcontract - community farm preparation	Subcontract for NGOs to support preparing 2,000 community farms (4 ha each) in the four targeted localities	60 000	Years 2 and 3	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of interested NGOs will be reviewed. The contractor will be selected depending upon qualification and experience.
2207	Subcontract for organization to support RWH	Subcontract for organization to support implementation of rainwater harvesting pits on the community farms (Paid government personnel will not be allowed to apply for this subcontract.)	128 000	Years 1, 2, 3	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of interested organizations will be reviewed. The employees will be selected depending upon qualification and experience.
2208	NGO subcontract - IPM	NGO subcontract to support Integrated Pest Management (IPM) techniques	40 000	Year 2	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of interested NGOs will be reviewed. The contractor will be selected depending upon qualification and experience.
2209	Organization subcontract on water management	Subcontract for organization to design and rehabilitate water reservoirs and wells (Paid government personnel will not be allowed to apply for this subcontract.)	470 000	Years 2 and 3	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of interested organizations will be reviewed. The employees will be selected depending upon qualification and experience.
2210	Support for NGO to conduct water infrastructure repair	Subcontract for NGOs to repair water hand pumps with the WUAs	40 000	Year 2	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of NGOs will be reviewed. The employees will be selected depending upon qualification and experience.
2211	Revolving fund	Financing for revolving fund grant supporting purchases that increase the climate resilience of the population	80 000	Year 2	The PC will oversee the administration of the revolving fund.
2212	Organization subcontract to provide	Government employees specialized in water to support training to WUAs on the maintenance of surface wells, the use of spare parts, mitigation measures for water borne diseases and proper	10 000	Year 3	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and

	training on water mgt	hygiene (Paid government personnel will not be allowed to apply for this subcontract.)			CVs of interested organizations will be reviewed. The employees will be selected depending upon qualification and experience.
2213	NGO subcontract - training to farming/pastoral groups	NGOs specialized in agriculture / pastoralism to support training to communities on the establishment of farmer and pastoral production groups	20 000	Year 2	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of interested NGOs will be reviewed. The contractor will be selected depending upon qualification and experience.
2214	NGO subcontract - establish extension farms	NGOs specialized in agriculture to support establishment of demonstration extension farms in areas of 2-4 ha for each of the 4 targeted localities	35 000	Year 1, 2	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of NGOs will be reviewed. The employees will be selected depending upon qualification and experience.
2215	VDC / WUA subcontract - collating local EbA lessons learned	Subcontract for organization to support the VDCs and WUAs in collating lessons learned on EbA. (Paid government personnel will not be allowed to apply for this subcontract.)	30 000	Year 4	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of interested VDCs/WUAs will be reviewed. The local organizations will be selected depending upon qualification and experience.
2216	NGO subcontract - collating national / international lessons learned on EbA	Subcontract for NGO to document lessons learned and best practices on EbA from other national / international projects	20 000	Year 4	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of NGOs will be reviewed. The employees will be selected depending upon qualification and experience.
2217	NGO subcontract - EbA cost-benefits	Subcontract for NGO to support the Economics Adaptation Expert in developing an economic cost-benefit assessment	40 000	Years 1	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of NGOs will be reviewed. The employees will be selected depending upon qualification and experience.
2218	NGO subcontract - EbA upscaling plan	Subcontract for NGO to support the Economics Adaptation Expert in developing an upscaling plan for EbA measures	22 000	Year 3	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of NGOs will be reviewed. The

					employees will be selected depending upon qualification and experience.
2300	**Sub-contracts (for commercial purposes)**				
2301	Subcontract - EbA policy support	Subcontract for private firm to support the Adaptation and EbA Policy expert in developing technical guidelines for policy- and decision-makers on best practices of EbA	33 000	Year 4	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of interested contractors will be reviewed. The contractor will be selected depending upon qualification and experience.
2302	Subcontract - EbA policy support	Subcontract for private firm to support the Adaptation and EbA Policy expert in developing policy briefs to mainstream EbA into national and state level planning / policies	33 000	Year 4	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of interested contractors will be reviewed. The contractor will be selected depending upon qualification and experience.
2303	Subcontract - V&A	This budget will be used to contract a specialized V&A company to conduct vulnerability assessments of specific climate change vulnerabilities in each of the target communities	101 000	Year 1	The Project Coordinator (PC) will publicize the ToRs listed in this Project Document for the position of V&A Expert Team as required by the project. Applications and CVs of interested teams will be reviewed. The specialist will be selected depending upon qualification and experience.
2304	Subcontract - Community-based adaptation	Supporting the international EbA expert in developing the reports that detail protocols to guide the implementation of EbA interventions based on CC predictions	8 000	Year 1	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of interested contractors will be reviewed. The contractor will be selected depending upon qualification and experience.
2305	Subcontract - EbA policy support	Supporting the Adaptation and EbA Policy expert in designing and implementing a national monitoring strategy on EbA	30 000	Year 4	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of interested contractors will be reviewed. The contractor will be selected depending upon qualification and

					experience.
2306	Subcontract - V&A	A specialized V&A company to support holding workshops to share the results of the V&A	5 000	Year 1	The Project Coordinator (PC) will publicize the ToRs listed in this Project Document for the position of V&A Expert Team as required by the project. Applications and CVs of interested teams will be reviewed. The specialist will be selected depending upon qualification and experience.
2307	Audio visual sub-contract	Audio-visual company to support preparing a short-film demonstrating successful EbA measures for agro-pastoralists	20 000	Year 4	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of interested contractors will be reviewed. The contractor will be selected depending upon qualification and experience.
2308	IT sub-contract	IT company to support creating a link with the existing Cloud database to store all EbA information	47 800	Year 4	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of interested contractors will be reviewed. The contractor will be selected depending upon qualification and experience.
2309	IT sub-contract	IT company to support dissemination of lessons learned on EbA on other web-based platforms	54 000	Year 4	The PC will draw up ToRs and put out an advertisement for this subcontract as required by the project. Applications and CVs of interested contractors will be reviewed. The contractor will be selected depending upon qualification and experience.
4100	**Expendable equipment**				
4101	EbA protocol dev.	Printing of protocols to guide the implementation of EbA interventions based on climate change predictions	8 000	Year 1	Procurement of these goods and services will be overseen by the PC.

4102	Succesful EbA experiences document	Printing of report documenting successful experiences by North Kordofan State in limiting the use of tractors	5 000	Year 2	Procurement of these goods and services will be overseen by the PC.
4103	Equipment for afforestation	This budget will be used for tree seedlings for afforestation.	16 000	Years 2, 3, 4	Procurement of these goods and services will be overseen by the PC.
4104	Equipment for shelter belts	Equipment for sand dune fixation	20 000	Years 2, 3, 4	Procurement of these goods and services will be overseen by the PC.
4105	Report preparation	Printing of maps of current land use and soil quality	5 000	Year 3	Procurement of these goods and services will be overseen by the PC.
4106	Equipment for agro-pastoralists	Materials for seed broadcasting and Integrated Pest Management	160 000	Year 2	The PC will oversee this payment and the procurement of related equipment.
4107	Equipment for backyard gardens, post harvesting and community nurseries	This budget will be used for equipment and EbA inputs such as improved seeds for backyard gardening, community nurseries and post-harvesting	40 000	Year 3	The PC will oversee this payment and the procurement of related equipment.
4108	Office rental	Rental of office space at the national level in Khartoum for the Project Coordination Unit	15 000	Years 1, 2, 3, 4	Office rental procurement will be led by the PCU.
4109	Office equipment	Printers, paper, internet connection at the PCU office	5 000	Years 1, 2, 3, 4	Office equipment procurement will be led by the PCU.
4110	Telecommunication cost	Mobile phone charges for the PCU	2 000	Years 1, 2, 3, 4	Telecommunication equipment procurement will be led by the PCU.
4200	**Non-expendable equipment**				
4201	Equipment for rainwater harvesting	This budget will be used for equipment such as rainwater harvesting pits.	141 000	Years 1, 2, 3	Procurement of these goods and services will be overseen by the PC.
4202	Equipment for farmers	Procurement of ploughs and agricultural implements for the farmers.	50 000	Years 1, 2	The PC will oversee this payment and the procurement of related equipment.
4203	Medical kits	To reduce the potential threat of water borne diseases, medical kits with prophylactics will be distributed to the Water User Associations.	8 000	Year 3	The PC will oversee this payment and the procurement of related equipment.
4204	Small ruminant feeding equipment	Distribution of feed stock for small ruminants (goats and sheep) including feed provided by local sugar factories	120 000	Years 2, 3	The PC will oversee this payment and the procurement of related equipment.
4205	Alternative building materials	Procurement of sand and/or limestone (CaCO3) alternative and naturally-found building materials	71 000	Year 3	The PC will oversee this payment and the procurement of related materials.
4206	Improved cook stoves	Butane gas stove equipment	104 000	Year 3	The PC will oversee this payment and the procurement of related equipment.
4207	Equipment for extension farms	Equipment for extension farms includes ploughs, agricultural implements and seeds for climate-resilient agriculture.	25 000	Years 1,2	The PC will oversee this payment and the procurement of related equipment.
4208	Equipment for EbA	Equipment and materials to establish demonstration farms and	39 900	Year 4	The PC will oversee this payment and the

	school education programmes	to plant trees at schools			procurement of related equipment and materials.
4209	Project Vehicle	This budget will be used to procure a project vehicle for site visits of the PC and CTA to the four project localities.	45 400	Year 1,2,3 and 4	The PC will oversee this payment and the procurement of the project vehicle.

Note 1 - Year when goods/services will be procured

Note 2 - In compliance with UNEP rules and procedures, this is an explanation of how the service provider/consultant/vendor will be selected

Note 3 – International rates - 550 USD per day plus 1,000 for flight plus per diem of 219 per day, 6 days per week
National rates - 350 USD per day plus transportation costs of 2,000 USD, 5 days per week

Experts Required

Expertise	**Year**	**Duration (weeks)**	**Salary**
EbA (International)	1, 2, 3	16	75,000
Community-based NRM (National)	1 - 4	78	139,000
Rural Alternative Energy (National)	3	5	11,000
Adaptation and Policy (International)	1, 3, 4	24	112,000
Vulnerability Assessment (National)	1	8	16,000
Revolving Fund (National)	3	10	20,000
Adaptation Economics (International)	1, 2, 3	10	85,000