ADAPTATION FUND

REGIONAL PROJECT/PROGRAMME PROPOSAL

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme:	Strengthening Adaptive Capacities for Smallholder Farmers in Water Stressed River Basins in Southern Africa
Countries:	Angola, Mozambique, Namibia, South Africa, Zimbabwe
Thematic Focal Area[1]:	Transboundary water management Food and nutrition security, Disaster risk reduction and early warning systems
Type of Implementing Entity:	UN agency
Implementing Entity:	United Nations Educational, Scientific and Cultural Organization (UNESCO)
Executing Entities:	Food and Agricultural Organization of the United Nations (FAO), and Food Agriculture Natural Resources Policy Analysis Network (FANRPAN)
Amount of Financing Requested	USD 14 Million

[1] Thematic areas are: Food security; Disaster risk reduction and early warning systems; Transboundary water management; Innovation in adaptation finance.

PROJECT / PROGRAMME BACKGROUND AND CONTEXT:

A. INTRODUCTION

Southern Africa Development Community (SADC) is a region that is particularly susceptible to climate variability and drought. The region has a total population of more than 250 million people which growing at an average rate of just above 2.5% per annum, and about 80% of rural people (who constitute 70% of the population) derive their livelihoods directly from agricultural and natural resources. There is increased degradation of land and water resources and accompanied by the loss of biological diversity, for example, according to FAO (2010)[2], the annual net forest loss in the SADC region was approximately 0.46 percent or 1.8 million ha, in the period 2005–2010. The majority of Southern Africa's 15 river basins are largely water stressed with less than 1666 m^3 /person/year (SADC, 1999[3]) while agricultural productivity is low with the production environments being normally characterized by soil moisture stress and poor soil fertility. There are large yield gaps between the average farmer and the best farmer, and returns to land, labour and capital are low. Climate variability induced droughts tend to reduce production below the already marginal levels; as such, subsistence farming itself is threatened.

In southern Africa, more frequent exposure to climate change induced drought events causes agricultural production to be out of equilibrium with the seasonal conditions, representing an inability on the part of most smallholders to adjust land use to climate variability. Many people living in the river basins of Southern Africa depend on crop and livestock farming, conservancy related tourism, and the use of biodiversity products for their daily livelihoods. All these natural resource-based livelihoods are vulnerable to climate change to some extent. People have already observed the ongoing natural variability as well as the changes in rainfall patterns, and the last few years have been marked by extreme weather conditions. These conditions occur in locations where the local economy is least diversified and where virtually everyone depends either directly or indirectly on agriculture.

In this proposal the United Nations Educational, Scientific and Cultural Organization (UNESCO), in collaboration with the Food and Agriculture Organization (FAO), and the Food Agriculture Natural Resources Policy Analysis Network (FANRPAN) intend to implement a set of concrete adaptation activities aligned to the Adaptation Fund results framework and structured to build systemic capacities at various levels targeting systems, institutions, commodity value chains and communities within the selected water stressed river basins of the Southern Africa region. Interventions will be targeted at SADC regional institutions (e.g., SADC secretariat), and at river basin level institutions (namely Limpopo Watercourse Commission (LIMCOM) for Limpopo river basin and Permanent Joint Technical Commission (PJTC) for Kunene river basin) and communities at the selected Programme sites.

B. PROBLEM

[2] FAO. 2010. Global forest resources assessment 2010: main report. FAO Forestry Paper No. 163. Rome.

[3] In FANRPAN/ARC/CGIAR.2008. Literature on Water Availability and Access Working Draft by Berhanu F Alemaw, University of Botswana,With inputs from Kevin Scott, ARC-ILI, South Africa, and Douglas Merrey, FANRPAN, 1 July 2008

Geo, socio-economic context: The three selected River Basins in context of climate change and smallholder farming

a) **Southern[4] Africa Region**

Southern Africa is the southernmost region of the African continent. The Southern African Development Community (SADC) is the Regional Economic Community (REC) comprising 15 Member States namely: Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. The main objectives of the SADC are to achieve economic development, peace and security, and growth, alleviate poverty, enhance the standard and quality of life of the peoples of Southern Africa, and support the socially disadvantaged through regional integration.

In coming decades, the SADC region is expected to experience higher land and ocean surface temperatures than in the past, which will affect rainfall levels and patterns, winds, and the timing and intensity of weather events (Masih, et al, 2014). Climate change poses a number of risks to SADC goals for regional economic development. The increased frequency of droughts, floods and cyclones has been damaging infrastructure, destroying crops and livestock, disrupting livelihoods, and causing loss of life. According to Maish et al. (2014)[5], based on analysis of droughts during 1900–2013, droughts have intensified in terms of their frequency, severity and geospatial coverage over the last few decades. That is, droughts that occurred in 1972–1973, 1983–1984 and 1991–1992 were most intense and widespread. In recent years (i.e., 2015-2016), the region was affected by an El Nino induced drought which resulted in food and nutrition insecurity for an estimated 40 million people. Another El Nino drought is anticipated in the region in 2018-2019 based on the information from Southern African Regional Climate Outlook Forum (Sacof). The impact of drought is normally felt across sensitive sectors such as water, food, and energy with a widespread impact on agricultural production and productivity. Due to the high dependence on direct rainfall, agricultural systems in southern Africa are particularly vulnerable to drought.

There are 15 recognised transboundary river basins in the SADC region. They range in size from the large Congo River basin (3 730 470 km^2) in the northern part of SADC, to Umbel Uzi river basin (5 500 km^2) in the southeast. The Zambezi river basin (1 390 000 km^2) covers eight SADC member states. It is estimated that about 70 % of the water resources in the SADC region are shared by more than one country. Thus, one of the characteristic features in the region are shared watercourse systems, with complex water rights and potential conflicts over utilisation of the shared resources. The map shows the distribution of transboundary river basins in the SADC region.

[4] For this proposal, focus is placed on Southern Africa Development Community, which is Southern Africa's biggest bloc

[5] Masih, I, Maskey S, Mussá F. E F, and Trambaue P, 2014. A review of droughts on the African continent: a geospatial and long-term perspective: Hydrology and Earth System sciences, Hydro. Earth Syst. Sci., 18, 3635–3649, 2014 www.hydrol-earth-syst-sci.net/18/3635/2014/ doi:10.5194/hess-18-3635-2014

Figure 1: River basins of Southern Africa

The implementation of specific community level and value chain interventions in the proposed Programme will be done in two transboundary river basins; namely, Kunene and Limpopo. Each of these basins is described in the proceeding section.

b) **Kunene/Cunene River Basin**

The Kunene river basin is located in South-West Africa and covers an area of 106 500 km², with 14 700 km² (13.3 %) in Namibia and 95 300 km² in Angola. Total human inhabitants amount to approximately 3 million with between 3 to 5 million livestock. The Kunene river is 1 050 km long and is one of the few perennial rivers in this region with a mean annual discharge of 5.5 km³ at its mouth. Geographically, the basin can be divided into three main sections: the Upper, the Middle and the Lower Kunene (see table and map for main features of the basin).

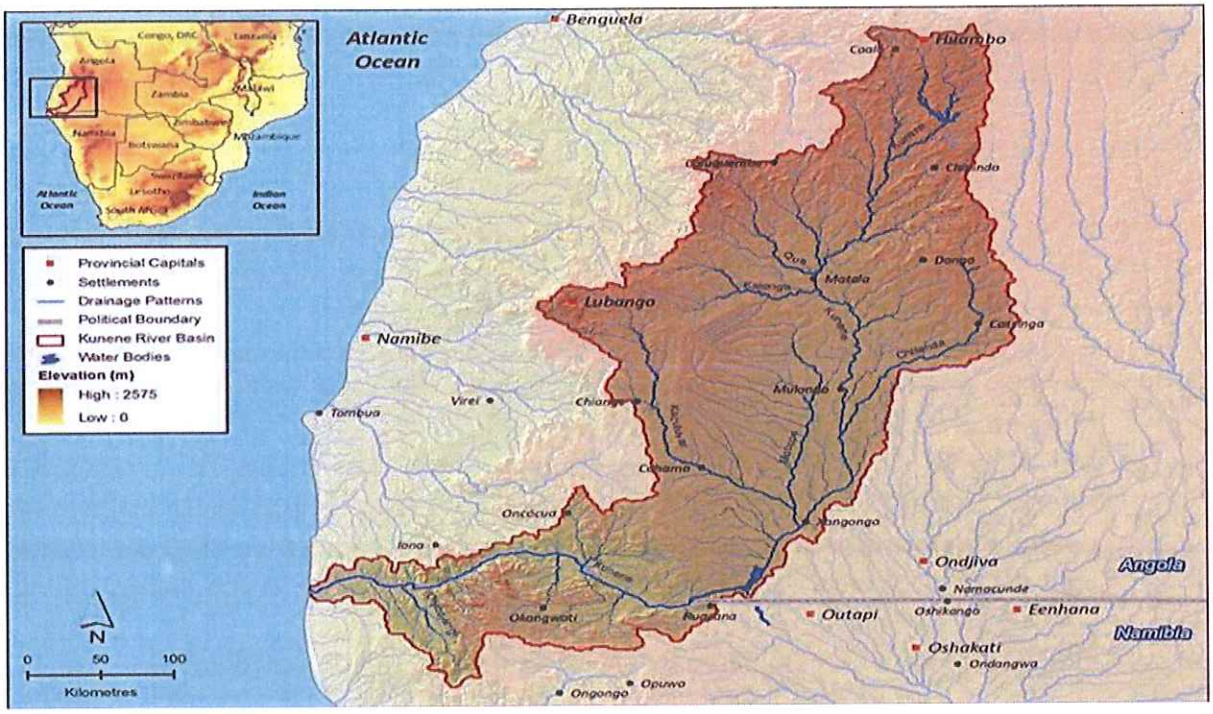

Figure 2: Kunene River Basin - Source: Kunene RAK

Kunene River Basin - Major features	
Total basin area	106,560 km^2
Area rainfall (mm/y) Average:	1 300 mm/yr. Upper Kunene sub-basin, which steadily decreases to a mere 20mm/yr. in Middle and Lower Kunene sub basins
Average discharge:	174 m^3/s (6,100 cu ft./s)
Water demand Total	372 million m^3 (13 % of total irrigation water demand in Angola) in 2005. Average of 8 900 m^3/ year has been applied per hectare of irrigation area. The water demand for livestock within the Kunene basin was estimated to be 30 million m^3 in 2005.
Population	+-3 million people and livestock of about 3-5 million)
Water availability (scarcity)	less than 2 000 m^3/ capita

Geomorphological characteristics

The geomorphic development and the climatological variation in the Kunene river basin have created an environment that is particular in terms of ecological regions, and makes it particularly fragile and vulnerable to interactions of human activities and natural phenomenon. From the north to south-west, the main eco-geographical regions in the basin are: Angolan Afromontane Forest (with tropical and subtropical moist broadleaf forests); Angolan Miombo Woodland (tropical and subtropical grasslands, savannas, and shrub lands); Kalahari Acacia-Baikiaea Woodland (tropical and subtropical grasslands, savannas, and shrub lands); Angolan Mopane Woodland (tropical and subtropical grasslands, savannas, and shrub

lands); Nama Karoo (deserts and xeric shrub lands); and Kaokoveld Desert (deserts and xeric shrub lands).

Climate in the basin

Using the Koppen Climate classification system, the Kunene river basin is divided into three classes which can be considered as very roughly corresponding to the three reaches of the river – the Upper Kunene, the Middle Kunene and the Lower Kunene.

- In the upper half of the basin, the climate is classed as **Cwb** implying a temperate climate (denoted by the C) with dry winters (w) and with warmest month temperatures averaging below 22 °C (b).
- Moving south and eastwards through the basin, the class changes to a category **B** climate. These are arid and semi-arid climates where the precipitation is less than the potential evaporation. In the middle section of the basin there is a class **BSh** climate indicating a semi-arid steppe with the average temperature in the coldest month above 0 °C.
- The Lower Kunene is dominated by a **BWh** climate – a dry desert climate.

Livelihoods-land and water use patterns

Crop and livestock farming patterns vary across the basin (TDA/EPSMO 2009, MUA 2006):

- In the Upper Kunene (humid sub-tropical climate, with average annual rainfall varying between 1000 and 1500 mm), the dominant crops are maize and beans and to a lesser extent sweet potato, with livestock playing a complementary role in local farming systems, being used for animal traction and as a source of milk.
- In the Middle Kunene (mostly semi-arid climate, with average annual rainfall in the range of 400-1000 mm) farming systems are generally based on livestock as well as crops to a greater or lesser extent, depending on relative location within the middle section, with a greater range of crops (maize, manioc, sorghum (*massambala*), millet (*massango*) and cowpea (*feijão macunde*)) being grown.
- The (semi-)arid lower section of the Kunene (average annual rainfall below 400 mm) is dominated by subsistence pastoralism, supplemented by crop cultivation (mostly millet, sorghum, maize and pumpkins) on the Kunene river bank and around springs during the rainy season.
- The importance of rainfed agriculture to rural livelihoods in the Kunene basin is highest near the source of the Kunene river in the far north, gradually decreasing further downstream. Seasonal floodplains (called *iishana* in Namibia and *chanas* in Angola) in parts of the middle basin provide favourable conditions for crop production.
- In the middle and lower sections of the basin, rainfed crop production is possible only in specific locations (along rivers and around springs), complementing transhumant livestock-based pastoral systems to ensure a more diversified diet and enhance food security.
- During the rainy season, heavy rain in the upper section of the basin gives rise to seasonal flooding in parts of the Middle Kunene. These resulting seasonal floodplains (referred to as *iishana / chanas*) lend themselves to seasonal crop production, using recession irrigation systems and water conservation techniques.

From Angola side: Current plans for the expansion of irrigation using water from the Kunene river basin foresee a total irrigated area of over 600 000 ha by 2025. This expansion is planned mainly for the Middle Kunene; where around 595 000 ha await development. There are several medium to large irrigation schemes currently operating in the Angolan part of the Kunene river basin: Matala, and Humpata-Neves (near Lubango) in Huíla Province and Manquete in Kunene Province, all in the middle section of the basin. In addition to the rehabilitation of irrigation schemes, the Programme also envisaged the construction of new irrigation schemes. In the face of limited and variable surface water resources in the drier parts of the Kunene basin, farmers have long relied on groundwater for watering livestock and irrigating crops, thus ensuring household food and nutrition security and sustaining family livelihoods (GOA 2005).

On the Namibian Side: The Kunene basin also provides water for irrigation in northern Namibia. Water is pumped from the Kunene at the Calueque weir in Angola and flows via an open canal built in the late 1960s, to feed water into the North Central Region of Namibia. Maize is the main commercial crop while various crops (sweet potatoes, cabbage, tomatoes, onions, butternuts, groundnuts, and melons) are cultivated seasonally throughout the year by small-scale farmers. However, the only significant stretch of irrigable land that is available directly along the river on the Namibian side of the Lower Kunene is at Marienfluss, some 250 km downstream from the Ruacana Falls.

c) Limpopo River basin

At 408 250 km^2 and estimated population of 14 million people, the Limpopo river basin is one of the largest drainage areas in the SADC region, covering large portions of Botswana, Mozambique, South Africa and Zimbabwe (LBPTC 2010). The Limpopo river flows north from the confluence of the Marico and Crocodile Rivers, where it creates the border between South Africa and Botswana, then the border between South Africa and Zimbabwe, before crossing into Mozambique, where it runs across a broad floodplain and into the Indian ocean. The percentage coverage of the different countries is provided in the table below.

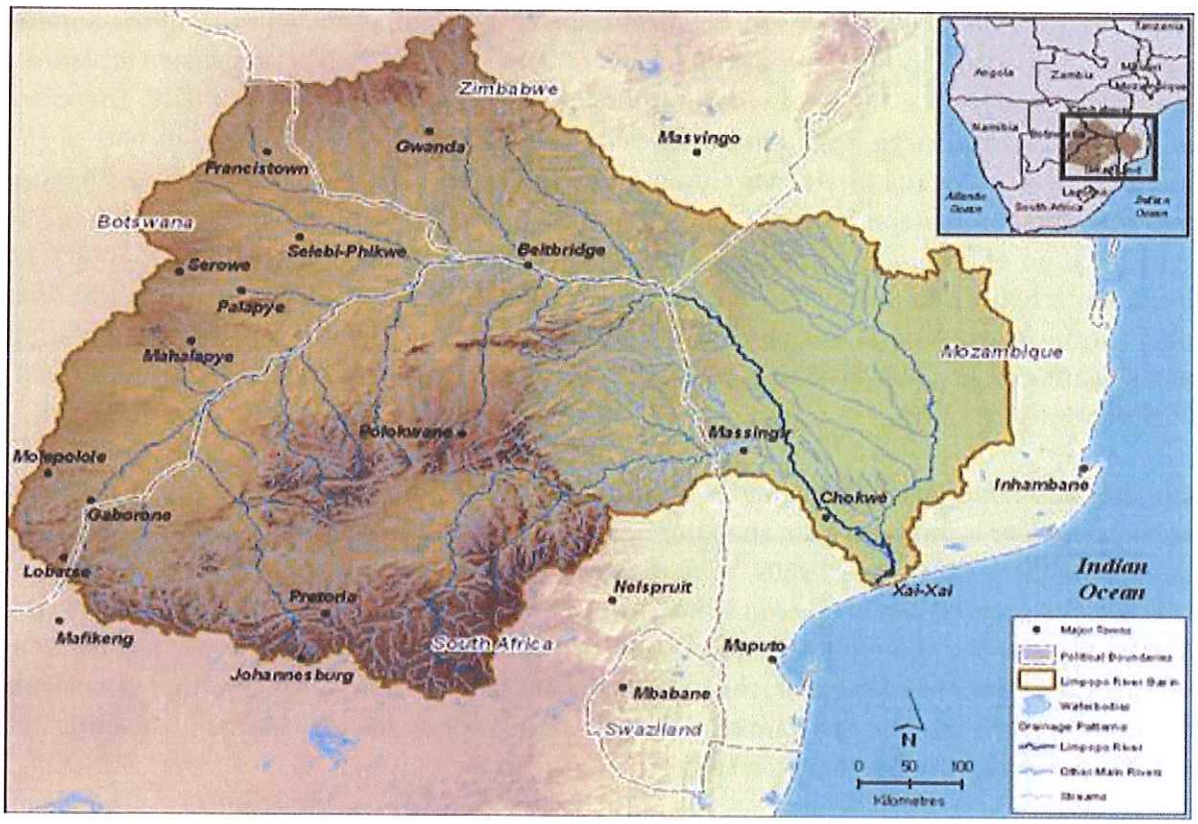

Figure 3: Limpopo River basin

Limpopo Basin - Major features	
Total basin area	415,000 km^2
Area rainfall (mm/y) Average:	200 *mm* per annum in the hot, dry parts of the *basin* (around the confluence of the *Limpopo* and the Shashe *Rivers*), to as high as 1 500 *mm* per annum in higher *rainfall* areas,
Average discharge:	170 m^3/s
Water demand Total	4750 m^3/Year
Population	14 million
Water availability	1,220 m^3/ yr (South Africa), 1,182 m^3/yr (Zimbabwe), 976 976 m^3/yr (Botswana), 5,856 m^3/yr (Mozambique)

Geomorphological characteristics

The valley of the Limpopo river basin separates the plateau areas of Zimbabwe and South Africa (also known as the Cape-Transvaal Highveld), to the north and south, and is bounded by the Kalahari basin in the west (FAO 2004; Bridges 1990). The region is transacted by the Great Escarpment, a feature that extends from the western edge of the Namibia and Angola plateaux, right around South Africa and north to the Zambezi River in Zimbabwe (Bridges 1990). This feature varies in height, reaching its maximum in the Drakensberg Mountains of South Africa at approximately 3 299 m above sea level (Bridges 1990).

Climate in the basin

The climate of the Limpopo river basin is heavily influenced by prevailing wind systems from the east, particularly Tropical Cyclones from the Indian ocean (Ashton *et al.* 2001). While a region of relatively low rainfall, the majority of the precipitation occurring in the Limpopo river basin falls within a short window, during the summer months (FAO 2004), with approximately 95% falling between October and April and a rainfall concentration index for the basin of 60% (100% indicates all rainfall occurring in one month; FAO2004). Rainfall events are highly episodic and intense, usually associated with convective thunderstorms (SARDC 2002). In the Koppen Climate classification system, the Limpopo river basin falls into several different classes (Köppen 1918; Rosenberg 1999; Rubel and Kottek 2010):

- The basin as a whole is classified as semi-arid, dry and hot - BSh
- The central river valley, arid, dry and hot - BWh
- The highveld of South Africa is classified as temperate, with summer rainfall and cool to hot summers - Cwc and Cwa.

Livelihoods - land and water use patterns

Agriculture is perhaps one of the most important economic activities in the Limpopo river basin. Agriculture in the Limpopo river basin is typically low-input and based on extensive management and utilization of the natural resources. However, irrigation of agriculture accounts for greater than 50% of the total water demand in the Limpopo river basin. The biophysical conditions of the Limpopo river basin mean that there are numerous challenges to overcome where agriculture as a livelihood is concerned. The area is generally semi-arid and has little arable land and a very low potential for agriculture. According to FAO 2004, the traditional land use systems in the basin are primarily low-input systems based on extensive management and utilization of the natural resources. Observed changes and trends in recent years have been mainly in response to demographic pressures leading to more intensive exploitation of natural resources, resulting in irreversible land degradation.

- Irrigation is important for crop production in the Limpopo river basin as rainfall can be unpredictable and variable in intensity and distribution. FAO (1997) estimated an irrigation potential of 295 400 ha in the basin: the current net irrigated area is 244 000 ha (Merrey 2008). Irrigation schemes never have enough water to meet their potential in any given season, reflecting high levels of water scarcity in greater part of the basin. Smallholder farmers in the Limpopo river basin have little access to irrigation schemes and rain water is therefore their main source of water (Nyalungu 2005).
- Serious salinity and sodicity problems exist in the lower Limpopo river basin and salt water intrusion affects the river mouth.
- Traditional agricultural yields are strongly influenced by environmental conditions in the basin and average yields tend to be low, reflecting the low-input/output system. However, the contribution of rainfed agriculture to food and nutrition security should not be underestimated and in years of good rains, subsistence agriculture can contribute substantial to household food requirements (FAO 2004).
- There are two distinct livestock production systems in the basin: "freehold and commercial livestock production and mixed crops or livestock systems under communal management" (FAO 2004). Nearly half of the land area located in the basin in South Africa and Zimbabwe is classified as commercial farmland used for cattle

ranching (FAO 2004). Improved pastures are limited to dairy cattle grazing and are not prevalent in the basin. Overall, communal management is the main land use among the four basin states in terms of the number of people involved. Cattle herd sizes are often small estimated at less than 10 in Zimbabwe and 4-10 in Mozambique. The herd numbers are generally higher in Botswana. As communal grazing is normally uncontrolled, it is not conducive to environmental management as it can lead to overgrazing and land degradation if not managed correctly.

- The Limpopo river has few fish species compared with other rivers in Africa (FAO 2004). The low number of fish species found in the Limpopo river is attributed to the prolonged dry periods that characterise the region. These fluctuations impact streamflow and water temperature, making rivers challenging environments for sustaining fish populations. Relatively more fish species are found in the stable tributaries and dams (watercourses with consistent water presence) than in the main stem of the Limpopo river (FAO 2004).
- The Limpopo river basin includes a large number of national parks and private game reserves, and land use related to tourism is mostly for wildlife tourism, crafts, and agri-/rural cultural tourism - whereby a tourist can see and experience how rural people in the basin live (FAO 2004).

I. Synthesis of Projected impacts of Climate change in the three river basins

a) Climate change impacts in Kunene River basin

Even though predictions of the future climate in southern Angola and northern Namibia are still uncertain when it comes to the finer details, most climate models predict an increase of maximum temperatures; a prolonged dry season; increase of humidity and convection; and increase of rainfall intensity. The climate simulation models predict that drought events will become more frequent as a consequence of climate change. It is also predicted that convective rainfall will increase in late summer, which means that large amounts of rainfall can be expected in a shorter period late in the rainy season. This will most likely lead to more frequent floods in the region particularly when coupled with similar increases in late summer rainfall in Angola and Zambia. However, a 10 to 20 % decrease in annual rainfall is predicted for Angola and Zambia in the coming decades. The contribution of this rainfall to floods in the region depends on the timing and intensity of these rainfalls. Some specific impacts of climate change in the Kunene river basin are as follows:

Precipitation changes

Regarding specific observations relevant to the Kunene River basin, the following statements relating to precipitation can be made:

- Precipitation is generally expected to decrease across all of Angola with the exception of northern areas where it may increase[6].
- Studies for Namibia suggest much greater variability in rainfall from year to year with a much shorter and more intense rainy season.

[6] High Level Conference on Water for Agriculture and Energy in Africa 2008

- These will result in changes in the run-off regime of rivers. Decreased precipitation in Angola, particularly in the Upper Kunene where up to 75% of the flow is generated, will have a marked effect on the entire Kunene basin.

Aggravation of water scarcity in Kunene Basin

- With almost half of the Namibian population living in the north and largely reliant on drinking water from the Kunene river, a decrease in water availability will increase competition for water resources from different users. In Namibia, drinking water is the priority use and as such will have first rights to any water taken from the Kunene for Namibia.
- Seasonal flow variations lead to seasonal scarcity particularly in the Lower Kunene, where the river is the only perennial water source, for example in the months of October and November when flows are lowest and the demand for Kunene water is at its highest in northern Namibia.

Temperature changes

- Available reports from the region, looking particularly at Namibia report, suggest a rise in mean temperature over the 20th Century that is three times that of the global average. A temperature rise in the region of between 2°C to 6°C has been predicted for 2100.

Evaporation changes

- Temperature increases will be associated with an increase in the potential evaporation rate, resulting in the overall water balance becoming drier, even if precipitation were not to change (Government of Namibia 2002). Soil moisture is expected to decrease and the dune system in the desert is expected to increase (High Level Conference on Water for Agriculture and Energy in Africa 2008).

Irrigation impacts

- Plans to vastly expand irrigation areas along the Kunene in Angola along with moderate expansion of irrigation areas in Namibia are dependent upon the availability of water for irrigation. Allocations for irrigation water are likely to come under pressure in the future as demands from the domestic and other sectors with a higher economic return on water use increase.

Agricultural impacts

Agricultural output in the basin is extremely sensitive to climatic conditions, particularly in the areas with lower rainfall. Periodic droughts cause considerable stock losses and reduce grain production. The uncertainty in future rainfall trends make projection of agricultural impacts very difficult, but certain projections under increased temperatures can be made with confidence.

- *Subsistence agriculture:* A decrease in soil moisture and increased inter-annual rainfall variability would result in a greater variability in yield of millet (the staple crop in drier areas) and thus decrease food security.
- *Commercial cropping:* The vulnerability of this sub-sector to competition for irrigation water has already been noted. Maize is the principal commercial crop. One study predicts a small increase in maize yield under future climate change

scenarios, although yield quality would be reduced because of shortened growing seasons. Given the projected increase in air temperature, already close to the maximum for maize, a probable decrease in rainfall and increased evaporation, a decrease in maize yield is more likely. This will bring more investment into irrigation and further increase overexploitation, economic losses and affect competitiveness of Namibian products and its costs on local markets even further

- *Livestock farming:* The raising of cattle, sheep and goats is practiced in the basin. A trend towards greater aridity would be associated with a shift towards farming with more small stock and game. Droughts are associated with a greater incidence of stock poisoning as stock animals are forced to eat unpalatable or toxic plants that are the first to emerge on overgrazed rangelands. More outbreaks of transboundary animal diseases can also be expected due to increased movement of people and livestock as they search for water and grazing. Drought lowers the availability of forage which in turn reduces milk production and growth rates and the health status of livestock. With increased temperatures the incidence of tick-borne diseases may increase, but diseases borne by the tsetse fly may decrease. The expanded use of indigenous livestock breeds may help mitigate this trend. Impacts on household food security in the subsistence farming areas could be dramatic and climate change has the potential to cause significant social disruption and population displacement in these communities (Government of Namibia 2002).

b) Climate change impacts in Limpopo River Basin

- While water scarcity is predicted to increase in many parts of the world, arid and semi-arid regions such as the Limpopo river basin, will suffer the most. These scenarios, if realized, will likely impact availability of water for domestic and agricultural use, creating water shortages and reduced agricultural production and productivity.
- Accelerated demand from socio-economic development and urbanization means more and more water is being drawn from a river basin system and makes it particularly vulnerable to the adverse effects of climate change and biodiversity loss, both of which limit the ability of the basin to provide its key ecosystem service. Building resilience to climate-related and other shocks in the basin requires natural runoff into the rivers to be maintained and, wherever possible, increased.
- The current assessment of water availability showed that given no further change in climate and water infrastructure the basin is already stressed. With appropriate management interventions, however, the situation could be stabilized over the coming years. When the climate changed-based model scenarios were utilized, using projected climate change impacts (temperature and precipitation) and increased water utilization for irrigation, the models showed that water scarcity would increase.
- Limpopo river basin countries are net importers of cereals and meats with a small amount of livestock exports from Botswana and Zimbabwe in 2000 (IFPRI 2009). Food and nutrition security is projected to improve overall by 2050 in the basin

based on estimated calorie availability; however, as shown in the table below, the current situation will get worse before it improves.

- Access to basic ecosystem services is at times limited in the Limpopo River basin because of its biophysical conditions. When access to ecosystem services is compromised then health is also compromised. This is demonstrated by food and nutrition insecurity, high child mortality rates, high incidences of HIV infection.

II. The fragility of Southern African region and its river basins

a) High Population growth, poverty and food and nutrition insecurity in SADC region

The SADC population is growing exponentially and putting pressure on natural resources and environment. The estimated population of the SADC region increased from 318.9 million in 2015 to 327.2 million in 2016 representing a 2.6% annual population growth rate. In SADC, two thirds of the population are below the age of 35 - referred to as a "Young Population", while women make up at least half the rural work force in the region. In addition, within the population, there are specific groups such as women, children, youth and the disabled who are particularly vulnerable to food and nutrition insecurity. For instance, with respect to stunting which is indicative of chronic nutrition insecurity, the majority of the SADC Member States (12 out of 15) have stunting rates that are above 20%, the level deemed as unacceptable by the World Health Organization (WHO). According to the Regional Vulnerability Assessment and Analysis Synthesis report of 2015, since 2010, an average of 25.2 million people are vulnerable to food insecurity annually, representing 8% of the Region's total population.

b) Increasing water scarcity and related disasters in SADC

Water resources (surface water, groundwater, and rainfall) are unevenly distributed in time and space in the SADC region. Water is becoming scarcer with many river basins having less than 1666 m^3 /person/year. Geographically, the region covers an extensive area of approximately 9.3 million square kilometers and there is tremendous climate variability across the region, which in turn significantly affects the availability of water resources. Average annual rainfall varies from 4,000 mm in the north to less than 50 mm in south-western parts of the region. Severe droughts have covered the region frequently over the last two decades, and extreme floods have hit many parts of the region. Table 2 shows frequencies and estimated numbers of affected people and economic damage for disasters in southern Africa region between year 2000 and 2016.

Table 1: Frequency, Estimated Numbers of affected people economic damage for disasters in southern Africa (2000-2016)

Disaster Type	Occurrence/Frequency	Total affected	Estimated Total Damage
Drought	46	73,842,258	2,108,000,000
Earthquake	15	196,444	515,000,000
Epidemic	161	1,338,350	-
Extreme Weather	2	20	-

Flood	198	16,142,359	2,424,204,000
Insect infestation	2	2,300,000	-
Landslide	6	1,467	-
Storm	87	5,397,912	858,722,000
Volcanic Activity	2	110,4	9,000,000
Wildfire	11	68,796	440,000,000
Total	530	99,398,006	6,354,926,000

Source: Summarized from IOM (2017)[7]

SADC is a region of shared water resources. It is estimated that about 70% of the water resources in the SADC region are shared by more than one country. Due to the high dependence of on rain fed agriculture Agricultural systems in southern Africa are particularly vulnerable to drought. In the Southern African region, about 80% of rural people who constitute 70% of the population derive their livelihoods directly from agricultural and natural resources are directly affected by climate related shocks.

c) Trends in Temperature and Precipitation

Rainfall in the SADC region is highly variable, with the resulting impact on reliability and disaster associated with droughts and floods and waterborne diseases. Although noting the existence of weak long-term trends and increased inter-annual rainfall variability in southern Africa since 1970s, Jury (2013)[8] highlights the strong influence of the Pacific El Niño Southern Oscillation (ENSO) as well as interactions with Indian and Atlantic oceans' climates on the intra-decadal oscillations – giving some pattern to the occurrence of drought in Southern Africa. Many scholars, for instance Jury (2013), Chikoore (2016) and Obasi (2005[9]) are in agreement with the patterns that shape the resultant climatic outcomes in Southern Africa with the ENSO modulating year-to-year climate variability amongst other factors.

Temperatures across the region have increased by 1°C to 1.5°C on average over the past 50 years. The increases were greatest (up to 2°C) in the interior regions of southern Africa and there is evidence suggesting the increases were higher during the dry season. Despite annual and decadal variability, across all seasons and locations temperatures have increased over this period; the region west of Lesotho in summer is an exception. Temperature increases were generally higher (approximately 1.6°C to 2°C) in the interior regions, particularly in north-eastern and central parts of Botswana, and lower (approximately 0.4°C to 1.4°C) along the coasts and parts of central and southern South Africa. It is widely accepted, based on future climate modelling findings, that the sub-region's climate will be hotter and drier in the future than it is today.

d) Pests and diseases incidence

[7] IOM.2017. Spaces of vulnerability and areas prone to natural disaster and crisis in six SADC countries
Disaster risks and disaster risk management capacity in Botswana, Malawi, Mozambique, South Africa, Zambia and Zimbabwe: International Organization for Migration, 17 route des Morillons 1211 Geneva, Switzerland

[8] Jury MR. Climate trends in southern Africa. S Afr J Sci. 2013; 109(1/2), Art. #980, 11 pages. http://dx.doi.org/10.1590/sajs.2013/980,

[9] Obasi GOP. The impacts of ENSO in Africa. In: Low PS, editor. Climate change and Africa. Cambridge: Cambridge University Press; 2005. p. 218–230. http://dx.doi.org/10.1017/CBO9780511535864.030

There is more and more consensus among scholars in linking the increases in crop and animal pests and disease incidence to the changing climate, making it ever more necessary to increase adaptive capacities for rural farming communities. A combination of native African armyworms and fall armyworms from the Americas are ravaging staple crops across southern Africa. If uncontrolled, they have the potential to cause major food shortages and catastrophic consequences on rural communities whose livelihoods depend on agriculture. The fall armyworm outbreak became more apparent in 2016/17 season to due to the drought, citing the weather conditions as being more ambient for the breeding and survival of the pest. More and more pests have become problematic for smallholder farmers including the fall armyworm, *tuta absoluta*, and fruit fly and this is being linked to the changing climate which is creating favorable ambient conditions for the rapid multiplication and growth of pests and diseases. In addition, according to the RIASCO Action Plan for Southern Africa: Response Plan for the El Niño-induced drought in Southern Africa May 2016-April 2017 there were more than 634,000 livestock deaths due to the drought. The response mechanisms are even more complicated in pastoral communities in some parts of Southern Africa such as Kunene river basin, as some pastoral people migrate in search of grazing land, complicating the social impact and rendering assistance more complex (UNICEF, 2017).

e) Trends in Land and soil Degradation

Thiombiano and Tourino-Soto (2007) report that southern Africa is seriously threatened by land degradation which is being caused by *inter alia,* population growth, conflicts and wars with expanded refugee settlements, inappropriate soil management, deforestation and resources degradation shifting cultivation, unsustainable agriculture insecurity in land tenure, and variation of climatic conditions as well as intrinsic characteristics of fragile soils in diverse agro-ecological zones. Africa as a whole accounts for 65 percent of the total extensive cropland degradation of the world. Closely linked to land degradation, Africa faces an escalating soil fertility crisis (Morris et al., 2007; The Montpellier Panel, 2013) costing the continent more than $4 billion worth of soil nutrients per year (IFDC, 2006). There is mounting evidence that at very high levels of rural population density, the well accepted positive relationship between population density and land intensification breaks down (Muyanga & Jayne, 2014; Ricker-Gilbert et al., 2014; Josephson et al., 2014). The declining fertility of African soils because of soil nutrient mining is a major cause of decreased crop yields and per capita food production in Africa and, in the mid to long-term, a key source of land degradation and environmental damage (Henao and Baanante, 2006). Various technologies can be used for the conservation of soil and water and for the restoration of degraded lands: composts and organic manure, cover crops, mulching techniques, conservation agriculture, agro-forestry, stones and earth bunds, rock dams, vegetation strips, and "zai" techniques, etc.

f) Forest Degradation

Population growth is driving the demand for forest resources such as firewood, food, fodder, medicines and extensive conversion of land to commercial and small-scale farming. Land used for crops and pasture has been increasing by an estimated 10 million hectares per year for Sub-Saharan Africa since the 1960s placing pressure on tropical forests (World Resources

Institute, 2014). East and southern Africa has over 3 million square kilometers of miombo woodland covering Angola, Malawi, Mozambique, Tanzania, Zimbabwe, Zambia, and most of the southern part of the Democratic Republic of Congo (DRC). The miombo forms a critical life-support system for over 65 million people (Dewees et. al., 2011). More than 730 million people in sub Saharan Africa depend on traditional biomass as a primary energy source[10] that invariably puts pressure on natural forests. Africa's forests are vulnerable to climate change and forest conservation and management will need to adapt to future climate induced conditions.

g) Pressure on the Commons

The challenge with common pool resources (CRPs) is that one person's use can infringe on another's use, and where exclusion of outside users, while necessary, may be difficult and costly. A productive activity such as livestock production (whether from agro or pastoral communities) is largely dependent on the commons and provides manure for fertility and soil quality. The commons also provide high quality food, the benefits of which may go beyond the community. Often the role of the commons in terms of food security, energy, water and grazing is poorly recognized and not supported in legal policy. Restoring resilience in the commons can benefit from ecosystem restoration and strengthening governance.

III. Climate and weather management institutions in SADC

a. Status of climate infrastructure and services in SADDC region

National Meteorological Services are essentially meant to provide services which will support the economies and ensure safety of lives and property of societies in member countries. On the global perspective, the application of meteorological services has made a significant contribution to the improvement of the economies of countries and to safety of life and property of the public. But nonetheless these advances are not fully utilised by National Meteorological Services (NMSs) in developing and Least Developing Countries (LDCs) due to many challenges ranging from inadequate meteorological infrastructure to inadequate personnel resulting into shortcomings in service delivery. It is also noted that despite the progress in improving services, many societies are increasingly vulnerable to natural hazards and national economies are becoming more sensitive to climate variability and change, as severe weather and extreme climatic events are occurring with greater frequency and intensity. The losses of life, the number of people affected and the economic losses associated with natural hazards are more severe for the LDCs, which includes most countries in the SADC Region, than for developed economies. This provides a strong argument and justification for improving weather, climate and related water, environmental services, as well as communications and emergency response activities in the SADC region.

In most of the SADC countries the NMSs, under National Parliamentary acts, are responsible for maintaining meteorological observation networks, provision of meteorological information and climate services and monitoring of national climatic conditions. People in

[10] http://www.worldenergyoutlook.org/resources/energydevelopment/africafocus

Southern Africa are most vulnerable to vagaries of severe weather and extreme climate whose impacts affect a range of social, political, economic and ecological factors. Meteorological Services play a strategic role in the social and economic development of the region. Weather and climate information and products provide useful inputs into sectors such as agriculture; livestock development and food security; road, air and maritime transport; health and public safety; tourism, building and construction industry; disaster management; environment and water resources management, etc.

The need for meteorological services in support of the various sectors will be even higher in the future due to the challenges emanating from negative impacts of climate variability and change which are predicted to affect more least developed and developing countries. In order to develop strategies for coping, adaptation and mitigation of the impacts of climate change, policy- and decision-makers will need accurate climate data and derived information. The provision of weather information and advisories to the various sectors of the economy is, therefore, a service that partner states have committed themselves to support.

The Meteorological Services in SADC are currently faced with high demand for timely and quality information, services and products. However, inadequate observational station network due to lack of instruments, shortage of trained personnel, telecommunications systems, data processing and information dissemination facilities are major drawbacks. The infrastructure and facilities have continued to deteriorate leading to great difficulties in giving weather and climate services in the region to meet national and regional needs.

Each NMS in SADC has peculiar needs and challenges. However, with regards to infrastructure the following major challenges are noted:

- Many NMSs in SADC lack adequate observation network of both surface and upper air stations as well as remote sensing such as Radar networks;
- Lack of modern telecommunications infrastructure for efficient exchange of data and products in conformity with the World Meteorological Organization (WMO) WIS;
- Lack of efficient data management systems and real-time data processing facilities including forecasting and dissemination systems; and inadequate trained personnel;
- Inadequate capacity to generate sector specific information and its dissemination;
- Inadequate capacity to monitor and evaluate effectiveness of utilization of weather and climate information;
- Lack of accurate and timely medium range to long-term (1 to 3 months) prediction as inputs for early warning for food security and mitigation of the impacts of natural disasters such as droughts and floods;
- Inadequate modelling capacity of regional weather, climate and climate change scenario development; and
- Inadequate communication capacity to effectively and timely share down scaled disaster risk reduction weather and climate information to high risk communities, decision makers and other key stakeholders.

The Meteorological services are also facing several challenges in the provision of services to the various social and economic sectors. These challenges include the lack of awareness and knowledge of the strategic and critical roles of meteorological contribution to the national socio-economic development and diminishing government financial budgetary support. In addition, keeping up-to-date with the ever-changing technology due to limited resources has been also a challenge. The seriousness of the level of inadequacy of observational data in SADC is evident from the latest WMO Annual Global Data Monitoring results carried out in October 2010 and from October 2010 to April 2011 where it comes out clearly that SADC's performance is far below the global average.

The situation is also bad in other infrastructure components that support data exchange, data processing, forecasting and data management and public weather systems. The non-availability of data has largely been attributed to the shortcomings in the implementation and efficiency of the Global Telecommunications System (GTS) and Global Observation System (GOS) in the Region.

Previous efforts by UNESCO and individual NMSs have provided significant improvements in the Global Observation System (GOS), Global Telecommunications System (GTS), Global Data Processing and Forecasting System (GDPS), Public Weather Services (PWS) and Data Management (DM). However, there are still countries in the SADC region that have significant deficiencies in the operation and maintenance of these programmes. Many NMSs have inadequate capacity in these areas and the situation is exacerbated by the acute shortage of trained manpower and resources.

The deficiencies in the collection and retransmission of meteorological data and products not only affects meteorological services in the SADC region, but the entire globe, in regard to aviation safety, marine safety, road safety, general public safety, safety of property, climate change monitoring and detection with socio-economic implications, food and security, disaster reduction, poverty reduction, conservation of biodiversity and economic growth, amongst many other weather and climate-related activities. The wide extent of the effects is a result of interdependence of the global weather and climate patterns. Poor and uneven distribution of data globally leads to bias in model results and erroneous weather and climate simulations and forecasts.

The Meteorological Association of Southern Africa (MASA) has been constituted by the Permanent Representatives (PRs) to WMO within the SADC Region by signing of the relevant constitution. MASA has the function of a steering institution to facilitate speedy improvement of relevant meteorological activities for the SADC region. The MASA Secretariat is located on a permanent basis within the South African Weather Service, Pretoria, following an offer by the Republic of South Africa to host it.

b. Organization of early warning systems

The most widely adopted seasonal early warning mechanism in the region is spearheaded by the Southern Africa Regional Climate Outlook Forum (SARCOF). The SARCOF is a regional climate outlook prediction and application process adopted by the fourteen countries comprising the Southern African Development Community (SADC) Member States: Angola,

Botswana, Democratic Republic of Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe in conjunction with other partners. It is one of the WMO Regional Climate Outlook Forums, developed under World Climate Services Programme (WCSP) of the World Climate Programme, active in several parts of the world, which routinely provide real-time regional climate outlook products. The SADC Climate Services Centre (SADC CSC) in Botswana coordinates the SARCOF. The Famine Early Warning Systems Network (FEWS NET) which provides early warning and analysis on food insecurity to eight countries in Southern Africa also provide additional early warning. From October 2015 to September 2016, FEWS NET projected that emergency food assistance in the countries it covers would be roughly 30 percent higher than previous year's estimates. In about half of the countries covered, El Niño's impacts on climates are a primary driver of acute food insecurity (FEWSNET, 2018)[11].

At the national level, there is considerable variation in the institutional architecture for climate disaster management and response including early warning systems across Southern Africa (SADC, 2017). In some countries, National Disaster Management Agencies (NDMAs) have been established as statutory bodies under an Act of Parliament while in others disaster management is coordinated from the offices of the Heads of State and Government. However, the national level early warning systems in SADC draws heavily upon the outcome of the SARCOF through the National Climate Outlook Forums (NARCOFs), National Meteorological Services (NMS), National Meteorological Observation Networks or national level similar forums.

Early warning and response in the region also benefits from the Integrated Phase Classification systems in Southern Africa. According to FAO (2018)[12], the Integrated Food Security Phase Classification (IPC) is a set of standardized tools that aims at providing a "common currency" for classifying the severity and magnitude of food insecurity. Integrated Food Security Phase Classification (IPC) technical working groups conducted IPC analysis workshops to train national Vulnerability Assessment Committee (VAC) teams and determine the severity of food insecurity in majority of SADC countries, according to FEWS NET (USAID, 2016[13]).

In 1999, SADC established the Regional Vulnerability Assessment Committee (RVAC) with International Cooperating Partners and other stakeholders. At Member State level, National Vulnerability Assessment Committees (NVACs) coordinate the annual vulnerability assessment and analysis. According to SADC (2018)[14], NVACs carry out annual and periodic vulnerability assessments, in addition to studies on selected topics such as nutrition, climate change and related themes that are critical in Vulnerability Assessment and Analysis (VAA). The RVAC system is acknowledged as the main system to track, report and respond to food insecurity in the Region.

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[11] FEWSNET.2018. FEWS NET El Niño and La Niña Monitoring Resources. 2015/16 El niño: http://www.fews.net/fews-net-el-ni%C3%B1o-monitoring-resources,

[12] FAO(2018): Integrated Food Security Phase Classification: http://www.ipcinfo.org/,

[13] USAID.2016. Southern Africa – Drought: Fact Sheet #2, Fiscal Year (Fy) 2016 MAY 6, 2016

[14] SADC.2018. Regional Vulnerability Assessment & Analysis Programme (RVAA): Southern African Development community Food Agriculture Natural Resources Directorate: https://www.sadc.int/sadc-secretariat/directorates/office-deputy-executive-secretary-regional-integration/food-agriculture-natural-resources/regional-vulnerability-assessment-analysis-programme-rvaa/,

c. Summary of problems to be addressed through the Programme

Given the analyses done in the preceding section, it is clear that water scarcity and insecurity in Southern Africa is a growing concern. Population growth and associated demands for domestic, farm, and industrial use are increasing stress on limited water resources. The majority of the region's watersheds are shared between two or more countries, implying that what happens in the upper reaches of rivers and watersheds affects people, wildlife and ecosystems downstream. Regional responses and coordination are required to insure equitable allocation and use of water resources within river basins. In all basins in the SADC region climate change is amplifying the negative impacts of population growth. There is higher water demand, increased water stress spanning from chronic water scarcity (less than 1666 m^3/person/year) in many areas, while other areas are experiencing frequent flooding and increasing temperatures leading to higher crop and animal disease and pest incidence including those of a transboundary nature. There is also increased unsustainable activities along key value chains along the river basins leading to land degradation and overgrazing resulting from mass activities of smallholder farmers through low input and low productivity agriculture systems. There is increased pressure on the natural ecosystems, which is incrementally reducing their ability to provide ecosystem services. These challenges are happening in a space where there is:

- Weak institutional framework/arrangements for farmers to participate viably in priority value chains;
- Weak adaptive capacities and systems especially among the smallholder farming communities;
- Low application of climate-smart technologies by smallholder farmers along the agricultural value chains;
- Inadequate and/or no policy measures and instruments by governments and authorities to support and incentivize actors along value chains to take up climate-smart technologies and practices; and
- Limited private sector and farmer driven technologies along the agricultural value chains.

An interplay of these characteristics, leads to less resilient livelihoods which is the main problem the proposed Programme will address. The full implementation of Southern Africa's adaptation strategies and related actions requires increased human, financial and institutional capacities. However, these requisite capacities are highly limited. Whilst Governments have been investing in a number of analyses including downscaling of climate data, there has been limited investment in technical capacities. Furthermore, the most affected populations reside in marginalized rural areas and where they depend on farming for their livelihoods. Resilience-building strategies should therefore be prioritized in such areas to avoid further deteriorations in the food and nutrition security situation and improve communities' ability to withstand future shocks. The biggest challenge is that there are currently very few "proofs of concept" to address the "disconnect" between climate science and African agriculture—to show that certain interventions will results in specific adaptation benefits. The proposed Programme will assist governments in proofing a number of interventions for wider scale application.

The need for additional liquidity in agriculture is not new. Smallholder farmers often lack access to capital that would allow growth and enhanced resilience to climate change and variability, while financial institutions lack appropriate tools to address climate risks in their portfolios such as credit scoring systems, loan product designs and monitoring systems. Additional public and private sources of climate finance are needed to ensure that there are sufficient capital flows into the agriculture sector. Climate finance can play a catalytic role in supporting the agriculture sector to become part of the climate solution and help transform the sector to deliver inclusive and sustainable growth. Key institutions from the public and private sector will be central to build climate finance mechanisms.

There is limited motivation to invest in long term adaptation and mitigation activities, particularly for the private sector. In addition, the financial sector does not invest in smallholder agriculture due to the high residual risk associated with them. The risks brought about by climate change and variability makes it even more difficult for private investment in smallholder farmers. This implies that without grants and properly structured incentives, the private sector will not invest in climate-smart and ecosystem based approaches to build resilience. It is therefore important for the Adaptation Funds (AF) to be structured to catalyze or stimulate further investment from the private sector. Concessionary funds from the AF will be used together with grants from government and loans from development finance institutions to facilitate the development and uptake of specific technologies and practices by smallholder farmers at specific sites.

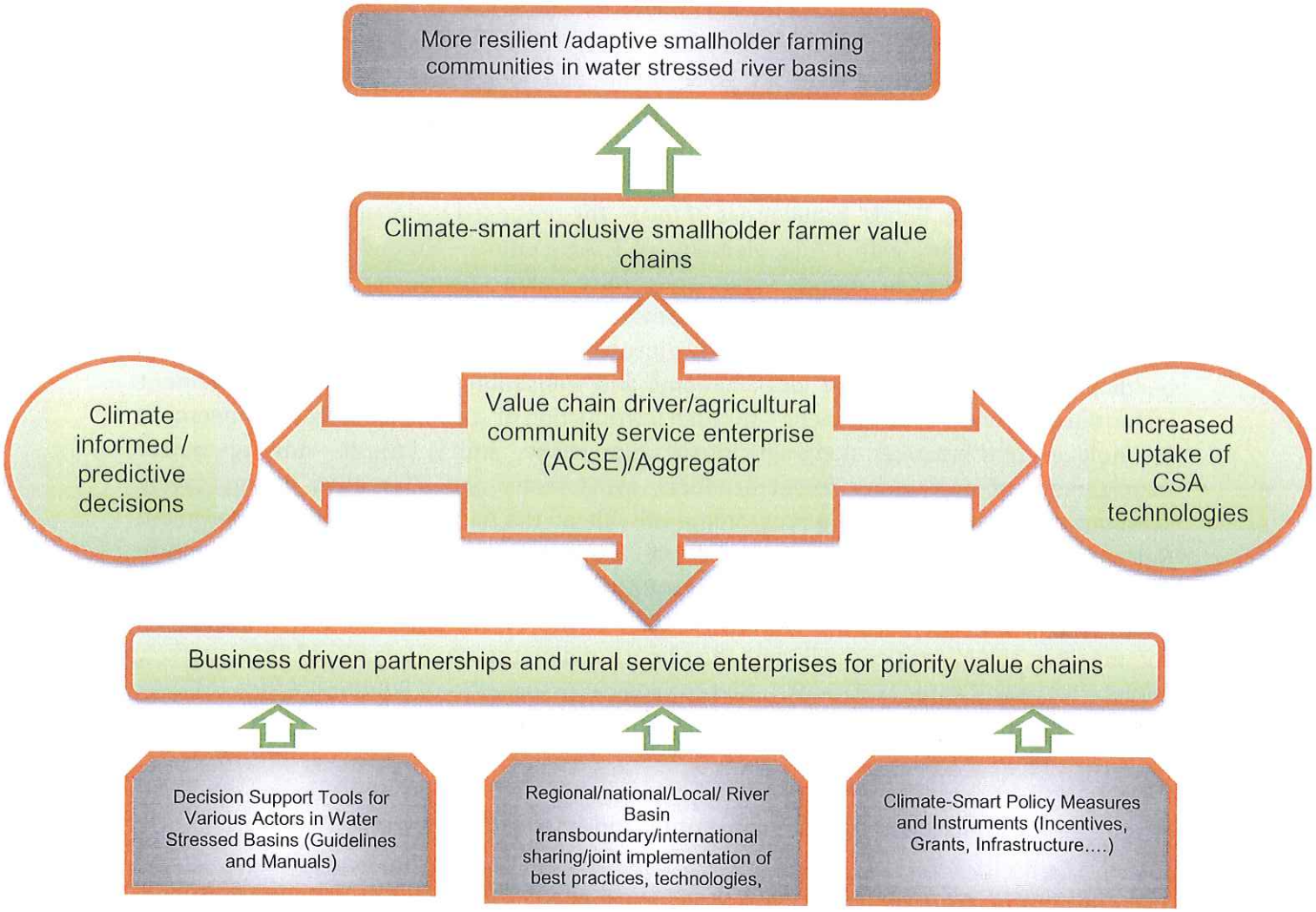
Basing on Adaptation Funds' broad areas of focus, the proposed regional Programme will be multi-sectoral in nature with strong elements of 1) Agriculture – through building of private sector driven sustainable climate-smart agriculture value chains, 2) Food and nutrition security – through focusing on smallholder farmers' priority agriculture value chains and high impact climate-smart and nutrition-sensitive interventions, 3) Rural development – through building adaptive capacities of local, national and transboundary resources management institutions, 4) water management – through introduction of sustainable water management technologies and practices along agricultural value chains, and 5) Forests – through better management of non-timber forest products, agroforestry and alternative energy saving solutions and technologies. The Programme will ride on the partnership between the United Nations Educational, Scientific and Cultural Organization, The Food and Agriculture Organization and the Food Agriculture Natural Resources Policy Analysis Network (FANRPAN). The Programme will support and work closely with River Basin and transboundary commissions and institutions including the climate and meteorological units of SADC, namely Climate Services Center (SADC-CSC), Meteorological Association of Southern Africa (MASA), and Regional Instruments of Cooperation (RIC), and National Meteorological Services (NMS).

d. Proposed Programme conceptual and strategic framework

The Programme will implement a set of concrete adaptation activities structured to build systemic capacities targeting systems, institutions, commodity value chains and communities. Interventions will be targeted at Regional institutions at SADC level, and at river basin level institutions and communities focusing on two river basins; namely, Kunene and Limpopo. This would be in alignment with the SADC Protocol on Transport, Communications and

Meteorology; Climate Change Adaptation (CCA) Strategy for the Water Sector and the SADC Policy Paper on Climate Change: Assessing the Policy Options for SADC Member States. In this proposal, UNESCO, FAO, SADC Secretariat and FANRPAN will collaborate with two River basin authorities namely LIMCOM for Limpopo, and Permanent Joint Technical Commission (PJTC) and the Governments of South Africa, Zimbabwe, Mozambique, Namibia and Angola to build resilient and climate-smart smallholder crop and livestock value chains. It seeks to strengthen local systems and institutions for service provision, including climate and weather information, to farmers and to provide innovative market driven financial incentives, measures and facilities that catalyze value chain based private and public investment in the development and adoption of appropriate technologies and best practices in managing agricultural ecosystems.

Figure 1: Theory of change for building adaptive capacities for smallholder holder value chains in water stressed river basins



The Conceptual entry points for the regional Programme are as follows:

i. **formation of business-driven partnerships and rural service enterprises** that spearhead introduction of new climate smart technologies and practices along the selected smallholder staple value chains

ii. strengthening systems and institutional arrangements for **climate informed decision making** at different levels (farm, local basin institutions, and national level)

iii. facilitating the development and application by national level authorities of a compendium of **policy level instruments, strategies and tools for supporting and incentivizing value chain actors** to invest in climate smart technologies and practices

iv. facilitating **inter-basin and transboundary sharing** of information, best practices, strategies and technologies that build adaptive capacities and resilience to climate change

e. Programme goal and objective

The goal of the Programme is to ***reduce vulnerability and increases adaptive capacity to respond to the impacts of climate change, including variability at local and national levels***. The expected impact is *increased resilience and adaptation to climate change of rural smallholder farmers, agro pastoralists and pastoralists in selected water stressed river basins (Kunene and Limpopo) in Southern Africa*. The overall objective is to strengthen the adaptive capacities of targeted smallholder farmers, agro pastoralists and pastoralists as well as service institutions.

f. Programme components, broad activities and anticipated costs

Adaptation Fund Impact: Increased resilience at the community, national, and regional levels to climate variability and change.	a) Programme Impact: **'Increased resilience to climate change of rural smallholder farmers, agro pastoralists and pastoralists in selected water stressed river basins (Kunene and Limpopo) of Southern Africa'**

Programme component	***Outputs***	***Description/Sub Activities***	***Budget***	
Implementing Measures to Reduce Exposure to Climate Related Risks, Hazards and Threats and Enhance People's Resilience	Output 1.1: Risk vulnerability assessments conducted and updated at regional and national levels	1.1.1 Generation of regular seasonal climate assessments, forecasting and projections by SADC Secretariat through SACCOF and NACCOFS downscaled to the farming communities in the region	$250 000,00	All SADC countries
		1.1.2 Capacities in climate vulnerability risk profiling for key crop and livestock production systems and value chains built	$50 000,00	Namibia, Angola, South Africa, Zimbabwe, Mozambique (focus on

				Kunene and Limpopo River Basins)
	Output 1.2: Targeted population groups covered by adequate risks reduction systems	1.2.1 Inventory of new/improved value chain specific climate-smart technologies, approaches and practices	$75 000,00	Namibia, Angola, South Africa, Zimbabwe, Mozambique (focus on Kunene and Limpopo River Basins)
		1.2.2 Build capacity of Agromet divisions in the Southern African region	$415 000,00	SADC Counties, Needs Based
		1.2.3 Facilitating harmonization of early warning and surveillance systems and mechanisms for priority climate induced transboundary risks and other hazards	$1 080 000,00	SADC countries
	Output 1.3: Strengthened capacity of national and regional centers and networks to respond rapidly to extreme weather	1.3.1 Agro-climatic advisory and feedback mechanism/systems in the region strengthened	$460 000,00	SADC Countries
	Output 1.4: Improved integration of climate resilience strategies into country development plans	1.4.1 Incentives and instruments for catalyzing adoption of climate smart approaches along value chains developed, improved and applied	$695 000,00	All SADC countries
		1.4.2 Develop capacities for targeted value chain specific actors to apply a range of new technologies/approaches/initiatives, and climate-smart tools	$600 000,00	All SADC countries
		1.4.3 Establish and operationalize a Regional Knowledge Policy Action Platform on Climate Resilience for Southern Africa	$25 000,00	All SADC countries
	Subtotal Component I		**$3 650 000,00**	
Diversifying, strengthening and increasing adaptive capacities, livelihoods and sources of income for vulnerable	Output 2.1: Targeted population groups participating in adaptation and risk reduction awareness activities	2.1.1 Support platforms for joint planning, implementation, coordination to build adaptive capacities and resilience to climate change	$ 350 000,00	

people in targeted areas	Output 2.2: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	2.2.1 Identify and support priority value chains and non-agricultural sources of income opportunities for upgrading into inclusive climate-smart and business driven activities	$100 000,00	Namibia, Angola, South Africa, Zimbabwe, Mozambique (focus on Kunene and Limpopo River Basins)
		2.2.2 Develop profiles and upgrading plans/proposals for i) priority value chains and ii) non-agricultural livelihoods and income sources	$925 000,00	Namibia, Angola, South Africa, Zimbabwe, Mozambique (focus on Kunene and Limpopo River Basins)
		2.2.3 Facilitate business alliances/partnerships for viable farmer clusters (aggregated agro pastoral and farmer field schools) and individuals in priority value chains and non-agricultural livelihoods	$3 325 000,00	Namibia, Angola, South Africa, Zimbabwe, Mozambique (focus on Kunene and Limpopo River Basins)
		2.2.4 Facilitate rehabilitation, construction and establishment of strategic livelihood and climate-smart value chain infrastructure provided through various forms of partnerships	$2 850 000,00	Namibia, Angola, South Africa, Zimbabwe, Mozambique (focus on, Kunene and Limpopo River Basins)
		Subtotal component II	**$7 550 000,00**	
	Grant Total Direct Programme costs		**11 200 000,00**	
	Execution costs		**1 977 900,00**	
	Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)		**822 100,00**	
	Amount of Financing Requested		**14 000 000.00**	

Projected Calendar:

Milestones	Expected Dates
Start of Project/Programme Implementation	01.04.2019
Mid-term Review	31.12.2020
Project/Programme Closing	31.12.2021
Terminal Evaluation	30.03.2023

g. Programme Specific project sites for the upgraded climate smart business model

i. Kunene basin

In the Angola side of the Kunene Basin, two sites namely Matala and Ombadja municipalities were identified through the consultation. **The Matala Municipality** in Huila Province is

situated along the Kunene river at an elevation of approximately 1300 metres above sea level. The municipality of Matala is 180 kilometers east of Lubango and has an estimated population of more than 243.000 inhabitants, accounting for 25 percent of the province's annual production. The Huila Province is dry, with rainfall ranging from 100 to 1,000 mm per year. **Ombadja municipality** is located in Cunene Province. It occupies 12,264 square kilometers and has about 290,077 inhabitants as of the 2014 Angolan census. It is bordered to the north by the municipality of Matala, in the east by the municipalities of Culevai, Namacunde Cuanhama, and west by the municipalities of Curoca and Cahama. In terms of agriculture, the area has the same conditions as Matala.

Although the areas are dry and high susceptible to drought, they hold tremendous agriculture potential with fertile soils, abundant underground water, and a favorable climate. The area has the natural resources to become one of the leading agricultural producing areas, as its diverse and fertile ecology is suited for a variety of crops and livestock. The main agricultural crops include cassava, corn, beans, potatoes, sweet potatoes, soy, bananas, coffee, rice, vegetables and fruits. The rainy season is from October to May, which is considered the prime season for vegetable cultivation. Tomatoes are grown during the dry season (June to September). Greenhouses and irrigation expand the growing seasons, but these technologies are not widely used in Angola.

In the Namibia side of the Kunene Basin, two sites were identified through the consultation process namely Ruakana in Omusati Region and Otjimuhaka in Kunene Region. **The Ruakana district** has a landscape made up of mopane trees which is a dominant specie and spreads across the Region on shallow sand. The sandy parts of the Region bears abundant makalani palms 'omilunga', fig trees 'omikwiyu', baobab trees 'omikwa' and marula trees 'omigongo', especially in the eastern part. It is a semi-arid and characterized by the high temperature ranging between 25-37 degrees Celsius. The average rainfall per year is about 350-500 mm between Novembers to April. The relatively high and reliable average rainfall allows for crop farming. After rain season, locals to produce agricultural products are utilizing innovative irrigation systems. The ground water in the west and south of the Region is sweet and shallow i.e. 10-20 meters from surface. During droughts, pits are dug and serve as reliable sources of water. The rest of water sources in the Region is predominantly saline.

The Otjimuhaka district is found in the Kunene Region, which is one of the fourteen regions of Namibia and home to the Himba ethnic group. Compared to the rest of Namibia, it is relatively underdeveloped. This is due to the mountainous inaccessible geography and the dryness that significantly hinders agriculture. Apart from the Kunene river and its extensive reach across a large part of the region through its streams and tributaries, the region also has fertile land, suitable for both irrigation and animal farming. The people of the Kunene are largely semi-nomadic livestock pastoralists. There is huge potential for development of viable irrigation schemes. The Otjimuhaka area is most affected by droughts and floods as part of the corridor connecting Ruakana to Epupa (close to Kunene river). Crops are produced under rain fed systems, amongst others include maize, mohango, tomatoes, leaf vegetables, sugar canes and papayas. There is also massive harvesting of Mopane worms.

ii. Limpopo Basin

South Africa

The Sekhukune, Vhembe and Mopani district munipalities are located in the Limpopo Province. The Limpopo Province is situated in the northern part of South Africa and is one of nine provinces in South Africa. It has strong reserves of agriculture, mineral and tourism resources many of which remain hugely under-exploited. In terms of agriculture, commercial farmers in mainstream value chains produces high volumes of mangoes, citrus, bananas, litchis and avocados, with little or no inclusion of smallholders. Other products include tea, nuts, guavas, sisal, cotton and tobacco, timber, sunflower, maize, wheat cultivation as well as grape. Most of the northern parts are devoted to cattle and game ranching. The Limpopo Province is comprised of five district municipalities, namely: Capricorn, Mopani, Sekhukhune, Vhembe, and Waterberg.

Zimbabwe

Beitbridge District is located in the most southern part of Zimbabwe. Beitbridge District is one of the least developed districts in Zimbabwe. It is located in region five (5), which is characterized by poor rainfall and very hot conditions. As such, it is not suitable for crop farming, although this takes place through irrigation schemes. The district is made up of an undulating landscape with shrubs, isolated hills and four big rivers namely the Limpopo river the Shashe river, the Umzingwane and the Bubi. It is significant to indicate here that although the rivers have potential for tourism because of their richness in flora and fauna, this potential has not been tapped until now. The land is divided into five land categories: Communal Land Area, Commercial Farming Area, Resettlement Area, Tuli Safari Area, and Beitbridge urban sometimes referred to as Beitbridge town.

Chivi and Mwenezi districts are located in Masvingo Province. Masvingo province is located in the low veld of the country where rainfall is minimal and uncertain. A large of the southern part of the province is drought prone, set as region 5 in the country's climatic regions. Most parts of the province, therefore, are generally unfit for agriculture, apart from cattle ranching. Mopane trees, drought tolerant and sturdy, are found throughout the province. The province is predominantly semi-arid, rainfall is minimal, highly variable/erratic and uncertain making the province prone to droughts. The bulk of the province is set as region 5 in the country's climatic agro-ecological regions. Though most of the province is generally dry, it does possess some of the most agriculturally fertile soils, inland water bodies and river systems (Save, Runde, Mwenezi, Mutirikwi and Limpopo river systems dominate the drainage system in the province), drought tolerant and sturdy vegetation like Mopani trees, and very rich natural pastures. The dominant agricultural activities include subsistence cultivation of drought resistant cereal crops (sorghum, rapoko, millet, and some varieties of maize) and cattle rearing (and commercial cattle ranching).

Mozambique

Guija, Chicualacuala, Chigubu and Mabalane districts are found in the Gaza province in Mozambique. The consultation process in Mozambique identified these four districts as equally vulnerable and potentially where sites can be established. The extreme events of

flooding and droughts which affect the different areas of Gaza province makes smallholder farmers particularly vulnerable. Guijá, Chigubo and Guija are affected by floods almost yearly while Mabalane and Chicualacuala are affected by severe water shortages. **Chicuacuala District** has approximately 6,000 farms, with 60% exploiting less than 2 hectares (0.0077 sq mi) of land. The main agricultural products are corn, cassava, cowpea, peanut, and sweet potato. Population of cattle, pigs, sheep, and goats was steadily growing prior to 2005. **Guijá District** covers 4,207 square kilometres (1,624 sq mi) and a population of 75,303 as of 2007. In the district, there are 13,000 farms which have on average 2.9 hectares (0.011 sq mi) of land. The main agricultural products are corn, cassava, cowpea, peanut, sweet potato, and rice. Population of cattle, pigs, sheep, and goats was steadily growing prior to 2005. **Mabalane District** covers 9,107 square kilometres (3,516 sq mi). It has a population of 32,040 (2007). In the district, there are 5,000 farms which have on average 4.1 hectares (0.016 sq mi) of land. The main agricultural products are corn, cassava, cowpea, peanut, sweet potato, and rice. **Chigubo District** covers 14,864 square kilometres (5,739 sq mi). It has a population of 20,685 (2007). In the district, there are 2,500 farms which have on average 4.3 hectares (0.017 sq mi) of land. The main agricultural products are corn, cassava, cowpea, peanut, sweet potato, and rice.

{Insert map of the Proposed Sites)

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Describe the project / programme components, particularly focusing on the concrete adaptation activities, how these activities would contribute to climate resilience, and how they would build added value through the regional approach, compared to implementing similar activities in each country individually. For the case of a programme, show how the combination of individual projects would contribute to the overall increase in resilience.

The Programme has two main components; i.e., Component I with one outcome and four outputs, and Component II with one outcome and three outputs. Each of these is described in the proceeding section.

COMPONENT I: *Implementing Measures to Reduce Exposure to Climate Related Risks, Hazards and Threats and Enhance People's Resilience.*

Outcome 1: Measures to reduce exposure to climate related risks, hazards and threats and enhance people's resilience, implemented.

To achieve Outcome 1, the Programme will implement a range of measures aimed at reducing exposure to climate related risks, hazards and threats and enhancing smallholder farming and agro pastoral community's resilience. This includes strengthening vulnerability assessments, enhancing risks reduction systems, strengthening capacity of national and regional centers and networks to respond rapidly to extreme weather, and facilitating integration of climate resilience strategies into country development plans.

Output 1.1: Risk vulnerability assessments conducted and updated at regional and national levels

The following activities will be implemented to achieve Output 1.1:

1.1.1 Support generation of regular seasonal climate assessments, forecasting and projections by SADC Secretariat through SACCOF and NACCOFS and downscale the information to the farming communities in the selected river basins.
This will include the following sub activities:

i. Establishment of historical climate baseline statistics, trends and historical and future climate change hotspots (areas of concern) for selected agricultural communities: This will focus on analysis of historical baseline and trend derivatives as well as downscaled climate baseline statistics to create awareness and significantly contribute to climate risk management and climate change adaptation. Appropriate tools and procedures will be applied to analyze historical data and generate useful climatological baseline products such as rain-fed cropping start, progression and end of season, number of rain days, seasonal rainfall distribution in space and time, probability of damaging dry spells and or storms occurring – when, where and for how long, SPI and percentile of precipitation, WRSI and related seasonal water balance variables, seasonal peak, etc. Useful location-

specific climatological trends and climate change projections will also be generated. Historical and future climate change hotspots will be mapped. These baseline products will be made available to each project location during inception, by generating dedicated Agro climatic 'Monitors' or 'Observatories' for the pilot regions.

ii. To identify the current and future vulnerabilities of water and food and nutrition security in the pilot water basins, a baseline analysis is required. The Programme adopts the recently established Climate Risk Informed Decision Analysis (CRIDA)[15], which provides a collaborative 5-step framework to identify climate risks for the basins. By engaging with the local stakeholders, a set of performance indicators will be identified, together with their critical threshold levels for water and food security. Through a climate stress test, the impact of climatic and non-climatic drivers will be assessed, which will form the baseline for further economic analysis to identify adaptation pathways, in line with the local vulnerabilities to projected changes.

iii. Capacity building and training in downscaling and bottom-up climate risk assessment techniques (e.g., CRIDA) and communication of uncertainties: This will include data processing and management, techniques for downscaling the seasonal forecast (e.g. blending of dynamical and statistical techniques), and communication methods. Capacity building workshops will rotate between member countries and the SADC Secretariat. The capacity building will reach 120 technical officials including 100 from the five focal countries and 20 from regional institutions. The countries will be supported to develop manuals for the downscaling process. Communication and outreach staff from SADC Secretariat and NMHSs will receive training on how to communicate uncertainty, and to develop a standard format for the main climate products, i.e. the downscaled seasonal forecast and the monthly and ten-day agrometeorological bulletins. In addition, NMHS Agro meteorologists to improve on methods of Agro meteorology product development, including use of new tools and procedures (including Instat), tailoring of products to the needs of farmers across the region and season, and use of efficient communication methods including online tutorials, community-based climate field school (face-to-face trainings) as well as use of mobile technology will be strengthened. Capacity building will involve exchange training and learning visits by scientists from SADC Secretariat to NMHSs as well as between NMHSs and vice versa. Three regional and three in-country training workshops will be conducted per year in line with the GHACOF calendar.

iv. Strengthening of the Regional SACOF under SADC Secretariat: The SARCOF process convened by the SADC Secretariat can be strengthened to play a stronger role in the regional climate outlook prediction and application process. In addition to yearly support to its convening, the Programme will develop a strategy and sustainability plan for the SARCOF to ensure that a long term resource plan is in place. It is one of the World Meteorological Organization (WMO) Regional Climate Outlook Forums, developed under World Climate Services Programme (WCSP) of the World Climate Programme, active in several parts of the world, which routinely provide real-time regional climate outlook products. The SARCOF is coordinated by the SADC Climate Services Centre (SADC CSC) in in Botswana.

[15] http://unesdoc.unesco.org/images/0026/002658/265895e.pdf

v. Post SARCOF High resolution forecast downscaling to national and river basin farming community level: There is a growing need for high resolution climate forecasts for target users in agriculture, hydrology, disaster management and health among others at sufficient lead times. To generate high resolution local climate anomalies, downscaling techniques, which can either be statistical or dynamical are applied. Some of these systems are already being applied by SADC Secretariat, however, for sustainability, capacity for both statistical and dynamical downscaling of seasonal forecasts will further be strengthened at NMHSs. Dynamical and statistical downscaling tools will then be routinely applied for skillful downscaling of weather and climate forecasts across participating countries to generate more reliable and actionable forecast products applicable for agricultural, household food and nutrition security planning and decision making. Starting from the current low-resolution African Flood and Drought Monitor (25 km), seasonal, monthly and dekadal forecasts will be downscaled to 1Km resolution at the project sites in the river basins. Downscaled products will act as basis for generation of agro-advisories upon which strategic and tactical decision making by farmers will be based, and will provide the pathway for the development of climate services.

1.1.2 Build capacity in climate vulnerability risk profiling for key crop and livestock production systems and value chains

Building further on the CRIDA approach for vulnerability assessment of water and food and nutrition security, more localized/value chain specific climate risk/hazard response models and protocols will be required to counter the effect of climate change. This will involve the undertaking of climate vulnerability risk profiling for crop and livestock production systems and value chains using the ADAPT framework. Climate change is amplifying the volatility and risk in value chains. Though rarely quantified, ecosystems provide natural goods and services of considerable economic value to businesses, such as flood protection and water treatment. The Programme will apply the Business ADAPT (analyze, develop, assess, prioritize, and tackle) and the Climate Risk Informed Decision Analysis (CRIDA) tools as a step-by-step climate resilience framework inspired by existing good practice risk management models. These tools are relevant for smallholder farming because of their value chain approach, the discussion of institutional entry points for climate adaptation and resilience, and the modules on the food, water and agricultural sectors. The Business ADAPT which is usually applied in the corporate sector, helps of climate-related risks throughout their value chains, identify where emerging market opportunities exist, take into account community needs, and develop plans that are integrated throughout the enterprise and receive the support of communities and civil society. Furthermore, the guide will help the financial services and insurance sectors understand how to engage with the value chains they invest in or insure to manage risk, maximize returns, and minimize future losses.

Output 1.2: Targeted population groups covered by adequate risks reduction systems

The following activities will be implemented to achieve Output 1.2:

1.2.1 Develop Inventory of new or improved value chain specific climate-smart technologies, approaches and practices

Climate-smart technologies, practices and approaches along value chains will ensure long term sustainability of the chains. The Programme will facilitate profiling of new or improved value chain specific climate-smart technologies, approaches and practices and establish an inventory of geo-specific crop production systems and value chain risk reduction strategies, technologies and practices. Such technologies will include solar-powered water infrastructure along predominant livestock migration routes, good practices such as community level fodder production, supplementary feeding and "bush-to-feed" initiatives. It will also include specific livestock breeds which are more heat, water-stress and pest tolerant, and require less biomass (good feed convention ratio (FCR)) for agro pastoral livestock communities and water harvesting and conservation, include: small size dams, water harvesting systems, boreholes etc. Others will also include appropriate seed and fertilizers, rotation intensification, residues, mulches, rotation diversification, no tillage, cover crops, manure, terracing, soil amendments, grazing management, pasture improvement, water harvesting, intercropping, cross slope barriers, tree crop farming, agroforestry, alley farming, improved fallow, bio char, clearing invasive and encroaching species, and restoration of wetlands and marginal lands.

1.2.2 Build capacity of Agro-met divisions for participating in the Southern African region

The Programme will build the capacity of agro-met divisions for five focal countries and at SADC Secretariat. It will also build regional capacity for application of Earth Observation Data systems in early warning, monitoring and observation and build GIS-climate capability of regional centers and networks through infrastructure upgrades. In view of the increasing adverse impacts of severe weather and extreme climate associated with climate variability and change, the Meteorological Services in SADC are currently faced with high demand for timely and quality information, services and products. The social and economic value of weather and climate information is derived from the influence of this information on decisions made by users in the sectors sensitive to weather and climate conditions, with the value tending to increase with the quality, accuracy, timeliness, location specificity and user-friendliness of the information. NMSs require adequate infrastructure for observations, data processing and exchange and dissemination as well as trained personnel to achieve this. However, inadequate observational station network due to lack of instruments, shortage of trained personnel, telecommunications systems, data processing and information dissemination facilities are major drawbacks. The infrastructure and facilities have continued to deteriorate leading to great difficulties in giving weather and climate services in the region to meet national and regional needs.

1.2.3 Facilitate harmonization of early warning and surveillance systems and mechanisms for climate induced transboundary risks and other hazards

There is considerable variation in the institutional architecture for climate disaster management and response including early warning systems across Southern Africa. Particularly, there is a need for monitoring and early warning systems that provide coherent information in a transboundary setting, such as the pilot watersheds. Building further on the African Flood and Drought Monitor, regional and sub-regional information will be harmonized

by establishing a SADC version of the Monitor, as well as higher resolution versions for the two pilot basins. Additionally, it is critical to support and contribute to regional crop and livestock data/information collection, disease surveillance, (with appropriate diagnostic support), monitoring and control of transboundary animal diseases (such as FMD, peste de petits ruminants and contagious bovine pleuropneumonia Fall armyworm, African armyworm and Migratory and Red Locusts)) and zoonoses (such as anthrax, rabies, brucellosis, etc.) in as far as they are enhanced by droughts and floods. It is also imperative to strengthen crop and livestock pests and disease surveillance through a number of platforms including the EMPRES-I and Fall armyworm Monitoring and Early Warning System (FAMEWS). FAMEWS provides real time geo-referenced data to monitor Fall armyworm (FAW) prevalence, population dynamics and movements. This will contribute to building the capacity to share information and technical capacity development on surveillance of major transboundary crop pests and animal diseases, zoonoses and other emerging diseases at national and regional levels. With EMPRES-i livestock farmers will be able to develop strategies for prevention of animal diseases, as well those for progressive control and improved management of veterinary services. EMPRES-i also integrates data from other databases, i.e. livestock density or environmental layers from FAO databases, e.g., the Global Livestock Production and Health Atlas, GLiPHA (user-friendly, highly interactive electronic atlas using the Key Indicator Data System (KIDS) and from other systems. The EMPRES-i genetic module is a novel tool that aims to facilitate the analysis and better understanding of influenza viruses by linking epidemiological outbreak data, including and genetic characteristics of influenza, (e.g., virus clades, antiviral resistance markers, mammalian adaptation markers, and re-assortment to the epidemiological information) to detailed epidemiological disease event records. The Programme will implement the following sub-activities:

i. Establish a SADC regional Monitoring and Early Warning system (MEWS) and two pilot high resolution monitors for the transboundary watersheds, based on the African Flood and Drought Monitor architecture.
ii. Provide technical support to regional crop and livestock data/information collection, disease surveillance and strengthen cross boarder and cross basin disease surveillance (possibly using similar platform as EMPRES-i EMA, FAMEWS, FAW Risk Mapping) and other systems being piloted by FAO in the region.
iii. Strengthen long-term harmonized information collection and exchange for the regional and local MEWS, and strengthen data collection tools and response protocols for the region for improved climate-informed decision making.
iv. Roll out capacity building at the regional and local level on: a) operationalization of Monitoring and Early Warning systems; b) data collection using agreed tools; and c) data analysis and decision making using the Monitoring and Early Warning products.
v. Provide an incentive for all SADC members states to domesticate and uptake data collection tools and response protocols for the region's climate induced hazards and disasters.

Output 1.3: Strengthened capacity of national and regional centers and networks to respond rapidly to extreme weather

The following activities will be implemented to achieve Output 1.3

1.3.1 Strengthen Agro-climatic advisory and feedback mechanism and systems in the region

This will involve the following sub-activities:

i. Establish database for intermediaries and famer users, including baseline surveys in all project sites in order to establish benchmark demographic and socio-economic status in the communities using appropriate methodology: Baseline year for the baseline data will be set to 2019. A database for all stakeholder categories, their needs and priorities, roles and perceptions will be generated. Of particular interest will be a database for extension and advisory service providers, other intermediary information disseminators and targeted user farmers. These baselines will constitute basis for measuring and quantification of the impact of project interventions within the participating communities. Baseline surveys will also identify climate information needs which will be basis for the project to prepare and design products and support climate information generation, use and management capacity.

ii. Carry out climate diagnostics (spatial maps, figures and summary statistics on current and projected climate conditions, and implications of projected changes for climate-sensitive sectors)

iii. Facilitate production of seasonal agriculture planners regularly through national participatory planning workshops: The Programme will support multi stakeholder dialogues at national and river basin levels to co-produce a comprehensive Seasonal Agricultural Planner (SAP) at least twice a year after release of every downscaled seasonal forecast. The seasonal planners will regularly be updated through Dekadal and monthly Agrometeorology bulletins throughout the season, based on input received from the developed basin-level monitoring and early warning system. The SAP will guide strategic seasonal planning while monthly and Dekadal bulletins will guide tactical decision making. The needs of all farmer categories, i.e. crop farmers, pastoralists and agro-pastoralists will be considered during (agro-meteorological) product development and customization.

iv. Review existing feedback mechanisms at NMHSs: The NMHSs of the target countries currently receive little feedback in a systematic manner from climate information users, which means that there is no efficient process in place for continuous improvement of the services provided. This Programme will therefore support the countries to undertake an assessment of the existing feedback mechanisms, rank them and come up with key recommendations on how to improve on feedback delivery. Comparisons will be made with similar past and ongoing work within the region.

v. Develop and apply a cost effective communication and feedback channel in order to obtain verifiable and actionable feedback from climate information disseminators and users: The communication and feedback channel will be anchored on the Connected Farmer Platform, which is a mobile software solution, will link thousands of smallholder farmers by enabling access to information, services and markets. Once a farmer is registered on a farmer database, communication can take place via SMS and deliver a range of services that enable

access to relevant climate-smart information, including weather- and market-related information and good agriculture practice guidelines, access to new markets through linkages with both formal and informal value chains both on the input and off-taking side, and access to financial services focusing on cashless value distribution (vouchers) and e-receipting.

vi. Develop a performance management and impact enhancement system which includes monitoring and evaluation, capacity development, networking, as well as development of communication and social marketing strategies: This will include continuous monitoring learning evaluation and feedback, scheduled periodic evaluations (mid-term and end of term), continuous performance assessment and impact enhancement.

Output 1.4: Improved integration of climate resilience strategies into country development plans

1.4.1 Develop, improve and apply incentives and instruments for catalyzing adoption of climate-smart approaches along value chains

Climate impacts are taking place alongside rapid social, economic and demographic transitions that combine to influence development outcomes, including interacting challenges across the nexus of food security (Ford et al. 2015), water availability and energy supply (Conway et al. 2015). Climate adaptation planning is subject to challenges of the paucity of reliable climate information (Jones et al. 2015) and uncertainties about the timing of impacts and their spatial distribution (Davis 2011). As climate change is a cross-cutting issue, adaptation needs to be mainstreamed into sector-based policies (Stringer et al. 2014) and across different levels of governance (Urwin and Jordan 2008).

Policy studies outside of southern Africa to date have identified the importance of strengthening partnerships and collaborations to manage the impacts of climate change, as well as developing an appropriate institutional context and supporting policy instruments (Massey et al. 2014; Biesbroek et al. 2010). The need to build such policy activities upon cross-sector dialogue and actions has also been recognised in southern Africa by the establishment of inter-ministerial climate change committees and task forces in many countries (Stringer et al. 2014). That said, major implementation challenges exist caused to a great extent by the fact that government ministries and departments often operate in relative isolation of each other, characterised by a lack of communication, information sharing and collaboration (Stringer et al. 2012).

Political, institutional and economic barriers

The enabling environment is critical for building the adaptive capacities of water stressed river basins of Southern Africa Region. There is need to take into account existing institutions and their capacities as well as the policy and regulatory framework, and the opportunities and constraints they provide. The policy and regulatory framework and its enforcement are critical for effective implementation of adaptation actions (this may include extension services, taxes or subsidies on agricultural inputs, credit and insurance schemes) because they provide the rules and incentives (or disincentives) for adoption of innovation. Engagement

and learning are critical, to create a space with key constituencies and actors to avoid political obstacles to the scaling processes (Linn, 2012).

To be on track, with the related Malabo commitment, the five focal countries need to:

- Facilitate the integration of climate change adaptation, in coherent manner, into relevant new and existing policies, programmes, activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate.
- Optimize policy coherence within sectors and across sectors in order to achieve adaptation outcomes that support development aspirations.
- Facilitate for integration of adaptation strategies in key sector plans, and facilitate for the adaptation responses that require coordination between sectors, provinces, and Local government
- Also conform with regional policy frameworks and commitment in terms of the SADC.

This will involve the following sub-activities which are underpinned by an approach which deals with policy research to generate research-based evidence, capacity strengthening of various stakeholders to engage fruitfully in policy processes, and policy advocacy.

(i) Policy Research

- Review of the policy instruments or basket of incentives for inclusive climate smart value chains available at national, provincial and regional levels in each country. For evidence-based policy- and decision making, scoping studies will assess existing interventions (i.e., policies, programmes and projects) related to the Programme.
- Identify and support implementation of incentives and institutional arrangements that enable and empower farmers, in particular women, to adopt climate-smart agriculture. Further, this will require training and supporting all value chain actors to access climate-smart incentives and other climate financing resources.
- Facilitate definition and introduction of missing incentives, and ensure that the basket of promising identified incentives climate-smart, are gender- and youth-sensitive.
- Develop recommendations for (i) improving the menu of policy tools available for inclusive climate-smart agriculture value chains development; and (ii) upgrading the procedures for the delivery of existing and new incentives.

(ii) Capacity Strengthening:

- Train intermediaries and government officials and parliamentarians on policy processes relating to transboundary water management, disaster risk reduction and climate risk management for floods and droughts. That is, there is a need to build capacity of intermediaries, government officials and parliamentarians on apprising the research-based evidence towards integration of climate change adaptation, in coherent manner, into relevant new and existing policies, programmes, activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate. This will also ensure buy-in and ownership of policy reforms by government officials and relevant stakeholders.

- Build institutions and incentives to enable all farmers to adopt climate-smart practices, such as low transaction cost mechanisms for accessing climate finance, support to farmers' organizations and policy instruments that produce trade-offs between food security, adaptation and mitigation.

(iii) Policy Advocacy

- Convene multi-stakeholder local, national and regional policy dialogues with targeted constituencies. The policy dialogues will identify knowledge and action gaps, share lessons on viable instruments, institutions, policies, and contribute to achieving multi-stakeholder consensus on priorities for appropriate investment and action by different actors/stakeholders for building resilience for food and nutrition security. In addition, this will include capacity building of the identified policy change champions/advocates and engaging on results dissemination and awareness initiatives.

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1.4.2 Develop capacities for targeted value chain specific actors to apply a range of new technologies/approaches/initiatives, climate risk reduction and climate smart tools

This will involve the following sub-activities:

i. Training on Livestock Emergency Guidelines and Standards (LEGS) for 250 agricultural extension workers and key livestock value chain actors: The LEGS enables extension workers and other livestock value chain actors to implement interventions and approaches which help to protect and/or rebuild livestock assets. The ultimate objective is to assist people affected by crises through livestock-related interventions. LEGS Participatory Response Identification Matrix the Livestock Emergency Guidelines and Standards (LEGS) are a set of international standards for improving the quality of livestock programs in humanitarian disasters. LEGS brings a livelihoods perspective into disaster relief for communities relying fully or partially on livestock. LEGS is global but focuses on regions prone to repeated or large-scale disasters – rapid onset, slow onset, complex. LEGS mirrors the 'Sphere handbook' in terms of process, content and layout and right based approach

ii. Training on Good Emergency Management Practice (GEMP) for Animal 250 health/veterinary officials and Community Animal Health Workers (CAHWs): Livestock Disease emergencies that are becoming more and more frequent in Kunene and Limpopo basins are one of the most challenging situations that a veterinary service can confront. Recent experience in various countries has shown that veterinary services must be well-prepared to deal with such an emergency in order to achieve rapid, cost-efficient control. To do this, the veterinary services must have a well-developed plan, the capacity to implement it, and it must practise implementing its plan. The aim of GEMP is to set out in a systematic way the elements required to achieve that level of preparedness for any emergency

disease in animals. In particular, but not exclusively, this manual focuses on the control of transboundary and cross basin animal diseases (TADs). Some of these principles may also be helpful in preparing for food safety, zoonotic and even non-infectious disease emergencies. Emergency management preparedness programmes should provide the key to identifying and prioritizing disease incursion threats. The basic components of these programmes to be considered are preventing the entry of TADs and other disease threats, rapidly detecting disease and taking early effective action in the face of an emergency. Learning from outbreaks and reviewing the response sequence are critical to better performance in future emergencies.

iii. Agro-pastoral communities' skills enhancement through tailor-made and co-created Agro pastoral farmer field schools trainings on Community-based Rangeland Condition Monitoring for early warning. This training will be delivered through the Agro pastoral and farmer field schools building on FAO work which was just completed; especially in Angola. Pastoral communities have a comprehensive knowledge of their environments. This knowledge acquired through extensive observation of the local environment and continuous herding practices and wisdom about their local environment and adaptation strategies to climate change is essential for sustainable development. Thus, appreciation of pastoralists' knowledge about their environment is also important for the integration of indigenous knowledge with the proper application of scientific approach to fit with the prevailing ecological potential of pastoral areas. This will be achieved by developing local and indigenous seasonal calendars, identifying key indicators for monitoring and early warning of climate hazards and their impact on crops and livestock. Synergies will be identified with the indicators developed as part of the Monitoring and Early Warning System to allow a pathway for the co-creation of climate-risk indicators that are tailored to the local communities.

1.4.3 Establish and operationalize a Regional Knowledge-Action Policy Platform (KAPP) on Climate Resilience for Southern Africa

The Programme will facilitate design, validation and operationalization of a Regional Knowledge-Action Policy Platform (KAPP) on Climate Resilience for Southern Africa, with a particular focus on flood and drought risk management policies. There is need for stronger regional collaboration in creation and application of knowledge including technologies, practices and approaches to addressing adaptation to climate change. The platform's role will be to identify what works for strengthening resilience and flood and drought risk management. This will be based on developing, sharing and scaling-up use of proven approaches, technologies and practices including resilience measurement, evaluation and learning approaches that are designed to address the unique challenges that resilience poses. The KAPP will be a collaborative network that facilitate highly integrative sustainability in knowledge co creation and application. The KAPP will build on the broad range and diversity of specialist expertise, multidisciplinary backgrounds represented in the large community of policy makers, researchers, private sector players and community development practitioners

associated with UNESCO, FAO, SADC Secretariat and FANRPAN and those within the Kunene and Limpopo river basins. It will also provide a platform to integrate the Monitoring and Early Warning Systems developed in this Programme into national and regional climate risk management strategies and policies.

COMPONENT II: *Diversifying, strengthening and increasing adaptive capacities, livelihoods and sources of income for vulnerable people in targeted areas*

Outcome 2: Diversified, strengthened and increased adaptive capacities, livelihoods and sources of income for vulnerable people in targeted areas

To achieve Outcome 2, the Programme will implement measures for diversifying, strengthening and increasing capacities, livelihoods and sources of income for vulnerable people in the selected basin areas. Targeted populations will be capacitated to participate in in adaptation and risk reduction awareness activities. Agro pastoral and farmer field schools will be established as a vehicle to aggregate and connect smallholder farmers to markets through innovative business alliances driven by an 'aggregator/agricultural community service enterprise of value chain driver' in targeted river basin areas; and improved smallholder farmers' access to climate smart technologies.

Output 2.1: Targeted population groups participating in adaptation and risk reduction awareness activities

2.1.1 Support platforms for joint planning, implementation, coordination, and learning to build adaptive capacities and resilience to climate change

This will involve the following sub activities:

i. *Facilitating inter basin and transboundary exchange visits and study tours:* The Programme will facilitate 3 visits in each year for 50 farmers from each basin. Exchange visits offer a bundle of benefits, well beyond just acquiring information. An intellectual and physical journey creates common understanding, relationships forged in the fun and hardships of shared experience, commitments to new approaches, and friendships as foundation for future networking. Visits allow travelers and hosts to focus time and attention on a topic, learning deeply, sharing ideas, and assessing the relevance of new approaches. Information comes alive, in dialog, in detailed responses to specific queries, in conversations enriched by the perspective of distance and difference. The chance to look behind the scenes, to get acquainted with real people, understanding their problems and achievements, can create inspiration to keep working and launch new climate adaptation initiatives. In terms of capacity development, exchange visits offer considerable scope for both women and men farmers. That is because they allow learning to take place at several levels. This learning process reflects the different stages in the adoption ladder. It also provides a platform to discuss the already developed climate information and services and to receive feedback on the way forward.

ii. *Support to activities of inter-basin and transboundary joint planning, implementation, coordination committees:* Joint planning and management of

transboundary water resources requires a common understanding on water issues and complementary strategies for water management. Basin planning is a comprehensive process of water management, with the objective of protecting and improving a river basin and its surrounding environment. It follows the main principles of Integrated Water Resources Management (IWRM) including inter-sectoral cooperation, public participation and strengthening human capacities. The activities will make use of the methodologies developed as part of the UNESCO Programme on joint management of transboundary rivers: from Potential Conflict to Cooperation Potential (PCCP)[16].

iii. *Support evidence-based adaptation information in the region through demonstration, documentation and reporting of good practices, lessons learned and success stories*: Building further on the CRIDA baseline assessment of climate vulnerability and proposed adaptation pathways, information will be provided through documentation of success stories, reporting and setting up of community sites for demonstrating adaptive crop pathways and practices for communities at high risk of climate change related impacts. The demonstration sites will be established each of the project sites will have a demonstration site which will be a farm used to teach agricultural techniques and technologies. Demonstration farms are used to teach various agricultural techniques and technologies, showcase new or improved crops. They also serve as a venue to research and test new methods alongside traditional ones. They will also help with the uptake of new concepts that are transforming agriculture including precision agriculture – a farm management system that ensures soils and crops receive exactly what they need for optimal growth and productivity, and many other climate smart technologies, approaches and practices, such as the uptake of climate services developed during the project.

Output 2.2: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability

The project facilitates aggregation through the 'value chain drivers/aggregators/agricultural community service enterprise' as a vehicle not just to ensure sustainable market led production, but adoption of specific climate smart agriculture technologies, practices and approaches along selected agricultural value chains in the river basins. Potential aggregator/buyer will sign a pre-agreement with land-farmers, and together respond to the call for proposal by FAO. The 'value chain driver' (private buyer) approach, is a major missing link in smallholder farmer development which creates the necessary and appropriate security and business conditions for private sector to do business with smallholder farmers. The value chain driver with their business partners (farmers, and other value chain actors such as private and public financiers as well as off takers) will clearly specify and profile the underlying business relationships between different value chain actors. The projects then facilitates meetings and business alliances, and adoption of technologies by value chain actors.

[16] http://www.unesco.org/new/en/pccp

Smallholder farmers' aggregation and commercialization will start with the selection of sites, beneficiaries, and aggregators (Private Buyer) at all sites in the three river basins (at least one site in each country). The selection of sites and the specific value chains will take into account Government strategic priorities and apply FAO Methodology to launch a call for proposals. Only aggregators/buyers with land care farmers in a pre-aggregation agreement will be eligible (Figure 4: shows an example of a typical aggregator model).

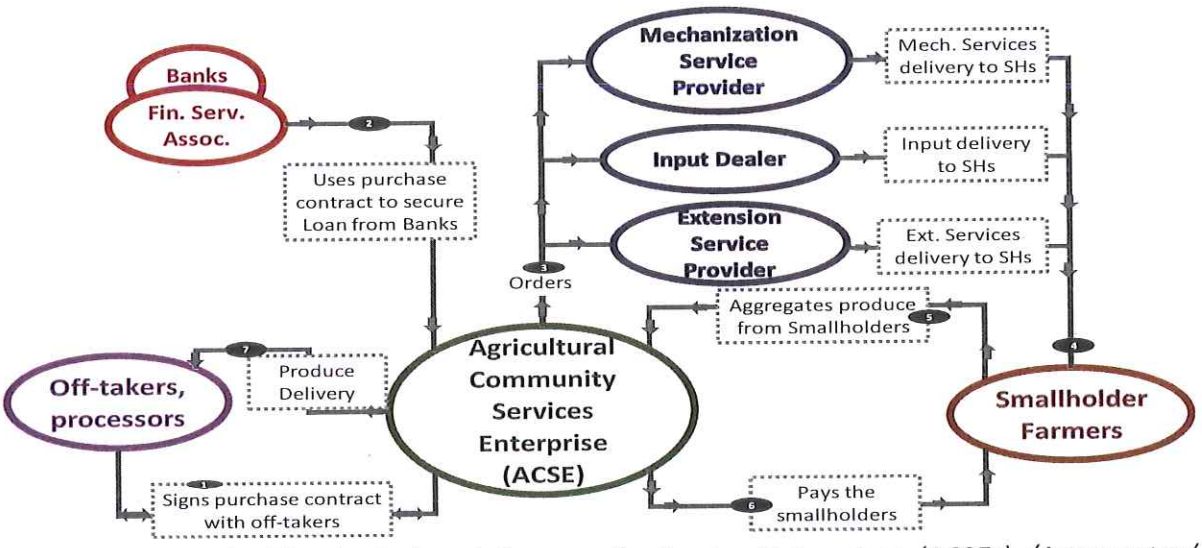


Figure 4: Example: The Agricultural Community Service Enterprises (ACSEs) /Aggregator/ Buyer Driven Business Model

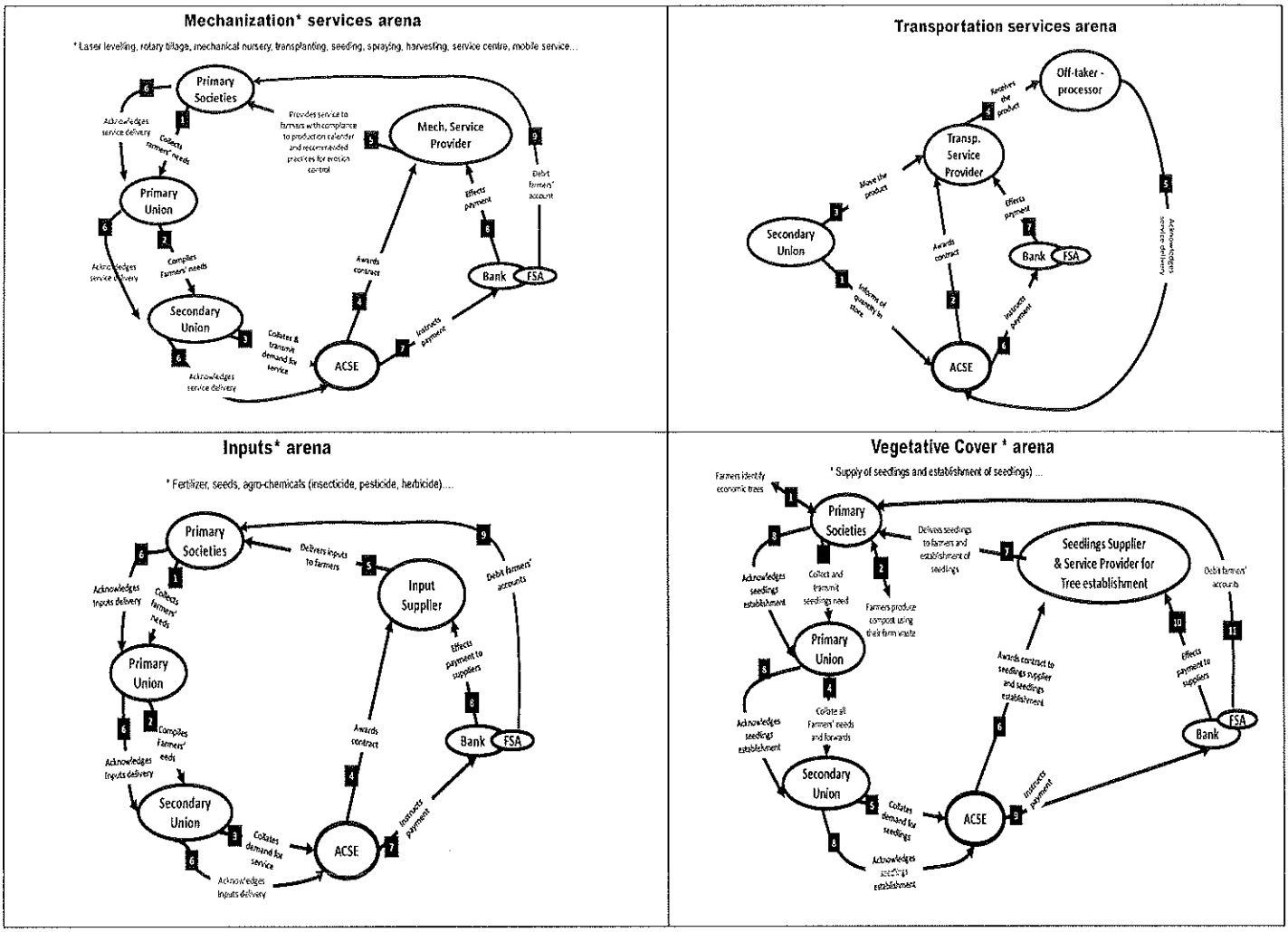
This is then followed by profiling and registration of the farmers at specific sites which is done together with a process profiling and adopting an upgraded business model for the identified commodity chains. This will also involve a detailed assessment of the registered farmers needs within the upgraded business model. It will also include the setting up and strengthening of business-driven farmer organization, into clusters/syndicates along these value chains. Capacities will be developed for the farmers to formalize aggregation agreement with the private buyer/aggregator and enter into business relationships with other value chain actors according to the adopted upgraded business model. This will enable the farmers to access quantity and quality goods and services including land care and climate smart technologies, and the specifications will be outlined in the aggregation agreement.

Support to smallholder farmers' access and application of climate smart technologies will start with assessment, documentation and dissemination of available climate smart technologies including land care, conservation agriculture, agro-forestry and others (outlined in component 1). Then the designing and rolling out of policy and financial tools (matching grant) to be used to promote farmers and other value chain players to conservation agriculture and climate smart technologies will be done. Other public and private sector players will be engaged in the preparation and signing of PPP agreement for blended financial support to aggregated farmers and other value chain players. The project will contribute an equivalent of UD$3 Million to be disbursed in grants per farmer as startup funds for inputs towards the blended PPP finance agreement. The intervention will ensure that equitable participation and benefits to women and men. It will pay

particular attention to the involvement of marginal groups such as women, youths, people with disabilities and the elderly. This will include the following sub activities:

2.2.1 *Identify priority value chains and non-agricultural sources of income opportunities for upgrading into inclusive climate smart and business driven activities*: This will involve the launch of a process to select sites, beneficiaries, and aggregators/Private Buyer at all sites. FAO will be responsible for design of a call (terms of reference), its advertisement, adjudication and awarding to the successful aggregators. In line with the different Government spatial definition of agro priority areas, and in application of FAO methodology a structured province/area/value chain specific call will be launched to identify the most suitable aggregator. The call will define parameters such as number of famers, type location, goods and services, alliances and competencies that the project will be expecting from the aggregator/buyer. This will also include consultative dialogue with all potential value chain actors at the identified sites.

2.2.2 *Profile commodity value chain, and adopt an upgraded business model:* Separate service providers/consultants with the technical guidance of FAO and close collaboration with the Aggregator will profile selected commodity value chains and facilitate adoption of an upgraded business model by value chain actors. will FAO will provide the Terms of reference and continuous technical guidance throughout the commodity profiling process. The profiling will start with a VC training using soft methodology provided by FAO, the commissioning of the profiling of status quo and upgraded model. The upgraded model is the one with the innovative business relationships and business arenas and which takes into account new land care and climate smart technologies. In addition, under the guidance and supervision of FAO, the Aggregator and the VC profiling experts will assess and report the farmers' needs within the upgraded business model. The upgraded business model carefully describes the underlying business relationships between each of the value chain actors, and explains how the smallholder farmers will access all the services that will make them participate sustainable in the upgraded business model. The collection of diagrams shows examples of typical definition of underlying business relationships that facilitate smallholder farmer's access to critical services. This process will also assist in identifying opportunities for enhancing value addition for local products and increasing commercial skills development and shared learning.



2.2.3 *Facilitate business alliances/partnerships for communities and individuals in priority VCs and non-agricultural livelihoods:* Using the Farmer field School Approach farmers/producers will be organized into viable and visible business entities for the selected VCs at the selected sites. In total over the 5 countries, the project intends to directly benefit 10 000 households which translates to approximately 50 000 people (assuming an average 5 member household). Up to 500 farmer field schools (+-100 in each country) comprising 20 people will be established. The farmer filed schools will aggregate in larger viable producer clusters to satisfy the business arrangements of the upgraded business model. The standard FAO driven farmer field school training approach comprising community mobilization, Trainer of Trainers and facilitators will be applied at each site. The aggregated clusters will be capacitated to form business relationships (MoUs, contracts, etc.) with the aggregator and other value chain players, in order in order to ensure their members' access to required quantity and quality goods and service. Capacitating/training/supporting value chain actors to enter into business agreements. FAO will continuously monitor and support the upgrading if need be, of the operation of the goods and services delivery arenas (i.e.) the business relationships between farmers and key value chain players

2.2.4 *Assist vulnerable individual, community, and VC actors to access resources/funds:* Basing on participation in the upgraded climate smart value chains, the aggregated farmers will access a startup grant for inputs to be able to participate in production activities. It is envisaged that the 10 000 farmers will access the grant across the 5 countries. FAO will apply the E-Voucher system to roll out matching grant to the farmers profiled and included in the upgraded business model as part of the blended PPP financial agreement. This grant will support the CS Technologies, but other contributors in the PPP Blended financial scheme will finance other needed goods and services. It is envisaged that the upgraded business model will be sufficiently viable to attract other private sector players including financial institutions. The Programme will therefore facilitate structured engagement through meetings of public and private sector players in the preparation and signing of PPP agreement for blended financial support to aggregated farmers and other value chain players. FAO will provide technical assistance to guide development of the blended finance agreement. The matching grant will be preconditioned on use and application of innovative climate smart technologies, approaches and practices.

Output 2.3: Physical, natural and social assets strengthened in response to climate change impacts, including variability Increased

2.2.5 Facilitate rehabilitation, construction and establishment of strategic livelihood and climate smart value chain infrastructure provided through various forms of partnerships

An assessment to specify the business infrastructure and equipment needs for the upgraded business models for each VC site will be commissioned. In line with the upgraded business model, and the assessment of aggregated farmer's needs, the Programme will either provide or identify and upgrade/rehabilitate irrigation, storage, processing and other relevant infrastructure at selected sites. A budget of US$3 Million will be set aside for the infrastructure needs of the upgraded business models for the 5 sites. Such climate smart equipment and infrastructure needs will include but will not be limited to:

1) Solar powered deep borehole smart irrigation systems,
2) Water harvesting and storage infrastructure
3) Livestock Dips, water troughs and other handling infrastructure
4) Climate smart processing and storage infrastructure
5) Minimal rehabilitation works on medium scale value chain infrastructure
6) Minimal construction and work of community level value chain, water and natural resources management infrastructure.

It will also cover the cost of community level equipment for agricultural product improvement/refinement (value addition) in communities and commercialization of products

B. Describe how the project /programme would promote new and innovative solutions to climate change adaptation, such as new approaches, technologies and mechanisms.

i. Climate-informed value chain facilitation, the missing link in sustainable adaptation interventions

The Programme builds/strengthens effectiveness of adaptation interventions through incentivizing and de-risking private sector investment in smallholders and climate smart technologies. Effective climate change adaptation requires effective – and adaptive – governance and institutional structures. The Programme will facilitate creation of farmer service driven agricultural service enterprises that bring appropriate technologies and new approaches. By creating conditions that allow for building the application of new technologies and climate smart practices into staple value chains, its makes investment into building resilience more effective and efficient.

There is no doubt that the return to investment per dollar, on incentivizing and de-risking private sector and farmers to take up new technologies and climate smart approaches to their main livelihood holds one of the promising avenue in sustainably developing adaptive capacity of vulnerable rural farming and agro-pastoral communities. While analyzing national policies provides a critical, overarching understanding of climate change adaptation for agriculture in Southern Africa, any national developments need to be effectively translated into sub-national policies and action plans. The Programme addresses the lack of connection between national policies on climate change adaptation and the local institutional situation on the ground. Innovative governance arrangements, particularly at levels closest to the grassroots, are key to achieving this. The Climate Risk Informed Decision Analysis (CRIDA) approach which will be applied in this project to the two basins, provides an innovative bottom-up approach to assess the farmers vulnerability to climate variability and change. This assessment provides adaptation pathways to address these challenges and ensure robust adaptation solutions aligned with the expected changes. It is important to build adaptive capacity, linked with continued monitoring and evaluation, to cope with current climate as one way of preparing society to better cope with future climate. It also builds the governance capacity of government and other societal actors to develop and implement strategies that address these multiple goals through a learning approach (reflective implementation) and holistic assessment of synergies, trade-offs, and opportunities, as well as coordination of support to those most impacted.

ii. Paradigm shift: Towards Farmer-managed natural regeneration to build resilience to climate change

The proposed approach in the Programme represents a major paradigm shift, in which farmers and private sector are incentivized to invest in and adopt better crop and rangeland management practices that brings sustainability to their businesses and their private ventures along climate-informed value chains. The Programme goes beyond simple Farmer-Managed Natural Regeneration (FMNR) to halt and reverse land degradation, soil loss, water loss, veld loss and general biodiversity loss which is core to climate change adaptation and mitigation, by adding a critical dimension of business-or value/profit generation from their ecosystem. FMNR in itself is a quick, affordable and easy-to-replicate way of restoring and improving agricultural, forested and pasture lands (World Agroforestry Centre, 2013). Thus through removing residual risk and creating necessary enabling environments, the proposal enables private sector particularly farmers by applying FMNR to be at the center of building their own

resilience to climate change. The Programme expects to reach more than 10000 farmers as direct recipients of either incentives, knowledge or skills that enable them to participate in value chains more sustainably and apply climate smart approaches.

iii. Embedding climate change adaptation into the planning and implementation of sustainable agricultural strategies

A challenge to be addressed by the Programme is that smallholder farmers tend to have a low capacity to adapt to changes in climatic conditions. Programmes that help these farmers adapt to climate change and associated climatic extremes are particularly important. Common adaptation measures include early maturing crops and varieties, drought tolerant crops, diversifying crops, planting different crops or crop varieties, replacing farm activities with non-farm activities, changing planting and harvesting dates, intergrated pest management, increasing the use of irrigation, and increasing the use of water and soil conservation techniques. The CRIDA approach that will be adopted will support the identification of effective adaptations strategies for farmers in light of their threatened water and food security under increased climate variability and change. Adoption of Climate smart agriculture and other ecosystem-based adaptation strategies offers a triple-win strategy for smallholder farmers in particular - simultaneously improving productivity for nutritious crops and helping farmers both adapt to climate change and mitigate agriculture's contribution to climate change. CSA embeds the integration of climate change into the planning and implementation of sustainable agricultural strategies, to enhance the resilience of agricultural systems and livelihoods and reduce the risk of food insecurity in the present, as well as the future (Lipper et al., 2014). More efficient resource use in agricultural production systems offers considerable potential for increasing agricultural incomes and the resilience of rural livelihoods while reducing the intensity of agricultural emissions.

iv. Use of Participatory approaches in seasonal and longer term adaptation planning

The use of a participatory method of seasonal and longer term adaptation planning based on actual downscaled weather forecasts and climate projections is an innovative aspect of the project that will support the conducting of adaptation practices on two time scales, the first being on a seasonal timescale to inform short term adaptation strategies (e.g. crop planting date and variety selection) based on the seasonal weather forecast, the second being on a longer term basis of 5-10 years informed by longer term climate projections. The project will also evaluate the Subseasonal-to-Seasonal[17] (S2S) framework for making skillful predictions using state-of-the art climate models, on the timescales which are particularly relevant for farmer communities (15-60 days ahead). In addition, the project not only supports adaptation planning aspects but goes further to fund viable, locally appropriate community adaptation investment proposals identified directly through the community adaptation planning process. In most cases in the target countries adaptation investments are often top down with little involvement of the communities in their identification and implementation or in other cases community-based adaptation planning has been supported but funds for implementation of the identified actions has not been available. The project ensures that there is both a bottom up planning approach (e.g. CRIDA) as well as that the planning efforts do not go to waste and are implemented with participation of the communities.

[17] http://s2sprediction.net/

v. Riding on the technology revolution to make adaptation more effective

The Connected Farmer Platform, which is a mobile software solution, will link thousands of smallholder farmers by enabling access to information, services and markets. Once a farmer is registered on a farmer base, communication can take place via SMS and deliver a range of services that enable access to relevant climate smart information, including weather- and market-related information and good agriculture practice guidelines, access to new markets through linkages with both formal and informal value chains both on the input and off-taking side, and access to financial services focusing on cashless value distribution (vouchers) and e-receipting. In addition, locally appropriate means of communicating climate and weather information through media such as community radio will be explored, including broadcasting of poetry and short drama programmes to create awareness on seasonal weather variability and climate change. The use of ICT for sharing weather and climate information will also be investigated as part of the project including use of mobile phone based technology that will be linked to a stakeholder feedback mechanism to ensure that all information, climate services and advisories generated through the project are relevant to those who receive them. The project foresees also several opportunities to engage directly with the local farmer communities, providing a pathway for bi-directional communication to fine-tune the climate services provided.

vi. Leveraging Strategic partnerships between organizations with complementary comparative advantages

The partnership between the United Nations Educational, Scientific and Cultural Organization, the Food and Agriculture Organization, Food Agriculture and Natural Resources Policy Analysis Network (FANRPAN), SADC Secretariat as well as the relevant government ministries/departments for agriculture and meteorological and hydrological services in the target countries is an innovation. This partnership is expected to be a lesson on the importance of collaboration and coordination of climate change adaptation activities in the region and beyond. The channeling of weather and climate information from regional to national to local level, for tailored location specific agrometeorological advisories feeding into community adaptation planning at seasonal and longer timescales through this partnership will be a model to be scaled up to all countries in Southern Africa and even beyond.

C. Describe how the project / programme would provide economic, social and environmental benefits, with particular reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations. Describe how the project / programme would avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy of the Adaptation Fund.

i. Economic benefits

Through the upgraded business models, the project will lead to increased production and incomes on the same the same amount of, or less, land and water, with more efficient and prudent use of inputs. The project will lead to stronger sustainable adaptive capacities based

on increased uptake of climate smart technologies, good agro-ecological practices (GAP) and technologies in the upgraded business model, which will sustain increases in total factor productivity (TFP) reflecting more efficient use of various factors of production. According to the World Bank, 2000, increases in TFP are needed to close the large yield gaps between the agronomic potential (what is attainable with good management practices under rain-fed conditions) and what farmers are currently getting. Increases in TFP reflect improvements in the efficiency in the use of the aggregate bundle of inputs.

The technological value chain based entry points which form the underlying thesis for the proposed intervention framework at value chain, and local river basin level have the potential to increase the TFP by raising productivity in the upgraded business models from existing cultivated land using improved crop varieties, soil and water management practices, while protecting the environment as well as delivering acceptable rates of economic returns to farmers.

- 500 smallholder and agro-pastoral farmers field school groups composed of approximately 20 farmers each (totaling 10000 farming households or 50000 individuals based on average household size of 5 people) aggregating into viable farmer producer clusters who will participate in the upgraded climate smart business value chains. The use of the field schools approach will also facilitate the ability of rural farmers to leverage appropriate financial services, markets and market information, as well as engage in diversification with a strong bearing on production, productivity and incomes. Through the field schools collective action is expected to be enhanced, negotiation skills will improve, information sharing will increase.
- The project will directly improve the economic, social and environmental resilience of approximately 50,000 people in the target communities in three river basins. Due to uptake of improved and upgraded business arrangements facilitated by the project through the VC soft methodology approach, the households are expected to begin to operate like any other private business with clear profit margins and sustainable turnover of production.
- An average yield increment of 3 times or more for most of the food security crops like sorghum, maize, millet, beans, cowpeas, sweet potatoes and cassava;
- a multiplier effect of at least 1:100 due to improved planning and decision making and management of agricultural practices by farmers;
- improved food and nutrition security through crop diversification, food & nutrition education creation of awareness on climate smart practices and precision farming to enable more farmers be able to plan and make the right decisions based on the anticipated weather/climate;
- farmers will be able to produce more diversified food to ensure that enough food is available within farming households till the next harvest;
- Capacity to safely and hygienically store surplus food will be enhanced, farmers will be able to generate more income from the sale of surplus produce and from the income generated, and farmers will be able to purchase other nutritious foods that they are not currently producing.

ii. Social benefits

The Programme will strengthen social resilience centering around three types of capacities: coping capacities (coping with and overcoming adversities), adaptive capacities (learning from past experiences to face future challenges), and transformative capacities (crafting institutions that foster individual societal responses). The innovative governance value chains in the upgraded business models to be implemented in the project at specific sites presents important mechanisms for shaping social resilience. In addition, households will experience reduced food and nutrition insecurity due to higher incomes which will enable availability and accessibility of diverse and adequate food in the homes. Higher incomes will enable them to meet basic, maintain their children in schools; as well as purchase other variety of foods that they do not produce, so as to enhance their nutrition security. This will create stable families , enhance livelihoods and contribute to community socioeconomic cohesion. Further to this, the Programme will enhance and prioritize the strengthening of livelihoods, of agro pastoralists especially in the Kunene River basin by improving access to services, knowledge, resources (including genetic resources), financial products and markets all in a climate-smart agriculture approach.

The use of the farmer field school approach will play a much broader role in society than simply as vehicle for agricultural development, by providing a platform for broader adult education thus filling critical gaps in rural societies commonly characterized by low education such as:

- Broader ability, to initiate or strengthen a self-perpetuating social system that promotes innovation and sharing of experiences to allow a community to adapt to a hanging environment and thus be more resilient to changes in the long term.
- Promotion of social cohesion within a community and enhance collective action that is both a key component on adaptive capacity and resilience building. With improved social cohesion, mutual trust and collective action the field school members, their families and the community at large gradually becomes more and more resilient to climate shocks, crises and other changes to their agroecosystems.
- Co-creation of knowledge and adaptive solutions through acknowledgement farmers as a key source of information and knowledge, thus promoting bottom up planning for improved and more sustainable actions to build resilience of the community as a whole to weather variability and climate change.
- Incorporation of both women, men and youth farmers to ensure gender equity, recognition of women's knowledge in agricultural production and climate change adaptation and ultimately encourage the examining of gender norms in the community with a view of empowering women socially and economically within the community.

iii. Environmental benefits

The Programme implements measures that lead to strengthening of resilience through innovative technologies and processes and minimizing the use of technologies or inputs that have adverse impacts on people and the environment. The climate smart agricultural practices such as improved soil and water conservation practices (like minimum or zero tillage, contour ridging, increased use of organic manure), water harvesting and irrigation, bush fallowing, integrated pest management, agro-forestry, diversified agriculture including

apiculture and plantation agriculture; and rotational grazing, programmed reseeding of degraded rangelands among pastoral and agro-pastoral communities, etc. will be encouraged and promoted by the project.

In many regions of Southern Africa continuous cropping and use of inappropriate farming practices has had massive negative environmental impacts characterized by declining soil fertility and erosion, degradation of vast expanses of arable land further causing low yields, food insecurity.. This has compounded the vulnerable communities' capacity to cope with the successive droughts. The specific upgraded business models which will be implemented by farm groups/farmer and agro pastoral schools will bring improvements in agricultural land management, such as conservation tillage, multiple crop rotations, agro-forestry, integrated plant-animal systems and rehabilitation of degraded crop and pasture land, can improve soil productivity are also important in enhancing the agricultural ecosystem capability to cope with stress. Other interventions that are important in improving the capability of the system to cope include improved skill on sustainable land management including improved fodder, improved water quality and improved river run off/ water courses flow. The potential benefits of inclusive climate smart value chains include:

- Improved ground water which increases water infiltration that reduces runoff, soil erosion and sedimentation, and improves surface and groundwater levels and quality leading to land rehabilitation.
- Improved soil cover – For example, in conservation agriculture, the crop residue is left on the field to cover the soil. Other types of mulch can also be placed between the rows and planting basins or planting holes.
- Long-term yield increase and output stability can be achieved while at the same time stopping and reversing land degradation.

iv. Ensuring compliance with AF's Environmental and social policy

The project does not involve conversion of natural habitats to other uses and will in fact through some activities such as agroforestry, improve and restore degraded lands, improve soil fertility, reduce erosion and soil nutrient depletion and enhance below and above ground carbon storage. Through the climate-smart agriculture approach the project will in fact improve biodiversity in crop and livestock production as a means of improving agro-ecosystem resilience to climate change and weather variability at the same time increasing natural capital and the flow of environmental services.

In addition both UNESCO and FAO incorporate social and environmental risk screening into the identification phase of all projects, conduct social and environmental impact assessments for all medium or high risk projects, ensures disclosure of project activities and their potential risks with affected communities, engages in a process of free, prior and informed consent (FPIC) with relevant stakeholders and target communities and ensures consultation with communities at all phases in the project cycle to minimise environmental and social risks. The project has been classified as having Low environmental and social risks by FAO. The limited adverse impacts that could emanate are mostly through Component 2 of the project which will incorporate on the ground adaptation investments along value chains. This means the project potentially falls within the Category B rating of the Environmental and Social Policy of the Adaptation Fund. However, any potential negative impacts as a result of this project are

believed to be small in scale, limited to the project area, reversible and can be either avoided, minimised or addressed through the use of recognized good environmental and social management practices. In order to be consistent with the Environmental and Social Policy of the Adaptation Fund the Project will ensure that all project activities:

- Are aligned with local, national and regional policies and programmes
- Comply with national laws and global instruments related to environment and natural resources management, plant and animal genetic resources
- Are in line with standards, policies and laws for the responsible governance of land including the Voluntary Guidelines for the Responsible Governance of Tenure for Land, Fisheries and Forests in the Context of National Food Security and The African Union Framework and Guidelines on Land Policy in Africa.
- Ensure participation of all relevant stakeholders in project activities without discrimination and with aim to ensure fair and equitable access to project benefits including for women and men as well as marginalized groups.
- Aim to ensure that project activities in fact target and support the most vulnerable to become more resilient to climate change including women, women headed households, children and the youth.
- Aim for 50% participation of women in project activities and 50% of project direct beneficiaries to be women, while also targeting specific project activities at women or women's groups (for example the integrated savings and lending).
- Ensure that all crop and livestock varieties supported as part of the project are locally appropriate non-invasive species and are nutrition dense and culturally acceptable.
- Use a climate-smart agriculture approach to maximize on and take advantage of opportunities within identified adaptation and resilience building options that reduce greenhouse gas emissions and improve the efficiency with which natural resources are utilized in agro pastoral communities.

D. Describe or provide an analysis of the cost-effectiveness of the proposed project / programme and explain how the regional approach would support cost-effectiveness.

i. Ensuring efficiency and effectiveness in facilitating adaptation

The Programme does three important things to raise efficiency and effectiveness in building resilience to climate change in the Southern African Region.

a) *Leverages climate finance to build resilience.*

Climate change is making the development of smallholder agriculture more expensive especially when the risks associated with financing them are considered. The requested funds will be used to make investment in interventions to build resilience more efficient by lowering the cost of investing. At the *Programme level*, climate-resilient programmes typically have higher upfront design and implementation costs for governments, donors and private investors – for example, the costs of infrastructure, increased upkeep, capacity-building, knowledge generation and the strengthening of institutions, in addition to higher project development costs (downscaled data generation and community-based approaches) and the

increased costs in enhancing cross-sectoral and stakeholder collaboration. In order to achieve the adaptation objectives, a significant increase in the amount of capital available for climate smart investments in agriculture will be critical. The Programme proposes new approaches to enable smallholder farmers to become beneficiaries of climate finance in order to reward multiple-benefit activities and help offset the transition costs and risks of changing practices. These include access to climate finance that promotes adaptation initiatives by sharing knowledge activities such as innovative land management approaches, CSA, and post-harvest practices and technologies as defined in the upgraded business model at each site. Directing climate finance to support institutional investments to accelerate adoption of practices for increasing resource-use efficiency represents an important step towards climate-resilient development in agriculture.

b) ***Building/strengthening effectiveness through incentivizing and de-risking private sector investment in smallholders and climate smart technologies***

Effective climate change adaptation requires effective – and adaptive – governance and institutional structures. The Programme will facilitate creation of farmer service driven agricultural enterprises that bring appropriate technologies and new approaches. By creating conditions that allow for building the application of new technologies and climate smart practices into key value chains in the river basins, makes investment into building resilience more effective and efficient. Through facilitating the reorganization of the national incentive framework for climate smart agriculture, the Programme addresses the lack of connection between national policies on climate change adaptation and the local institutional situation on the ground.

c) ***Leveraging digital technology platforms to facilitate adaptation***

The Connected Farmer Platforms, which are digital mobile software solutions, to link thousands of smallholder farmers by enabling access to information, services and markets. Once a farmer is registered on a farmer base, communication can take place via SMS and deliver a range of services that enable access to relevant climate smart information, including weather- and climate services, as well market-related information and good agriculture practice guidelines developed by the project, access to new markets through linkages with both formal and informal value chains both on the input and off-taking side, and access to financial services focusing on cashless value distribution (vouchers) and e-receipting.

ii. Strengthening regional institutional and operational frameworks for adaptation

The SADC Region aims to adapt to and mitigate the current and potential future impact of an array of climate change induced hazards and risks which reduce resilience and contribute to social and economic vulnerability. The risks and hazards include floods and droughts and transboundary and cross river basin pests and diseases of plants and animals, food hazards and insecurity. Because of transboundary nature of the above challenges, an inefficient coping system in any one member state has a regional dimension, thus the hazards cannot be effectively addressed at individual member states level in the absence of a streamlined regional coordination and linkages to information and knowledge for informed decision making.

Over 70 per cent of the SADC region's fresh water resources are shared between two or more Member States, a situation that has been the basis for the development and adoption of a series of regional instruments to support the joint management and development of shared water courses. The SADC instruments for water cooperation include the Regional Water Policy, adopted in 2005; the Regional Water Strategy adopted in 2006 and Regional Strategic Action Plan on Integrated Water Resources and Development Management which was first approved by SADC Summit in August 1998 to run in five-year phases. This facilitates the need for strengthening the regional approach in dealing with adaptation to climate change in as much as it affects the availability of water as a shared resource. Integrated planning of land, agriculture, forests, fisheries and water at local, watershed and regional scales, to ensure synergies are properly captured is thus important. Some of the reasons why regional institutional frameworks and operational processes for managing resilience to climate change is required, include:

- A regional approach creates opportunity for cross border and transboundary internalization of the international externalities especially of those associated with shared water courses and resources. Since freshwater in rivers is a flow resource, no single country can claim absolute sovereignty over it; different riparian in transboundary basins may have different needs and goals, which have potentials for conflict as well as cooperation. Probable transboundary impacts and conflicting interest can, however, be solved by equity-based cooperation, strong and enforceable legal framework, and joint approaches to planning and management. The UNESCO Programme from Potential Conflict to Cooperation Potential (PCCP) will provide the tools for this project to strengthen the regional and transboundary water management.
- A significant part of weather prediction and forecasting, monitoring and early warning is already done at regional level in the SADC region. There is however a need in strengthening these processes to bring better benefits and services to the communities. The SARCOF is a regional climate outlook prediction and application process adopted by the fourteen countries comprising the Southern African Development Community (SADC) Member States: Angola, Botswana, Democratic Republic of Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe in conjunction with other partners. Currently, there is however a mismatch in temporal and spatial resolution of the climate information currently provided, which are too coarse for local farmer to be useful as a climate service. The Programme will engage in regional capacity building to address this gap and generate high resolution climate services at sub-seasonal-to-seasonal (S2S) timeframes for the pilot basins.
- There are opportunities to facilitate transboundary and cross basin sharing of practices, technologies and joint planning of responses in times of emergencies and disasters. Adaptation measures being applied in this Programme in the five project countries will generate lessons learned, and validation of best practices to be documented and replicated in other areas and countries. UNESCO, FAO, SADC SECRETARIAT and FANRPAN have sufficient experience and systems in place for knowledge management, documentation and dissemination. FAO has both national and field level offices and technical teams in place in all project countries that will provide a critical role in capturing and sharing experiences.

- The regional approach will enhance cost effectiveness of capacity development as well as ensuring a certain level of generic scope of tools and processes developed for future application beyond the target sites and countries. By using existing structures and staffing in the field already familiar or skilled in the farmer field school approach, start-up will be quick and cost effective.
- Provide accountability and resilience to capture: All projects are exposed to capture by local elites and political interests. A regional approach helps create greater visibility and accountability to the use of funds. More impartial external audits can be used to track use of funds and impact achieved.

iii. Leveraging the river basin approach to facilitate cross basin and transboundary response

There are incremental benefits in cross-basin and trans-boundary sharing of information on technologies, practices and new approaches. The basins being considered in this project currently experience a myriad of challenges such as population pressure, deforestation, agriculture-related pollution and environmental degradation, over-abstraction of water, overgrazing, flooding, charcoal production, and resource conflicts that are best addressed through a holistic ecosystem based approach. Some of the benefits of taking the basin approach include:

- Both water basins are vulnerable to climate change effects. Catchment degradation which increases the risk of droughts and floods is the most widely faced challenge, increasing risks for all water users - farmers, energy producers, industry, and pastoral groups. Increase climate variability and change has led to deforestation, desertification and forest/land degradation.
- Climate change is expected to affect all of natural resources to some degree, groundwater included. Not only will changes in climate affect the amount of water falling as precipitation and the amount of evapotranspiration, ultimately affecting the amount of groundwater recharge; but it will also affect the degree to which populations rely on groundwater.
- The changes that are being observed in precipitation and other factors that impact water balance suggest that a dynamic climate risk assessment framework which captures changes in basins is necessary to conceptualize and investigate the projected changes in groundwater. Therefore, the Programme foresees the establishment of a Climate Risk Informed Decision Analysis (CRIDA), to identify current and future water security vulnerabilities, and to provide a pathway for the identification and selection of robust adaptation strategies.
- Green Water Potential[18]: Many of the large river systems of the region are nearing closure or are already closed, meaning that all of the blue water in these systems is largely already allocated (Falkenmark and Rockström 2005). In the majority of the countries in southern Africa, green water supplies comprise over 80 % of the annual water used in the food sector. The majority of this water is used in the production of rainfed crops. In hyper-arid areas blue water plays more of a role, supplementing the inadequate availability of precipitation. Irrigated agriculture

[18] Green water is soil moisture used in rain fed agriculture, while Blue water is the surface and groundwater water extracted from rivers, lakes and aquifers for irrigation.

accounts for two-thirds of blue water withdrawals in southern Africa. Future demands will increasingly have to rely on more efficient uses of green water and improved rain fed agriculture. There are inefficiencies in the use of green water that with improved management could help meet future water demands in sub-Saharan River basins (Falkenmark and Rockström 2005).

E. Describe how the project / programme is consistent with national or sub-national sustainable development strategies, including, where appropriate, national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist. If applicable, please refer to relevant regional plans and strategies where they exist.

Cross-sectoral approaches to policy development are essential. The proposed Programme and its interventions presented in Section A should be in-line with the respective global, regional and national government priorities. This Section presents how the proposed Programme's thematic focal area of (i) transboundary water management, (ii) food and nutrition security, (iii) disaster risk reduction, and (iv) early warning systems offers significant additional adaptation efforts needed to address adaptive capacities for smallholder farmers in water stressed river basins in Southern Africa. The Section addresses the critical interface between climate, agriculture, disaster risk management and livelihoods. Coherent policy development requires strategic, logical assessment of interlinkages, trade-offs and opportunities within and across sectors and over spatial and temporal scales. However, for many countries realising policy coherence is challenging.

At Global Level

The Sustainable Development Goals, which are the blueprint to achieve a better and more sustainable future for all, are guiding our Programme to address the global challenge of strengthening adaptive capacities related to poverty, inequality, climate, environmental degradation, prosperity, and peace and justice. Specifically, our Programme addresses Goal 13 which is asking us to "take urgent action to combat climate change and its impacts"
Regarding the United Nations Framework Convention on Climate Change (UNFCCC), all five focal countries are signatories to the Paris Agreement[19] which encourage all stakeholders to take action toward reducing the impacts of climate change.

The proposed Programme directly supports the Global Framework for Climate Services (GFCS) which seeks to provide a worldwide mechanism for coordinated actions to enhance the quality, quantity and application of climate services. GFCS, aligns to our Programme as it is a UN-led initiative spearheaded by WMO to guide the development and application of science-based climate information and services in support of decision-making in climate sensitive sectors; especially its agriculture and food security, water and disaster risk reduction.

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[19] Paris Agreement: https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=XXVII-7-d&chapter=27&clang=_en

Regional level (especially SADC)

At continental level, commitment 6 of the Malabo Declaration seeks to "Enhancing Resilience to Climate Variability" and this requires the existence of government budget-lines on resilience building incentives and instruments for catalysing adoption of climate-smart approaches along value chains. However, progress is still lagging behind and therefore the proposed Programme is timely.

Relevant to the topic, there is a Water Sector Governance in Africa (web link) covering key issues related to national level governance, legal frameworks, institutional arrangements and equitable services provision; amongst others.

The Southern African Development Community (SADC) has the following strategies and instruments which support the Programmes work:

- *Transboundary water management*: There are; Regional Water Strategy (web link); Integrated Water Resources Management Initiative (SADC-WIN) (web link), and Water and Regional Integration Strategy - The role of water as a driver of regional economic integration in Southern Africa (web link).
- *Food and nutrition security*: There are Regional Agricultural Policy Country Summary Agricultural Policy (i.e., a review report - web link); and The Food and Nutrition Security Strategy (FNSS – web link) which was developed to implement a wide range of SADC policies and programmes which aim to holistically address issues of food and nutrition security from a multi-sectoral perspective. In addition, the SADC has a Regional Vulnerability Assessment & Analysis (RVAA) instrument which add value to our Programme and vice versa. The Programme will also leverage the Famine Early Warning Systems Network (FEWS NET) which is a leading provider of early warning and analysis on food insecurity.
- *Disaster risk reduction*: SADC has an established a Regional Platform for Disaster Risk Reduction responsible for coordinating regional preparedness and response programmes for trans-boundary hazards and disasters. However, its information and knowledge management systems is till weak which also lacks comprehensive and constantly updated risk assessments and analysis.
- *Early warning systems*: The SADC Climate Services Centre intends to provide operational, regional services for monitoring and predicting extremes in climate condition; but it struggles to develop and disseminate meteorological, environmental and hydro-meteorological information and products. Therefore, the Programme will develop strong linkages with the Climate Services Centre.
- *Climate change adaptation*: there is an SADC level Climate Change Adaptation in SADC: A Strategy for the Water Sector (web link)

As a cross-cutting theme, the Programme will mainstream gender as per SADC Gender Protocol that seeks to integrate gender equality and equity as a fundamental human right and climate change as per Climate Change Adaptation (CCA) Strategy for the Water Sector whose

main goal is to lessen impacts of climate change through adaptive water resources development and management in the Southern African region.

National Level

National Development Plans

Angola: The Development strategy for 2000 – 2025 aim to (i) To promote employment and enhance human resources; (ii) To construct a more fair and equitable society; (iii) To guarantee the sustainable use of the environment, natural resources and to fight desertification; and (iv) To build up competitiveness and develop the private sector.

Mozambique: The current development plan, the Action Plan for Reducing Poverty 2011-14, aims to reduce the proportion of the population living in poverty from 55 per cent in 2009 to 42 per cent in 2014; to close the country's infrastructure gap; and to promote human and economic well-being through rapid and inclusive growth.

Namibia: The fourth National Development Plan (NDP4), in order to keep our national pride of having a clean environment (as is a right stated in our Constitution) we expect all elements of society, and businesses in particular, to support a precautionary approach (as per the Precautionary Principle) to environmental challenges and alterations of the natural world contributing to climate change, undertake initiatives to promote greater environmental responsibility, and encourage the development and diffusion of environment-friendly technologies.

South Africa: The National Development Plan aims to eliminate poverty and reduce inequality by 2030. Section 5 - Environmental sustainability: An equitable transition to a low-carbon economy, and Section 6 - An integrated and inclusive rural economy are the most relevant to our proposed Programme.

Zimbabwe: The Zimbabwe Country Strategic Plan (2017-2021) supports the Government's social protection strategy, so that vulnerable populations across the country are able to meet their basic needs all year round, and thus minimize the need for humanitarian responses in future. Most relevant are the following specific objectives (i) Smallholder farmers have increased access to well-functioning agricultural markets by 2030; (ii) Food-insecure rural households achieve food security and demonstrate resilience to seasonal shocks and stressors; and (iii) Zimbabwe's social protection system ensures that chronically vulnerable populations across the country are able to meet their basic needs all year round.

National Adaptation Plans

At country level, the Programme will also aim to be aligned with the National Adaptation Plans (NAPs) and other national climate change strategies, policies and frameworks of the target countries. With regard to presence of NAPs at the focal countries, Zimbabwe and Namibia have national climate change (CC) strategies while Angola, Mozambique and South Africa has NAPs.

- *The Angola 2011 National Adaptation Programme of Action* is an instrument aimed at communicating the urgent and immediate adaptation challenges facing the country. The NAP prioritize the following sectors relevant to our Programme: Farming,

livestock, forestry and fisheries sectors; Water sector; and Telecommunications and information technologies sector.

- *The 2007 Mozambique National Adaptation Programme of Action* presents the immediate and urgent needs of the country that have been identified during the participative evaluation process, for the purposes of strengthening national capacity to cope with the adverse effects of climate change. Most relevant specific objectives are to (i) Strengthen the early warning system in the country; (ii) Strengthen the capacities of family farmers to dealing with the adverse effects of climate change; and (iii) Improve the knowledge and strengthen the management of river waters.
- *The 2020-2013 Namibia National Climate Change Strategy and Action Plan* outlines a coherent, transparent, and inclusive framework on climate risk management. Most relevant it presents detailed Namibia's regional profile for all regions in the country, and the projections under climate change for key agriculture sectors. It also underscores (i) need for information packages and targeted awareness-raising and training to decision-makers and practitioners on Climate Change Adaptation, (ii) Information Packages and Targeted Awareness-raising and Training to Decision-makers and Practitioners on Climate Change Adaptation; and National Climate Risk Management Capacity.
- *The 2016 South Africa National Adaptation Strategy* seeks to enhance the momentum increased, in particular, after South Africa issued its National Climate Change Response Policy (NCCRP) White Paper. The NAP promotes the vision of a climate-resilient South Africa. Relevant to our Programme, disaster risk reduction and management; water; agriculture, forestry and fisheries; and climate change adaptation governance are emphasized as the way forward.

The Table below presents how the proposed Programme strategic areas of transboundary water management, food and nutrition security, disaster risk reduction, and early warning systems are covered:

Country	Thematic Focal Area			
	Transboundary water management	***Food and Nutrition Security***	***Disaster Risk Reduction***	***Early warning systems***
Angola NAP[20]	Talks about water resources but is not explicit on transboundary issues.	Has a section dedicated to food and nutrition security.	Has a section that talks to disaster prepared but is not explicit on risk reduction.	Talks to early warning systems
Mozambique NAP[21]	The plan is precise on "strengthening of management or regulations in order to better manage river resources with neighbouring countries".	Talks about "Strengthening capacities of agricultural producers to cope with climate change", but does not give food and nutrition security	The document puts "...emphasis on the prevention of natural disasters and Alert and Early Warning Systems".	The document puts "...emphasis on the prevention of natural disasters and Alert and Early Warning Systems".

[20] Angola NAP: https://unfccc.int/resource/docs/napa/ago01.pdf
[21] Mozambique NAP: https://unfccc.int/resource/docs/napa/moz01.pdf

		the weight it deserves.		
Namibia CC strategy[22]	One of the strategies is to, "Improve Trans-boundary cooperation regarding water resources".	Emphasis is on food security and not food and nutrition security.	"Disaster Reduction and Risk Management" is regarded as a cross cutting theme in the document.	Early Warning System (EWS) is part of the strategic focus areas in the document.
South Africa NAP[23]	Is precise on "Transboundary Cooperation" is one of the governance strategies.	Emphasis is on food security and not food and nutrition security.	Has Disaster risk reduction and management as one of the sectoral adaptation priority strategies.	Early warning systems are intervention two under Disaster risk reduction and management in the document.
Zimbabwe CC strategy[24]	Recognises Transboundary River Basin agencies in the strategy framework however, not much detail is provided.	Emphasis is on food security and not food and nutrition security.	Pillar one of the strategy is "Adaptation and Disaster Risk Management".	Early warning systems are cross-cutting in almost all "Sector Specific Strategies".

Sector Specific Policies and Strategies

The Table below presents other related policies and strategies which are in one way or the other are relevant to the Programme components of (i) Implementing Measures to Reduce Exposure to Climate Related Risks, Hazards and Threats and Enhance People's Resilience; and (ii) Diversifying, strengthening and increasing adaptive capacities, livelihoods and sources of income for vulnerable people in targeted areas. They are classified per country and per sector. For easier reference, were possible the policy and strategy documents web links are provided.

22 Namibia CC strategy: http://www.met.gov.na/files/files/National%20Climate%20Change%20Strategy%20&%20Action%20Plan%202013%20-%202020.pdf

23 South Africa NAP: https://www.environment.gov.za/sites/default/files/docs/nas2016.pdf

24 Zimbabwe: http://extwprlegs1.fao.org/docs/pdf/zim169511.pdf

Country	Key policies relevant to proposed the Programme
Angola	*Water Management* • Water Resource Management Under Changing Climate in Angola (web link) • Angola Water Partnership (web link) • Water Governance – Influencing Policy in Angola (web link) *Agriculture and Poverty Reduction* • Agricultural Economy and Policy (web link) • Angola Country Programming Framework: 2013-2017 (web link) • Resettlement Policy Framework: Smallholder Agriculture Development and Commercialization: 2015 (web link) • Strategy to Combat Poverty - Social Reinsertion, Rehabilitation and Reconstruction and Economics Stabilization: 2013 (web link) *Disaster Risk Management/Reduction* • Sendai Framework for Disaster Risk Reduction 2015 – 2030 (web link) *Early Warning System* • Did not find *Climate Change Adaptation* • Climate Change Adaptation in ANGOLA (web link) *Gender* • Did not find
Mozambique	*Water Management* • Mozambique Country Water Resources Assistance Strategy (web link) *Agriculture and Poverty Reduction* • Mozambique Agricultural Development Strategy (web link) • Action Plan for the Reduction of Absolute Poverty (web link) • Poverty Reduction Strategy Paper (web link) *Disaster Risk Management/Reduction* • National policy on disaster management: 1999 (web link) *Early Warning System* • Did not find *Climate Change Adaptation* • *National Adaptation Programme of Action (NAPA) (web link)* *Gender* • Beijing+20 Mozambique Report on the Implementation of the Declaration and Platform For Action (web link)
Namibia	*Water Management* • National Policy on Climate Change (web link) *Environment* • Environmental Management Act No 7 (web link)

	• Environmental Law and Policy in Namibia (by Universiteit van Stellenbosch) (web link) • Nature conservation legislations (web link) *Agriculture and Poverty Reduction* • Namibia Agriculture Policy: 2015 (web link) • Communal Land Reform Act (web link) • Agricultural (Commercial) Land Reform Act, 1995 (web link • Poverty Reduction Paper (web link) • Livestock improvement act 25 of 1977 (web link) • Drought Policy (web link) *Disaster Risk Management/Reduction* • National Disaster Risk Management policy (web link) • National Disaster Risk Management Plan: 2011 (web link) *Early Warning System* • National Early Warning and Food Information System (web link) *Climate Change Adaptation* • Namibia Climate Change Strategy (web link) • FANRPAN climate-smart agriculture policy brief (web link) *Gender* • National Gender Policy: 2010/20 (web link)
South Africa	*Water Management* • White Paper on Water Policy (web link) • National Water Resource Strategy (web link) *Agriculture and Poverty Reduction* • White paper on Agriculture, 1995 (web link) • White Paper on Agricultural Policy, 1998 (web link) • Land Redistribution for Agricultural Development (LRAD), 2001 (web link) • Comprehensive Rural Development Programme (CRDP) – 2013 (web link) • Policy on Agriculture and Sustainable Development (web link) • National Agriculture Research and Development Strategy (web link) • South African Agricultural Production Strategy (web link) *Disaster Risk Management/Reduction* • *Policy framework for disaster risk management in South Africa (web link)* *Early Warning System* • Climate Information and Early Warning Systems (web link) *Climate Change Adaptation* • South Africa climate-smart policy brief (web link) *Gender* • Strategy toward gender mainstreaming in the environment Sector: 2016-2021 (web link) • National Gender Policy Framework (web link)

Zimbabwe	*Water Management* • The National Water Policy: The Gaps Between the Policy and its Implementation (web link). *Agriculture and Poverty Reduction* • Zimbabwe Medium Term Plan (MTP) 2011-2015 (web link) • The National Agricultural Sector Policy (web link) • Comprehensive Agricultural Policy Framework (2012-2032) (web link) • Integrating Food, Nutrition and Agricultural Policy in Zimbabwe (web link) • The Food and Nutrition Strategy (web link) • FANRPAN's Pathways for irrigation development: policies and irrigation performance in Zimbabwe (policy paper) • The Conservation Agriculture (CA) Upscaling Framework Document for Zimbabwe (web link) *Disaster Risk Management/Reduction* • Zimbabwe's Preparedness to Manage Meteorological Disasters as Informed by Disaster Risk Management (web link) • Zimbabwe National Contingency Plan (web link) *Early Warning System* • Famine Early Warning Systems Network *Climate Change Adaptation* • FANRPANs climate-smart agriculture policy study report (web link) • FANRPANs climate-smart agriculture policy brief (web link) *Gender* • The National Gender Policy: 2013-2017 (web link)

F. Describe how the project / programme meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund.

In compliance with AF's Environmental, Social and Gender policies, the project implementation team will also ensure that all relevant national technical standards, laws and byelaws for construction and infrastructure are adhered to where such developments are required as part of the project especially under Component 2. To support this, all project activities will be implemented in close collaboration with the SADC Meteorology Department which Houses the Secretariat, National Meteorological and Hydrological Services (NMHS's) and the relevant Ministries of Agriculture, Livestock and Environment so as to ensure

compliance with the relevant standards and technical guidelines in each of the target countries. Overall, the project has been designed to comply with all relevant national and international laws including various SADC Protocols on Shared Resources, climate change and meteorology, regulations and technical standards related to resilience building in the project target areas. Labor laws will also be adhered to in line with international standards. The national and international standards related to weather and climate information as prescribed by the WMO and the National Meteorological and Hydrological Services in the target countries will be adhered to so as to ensure quality outputs in this regard. A project grievance mechanism will be introduced in all target communities, so as to ensure that there is a mechanism for stakeholders to communicate and get feedback on any problems regarding project implementation including problems related to environmental and social standards.

The UNESCO and FAO project cycles obligates every project to be screened for environmental and social risks, and as such this project has been preliminary screened to comply with the Adaptation Fund's Environmental and Social Policy. The preliminary screening has involved checking for the following factors:

- That the project will not negatively affect the tenure rights of individuals, communities or others;
- That the project will not have any negative impact on the biodiversity and genetic resources of the target communities;
- That the project will not have a negative effect on water availability and quality in the target areas;
- That the project will not result in the displacement of any people in the project target areas;
- That the project will not encroach into or affect protected areas and critical habitats;
- That the project will foster gender equality and promote equitable access to resources and services;
- That the project will be sensitive to the culture of the people in the target areas.

The Programme has been found to meet all of these requirements all of which will be continually monitored throughout project implementation to ensure that no negative social or environmental affects emerge as a result of the project. The limited adverse impacts that could emanate are mostly through Component 2 of the project which will incorporate on the ground adaptation investments related to the upgraded business model. This means the project potentially falls within the Category B rating of the Environmental and Social Policy of the Adaptation Fund.

G. Describe if there is duplication of project / programme with other funding sources, if any.

Name of project and year	Project focus	Complementarity/ Synergies
Limpopo River basin		

Resilience In The Limpopo Basin (RESILIM) Program (2012-2017)	USAID southern Africa-funded Resilience in the Limpopo Basin (RESILIM) program, which commenced operation in June 2012, has at its core the improvement of the basin's ecosystems and the resilience of livelihoods. The RESILIM strategy integrates water management, biodiversity conservation and adaptations to climate change, with a view to building resilience for the long term sustainability of the LRB. A desk-top review status quo of the basin – its water users, development prospects, governance and institutions, as well as risks and vulnerabilities using geographical information systems (GIS) formed a spatial picture of climate risk and vulnerability of the area. The expert review of these findings provided critical in-depth insights into this highly vulnerable region, complemented by stakeholder consultation and participatory analysis across the basin. The second component of RESILIM work undertaken by OneWorld has been a communications and training strategy, focused mainly on improving transboundary river management and supporting the development goals of the Limpopo Watercourse Commission (LIMCOM) and Southern Africa Development Community (SADC).	The project largely generates evidence for targeting within the LRB. OneWorld, a core consortium member of the RESILIM Program implementation team, has led the work done in building the evidence base for building resilience in the basin. Through the combined process of R&V mapping and expert consultation, eight case studies (or 'hotspots') emerged as areas of heightened vulnerability. These case studies were used as a means of understanding more localised vulnerabilities across the LRB, as well as ways in which basin-wide resilience could be built through replication and scale.
Challenge Program on Water and Food: Limpopo Basin Development Challenge (LBDC)	The LBDC is a scientific and development challenge that seeks to increase the productivity of rain fed agriculture, increase the resilience of small-scale farmers and reduce the risks associated with an unpredictable climate. The LBDC consists of four technical research projects and one coordination project. The lead institutions and projects are: L1) SEI – Targeting and scaling out; L2) ARC – Small water infrastructure; L3) ICRISAT – Farm systems and risk management; L4) WaterNet – Water governance; and L5) FANRPAN – Learning for innovation and adaptive management. The ultimate goal is to have science based evidence included in and/or informing basin decision making	The project largely generates evidence for the proposed program. The LBDC research projects were designed to support existing efforts by the four basin countries to improve water management, agricultural productivity and livelihoods in the basin.

	leading to improved smallholder productivity and reduced risk in rain fed production systems.	
WACDEP programe under the Global Water Partnership	WACDEP is an African Ministers' Council on Water (AMCOW) Programme implemented by GWP and Partners in order to realize the climate change related commitments expressed by African Heads of State and Government in the 2008 Sharm el Sheikh Declaration on water and sanitation. The Programme is embedded in the AMCOW Work Plan and is supported by a WACDEP Africa Coordination Unit (CU) based in Pretoria in close coordination with the AMCOW secretariat. The WACDEP aims to promote water security as a key element of sustainable development of countries and regions and to contribute to climate change resilience for economic growth and human security.	WACDEP is aimed at supporting governments and communities in the basin to take measures that are focused in the areas of flood mitigation and risk management as well as aligning crop production systems that can cope with water scarcity.
GRID Arendal: Limpopo River Basin: Atlas of Our Changing Environment.	The project will produce an Atlas of the Limpopo River Basin's Changing Environment, with a particular focus on the impact of drought and floods. Local experts will be trained in the gathering and generation of satellite change pairs, a skill that they will use in preparing similar atlases in future. Databases of maps, graphics and photographs will also be built from materials used in the visualization of the atlas. This Story Map describes the disaster risk profile of the Limpopo River Basin and is a synthesis of material drawn from the forthcoming Limpopo River Basin: Atlas of Our Changing Environment. The Story Map uses text which is enriched by a set of visuals that include maps, graphics, photographs and satellite imagery.	The project generates a lot of baseline information for the proposed Programme. The findings from the Limpopo River Basin atlas are mainly targeted at the Limpopo River Basin Commission, the Southern Africa Development Community, technical arms of the African Union such as the African Ministerial Conference on the Environment and African Ministerial Conference on Water, media groups, and politicians.
Kunene River Basin		
African Centre for Water Research capacity building of the Permanent	GTZ (German Technical Cooperation) is assisting in providing capacity building to further strengthen River Basin Organizations in SADC. Together with its project partners Ramboll Natura (Sweden) and Stockholm International Water Institute (SIWI), the African Centre for Water Research provides training in	A main recommendation from this initiative useful for the proposed Programme is that there is need to provide and further develop water supply infrastructure to serve communities in the basin as well as an input to socio-

Joint Technical Commission (JPTC)	transboundary water management for the Permanent Joint Technical Commission (JPTC) for the Cunene River, shared between Angola and Namibia. The rehabilitation of the Calueque-Ondangwa-Ondjiva water supply scheme (Cunene River, Angola / Namibia), financed within the Financial Cooperation of SADC and Kreditanstalt für Wiederaufbau (KfW) has been chosen as pilot project in SADC.	economic development projects in both countries.
Transboundary Water Management in SADC	The objective of the Transboundary Water Management in SADC Programme is to strengthen human and institutional capacities for sustainable management of water resources according to the Regional Strategic Action Plan (RSAP) at regional and basin levels. The program focuses on Strengthening of SADC Water Division, RBOs and Water Utilities, RBO Exchange Programme; Development of Integrated Water Resources Management (IWRM) Plans, Training in IWRM, Information Management and Policy harmonisation The international cooperating partners are BMZ - Federal Ministry for Economic Cooperation and UKaid (from the Department for International Development) and AusAID - Australian Agency for International Development. The lead implementing agency and responsible institution for the Programme is the SADC Secretariat in Gaborone, Botswana. The project duration is from 2005 to 2015. This Programme includes LIMCOM - Limpopo Watercourse Commission, ORASECOM - Orange-Senqu River Commission, Kunene PJTC - Kunene Permanent Joint Technical Committee and Rovuma JWC - Rovuma Joint Water Commission	The Programme provides important lessons and baselines in terms of transboundary and inter-basin collaboration which the proposed Programme will leverage.
UNESCO: Enhancing Climate Services for Improved Water	The overall objective of the project is to provide reliable climate services to monitor and forecast droughts and floods at the local level to improve national risk management strategies and to lower the impact of water-related hazards on vulnerable communities through improved	The project is not targeting specifically the pilot areas of this Programme, but can leverage in co-funding for capacity building and the development of (regional) climate services.

Management	communication and outreach in pilot regions of Latin America, the Caribbean and Africa, with particular attention to climate change vulnerabilities.	

H. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

The Programme applies some cutting edge approaches deep rooted in inclusive climate smart value chain development applying FAO Soft methodology in facilitating sustainable adaptation in rural communities. It therefore generates a lessons and validates best practices, technologies and approaches in dealing with adaptation in poor rural communities. These will be documented and packaged for replication in other areas and countries.

Under activity 1.4.1, the Programme will facilitate the establishment and operationalization of a Regional Knowledge- Action Policy Platform (KAPP) on Climate Resilience for Southern Africa. The KAPP will be a collaborative network that facilitate highly integrative sustainability in knowledge co creation and application. The KAPP will build on the broad range and diversity of specialist expertise, multidisciplinary backgrounds represented in the large community of policy makers, researchers, private sector players and community development practitioners associated with UNESCO, FAO, SADC SECRETARIAT and FANRPAN and those within the Kunene and Limpopo river basins.

UNESCO, FAO, SADC SECRETARIAT and FANRPAN have significant experience and systems in place for knowledge management, documentation and dissemination across countries. FAO will use its network of Country offices and regional offices in the Africa Region to disseminate the knowledge and the lessons leant through the project. The UNESCO will also use its networks and other ongoing projects and leverage its MoU with SADC SECRETARIAT to disseminate lessons and best practices generated through the project. The SADC will leverage the Institutions in the Meteorology Department including the Climate Services Center, the Meteorological Association of Southern Africa (MASA), and Regional Meteorological Training Centers (RMTCs), Regional Instrument Calibration Centre (RICC) to communicate lessons and best practices generated through the Programme. Further, the SARCOF which is the regional climate outlook prediction and application process adopted by and coordinated by the SADC Climate Services Centre (SADC CSC) will be used to disseminate and share lessons and knowledge related to climate and weather. The FANRPAN will leverage its inter-sectoral platform designated as country nodes. Each country node has members comprising stakeholders from government, private sector, farming unions, policy research institutions and non-governmental organizations. The nodes convene in-country stakeholder consultations to define policy agenda, undertake policy research and conduct policy advocacy. FANRPAN builds its foundation on a long-term investment and commitment already made in established knowledge centers such as universities and policy institutes in Africa.

I. Describe the consultative process, including the list of stakeholders consulted, undertaken during project / programme preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy of the Adaptation Fund.

To initiate and sustain constructive stakeholder relationships over time, informed participation of all Programme stakeholders including indigenous communities and compliance with the Environmental and social policy of the Adaptation fund(which is intended to minimise social harms as outlined in Section L) the Programme underscores multilevel consultation as a key priority.

The consultative process for this Regional Programme includes three phases namely i) Key informant interviews with strategic stakeholders that have been ongoing; ii) Country level consultation and engagement which has been done; and iii) Community and value chain level consultation and engagement which will be done at inception. Each of these key components of the consultation process is described in the proceeding section.

i) Key informant interviews with strategic stakeholders

A number of consultative interviews were held with strategic stakeholders in the scoping and conceptualization phase and throughout the process of development of the proposal. These stakeholders were identified because of their knowledge and roles in the region.

- **SADC Secretariat**: A number of meetings were carried out with the SADC Secretariat some of which were held on the sidelines of the Southern African Regional Climate Outlook Forum (SACOF). The SADC Climate Services Centre helped in identifying, aligning and framing the priorities with respect to weather and climate information as well as existing programmes and projects. Interviews with the SADC Disaster Risk Reduction Unit responsible for coordinating regional preparedness and response programmes for trans-boundary hazards and disasters gave insights on the challenges and intervention priorities in terms of regional early warning and response systems. The SADC water division gave inputs on the adaptation priorities especially transboundary and integrated water resources development and management especially in the face of climate change.

- **CRIDF:** Consultation was done with Climate Resilient Infrastructure Development Facility (CRIDF), an institution working in 12 different countries in Southern Africa that share water resources to provide long-term solutions to water issues that affect the lives of the poor in Southern Africa. The meeting provided valuable inputs on water based adaptive solutions that will be part of the upgraded climate smart infrastructure described under Outcome 2 of the intervention framework. Insights were also given on not only building short-term water infrastructure, but on working with organizations to show them how they can better build and manage their own water infrastructure to improve people's lives.

- **FANRPAN:** The Food Agriculture Natural Resources Policy Analysis Network (FANRPAN) was consulted to give more insights on the regional adaptation and

climate change policy terrain, and valuable contributions were made which have become part of the intervention framework under Outcome 1.4. Due to the importance of the enabling environment and the need to make adaptation more sustainable by reorganizing the national incentive framework for facilitating adaptation, FANRPAN has now been roped into the project execution team. FANRPAN will lead in activity 1.4 in improving integration of climate resilience strategies into country development plans.

- **Chemonics International**: a consultative meeting was done with Chemonics International which from June 2012 to December 2017 has been implementing the USAID-funded Resilience in the Limpopo Basin Program (RESILIM) in water management, biodiversity, and climate change adaptation in the Limpopo basin. One of the major products is an Atlas which shows Changes, challenges and opportunities in the basin, and which has been used to inform formulation of the intervention framework proposed in this Programme.

Catalytic value and potential of the intervention framework: Further to these meetings, the FAO value chain Soft methodology proposed in the intervention framework has been presented to a number of actors is already demonstrating how different stakeholders would leverage the Adaptation Fund funding to upscale sustainable adaptation activities in the region as below:

- **International Fund for Agricultural Development (IFAD)**: Meetings were held with the IFAD and the organization has expressed willingness to avail additional grant funding to upscale the aspect of development of climate smart inclusive value chains particularly in South Africa. FAO is already working to develop a proposal on Rural Income Certainty and Climate Smart Value chains that applies the FAO value chain Soft methodology proposed in the intervention framework to access the IFAD Grant. This demonstrates how AF funding can be used to catalyze additional funding from other actors in blended finance models in the upgraded business model.

- **AfDB and Landbank of South Africa**: Meetings were held with two key financial institutions to explore areas of collaboration especially in the development of the upgraded business model for the climate smart inclusive value chains. The African Development Bank has since expressed interest in potentially collaborating, or upscaling this transformative initiative building on the potential successes they see in the proposed intervention model (as outlined under Outputs 2.2 and 2.3). There is registered interest in upscaling to other commodities and other countries the upgraded inclusive climate smart value chain business model basing on the FAO value chain Soft methodology proposed in the intervention framework. The same interest has been expressed by the Landbank of South Africa in terms of blending the financial model of the upgraded business model.

- **Water Research Commission (South Africa)**: Consultation meetings with the Water Research Commission in South Africa have shown that the WRC is willing to collaborate in implementation particularly on aspects to do with Water Energy Nexus. They are prepared to put in financial resources to complement activities especially

from a research perspective to ensure that issues of water –energy -food nexus are dealt with, recognizing and emphasizing the transboundary nature of water resources.

i) Country level consultation and engagement;

The process for country level consultation was mainly through one-day workshops with the exception of Mozambique. The main purpose of the workshops was to obtain the inputs and contributions of national level stakeholders in terms of overall design and relevance of interventions. In addition, the consultation was aimed at ensuring and facilitating alignment, alliance and compliance with national and local policies, rules, regulations as well as ongoing programmes and projects in line with the AF's Environmental and Social Policy; and to get guidance on the selection of actual target communities and priority value chains to be targeted under the programme (the sites that have been identified are presented in Part 1(Section B IV g). In all the five countries, the consultation proceeded as follows:

- **In Namibia**, 31 participants with more than 15 of the participants being women attended the consultation workshop. It was opened by the Deputy Minister of Environment and Tourism and attended by two representatives for the Governors offices for Oshama and Omusati regions. The FAO Representative for Namibia and UNESCO Regional representative also gave opening Remarks. A detailed presentation of the project idea was done and participants deliberated and discussed the intervention framework. They were then split into two groups with Group 1 focusing on alignment of proposal to policies and ongoing projects; while group 2 focused on selecting the sites within the Kunene province.

- **In Angola**, the consultation followed the same approach with 20 participants attending of which 5 participants were women. The Governor of Kunene Province opened the meeting and expressed enthusiasm over the proposal. In the same fashion, a detailed presentation of the project idea was done and participants deliberated and discussed the intervention framework. They were then split into two groups with Group 1 focusing on alignment of proposal to policies and ongoing projects; while group 2 focused on selecting the sites within the Kunene province.

- **In Zimbabwe**, 26 participants with 14 of the participants being women attended the consultation workshop. It was opened by the UNESCO Regional Director, Senior officials from the Government of Zimbabwe particularly from the Ministry of Lands, Agriculture, Water, Culture and Rural Resettlement. A detailed presentation of the project idea was done and participants deliberated and discussed the intervention framework. They were then split into two groups with Group 1 focusing on alignment of proposal to policies and ongoing projects; while group 2 focused on selecting the sites within the Limpopo province.

- **In South Africa**, consultation 33 participants with 12 of the participants being women attended the consultation workshop. Participants came from Government, Government Parastatals, Farmer organizations and Research Institution. Senior officials from the Department of Agriculture Forestry opened the proceedings. A detailed presentation of

the project idea was done and participants deliberated and discussed the intervention framework. They were then split into two groups with Group 1 focusing on alignment of proposal to policies and ongoing projects; while group 2 focused on selecting the sites within the Limpopo province.

- **In Mozambique**, the consultation proceeded by way of meetings with key stakeholders. The stakeholders that were met over the two days include, Government of Mozambique officials, FAO Field Level officials, UNDP officials, Save the Children officials, and Care International officials. In each of the meetings, an overview presentation of the project idea was done to give a full picture of the intervention framework. Each of the stakeholders met were also asked to give their view in terms of policy and Programme alignment as well as on the selection of sites within the Limpopo province.

Table 3 presents a synthesis of the key issues raised by stakeholders during the multi country consultative process and how these have been or will be dealt with during the project cycle.

Table 2: keys issues raised by stakeholders from consultative process and how they are addressed

Issue raised by stakeholders	**How it is addressed**
How does the Programme capture the aspect of insurance and early warning to deal with more and more climate change related hazards?	In the upgraded business model for the inclusive climate smart value chain at each site, the proposal factors in the aspect of insurance as well as early warning systems are adequately captured as some of the services, which will be availed to the participating farmers and agro-pastoralists.
How will the proposal ensure representation of women and gender disaggregation?	At community and value chain level, initial gender analysis and assessment will be done to ensure that the upgraded business model is sensitive to the different needs, capabilities, roles and knowledge resources of women and men and identify how changing gender dynamics might drive lasting change. This will also give an estimation and allocation of adequate resources in the project/Programme budget for gender-responsive implementation, for example for the inclusion and capacity building of women stakeholders as important actors in implementation.
The issue of the size of the envelope needs to be carefully handled to ensure that we do not spread the resources too thin over a large area; it makes sense to focus even on one site	The Programme is structured to be catalytic and transformative, meaning it will enable institutions to transform and private sector to be attracted to provide certain services to smallholder farmers. It will demonstrate and prove the concept of strengthening adaptive capacities through embedding climate smart technologies and best practices into viable business chains for smallholder farmers, which become more and more funded by private sector. This

per country and make reasonable impact.	is expected to attract further investment from other key national actors. As highlighted, in key informant interviews with strategic stakeholders such as African Development Bank, land Bank of South Africa, and International Fund For Agricultural Development, there is already interest in upscaling such business driven climate value chains based on value chain Soft methodology
The roles of different government Departments should be very clear in the proposal.	The proposal has a very clear delivery mechanisms at the national level, which is spearheaded by a National Implementing Team with three working groups namely a Climate Information, Exchange and Meteorology Working Group; Inclusive climate smart value chain Development Working group and a Climate Smart Policy Incentives and Instruments working group. The NITs will be different each country but will likely be coordinated by Departments of Agriculture due to the strong value chain component. Section A under implementation arrangements provides detailed description of the overall arrangements and an initial indication of the stakeholders that will participate in the NIT in each country.
At what point is a socioeconomic and environmental baseline going to be conducted to ensure that we are able to measure the impact of the intervention after implementation?	At inception a number of processes will happen at different levels; most importantly, at the community and value chain levels, in-depth profiling and assessment not just from the business value chain perspective, but also from both a gender sensitive socioeconomic and environmental perspectives will be conducted to ensure that we are able to measure the impact of the intervention after implementation.
As the proposal is taking a basin approach, the aspect of water should be clearer –i.e. the proposal should be more clear how water issues are being addressed	The major cost driver in the proposal water management technologies and water infrastructure in the upgraded value chain business model and at community level. As outlined in Activity 2.2, the upgraded business model ensures better management of water resources as a factor of production.
How does the project address the issue of land ownership given that the most vulnerable people especially women are also likely not likely to have land---how does the proposal deal with this?	Land is one of the fundamental factors of production and access to secure land is important for meaningful inclusive VC development. Ensuring access to land is very important, but is beyond the scope of the project. At the sites, the proposal will work with smallholders who have secure use rights to land including women and youth, to be able to produce both livestock and crops.
How will the project deal with the issue of remoteness and	This is an important fact. However, the upgraded business model to be developed for a specific value chain at each site and the Value chain profiling that happen as part of the

inaccessibity of some of the potential sites a reality that might have negative impacts on success of project?	process will help in defining such business constraints. The hallmark of the value chain soft methodology is to deepen the understanding of the underlying business relationships, including with public institutions that have mandates in specific public services. However, the investment at each VC site will not depend on Government or other stakeholders for large public infrastructure investments to facilitate success of project. Instead, the choice of the specific sites will be carefully informed by the outcome of the VC profiling exercise that feeds into the upgraded business model, to direct investment to such areas, which are feasible, and requiring modicum adaptation infrastructure investments that are allowable within the AF investment framework. So under Activity 2.2, depending on the outcome of the profiling exercise, certain minimal investments in VC and community adaptive infrastructure may be inevitable.
To what extent will the project establish linkages with and lessons from other regional and national agricultural projects to enrich the invention framework and its implementation?	The consultation process has led to an initial identification of programs and project with which the project can form synergies. In addition, value chain soft methodology, which starts with in-depth VC and business profiling at VC level to develop the upgraded business model, will provide another opportunity so concretise synergies and linkages with other programmes and projects at each site. This is a major strength of the methodology applied in the project. This will ensure optimisation of resource use by stakeholders and prevent replication of activities
At what stage is in-depth consultation of farmers and agro-pastoral communities going to happen?	The proceeding section addresses this issue in more detail. This will be done extensively at project inception before any activities are carried out at the identified sites –especially in the design of the upgraded business model. The first activity at the site is in-depth consultation involving socioeconomic baselining profiling and a structured process to develop the upgraded VC.
How does the project address the involvement of youth?	The youth in the communities in each country have the opportunity to participate in the upgraded business models. This is particularly because the proposed intervention model –with a digital platform and business approach can be easily attractive to the youth.
The Kunene Governor in Angola raised the importance of the need for database of climate smart interventions to promote development partnerships-between government and other actors such as private	This is already part of the proposal under Activity 1.2 which focuses *inter alia* on facilitating profiling of new/improved value chain specific climate smart technologies, approaches and practices and establish an inventory of geo-specific resilient crop production systems and value chain risk reduction strategies, technologies and practices.

sector and development partners.	
How do we move away from handouts to more long-term interventions that sustainable build resilience?	This question came from high-level government officials in Mozambique. While there are many interventions in Gaza province, year in year out, there are disasters and people are clearly not better off with the interventions that are being implemented by both Government and development partners. It is therefore important to consider an intervention approach that is different, and that can bring real long terms adaptation benefits that go beyond the life of the project---and those that bring diversity to the sources of livelihoods to the vulnerable. The approach being proposed in the project embeds climate smart technologies adoption within the daily livelihood activities of the people, and connects them to the services they require to be able to participate actively in value chains. It strongly builds the business aspect to adaptation and represents a significant move from the handouts. According to official from CARE International, their evaluation has shown that if one is promoting value chains, it should not just be about nutritional outcomes, but should have impact on the household incomes for it to be sustainable. The business and profit component always makes the activity more attractive to the venerable people. Only those projects that had a significant component have a visible foot print in terms of technologies and good practices adopted.
How will the project deal with the issue of different farming systems?	The project intervention frame is sensitive to the different farming systems at all the different sites, including differences between sedentary and agro pastoral in Kunene, and those in the Limpopo basin as these farming systems are affected by different hazards. For instance, the upper part of Limpopo is prone to drought, while the lower part is prone to flooding. The consultation has also revealed that some of the people depend on (unsustainable) harvesting and selling of natural resources such as wood charcoal, mopane worms and such intricate differences will be considrere3d in the upgraded business models for each site.

ii) Community and value chain level consultation and engagement.

At project inception phase comprehensive and in-depth follow-up consultative activities will be undertaken to ensure that the end clients and target communities are adequately consulted and their views taken into account in project implementation. This will be to build on the initial consultative process, which included key informant interviews and multi-country workshops during the overall project design and preparation described in the preceding section. This will include comprehensive value chain and community level consultations at the sites, including with vulnerable groups such as female-headed households and key informants in the value chain upgrading consultation process. Further consultations will be

done at community level during socio economic and environmental baseline studies, needs assessment and priority setting activities of the project inception phase. These assessments will be designed to gather the views of a wide variety of stakeholders and will be used to refine the project implementation strategy where needed.

The community level consultations will aim to ensure that all different socio-economic groups of the community have a say in project design and implementation including men, women, youth and the elderly so that project activities can take account of and in some cases be specifically tailored to the specific needs and vulnerabilities of these different groups.

The main tool will be the FAO Value Chain Soft methodology approach which involves engaging all the potential actors for value chain in coming up with detailed underlying business relationships explained under Activity 2.1. This will yield the upgraded climate smart and resilient business model in which participating farmers have more capacity to adapt to the effects of climate change. The consultation will also include application of participatory tools for gender sensitive community consultation and the FAO Self-evaluation and Holistic Assessment to Climate Resilience of Farmers and pastoralists (SHARP). The process to identify community adaptation investments will also be a community based process with extensive stakeholder consultation in the target communities as a critical means of ensuring that the adaptation options utilized in the project meet the needs of the most vulnerable.

Following Programme inception consultations will be held in each of the target countries to obtain stakeholder support for the project and validate the final project design. As the project will work with a number of different field school and extension actors in each of the target communities including private sector, NGOs, CBOs and other community level support, the consultative process in each target community will also aim to engage all of these actors for their views on project implementation.

J. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

COMPONENT I: *Implementing Measures to Reduce Exposure to Climate Related Risks, Hazards and Threats and Enhance People's Resilience.*

Baseline scenario (without AF funds)

The information and surveillance systems in SADC member states vary and are constrained by variability in quality of information gathered, limited surveillance and inadequate sharing of information. Further, to minimize their impacts, the hazards must be contained at infancy stage but some SADC member states lack well-coordinated and efficient monitoring and early warning systems (MEWS) which poses a challenge to developing a regional MEWS as it draws from nationally generated information and data. Also, the limited resources including timely access to finances constrain regular surveillance activities and efforts to rapidly mitigate hazard outbreaks. Another reality within the region is that there are inadequate/or no policy measures /instruments by governments and authorities to support/incentivize actors along value chains to take up climate smart technologies and approaches.

Appropriate packaging and timely dissemination of weather information is necessary in early warning and response to disasters. The SADC (2016) review highlights that there is a lack of communication of the likelihood of the occurrence of emergencies in languages that the ordinary people understand. Ethno-meteorological knowledge systems in SADC generally are not incorporated into the interpretation and dissemination of weather information. For example, during the response to the 2015/16 drought, while the transport plan and the associated policy measures developed by the SADC Logistics cell facilitated the moving of the large volumes of food aid required to feed the large numbers of people affected by the El Niño drought phenomenon, the SADC(2016) review established that their effectiveness was affected by poor flows of information between national authorities responsible for importing food and port authorities and transport operators especially with respect to quantities of food that needed to be transported. The review particularly highlights that in future SADC Secretariat and its Member States need to improve on their handling and processing of data relating to potentially affected people, and countries should consider adopting a common reporting system based on the mobile vulnerability assessment system that is used under the IPC assessment approach.

While there are a number of ongoing initiatives focused on provision of weather information to inform small holder farming activities in the River Basins, there are still large gaps in the collection, analysis and dissemination of climate and weather information especially in remote pastoral and agro-pastoral communities where this information is needed most. These gaps include short-term sub seasonal to seasonal information to inform agricultural and livelihood activities as well as longer term climate scenarios to inform long term adaptation planning. Weather and climate information, especially seasonal, often arrives too late in the communities to inform planning or is not adequately disseminated to the majority of farmers.

While the SADC Secretariat coordinates the regional and national climate-outlook forums the extent to which this information is used in institutional decision making is limited, while the limited availability of high resolution down-scaled climate scenarios as well as lack of understanding by decision makers of their use in planning also poses a challenge. The weather and climate information generated and disseminated is often generalized climate information that is not tailored to any specifics of the weather and climate usable by farmers in specific climatic conditions including River basins and other agricultural landscapes. In addition, climate information users and decision makers are often part of a one way information flow from the Regional and national meteorological and hydrological services agencies, and thus in many cases the information received is not relevant to the user and there is no means of channeling feedback on the needs of the user or the relevance and impact of the information received. The NMHSs of the target countries, and the river basin institutions currently receive little feedback in a systematic manner from climate information users, which means that there is no efficient process in place for continuous improvement of the services provided.

Additionally (with AF funds)

The programme will support harmonization of monitoring and early warning systems (MEWS) and mechanisms for priority climate induced transboundary risks and other hazards. This will

be done through supporting development, updating and strengthening of long-term harmonized MEWS information/tools for decision making, data collection tools and response protocols for the region's needs-based content/approach for short term and climate induced hazards and disasters, and will be based on a tailored version of the African Flood and Drought Monitor. The programme will provide technical support and contribute to regional livestock data/information collection, disease surveillance, strengthen cross border and cross basin disease surveillance using EMPRES-i EMA. Incentives will be provide for members states to domesticate and uptake data collection tools and response protocols for the region's climate induced hazards and disasters.

The Programme will directly support the SADC Secretariat to improve capacity to generate regular tailored sub seasonal-to-seasonal forecasts and longer-term climate scenarios; downscale high resolution climate scenarios to specific locations in the target countries; map climate change "hotspots"; and establish climate baselines and trends. The project will support generation of high resolution seasonal, monthly and decadal forecasts with an advance period (lead time) of at least 1 month for all SADC countries. The project will further facilitate capacity building of both the SADC Climate Services Center and the SARCOF process and the National Meteorological and Hydrological Services of the target countries in data management and data exchange; communicating uncertainty; and a standard procedure and format for downscaling and communication of the results to decision makers and stakeholders will be put in place in the three target countries.

At the sites in the two river basins Kunene and Limpopo, all seasonal, monthly and decadal forecasts and products will be further downscaled to the target communities at 1km resolution with a focus on farmers, agro-pastoralists and pastoralists. Future climate scenarios and short-term forecasts will be complemented by analysis of past trends thus giving a wholesome picture of the changes in climate in the target communities. The project will put in place a systematic feedback mechanism on the relevance, timeliness and effectiveness of the climate services received and what can be done to improve it. This will facilitate a process of continuous improvement of weather and climate information products to aid climate informed decision making and improved resilience to climate change in the target countries. The project will also build the capacity of Agro meteorologists at SADC and River basin institutions and promote the tailoring of climate information for agricultural advisory rather than having broad climate advisories that are not tailored to any specific sector.

COMPONENT II: *Diversifying, strengthening and increasing adaptive capacities, livelihoods and sources of income for vulnerable people in targeted areas*

Baseline scenario (without AF funds)

A number of initiatives have been implemented to assist communities to adapt to climate change in SADC sural communities, however, the method and approach to facilitating adaptation has some gaps in terms of embedding the technologies and approaches in economically viable value chains. Most of the current approaches have not adequately upgraded the underlying business relationships between various actors in the communities

and allowed formation of formal business relationships to bring sustainability to adaptation measures. The result has been that such value chains are just attractive to poor communities for as long as the project is there, but not to private sector players who under normal circumstances would get attracted by sustainable profits. The majority of SADC rural communities including the three river basins targeted in the programme, crop and/or livestock farming contributes most to household food security and is the principal source of subsistence livelihoods. In this environment, rain fed farming is a high-risk enterprise but also a way of life. People are committed to making the best of the scarce resources at their disposal.

Due to a 'non business approach to adaptation', agricultural productivity remains low and the production environments are normally characterized by soil moisture stress and poor soil fertility in many areas in SADC and the farmers do not see the incentive to take up new technologies and approaches and new climate smart ways of doing things. There are large yield gaps between the average farmer and the best farmer, and returns to land, labour and capital are low. Droughts tend to reduce production below the already marginal levels, so that subsistence farming itself is threatened. These conditions occur where the local economy is least diversified and where virtually everyone depends either directly or indirectly on agriculture.

The more frequent exposure to drought events causes agricultural production to be out of equilibrium with the seasonal conditions, representing an inability on the part of most smallholders to adjust land use to climate variability. Thus, managing for drought is about managing for the risks associated with agriculture, and managing for climate variability must become the norm rather than the exception. Farmers must either increase agricultural productivity or develop alternative sources of income if their livelihoods are to be sustained.

Although livelihoods are complemented in some instances by the collection of firewood, the production and sale of charcoal (especially near major urban centres), the gathering, consumption and sale of natural food and medicinal plants, the hunting of wild animals, as well as artisanal inland fisheries in rivers and lakes, these activities are often carried out unsustainably. Some of these activities also provide or contribute usually modest cash incomes and associated livelihoods. Natural foods, medicines and cash incomes may become the principal sources of livelihoods for subsistence farmers during times of resource scarcity and hardship. For those too poor to farm, however, these supplementary livelihoods may be the only means of survival.

Climate change is therefore making the development of smallholder agriculture more expensive especially when the risks associated with financing them are considered. There are also challenges of weak institutional framework/arrangements for farmers to participate viably in priority value chains and low application of climate smart technologies by smallholders along value chains. There is limited or no private sector/farmer driven technologies along value chains which results in many project driven interventions disappearing fast as soon as the project is concluded.

Additionally (with AF funds):

The Programme will facilitate diversification of livelihoods and sources of income, and strengthening of adaptive capacities for vulnerable people in targeted areas. The highlight of the Programme in the specific sites is value chain facilitation, which is regarded as a major missing link to facilitate uptake of climate smart technologies along value chains. The promotion of value chain facilitation services will enable marginalized groups, specifically (smallholder farmers, small and medium enterprises) to meet the conditions required to access the wide range of facilities available at national provincial and district levels. Value chain facilitation focuses on i) linkages: promoting business relationship between value chain players, specifically smallholder farmers and small and medium agribusiness enterprises and other value chain players, in commercially viable way, ii) Strengthening the capacity of value chain players to meet required standards and to fulfil their contractual obligations, and , iii) working with enablers to render the business environment more conducive for smallholder farmers and small and medium agribusiness enterprises.

To strengthen targeted individual and community livelihood strategies in relation to climate change impacts, including variability, the Programme will identify priority value chains and non-agricultural sources of income opportunities for upgrading into inclusive climate smart and business driven activities at specific sites in the three basins. Profiles will be developed for each selected priority value chain or commodity, then upgrading plans/proposals will be developed. The Programme will facilitate formation of business alliances/partnerships for communities and individuals in priority VCs and non-agricultural livelihoods between farmers in viable producer clusters and visible business entities facilitating meetings and capacitating capacitating/training/supporting value chain actors to enter into business agreements (MOUs, contracts, and offtake agreements etc).

Farmer groups and value chain actors who are part of the upgraded climate smart value chain will access grants and will be assisted to access resources/funds from other sources in blended finance arrangements based on the agreed upgraded business model. In addition, *targeted population groups participating in adaptation and risk reduction awareness activities will also be assisted to* access specific concrete adaptive physical, natural and social assets in response to climate change impacts in line with the upgraded business model. The Programme will facilitate rehabilitation, construction and establishment of strategic livelihood and climate smart value chain infrastructure provided through various forms of partnerships. At each site, irrigation, storage, processing and other relevant infrastructure needs will be identified in a participatory manner and then established, upgraded or rehabilitated depending on the findings of the VC profiling exercise. Further to facilitating access to tangible adaptive infrastructure, the Programme will use AF funds to support platforms for joint planning, implementation, coordination to build adaptive capacities and resilience to climate change. Such Platforms include the KAPP outlined in Component I, conducting inter basin exchange visits and study tours and support to activities of inter basin and transboundary joint planning, implementation, coordination committees. The Programme will also support evidence based climate information to feed into policy dialogues in the region through documentation and reporting of good practices, lessons learned and success stories, particularly on proactive flood and drought risk management strategies. This will include setting up of community sites

for demonstrating adaptive crop pathways and practices for communities at high risk of climate change related impacts, which will be framed around the farmer and agro pastoral field schools

K. Describe how the sustainability of the project / programme outcomes has been taken into account when designing the project / programme.

This project will facilitate long term action by supporting the entrenchment of inclusive climate smart value chains and climate informed decision making in INDCs and National adaptation plans. The Programme will lay the foundation for the wide-spread scaling up of inclusive climate smart value chain driven adaptation in SADC region, Africa and globally through application of comparative advantage in regional and global presence by UNESCO, FAO, SADC Secretariat and FANRPAN. An important requirement for interventions to be locally owned and hence sustainable is the extent to which local indigenous knowledge and expertise are entrenched. This programme through the platforms for co-creation of knowledge with local and indigenous communities and fostering ownership and in project planning, implementation and monitoring facilitates ownership of interventions by local communities, which will be achieved in close coordination with UNESCO's Local and Indigenous Knowledge Section (LINKS). This is further enhanced by the embedding of ecosystem-based adaptation interventions in farmer and agro pastoral field schools, communities of practice/knowledge action networks and learning sites at different levels, which will be formed and operationalised by the programme.

The Programme also entrenches the interventions within existing regional, Basin level, national and private sector institutions. At the regional level, the CSC, MASA, RMTCs, RICC and the SARCOF process will be key in ensuring sustainability of measures to reduce exposure to climate related risks, hazards and threats and enhance people's resilience. At the River Basin level, the Permanent River basin Commissions i.e. LIMCOM for Limpopo, and Permanent Joint Technical Commission (PJTC) for Kunene will be the main institutions through which implementation will take place. At the national level, the Ministries of Agriculture and Ministries of Environment, NMHS and NACOFs will be engaged and capacitated in various activities through the programme.

The private sector actors who will form part of the upgraded business models at the selected VC sites in each river basin will also form an important part of the framework that will ensure sustainability of the interventions well after the end of the programme. Private sector players including financial service players and IT service providers are expected to see and recognize the business within the value chains in the upgraded business model, and thus will be incentivized to continue doing business with the smallholders. The incentives and subsidies to be rolled out through the programme remove residual risk for private sector to invest in climate smart agriculture, agricultural landscape management and other new technologies and approaches that build resilience. A significant number of the targeted smallholders also produce for the market and therefore are expected that involving private sector through investments in profitable and more sustainable value chains production are key to raising more investments for climate smart agriculture and other ecosystem based activities and up-

scaling in the long run. Naturally private sector is expected to flow in to invest in a more sustainable production system.

Long terms sustainability is further ensured by focusing on existing extension staff, field workers and community focal points and building their capacity in climate change adaptation. This is enhanced by making of use of institutions that are already in that field of specialization so that when the project comes to an end, activities continue. In addition, by taking advantage of FAOs global modalities for knowledge dissemination in agriculture, food and nutritional security the reach and spread of program outcomes will be enhanced. The proven ability of farmer field schools to link technical advancement with enhanced social and financial capital will create a holistic foundation for enhanced and resilient rural livelihoods. Since activities at local level are defined and led by the community thought the farmer clusters/field schools, the risks of culturally inappropriate practices are minimal.

L. Provide an overview of the environmental and social impacts and risks identified as being relevant to the project / programme.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Compliance with the Law	x	Risk: Low Potential Impact: Low The Programme management team will ensure extensive consultation with local, River basin level, national and regional stakeholders to ensure that the final project design will be compliant with all relevant regional and national laws
Access and Equity	x	Risk: Low Potential Impact: Low The Programme management team will comply with the Adaptation Fund's policy, as well as UNESCO and FAO rules regarding access and equity. In addition, the design will ensure equitable access to the services at project sites from accessing basic health services, clean water and sanitation, energy, education, housing, safe and decent working conditions and land rights.
Marginalized and Vulnerable Groups	x	Risk: Low Potential Impact: Low The programme will comply with the Adaptation Fund's Policy as well as FAO and UNESCO policy for marginalised and vulnerable groups. In addition, the main beneficiaries of the proposed

		intervention will be the marginalized groups that are living in the dryland areas.
Human Rights	x	Risk: Low Potential Impact: Low The programme is building on FAOs experience in using the farmer and agro-pastoral field schools approach to enhance awareness of civil rights, including the right to demand for basic services from local and central government.
Gender Equity and Women's Empowerment	x	Risk: Low Potential Impact: Moderate Participation of women will be encouraged in the field schools, and the programme will draw on UNESCOs and FAOs experience of promoting the role of women and gender equality within the field school setting.
Core Labour Rights	x	Risk: Low Potential Impact: Low The programme will not undertake any significant works that would utilize manual labour.
Indigenous Peoples	x	Risk: Low Potential Impact: Moderate The programme will apply UNESCO and FAO policies on indigenous groups
Involuntary Resettlement	x	Risk: Low Potential Impact: Low The programme will work with communities in their locations, and will not in any way promote resettlement of communities to new locations or sedentarization of pastoralists.
Protection of Natural Habitats	x	Risk: Low Potential Impact: Low
Conservation of Biological Diversity	x	Risk: Low Potential Impact: Low The conservation agricultural practises promoted by the programme will bring about additional benefits related to the conservation of biological diversity.
Climate Change	x	Risk: Low Potential Impact: Low By providing accurate and relevant climate and weather information to the targeted communities the programme will improve adaptive capacity to climate change in the targeted areas, and at the national level through the development of climate products to inform planning processes at the national and regional level.
Pollution Prevention and	x	Risk: Low Potential Impact: Low

Resource Efficiency		Through the field schools practises for improved water management and conservation agricultural techniques, reducing the application of fertilizer with related runoff and pollution issues will be promoted.
Public Health	x	Risk: Low Potential Impact: Low The programme aims to have indirect public health benefits by improving the water and food security situation of the beneficiaries.
Physical and Cultural Heritage	x	Risk: Low Potential Impact: Low
Lands and Soil Conservation	x	Risk: Low Potential Impact: Low The agricultural management practises promoted in the farmer and Agro pastoral field schools will include management techniques to improve soil conservation and prevent land degradation.

PART III: IMPLEMENTATION ARRANGEMENTS

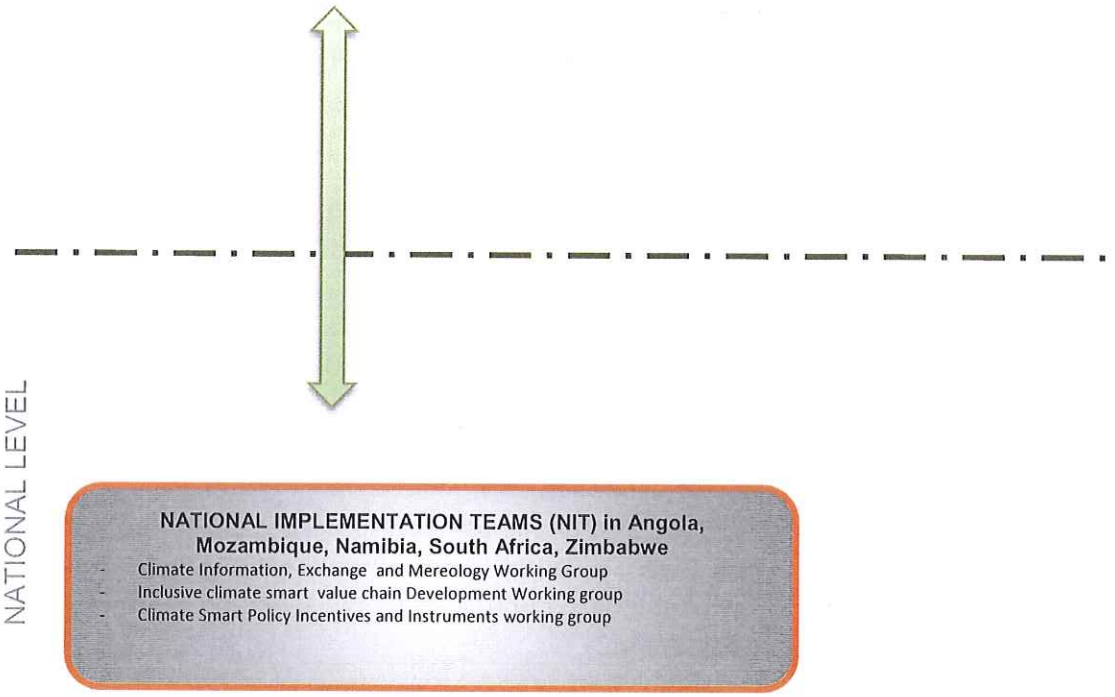
A. Describe the arrangements for project / programme management at the regional and national level, including coordination arrangements within countries and among them. Describe how the potential to partner with national institutions, and when possible, national implementing entities (NIEs), has been considered, and included in the management arrangements.

The Programme will be implemented by UNESCO and executed by FAO and FANRPAN, in close collaboration with SADC Secretariat, all relevant National Ministries/Departments of Agriculture, Environment, and Climate change in target countries as well as of permanent commissions for the two river basins namely LIMCOM for Limpopo, and Permanent Joint Technical Commission (PJTC) for Kunene. The Diagram shows how partners will be organized to deliver the Programme. UNESCO will also execute some of the activities in line with its technical capacity.

REGIONAL LEVEL

REGIONAL PROGRAMME STEERING COMMITTEE (RPSC)

- UNESCO: Programme Chair/Convener-Technical Lead climate services
- FAO: Country Level Programme Coordination-Technical Lead inclusive climate smart value chains
- FANRPAN: Technical lead Climate Smart Policy Incentives and Instruments
- Key regional stakeholders: SADC Secretariat, LIMCOM for Limpopo, and Permanent Joint Technical Commission (PJTC) for Kunene



The roles of the different Programme partners will be as follows:

- **UNESCO**: will assume the role of Programme implementer, and provide fiduciary and Programme management oversight and chair the Regional Programme Steering Committee. In addition, UNESCO will lead with FAO to support SADC Secretariat to deliver climate services the promotion of utilization of climate information in decision making in collaboration with relevant national institutions.
- **FAO**: In addition backstopping is all components of the Programme, FAO will be responsible for the day-to-day coordination of activities at country level through the network of country offices. FAO will lead development of inclusive climate smart value chain and natural resource aspects and also facilitate formation of business driven partnerships and rural service enterprises that spearhead introduction of new climate smart technologies and practices along the selected smallholder priority value chains at specific sites in the three river basins. UNESCO will also support FAO is relevant aspects in the development of inclusive climate smart value chains
- **FANRPAN** will lead with the support of FAO and UNESCO in the review, development, improvement and application of incentives and instruments for catalyzing adoption of climate smart approaches along value chains.

Regional Programme Steering Committee (RPSC): UNESCO with the support of the executing entities will set up the Regional Programme Steering Committee (Regional PSC) whole role will be to provide direction in implementation of all the project components and activities. The Regional PSC will provide fiduciary oversight and also oversee project implementation

through existing structures to monitor performance, provide technical oversight, advice on strategic challenges, and ensure systems exist to mitigate risks and disseminate best practice. The Regional PSC will also be responsible for the day-to-day coordination of the project and for promoting and facilitating stakeholder engagement at regional level.

National Implementing Team (NIT): In each Project country, a National Implementing Team coordinated by government line ministry responsible for the main activity, with technical assistants from FAO, will be established which will be responsible for the facilitating stakeholder engagement at national, basin and local community level. In each country, the actual composition of the NIT will be different and will at best be structured to conform to already existing institutional arrangements as opposed to formation of new structures. Based on the consultation exercise, the table provides a list of organizations from which the NIT in each country will be established. The roles of the actors and stakeholders at country level will be aligned to their mandates, and will be further identified, defined and refined during the inception meeting in each country.

Country	**National level stakeholders and institutions with potential roles in the NIT (identified during consultation)**
Angola	• Department of Environment of Cunene province • Department of Agriculture of Cunene province • Department of Environment of Huila province • Department of Agriculture of Huila province • Agriculture Development Institute (IDA) • National Institute of Meteorology (INAMET) • National Institute of Hydric Resources (INRH) • Forest Development Institute (IDF) • Artisanal Fishers Institute (IPA) • ADPP (NGO) • CODESPA (NGO) • UNDP • ADRA (NGO) • Civil Protection Department • World Vision (NGO) • Polytechnic Institute of Cunene • Polytechnic Institute of Huila • Department of Climate Change (GABIC) • Irrigated perimeters Development Society (SOPIR) **Private sector players active in the value chains** • ANO Association • Farmers associations
Mozambique	• National Directorate of Agriculture and Silviculture (DINAS) - Crop and Early Warning Unit (DCAP) • National Directorate for Agricultural Extension (DNEA) • National Directorate for Veterinary Services • National Institute of Meteorology (INAM)

	• National Directorate of Environmental (DINAB) • National Water Directorate • Regional Water Authorities (ARA Sul) • Lower Limpopo Irrigation State-owned Company • National Institute of Cashew • African Development Bank • IFAD • WFP • Save the Children • The world Bank • National Institute for Disaster Management (INGC) **Private sector players active in the value chains** • Farmers associations • Microfinance institutions • Input providers • agro dealers • Processing Associations • Private industries
Namibia	• Ministry of Agriculture, Water and Forestry o Directorate of Agricultural production, Extension and Engineering services o Directorate of Forestry o Directorate of Water Resources Management o Directorate of Veterinary Services o Directorate of Planning and Business Development o Directorate of Research and Development o Directorate of Water Supply and Sanitation Coordination • Ministry of Environment and Tourism o Directorate of Environmental Affairs • Ministry of Industrialization, Trade and SME Development o Industrial Development Directorate • Ministry of Fisheries and Marine Resources o Directorate of Resources Management o Directorate of Aquaculture • Ministry of Urban and Rural Development o Rural Development Program o Kunene and Omusati Regional Councils o Traditional Authorities • Ministry of Poverty Eradication and Social Welfare • Namibia Meteorological Services • University of Namibia • Namibia University of Science and Technology • National Commission on Research Science and Technology • Kunene Permanent Joint Technical Committee • National Climate Change Committee

	• Development partners including various NGOs **Private sector players active in the value chains** • Namibia National Farmers Union • Local Farmers' Associations and Cooperatives • Agro-Marketing and Trade Agency • AgriBusDev • Local millers and food processors • National Water Utility company (NAMWater) • Agricultural and Commercial Banks
South Africa	• Limpopo Department of Agriculture and Rural Development (LDARD), • Department of Agriculture Forestry and Fisheries(DAFF), • Department of Environmental Affairs (DEA), • Department of Small Business development • Department of Trade and Industry • Traditional authorities • Great North Farmers' Union(NAFU) • The African farmers' association of South Africa Organization(AFASA), • South African Weather Service (SAWS), • Water Research Commission(WRC), • Agricultural Research Council(ARC), • Council for Scientific and Industrial Research(CSIR), • University of Venda, • University of Limpopo. • Limpopo Economic Development Agency • Small Enterprise Development Agency • Industrial Development Cooperation • Research councils • Commodity organizations • *Global GAP* • Various NGOs **Private sector players active in the value chains** • Mining houses (Waterberg Red Meat • Commodity groups • ZZ2 • Country Bird • Progress Milling • Enterprise • Tropical and sub-tropical industries • Tiger Brand • McCain
Zimbabwe	• Ministry of Agriculture, Water and Forestry

	○ Directorate of Agricultural production, Extension and Engineering services ○ Directorate of Forestry ○ Directorate of Water Resources Management ○ Directorate of Veterinary Services ○ Directorate of Planning and Business Development ○ Directorate of Research and Development ○ Directorate of Water Supply and Sanitation Coordination • Ministry of Environment and Tourism ○ Directorate of Environmental Affairs • Ministry of Industrialization, Trade and SME Development ○ Industrial Development Directorate • Ministry of Fisheries and Marine Resources ○ Directorate of Resources Management ○ Directorate of Aquaculture • Ministry of Urban and Rural Development • Rural Development Program • Kunene and Omusati Regional Councils • Traditional Authorities • Ministry of Poverty Eradication and Social Welfare • Namibia Meteorological Services • University of Namibia • Namibia University of Science and Technology • National Commission on Research Science and Technology • Kunene Permanent Joint Technical Committee • National Climate Change Committee • Development partners including various NGOs • Private sector players active in the value chains • Namibia National Farmers Union • Local Farmers' Associations and Cooperatives • Agro-Marketing and Trade Agency • AgriBusDev • Local millers and food processors • National Water Utility company (NAMWater) • Agricultural and Commercial Banks

This core team of the NIT will be comprised of Executing Entity Team Leaders/Programme Focal point persons/Project officers at national level and will rope in focal point persons from LIMCOM, and Permanent Joint Technical Commission (PJTC) and will be reporting to the RPSC. Under the NIT there will be three main working groups to achieve the objectives of the Programme namely:

- ***Climate Information, Exchange and Mereology Services Working Group*** responsible for national and subnational implementation of all activities related to climate services the promotion of utilization of climate information as well as inter-basin and transboundary sharing of information, opportunities, best

practices, strategies and technologies as well as platforms for joint planning/implementation/coordination

- ***Inclusive Climate Smart Value Chain Development Working Group*** responsible for implementation of inclusive climate smart value chain and natural resource aspects and also facilitate formation of business driven partnerships and rural service enterprises that spearhead introduction of new climate smart technologies and practices along the selected smallholder priority value chains
- ***Climate Smart Policy Incentives and Instruments working group*** responsible for implementation of the process to review, develop, improvement and application of incentives and instruments for catalyzing adoption of climate smart approaches along value chains at national level.

FAO, and FANRPAN shall have contractual engagements with the Implementing Entity and will account to the Implementing Entity. Team Leaders/Programme Focal point persons/Project officers will be appointed by the respective executing Entities to oversee coordination, management, implementation, monitoring and reporting of Programme activities in collaboration with accredited National Implementing Entities in the project countries and in the River basins. In the Basin countries project countries the lead Institutions shall be the permanent commissions and National Meteorological Institutions working with the NIEs depending on the work package.

FAO will apply the e-voucher system manage the grant component for the farmers participating in the upgraded business model at the selected sites in the two river basins. The electronic voucher implemented successfully by FAO in Zambia, Mozambique, Swaziland and other countries will not only make farmer's production decisions more flexible, but it will also improve their knowledge of electronic money systems. Furthermore, it helps to reduce smallholder's lack of familiarity with technology. Functioning on a mobile phone network, the e-voucher initiative is an update on previous paper voucher systems. The digital nature of the e-voucher platform makes the process more secure and expedites trade through automatic payments to suppliers upon successful e-voucher redemption, keeping with the rising trend of mobile phone banking throughout Africa. The application will be based on established FAO rules and regulations. The grants will be disbursed through a combination of mechanisms; 1) direct grants of smaller amounts as a one off disbursement to farmer producer groups and clusters; 2) Letters of Agreements (LOAs) with community based organisations and formally registered farmer groups/associations which constitutes a legal protocol with established disbursements schedule and reporting mechanisms; 3) direct procurement as per FAOs procurement regulations for hard ware in relation to investments, for example building materials, equipment, farm inputs etc.

The community grant mechanisms will be under the overall responsibility of the National Implementation Team who will technically and administratively manage the grants through the FAO Country Offices in each country. A technical review committee will be established at regional level comprising members from the RPSC. The committee will provide technical review of proposals and recommend actions to be financed.

B. Describe the measures for financial and project / programme risk management.

As implementing entity, UNESCO will assume the role of fund manager for this project, basically ensuring value for investment by AF. Letters of Agreement and other appropriate agreements will be signed with each of the executing agencies and implementing partners. In the case of FAO, a UN to UN agreement will be signed. These agreements will follow the standard UNESCO format, and include provisions on financial management, accountability, procurement, minimizing risk of corruption and reporting deadlines and templates. Executing agents and implementing partners will submit six monthly reports to UNESCO, including certified financial statements on programme expenditure.

If from the reports, it emerges that there some issues posing as potential risks to the successful implementation of activities, these will be brought to the RPSC which is chaired by UNESCO. Within UNESCO, the UNESCO Project Management Board, consisting of the Directors of the main Departments within UNESCO, which meets quarterly, will also provide oversight of the project and advice on any management measures needed to address emerging risks.

The Programme shall be subject exclusively to the internal and external auditing procedures laid down in the Financial Regulations, Rules and directives of UNESCO. The internal audit regime in UNESCO operates as an integral part of the Organization's system of internal controls, following best practices, and under policies established by senior management. The internal audit strategy of UNESCO is comprehensive embodying financial, compliance, performance and value for money features and provides assurance that operations in the field and at headquarters are managed in an economical, efficient and effective manner.

Project Risk Management Table

Risk	Level of risk	Risk mitigation measure
Different pace of project implementation for each country and river basins may delay overall project implementation and affect regional activities.	Low	Regional Inception, Annual Planning and Biennial Review as well as reflective and experiential learning meetings will facilitate synchronization of pace of implementation of activities. UNESCO and its executing entities will establish appropriate project management and coordination structures at both regional, national and at basin level to monitor, report on and discuss progress on a regular basis and take corrective action where needed to ensure that the project moves at the required pace in all 5 countries.
Uneven speed of implementation and expenditure rate among the three main partners may hamper overall	Medium	The project design ensures a joint management set-up where the three partners will jointly steer and manage the intervention through the RPSC. Through these mechanisms it will be possible to spot at an early stage any potential delays among any of the partners, and thus enable early corrective action.

project performance		
Non formalized relationships between executing and implementing bodies	Low	Standard and well proven formats will be used for fund disbursement between UNESCO, FAO and FANRPAN including formats and standards for reporting and financial accounting.
National, subnational governments and river basin level institutions might have alternative implementation frameworks approaches.	Low	The Programme will espouse a Multistakeholder participatory approach which will be coupled with systematic lobbying and advocacy to ensure that all stakeholders including national, subnational governments and river basin level institutions work in a harmonized and coordinated manner.
Political uncertainties affect project implementation.	Low	The project target areas are relatively stable politically and all effort will be made to ensure that project activities are conducted with participation of all relevant stakeholders including government departments and local structures so as to aid conflict resolution should any arise.
Occurrence of a major natural disaster in the project areas.	Medium	Since the project focus directly lay in supporting climate resilience, its interventions are not likely to be side-lined at times of extreme climate events. In fact such events may boost the interest and buy-in for the project. The project will aim to ensure that development initiatives prioritized under the project run side by side any potential emergency work that could result from occurrence of a major natural disaster (as per FAOs twin track approach to resilience).
Intercommunity differences regarding adaptation planning priorities in each community.	Low	The use of community based approaches to adaptation planning will aim to ultimately ensure that all views are heard and included in the adaptation planning process as well as prioritized based on agreement of the community as a whole.
Governments continue to prioritise emergency initiatives over development initiatives.	Low	A key part of the project will be advocacy related to the need to enhance investments in resilience building in the river basins as a more efficient and cost effective means of enhancing adaptation to climate change and promoting food security rather than short term measures.
Limited coordination with	Low	A thorough review of ongoing initiatives has already been conducted and partners will be continually consulted to

other ongoing adaptation initiatives in the target countries.		ensure that there is alignment with these and other initiatives in the target countries.

Financial Risk Management Table

Risk	Level of risk	Risk mitigation measure
Instability in currencies, market prices and availability of project inputs.	Medium	All funds will be maintained in USD to reduce the impact of price and currency fluctuations. Procurements plans to be developed in line with the project work plan so as to ensure timely availability of inputs.
General financial risks	Low	Financial Regulations, Rules and directives of UNESCO will be utilized throughout project implementation so as to minimize financial risks. This includes internal and external auditing procedures laid down in these regulations.
Delays in financial disbursements	Low	Executing agencies and implementing partners will be engaged using LoAs and agreements which can be utilized to quickly disburse funds for project activities while at the same time ensuring provisions on financial management, procurement, minimizing risk of corruption.
Misuse of community financial grants at local levels	Medium	FAO will apply the e-voucher system manage the grant component for the farmers participating in the upgraded business model at the selected sites in the three river basins. The digital nature of the e-voucher platform makes the process more secure and expedites trade through automatic payments to suppliers upon successful e-voucher redemption. The application will be based on established FAO rules and regulations. Direct financing to communities always implies a certain level of risks. However the hands-on support process imbedded in the project where FAO together with the key ministries will heavily support communities throughout design and implementation of community investment projects, will minimize such risks.

Project monitoring and evaluation will incorporate monitoring and reporting on these risks and any others that may emerge during project implementation. Critical issues and changes to the risk level will be reported in a timely manner so that mitigation action can be taken before risks spiral.

C. Describe the measures for environmental and social risk management, in line with the Environmental and Social Policy of the Adaptation Fund.

The project has been screened for environmental and social risks as per the Environmental and Social Policy of the Adaptation Fund and was found to have no or limited significant adverse environmental or social impacts expected. Limited adverse impacts that could emanate are mostly through Component 2 of the project which involved adaptation climate smart investments, along upgraded value chains, implying the project potentially falls within the Category B rating of the Environmental and Social Policy of the Adaptation Fund. However, any potential negative impacts as a result of this project are believed to be small in scale, limited to the project area, reversible and can be either avoided, minimized or addressed through the use of recognized good environmental and social management practices.

In order to ensure that the project minimizes the risk of negative environmental and social impacts emanating from the project, an analysis has been conducted to identify any potential negative impacts as well as to elaborate on the risk management measures that will be taken to avoid, counteract or minimize their occurrence and impact. The table below shows main social and environmental risks that could emanate from the project and management measures to be taken.

Environmental and/or social risk	**Measure for environmental and social risk management**
Lack of gender equity and women's empowerment in project implementation and outcomes	- To ensure compliance with AF's Environmental and Social Policy the project will use tools developed by UNESCO and FAO and partners for integrating gender at the core of project implementation and in particular in climate-smart agriculture (http://www.fao.org/3/a-i5299e.pdf and http://www.fao.org/3/a-az917e.pdf). - All population and demographic data and information including baselines, M&E will be gender disaggregated specific questions. - Use participatory tools for gender sensitive community consultation and the FAO Self-evaluation and Holistic Assessment to Climate Resilience of Farmers and Pastoralists (SHARP). - Aim for 50% participation of women in project activities and 50% of project direct beneficiaries to be women, while also targeting specific project activities at women or women groups (for example the integrated savings and lending). - Foster equal participation of men and women in institutions and decision-making processes related to the project.
Biodiversity loss	The underlying thesis for the Programme is to introduce climate-smart agriculture technologies, best practices and approaches which ensure that the project does not in any way contribute to biodiversity loss. Through introducing climate-smart agriculture in the upgraded business model the project will in fact improve biodiversity in crop and livestock production as a means of improving agro-ecosystem resilience to climate change and variability. The project will not involve or entertain introduction of invasive species or new pests and diseases into the project sites and any actions that may

	result in these will be appropriately screened and subjected to the relevant national and international laws and guidelines.
Exclusion of marginalized and Vulnerable Groups	The project will specifically target vulnerable and food insecure members of society in the targeted river Basin communities. To aid this the project will use the following measures: • Ensure participation of all relevant stakeholders in project activities without discrimination and with aim to ensure fair and equitable access to project benefits including for women and men as well as marginalized groups. • Utilize proven community based adaptation planning methodologies (e.g. CRIDA) that take into account the needs of different socio-economic groups in the community. • Conduct comprehensive community level consultations in the target districts, including with vulnerable groups, female headed households, indigenous communities and key informants such as traditional forecast providers. • Aim to ensure that project activities target and support the most vulnerable to become more resilient to climate change including women, women headed households, children and the youth.
Land and soil degradation	The project will promote improved agricultural practices such as soil and water conservation practices (e.g. minimum or zero tillage, contour ridging, increased use of organic manure). Water harvesting, storage and irrigation, bush fallowing, agro-forestry, diversified agriculture including apiculture and plantation agriculture; and rotational grazing, programmed reseeding of degraded rangelands among pastoral and agro-pastoral communities, etc. will be encouraged and promoted by the project.
Protection of natural habitats.	The project partners, through broad stakeholder consultation and engagement, will ensure that adaptation investments do not encroach onto protected areas, buffer zones and natural habitats. Climate change adaptation investments will be screened for negative impact on adjacent ecosystems and natural habitats.
Pollution and lack of efficiency in use of natural resources	In line with FAO guidelines, the project will where possible, promote techniques such as Integrated Pest and Disease Management (IPDM) as a pillar of sustainable agriculture, reduce reliance on pesticides and avoid adverse impacts from chemical use on the health and safety of farming communities, consumers and the environment. The climate-smart agriculture practices promoted through the project will also reduce soil erosion and hence reduce water pollution. As part of the climate-smart agriculture approach to be used in the project, maximizing efficiency in the use of natural resources will play a major role in supporting improved productivity and food security as well as supporting climate change adaptation.

Compliance with the law	The final project design will be compliant with all relevant regional and national laws following extensive consultation with national and regional stakeholders. No adaptation investments (or any project activities) will be conducted if they do not comply with local, national and international laws
Access and equity	Given that the project will involve the development of shared community resources the project team will ensure that any activities or developments do not negatively affect current user rights to shared natural resources as well as ensuring equitable benefits from adaptation investments and other project activities. Any activities involving shared resources will be conducted in the context of the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGT) and the relevant national laws.

The project will also be conducted in the framework of FAOs Environmental and Social Management Guidelines and in line with FAOs principles for sustainable food and agriculture systems which aim to balance economic, social and environmental dimensions of sustainability in agriculture and food systems, and provide a basis for developing policies, regulations and incentives to guide the transition to sustainability, while promoting resilience through an adaptive response to shocks and opportunities. In addition, the project implementing entities and partners will also incorporate the following measures for environmental and social risk management:

- Conduct sensitization and awareness raising on both positive and negative environmental and social impacts during community based project activities.
- Ensure that discussions on environmental and social impacts (both positive and negative) will be conducted when developing community adaptation plans.
- Where identified adaptation investments are deemed to have potential negative environmental and social impacts, these will be subjected to further Environmental and Social Impact screening and analysis including the development of Environmental and Social Management Plans (ESMPs) and where required by law, Environmental Impact Assessments (IEAs). Adaptation investments with potential for large scale adverse environmental and social impacts (either at the project site or its surroundings) will not be conducted.
- Disclosure over an adequate period of time will be conducted for any adaptation investments with potential negative environmental and social impacts and the plans for their management. Disclosure of relevant project information will help stakeholders understand the risks, impacts and opportunities of a project and will be done in an appropriate format and language for the respective communities.
- Introduce a project grievance mechanism in all target communities, so as to ensure that there is a mechanism for stakeholders to communicate and get feedback on any problems regarding project implementation including problems related to environmental and social impacts. The grievance mechanism shall be shared within the target communities and stakeholders while all project partners will be required to adhere to a set principle regarding the method and timeliness of addressing of grievances and complaints.

- Ensure that environmental and social risks and impacts of the project are incorporated in the monitoring, evaluation and reporting of the project.
- Raise all issues related to changes in the status of environmental and social risks to the project management team for immediate corrective action where needed.

The environmental and social risk management hierarchy for the project will be adopted as follows:

- Avoid adverse environmental and social impacts as a priority;
- Where avoidance is not feasible, minimize or mitigate risks to acceptable levels; and
- As a last option where residual impacts remain, compensate for/offset them if technically and financially feasible.

D. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan.

Monitoring and evaluation of the project will be integrated within the existing M&E systems of UNESCO, FAO and FANRPAN. The RPSC will provide oversight to the detailed M&E framework to be developed jointly by UNESCO, FAO and FANRPAN. The M&E framework will describe objectives, performance indicators and the methodologies for data collection. During the inception phase, relevant stakeholders shall be engaged to review and validate the M&E framework. The main monitoring and evaluation processes will include:

i) Work Planning: Work plans shall be reviewed annually in annual programme reflective and planning meetings in order to redefine activity implementation and targets based on performance. Starting with the year 1, (Inception and planning meeting) project work plans will guide implementation throughout the project cycle.

ii) Harmonized baseline surveys: to be conducted at the inception phase in order to establish the baseline values of indicators upon which the project performance will be measured. The surveys will also gather information that will guide implementation of the three project components.

iii) Continuous Monitoring and technical backstopping: to be carried out by project technical teams throughout the project cycle to track progress of activities and delivery of outputs. Joint monitoring missions will be carried out by project coordination committees at regional, national and river basin levels. The mission teams will comprise of representatives from Adaptation Fund, implementing partners, host governments and communities.

iv) Monitoring short-term outcome results: to be conducted mid and end-of-season to assess the extent to which farmers utilize climate smart technologies and climate information and comply to agreed-upon seasonal work plans and activities. In addition, this will include close monitoring of the business agreements between value chain actors in the upgraded business model. Participatory experiments through FS will determine the immediate outcome results. Monitoring will be undertaken by local extension officials and meteorological officers.

v) Mid-term review and final project evaluations; to be conducted to critically assess effectiveness, relevance, efficiency, sustainability and/or impacts. Findings and recommendations of the mid-term review shall inform the remaining period of project implementation.

Reporting schedule
The project aims to produce the following reports:

Inception phase report: detailing what has been put in place (in terms of institutional arrangements, staff recruitment, assignment/deployment and other arrangements); overall direction of the programme, annual work plans, problems/constraints encountered and adjustments needed in specific cases, etc.

Periodical Progress Reports: The progress report for on the project implementation shall be submitted to the donor either on bi-annual or annual bases, as shall be agreed upon. All reports will be prepared based on the reporting formats which will be developed during the inception phase. In general it is expected that the bi-annual report shall include the following a) planned vs. achieved in terms of implementing planned activities; b) main constraints encountered, solutions sought and recommendations for the next mid-term activities. C) Reference should be made against achieving the expected outputs in each of the bi-annual reports. d) Fundamental changes which may affect project performance should be detailed. Adaptation Fund monitoring and reporting guidelines, schedules and templates shall be adhered to (e.g. Project Performance Report (PPR), results tracking and reporting on Core Indicators).

Special Technical Reports: UNESCO in collaboration with FAO will ensure that special reports such as technical reports, publications, press releases and updates, policy briefs, relevant to the project are communicated to the donor and the Steering Committee, and the NPAC as and when they are issued.

Project Completion Report: towards the end of the programme duration, a final report will be prepared and submitted to the AF. Main contents of programme completion report shall include:

- A full description of programme components activities actually carried out with an explanation for the variances with the original plans, and a description of accomplishments and failures;
- Description of the process of implementation modalities and the degree to which actual implementation met the original plans in the programme document;
- Programme performance detailing the degree to which planned activities actually led to the accomplishments of expected outputs and the project outcome. In the case of variations, a full account of the circumstances which prevented progress or delivery of services and the measures taken by stakeholders to address the bottlenecks should be reported;
- The extent to which proposed mitigation measures have been effective in managing risks;
- A statement of final programme costs by budget lines, compared to the original financial plans;
- The most significant positive and negative lessons learned from the success or failure of the programme;
- Maintenance and sustainability plan put in place.

Project Monitoring and Evaluation Work Plan and Budget

Activity	Responsible parties	Budget (USD)	Time frame												Notes
			Year 1				Year 2				Year 3				
			Quarters				Quarters				Quarters				
			1	2	3	4	1	2	3	4	1	2	3	4	
Baseline and end line data collection	FAO and FANRPAN (M&E)	50000													Baseline and end line surveys in target sites with data collection based on FAO VC profiling and community assessment tools
Continuous Technical backstopping and monitoring component 1 and 2.	National Focal points and Regional M & E officer.	120000													Under the supervision of the Regional M and E officer
Routine project implementation monitoring component 1 and 2.	National focal points	85000													Regular monitoring of value chain and community investments
Final project evaluation outcome 1 and 2	UNESCO/FAO-OED	70 000													UNESCO in support of FAO office of evaluation
FAO Project Reporting	FAO-OED	20000													
Regional historical baseline, with statistics and trends and climate change hotspots applying EODS and other data systems	FAO, UNESCO, SADC Secretariat, NMHSs	50000													This will be done jointly with other components immediately after project inception
Quarterly joint monitoring missions	UNESCO, FAO, SADC	40000													This will be done once per quarter

	SECRETARIAT, NMHSs,												
Monitoring Short term –outcome results	UNESCO, FAO, SADC SECRETARIAT NMHSs,	40000											This will be done annually at end of year 1 and year 2.
Mid Term evaluation	External M&E	40000											This work will be done by a hired External M&E consultant
TOTAL budget allocation to M&E activities		**515 000.00**											

E. Include a results framework for the project / programme proposal, including milestones, targets and indicators.

Programme Impact indicators

Results	indicators	Baseline	Milestones	End of project target	Means of Verification	Responsible parties	Risks and assumptions

Improve adaptive capacities and resilience to climate variability and change of rural crop/livestock smallholder farmers, agro pastoralists and pastoralists in water stressed river basins (Kunene and Limpopo) in Southern Africa'	Number of beneficiaries received support for increased adaptive capacity to mitigate and respond to effects of climate change.	-	(Plus/Minus) 500 farmer /agro pastoral/pastoral field schools adding up to viable commodity producer clusters in an upgraded business model in the 5 countries	50,000 beneficiaries through direct participation households in upgraded business models(10000 households - average household size of 5)	Project implementation, training reports	FAO/VC aggregators/ACSEs/VC driver, Basin commissions and Local governments	Marginal dropout rates among targeted groups. Election related uncertainties in region(Zimbabwe 2018 , South Africa 2019) No major disputes and conflicts within target communities. Competing/contradicting development or emergency actions by other partners or actors.
			10000 farmer field schools households merging into producer clusters by year 2	10 000 households targeting 50% females participating in farmer/agro pastoral field schools i)direct beneficiaries of startup input grant for application of climate smart technologies, approaches and practices, ii) accessing upgraded climate smart infrastructure and equipment iii) receiving tailored climate and weather, marketing, and technical information	E voucher system reports and SMS tally records	SADC SECRETARIAT/ UNESCO/FAO	
			Learning and demonstration sites established by year 2	Additional 300 000 indirect beneficiaries through receiving climate and weather information, learning through demonstration	Farmer field school graduation and attendance registers	SADC SECRETARIAT/ FAO/UNESCO/ FANRPAN/NMHSs	

				sites and being reached through Programme awareness activities			Community buy-in for collective action and communal investment projects. Availability of productive resources e.g. land, vegetation, labor etc. Disconnect between weather prediction and actual occurrence on the ground creating dis-trust in advisory services, in the short term. Frequent turnover/movement of extension staff
	Percentage of targeted population with sustained climate-resilient alternative livelihoods.		E voucher system for management of farmer start up grants established in year 1	60% of direct target population with climate resilience livelihoods	Baseline survey, End line survey Beneficiary focus group discussions Project monitoring reports farmer and Agro pastoral member records Investment project progress reports	FAO/River basin Commissions/ Local governments FFS facilitators	
	Change in quality of climate related advisory to target population by the extension service.		Technical staff with enhanced skills to support community level adaptation strategies by end of year 2. Total 120 capacitated in Downscaling techniques, 120 capacitated in harmonized early	Minimum 40% increase in satisfaction rates among direct and indirect beneficiaries with climate advisory services prior to the last extreme weather event.	Spatial distribution maps. Weather bulletins Radio advisories Training reports End line survey	FAO/Local level governments SADC SECRETARIAT/ UNESCO FAO / farmer field school stakeholders	

			warning, 250 capacitated in LEGS and 250 capacitated in GEMP			Extension services	Illiteracy levels may restrict audience of some climate advisory products.

Component I: Outcome indicators

Outcome	Indicators	Baseline	Milestones	Target	Means of Verification	Responsible parties	Assumptions
Measures to reduce exposure to climate related risks, hazards and threats and enhance people's resilience, implemented	Harmonized monitoring and early warning systems developed, including hazard and disasters response strategies for the region	TBD	Harmonized tools developed by end of year 1	Harmonized Monitoring and Early warning and response mechanisms in place at SADC regional level and downscaled and domesticated to at least 5 SADC countries	Institutional Annual Reports; Programme reports,	SADC SECRETARIAT, UNESCO, NMHSs,	Adoption of harmonized tools into the national and regional climate change adaptation strategies could be influenced by political interests
	Percentage change in national budgets allocated to climate adaptation activities	TBD	10% increase by end of year 2	15% increase	National Budgets figures	FANRPAN, FAO	

	Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis (climate services)	TBD	Capacity development in downscaling techniques and packaging of climate and weather information availed to 100% of target technical officers by year 1	SADC SECRETARIAT and all NMHSs in targeted countries applying downscaling techniques	SARCOF and NARCOF process reports, Programme M&E Reports	SADC SECRETARIAT, UNESCO, FAO, NHMSs	Governments allocate funds according to nationally determined priorities and emergencies Involvement of Government into project planning and execution will ensure quick buy-in of project lessons and good practices
	Percentage of households using tailored seasonal climate forecasts to plan their activities or enterprises	TBD	Up to 50% of upgraded model farmers by end of year 2	100% of upgraded model farmers	Programme Reports	FAO, UNESCO, SADC SECRETARIAT, NMHSs	
	Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased	TBD	Capacity development in strategies to respond availed to 50% of targeted by second year	Capacity development in strategies to respond availed to 100% of targeted by end of Programme	Program Reports	FAO, UNESCO, SADC SECRETARIAT, NMHSs	

Component I-Output indicators

Output	**Indicators**	**Baseline**	**Milestones**	**Target**	**Means of Verification**	**Responsible parties**	**Assumptions**
Output 1.1: Risk vulnerability assessments	No. of river basins and countries that conduct and update	TBD	At least 2 river basins and 3	All targeted basins conduct and update risk	Programme documents, SARCOF and	UNESCO, SADC SECRETARIAT, FAO	There is country basin level buy in to domesticate

conducted and updated at regional	risk and vulnerability assessments (by sector and scale)		countries conduct assessments by end of year 2	and vulnerability assessments	NRCOF processes reports		harmonized early warning tools developed a There is country level buy in to domesticate harmonized early warning tools Private sector players take up the opportunity to do business with smallholder farmers Institutions are willing to take up new approaches and technologies Governments are willing to take up recommendations to reorganize climate smart technology incentive framework
	No. of early warning systems (by scale) and no. of beneficiaries covered	SARCOF, FEWSNET, SAVAC	Capacity building in; a) data collection using agreed tools and b) data analysis and decision making and arriving at Early Warning products by end of year 2	SADC regional Harmonized monitoring and early warning tools for climate induced transboundary risks and other hazards	Programme documents, SARCOF and NRCOF processes reports	UNESCO, SADC SECRETARIAT, FAO	
Output 1.2: Targeted population groups covered by adequate risks reduction systems	Percentage of target population covered by adequate risk-reduction systems	0	50% of targeted beneficiaries apply new improved climate smart technologies by end of year 2	100% of targeted beneficiaries apply new climate smart technologies by end of project	Programme documents, Upgraded Business model performance reports	FAO, UNESCO Basin commissions, Aggregators/VC driver	
Output 1.3: Strengthened capacity of national and regional centers	No. of staff trained to respond to, and mitigate impacts of, climate-related events (by gender)	0	At least 400 technical officers trained by year 2	At least 750 technical officials trained by end of project.	Programme Documents, training Reports	FAO, UNESCO, Basin commissions, SADC SECRETARIAT,	

and networks to respond rapidly to extreme weather	No. of targeted institutions with increased capacity to minimize exposure to climate variability risks (by type, sector and scale)	0	At least 3 Regional institutions, and at least 10 national and basin level institutions by year 2	at least 10 Regional institutions and at least 20 national and basin level institutions by end of project	Programme documents and reports	UNESCO, FAO, Basin commissions, SADC SECRETARIAT, FANRPAN	
Output 1.4: Improved integration of climate resilience strategies into country development plans	No. of countries with new policy measures/regulations introduced or adjusted to address climate change risks (by sector)	0	At least 5 Countries by year 2	At least 10 SADC countries by end of project	Programme reports, National level Policy and legislation	FANRPAN, UNESCO, FAO	
	No. of targeted countries development strategies with incorporated climate change priorities enforced	0	at least 2 countries by end of year 2	At least 5 countries by end of project	Programme reports, National level Policy and legislation	FANRPAN, FAO, UNESCO	

Component II: Outcome indicators

Outcome	Indicators	Baseline	Milestones	Target	Means of Verification	Responsible parties	Assumptions
Outcome 1: Diversified, strengthened	Percentage change in crop/livestock yields among	TBD	10% increase by end of year 2	30% increase in crop/	Household Surveys.	National focal points.	The 5 countries with project sites implement the

and increased adaptive capacities, livelihoods and sources of income for vulnerable people in targeted areas	targeted households			livestock yields	FS assessment data.	M and E focal points	project at the same pace. The sub-national government /institutions do not prioritize alternative implementation frameworks. Political uncertainties in the region do not affect implementation of project
	Percentage change in productivity of land, crop and livestock resources among targeted communities.	TBD	20% increase in produce by end of year 2.	At least 50% increase	Household Surveys.	National focal points.	
					FS assessment data.	M and E focal points	
		TBD	15% by end of YR 2	At least 30% adoption.	Household surveys.	National focal points.	
					Project reports.	M and E focal points	
	Percentage change in household incomes disaggregated by gender of household heads	TBD	20% increase by end of year 2.	At least by 50%	Household surveys.	M and E focal points.	
	Physical infrastructure improved /rehabilitated to withstand climate change and variability induced stress	TBD	Upgraded model farmer infrastructure needs assessment done by year 1 and 50% of upgraded model farmers accessing physical infrastructure by year 2	100% of Upgraded model farmers accessing physical infrastructure	Household surveys, M&E reports, end line report	National focal points, M&E Focal points	

	Percent of targeted population aware of predicted adverse impacts of climate change an of appropriate responses	TBD	50% of upgraded model farmers by end of year 2	100% of Upgraded model farmers	Household surveys, M&E reports, end line report	National focal points, M&E Focal points	
	Percentage of households and communities having more secure access to livelihood assets	TBD	Sustainable upgraded business model arrangements established for all sites by end of year 2	60 % of direct target communities with secure access to livelihood assets	Household surveys, M&E reports, end line report	National focal points, M&E Focal points	
	Percentage of households adopting new or scaling up existing climate adaptation practices (including indigenous knowledge)	TBD	15% by end of YR 2	At least 30% adoption.	Household surveys. Project reports.	National focal points. M and E focal points	

Component II: Output Indicators

Output	Indicators	Baseline	Milestones	Target	Means of Verification	Responsible parties	Assumptions
Output 2.1: Targeted population groups participating in adaptation and risk reduction awareness activities	Number of news outlets in the local press and media have covered the topic	0	At least one article or story per year per River basin/project site	at least 9 stories/articles for all river basins by end of project	Local newspapers/radio stations. Programme Reports	FAO, FANRPAN, SADC SECRETARIAT, River basin commissions	Local news houses find the story newsworthy
Output 2.2: Physical, natural and social assets strengthened in response to climate change impacts, including variability Increased	No. and type of development and private sector services modified to respond to new conditions resulting from climate variability and change (by sector and scale)	0	At least two private sector players engaged for two business models at each site by end of year one	at least 5 private sector players engaged as value chain driver for the 5 countries project sites	Programme Reports, FFS Reports	FAO, FANRPAN, SADC SECRETARIAT, River basin commissions	Private sector players see the business opportunity in engaging through the upgraded business model
	No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by sector and scale)	0	At least 100 infrastructure at end of year 2	At least 200 middle sized infrastructure rehabilitated/constructed by end of project	Programme Reports, FFS Reports	FAO, FANRPAN, SADC SECRETARIAT, River basin commissions	Communities see the value in the climate smart infrastructure Communities see the value in the

Output 2.3: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	No. and type of adaptation assets (tangible and intangible) created or strengthened in support of individual or community livelihood strategies	0	At least 100 infrastructure at end of year 2	At least 200 middle sized infrastructure rehabilitated/constructed by end of project	Programme Reports, FFS Reports	FAO, FANRPAN, SADC SECRETARIAT, River basin commissions	climate smart infrastructure

F. Demonstrate how the project / programme aligns with the Results Framework of the Adaptation Fund

Project Objective(s)[25]	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Reduced exposure to climate related risks, hazards and threats enhanced people's resilience	1. Harmonized monitoring and early warning systems developed, including hazard and disasters response strategies for the region	**Outcome 1**: Reduced exposure to climate-related hazards and threats	AF Outcome Indicator 1: Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis	

[25] The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

	2. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis (climate services)	**Outcome 2:** Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	AF Outcome Indicator 2.1. Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased	
	3. Percentage change in national budgets allocated to climate adaptation activities	**Outcome 7**: Improved policies and regulations that promote and enforce resilience measures	AF Outcome Indicator 7. Climate change priorities are integrated into national development strategy	
Diversified, strengthened and increased adaptive capacities, livelihoods and sources of income for vulnerable people in targeted areas	4. Percent of targeted population aware of predicted adverse impacts of climate change an of appropriate responses	**Outcome 3:** Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	AF Outcome Indicator 3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	
	5. Percentage change in household incomes disaggregated by gender of household heads		AF Outcome Indicator 3.2. Percentage of targeted population applying appropriate adaptation responses3	
	6. Percentage change in productivity of land, crop and livestock resources among targeted communities.	**Outcome 4:** Increased adaptive capacity within relevant development sector services and infrastructure assets	AF Outcome Indicator 4.1. Responsiveness of development sector services to evolving needs from changing and variable climate	

	7. Physical infrastructure improved /rehabilitated to withstand climate change and variability induced stress		AF Outcome Indicator 4.2. Physical infrastructure improved to withstand climate change and variability-induced stress	
	8. Percentage of households and communities having more secure access to livelihood assets	**Outcome 6:** Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	AF Outcome Indicator 6.1 Percentage of households and communities having more secure access to livelihood assets	
	9. Percentage change in crop/livestock yields among targeted households			
	10. Percentage of households adopting new or scaling up existing climate adaptation practices (including indigenous knowledge)		AF Outcome Indicator 6.2. Percentage of targeted population with sustained climate-resilient alternative livelihoods	
Project Outcome(s)	**Project Outcome Indicator(s)**	**Fund Output**	**Fund Output Indicator**	**Grant Amount (USD)**
Output 1.1: Risk vulnerability assessments conducted and updated at regional	1. No. of early warning systems (by scale) and no. of beneficiaries covered	***Output 1.1:*** Risk and vulnerability assessments conducted and updated	**AF Output Indicator 1.1.** No. of projects/programmes that conduct and update risk and vulnerability assessments (by sector and scale)	

Output 1.2: Targeted population groups covered by adequate risks reduction systems	2. Percentage of target population covered by adequate risk-reduction systems	***Output 1.2:*** Targeted population groups covered by adequate risk reduction systems	**AF Output Indicator 1.2.1.** Percentage of target population covered by adequate risk-reduction systems	
Output 1.3: Strengthened capacity of national and regional centers and networks to respond rapidly to extreme weather	3. No. of staff trained to respond to, and mitigate impacts of, climate-related events (by gender)	Output 2: Strengthened capacity of national and sub-national centres and networks to respond rapidly to extreme weather events	**AF Output Indicator** 2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events (by gender)	
	4. No. of targeted institutions with increased capacity to minimize exposure to climate variability risks (by type, sector and scale)		**AF Output Indicator** 2.1.2 No. of targeted institutions with increased capacity to minimize exposure to climate variability risks (by type, sector and scale)	
Output 1.4: Improved integration of climate resilience strategies into country development plans	5. No. of countries with new policy measures/regulations introduced or adjusted to address climate change risks (by sector)	Output 7: Improved integration of climate-resilience strategies into country development plans	**AF Output Indicator** 7.1. No. of policies introduced or adjusted to address climate change risks (by sector)	
	6. No. of targeted countries development strategies with incorporated climate change priorities enforced		**AF Output Indicator** 7.2. No. of targeted development strategies with incorporated climate change priorities enforced	
Output 2.1: Targeted population groups participating in adaptation	7. Number of news outlets in the local press and media have covered the topic	Output 3: Targeted population groups participating in adaptation and risk	**AF Output Indicator** 3.1 No. of news outlets in the local press and media that have covered the topic	

and risk reduction awareness activities		reduction awareness activities		
Output 2.2: Physical, natural and social assets strengthened in response to climate change impacts, including variability Increased	8. No. and type of development and private sector services modified to respond to new conditions resulting from climate variability and change (by sector and scale)	Output 4: Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability	**AF Output Indicator** 4.1.1. No. and type of development sector services modified to respond to new conditions resulting from climate variability and change (by sector and scale)	
	9. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by sector and scale)		**AF Output Indicator** 4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by sector and scale)	
Output 2.3: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	10. No. and type of adaptation assets (tangible and intangible) created or strengthened in support of individual or community livelihood strategies	Output 6: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	**AF Output Indicator** 6.1.1.No. and type of adaptation assets (tangible and intangible) created or strengthened in support of individual or community livelihood strategies	

Adaptation Fund Core indicators for the programme

Three Adaption Fund Core Indicators will be monitored for the programme as per the table below.

Adaptation Fund Core Indicator	Indicative Project Targets	Comments
Number of beneficiaries	• 50,000 beneficiaries through direct participation households in upgraded business models(10000 households - average household size of 5) • 10 000 households targeting 50% females participating in farmer/agro pastoral field schools i)direct beneficiaries of start-up input grant for application of climate smart technologies, approaches and practices, ii) accessing upgraded climate smart infrastructure and equipment iii) receiving tailored climate and weather, marketing, and technical information • Additional 300 000 indirect beneficiaries through receiving climate and weather information, learning through demonstration sites and being reached through Programme awareness activities • At least 750 technical officials trained and capacitated by end of project. •	This will be the main core indicator used for monitoring and reporting on the project.
Assets produced, developed, improved or strengthened	• at least 5 private sector players engaged as value chain driver for the 5 countries project sites • At least 200 middle sized infrastructure rehabilitated/constructed by end of project • At least 200 middle sized infrastructure rehabilitated/constructed by end of project • 60% of direct target population with climate resilience livelihoods • at least 10 Regional institutions and at least 20 national and basin level institutions with increased capacity to minimise exposure to climate variability (by type, sector and scale) by end of project • At least 10 SADC countries with new policy measures/regulations introduced or adjusted to address climate change risks (by sector) by end of project • At least 5 countries with development strategies incorporating climate change priorities enforced by end of project • Harmonized Monitoring and Early warning and response mechanisms in place at SADC regional level and downscaled and domesticated to at least 5 SADC countries	Assets will include improvements and enhanced quality of land, water and natural resources, application of climate adaptation technologies/practices. It will also include strengthened capacity on agricultural climate change adaptation among public and private agricultural extension institutions and their staff and development

	• SADC secretariat and all NMHSs in targeted countries applying downscaling techniques • All targeted basins conduct and update risk and vulnerability assessments yearly by end of project • SADC regional Harmonized monitoring and early warning tools for climate induced transboundary risks and other hazards • 100% of targeted beneficiaries apply new climate smart technologies by end of project • 100% of Upgraded model farmers accessing physical infrastructure • 100% of Upgraded model farmers • 60 % of direct target communities with secure access to livelihood assets •	institutions and partners supported in the target communities.
Increased income, or avoided decrease in income	• At least a 40% increase in number, types and levels of income among target population. • 30% increase in crop/ livestock yields • At least 50% increase in productivity of crop/ livestock in upgraded business models	The project baseline will provide information on income sources and levels against which this will be measured.

Direct Costs (Component 1, 2 &3) Detailed Budget

Outcome 1: Measures to reduce exposure to climate related risks, hazards and threats and enhance people's resilience, implemented.							
Outputs	***Description/Sub Activities***	***Budget Notes / Activities***	***Year 1***	***Year 2***	***Year 3***	***Total***	***Explanation***
Output 1.1: Risk vulnerability assessments conducted and	1.1.1 Generation of regular seasonal climate assessments, forecasting and projections by SADC Secretariat through SACCOF	Establish Regional historical baseline, with statistics and trends and climate change hotspots applying EODS and other data systems	20 000,00			20 000,00	40 days data acquisition and consultancy for data processing

updated at regional and national levels	and NACCOFS downscaled to the farming communities in the region supported						
		Climate Risk analysis (CRIDA) for the two pilot watersheds	50 000,00				Establishment of the baseline climate change vulnerability of water security in the two basins, as a pathway to identify appropriate adaptation strategies
		Capacity building on downscaling and bottom-up approaches and communication of uncertainties for 60 participants	35 000,00			35 000,00	Capacity Building material costs, Travel & staff time for training event, trainers fees, participants travel and accommodation, training venue, stationary. Workshop Participants will be drawn from all basin institutions and regional weather institutions who participate in the SARCOF
		Strategy and sustainability plan and yearly Support to the Regional SARCOF process under SADC SECRETARIAT	30 000,00	30 000,00	30 000,00	90 000,00	Support to yearly regional seasonal climate forecasting process under the SADC Secretariat Southern African Regional Climate Outlook Forum (SARCOF). 60 days Consultancy for developing a strategy and sustainability plan for the SARCOF
		Post SARCOF national capacity building on high resolution forecast downscaling techniques and communication of uncertainties (5 Countries)		55 000,00		55 000,00	Capacity building material costs, Travel & staff time for regional trainers for the 5 national training events, trainers fees, participants travel and accommodation, training venue, stationary(30 participants for each country). Participants for the national level workshops will be drawn from National Climate Outlook Forum (NACOF) in each of the focus countries
		Subtotal				**250 000,00**	

	1.1.2 Capacities in climate vulnerability risk profiling for key crop and livestock production systems and value chains built	Undertake climate vulnerability risk profiling and Develop localized/value chain specific climate risk/hazard response models/protocols for crop and livestock production systems and value chains at specific project sites	25 000,00	25 000,00		50 000,00	Climate Risk Profiling and Local climate risk response modelling consultants and half day reporting and validation events at each project site. Communication materials(brochures, publications on risks, responses, policy briefs)
		Subtotal				**50 000,00**	
Output 1.2: Targeted population groups covered by adequate risks reduction systems	1.2.1 Inventory of new/improved value chain specific climate smart technologies, approaches and practices	For each of the project sites conduct a profiling exercise of geo and value chain specific climate smart technologies(solar powered water infrastructure, community level initiatives, bush to feed etc)	75 000,00			75 000,00	Regional Climate smart technology/approaches profiling experts/consultants drawing specific examples from sites in the selected project river basins. Develop ToRs, Develop technology qualification criteria, develop profiling criteria, two day regional reporting and validation event , publication of inventory
		Subtotal				**75 000,00**	
	1.2.2 Build capacity of Agromet divisions for participating in the Southern African region	Capacity for agro-met divisions at national level(5 countries) and at SADC SECRETARIAT strengthened	100 000,00	100 000,00	65 000,00	265 000,00	Five automatic Weather Stations, other relevant equipment and software for the Agromet divisions of participating countries and refresher training courses for Agro meteorologists at SADC SECRETARIAT and National meteorological institutions
		Establish a SADC Flood and Drought Early Warning System	50 000,00			50 000,00	Establish a regional platform for monitoring and early warning of water related hazards, based on the African Flood and Drought Monitor
		Build the Earth Observation Data systems GIS-climate capability of regional centers and networks through infrastructure upgrade	100 000,00			100 000,00	Purchase of GIS Upgrading equipment for regional climate

		Subtotal				**415 000,00**	
	1.2.3 Facilitating harmonization of early warning and surveillance systems and mechanisms for priority climate induced transboundary risks and other hazards	Establishment of tailored high-resolution Monitoring and Early Warning Systems in the two pilot basins	60 000,00	60 000,00	60 000,00	180 000,00	Development of an adequate high-resolution Monitor as a platform to provide climate services with adequate spatial and temporal resolution, in line with the requirements of the farmer communities in the pilot basins
		Provide technical support and contribute to regional livestock data/information collection, disease surveillance.	60 000,00	60 000,00	60 000,00	180 000,00	Ongoing Technical assistance to SADC Regional Livestock institutions and national level institutions. Provide appropriate diagnostic support, monitoring and control of transboundary animal diseases (such as FMD, peste de petits ruminants and contagious bovine pleuropneumonia) and zoonoses (such as anthrax, rabies, brucellosis etc.) in as far as they are enhanced by droughts and floods
		Strengthen cross boarder and cross basin disease surveillance (possibly using similar platform as EMPRES-i EMA),	65 000,00	65 000,00	65 000,00	195 000,00	Provide resources for cross border and cross basin joint planning in order to improve the sharing of disease information and technical capacity development on surveillance of major transboundary animal diseases, zoonoses and other emerging diseases at national and regional levels
		Support development/updating/strengthening of long-term harmonized EWS information/tools for decision making, data collection tools and response protocols for the region's needs-based content/approach for short and climate induced hazards and disasters.	100 000,00			100 000,00	Consultant/experts to develop products and a regional reporting and validation including the following: (a) a regional risk register – database with profiles of hazards and risks; (b) a regional food balance sheet; (c) a plant and animal pests and diseases status-data; (d) a meteorological data; (d) conflict monitoring mechanisms; (e) alert and escalation system; (f) response protocols and procedures for dealing with

							different disasters, and (i) built in systems of tracking and monitoring variables as per Malabo declaration
		Three day Regional training in; a) data collection using agreed tools and b) data analysis and decision making using the Monitoring and Early Warning system.	25 000,00			25 000,00	Training of water experts and regional stakeholders on harmonized tools. Training material costs, Travel & staff time for training event, trainer's fees, participants travel and accommodation, training venue, stationary.
		Support national training in; a) data collection using agreed tools and b) data analysis and decision making using the Monitoring and Early Warning system		80 000,00		80 000,00	Support to country level training for water experts from 16 countries. Training material costs, Travel & staff time for training event, trainer's fees, participants travel and accommodation, training venue, stationary.
		Provide incentive for members states to domesticate and uptake data collection tools and response protocols for the region's climate related hazards and disasters.		200 000,00	120 000,00	320 000,00	Incentive for each country to domesticate the regional tools. This will be a grant for member states that bring proposals to domesticate the regional tools. It will cover the cost of implementing the regional tools
		Subtotal				**1 080 000,00**	
Output 1.3: Strengthened capacity of national and regional centers and networks to respond	1.3.1 S Agro-climatic advisory and feedback mechanism/systems in the region strengthened	Database for intermediaries and famer users established	20 000,00			20 000,00	Participation in project baseline surveys by climate scientists

rapidly to extreme weather		Seasonal agriculture planners regularly produced through national participatory planning workshops	60 000,00	60 000,00	60 000,00	180 000,00	Cost of project staff travel, subsistence, venue and workshop logistics (one workshop per season for 3 seasons for 5 countries)
		Existing feedback mechanisms reviewed	20 000,00			20 000,00	Procurement of consultancy services to review existing feedback mechanisms
		Develop and apply a cost effective communication and feedback channel anchored on the Connected Farmer Platform	100 000,00	15 000,00	35 000,00	150 000,00	Consultancy services to develop a draft prototype communication strategy and conducting validation workshops
		Continuous assessment, impact enhancement, learning, monitoring and evaluation	30 000,00	30 000,00	30 000,00	90 000,00	Costs of monitoring and evaluation visits by SADC SECRETARIAT and FAO experts. Two monitoring visits involving meteorological staff per season per country for 3 seasons
		Subtotal				**460 000,00**	
Output 1.4: Improved integration of climate resilience strategies into country development plans	1.4.1 Incentives and instruments for catalyzing adoption of climate smart approaches along value chains developed, improved and applied	Review of the policy instruments or basket of incentives for inclusive climate smart value chains available at national, provincial and regional levels in each country, with particular attention to pro-active flood and drought risk management strategies	80 000,00	55 000,00	25 000,00	160 000,00	Cost of national consultants to perform reviews and validation events in each country
		Facilitating definition and introduction of missing incentives, and ensuring that the basket incentives is gender and youth sensitive.	80 000,00	80 000,00	25 000,00	185 000,00	Cost of national consultants/expertise to facilitate design and mainstreaming of new or proposed policy incentives in each country, including the validation events
		Grants for governments to improve the menu of policy tools available for inclusive climate smart VC development	100 000,00	100 000,00	50 000,00	250 000,00	Cost of expertise/consultants to develop recommendations, costs of lobbying, advocacy and communication materials

		Developing recommendations for upgrading the procedures for the delivery of existing and new incentives			50 000,00	50 000,00	Cost of expertise/consultants to develop recommendations, costs of lobbying, advocacy and communication materials
		Capacity building and support for VC actors to access climate smart incentives and other climate financing resources			50 000,00	50 000,00	Capacity building material costs, Travel & staff time for training event, trainers fees, participants travel and accommodation, training venue, stationary. Training to be rolled out to 500 value chain players at all project sites in the specified basins
		Subtotal				**695 000,00**	
	1.4.2 Develop capacities for targeted value chain specific actors to apply a range of new technologies/approaches/initiatives, climate smart tools	Training on Livestock Emergency Guidelines and Standards (LEGS) for agricultural extension workers		100 000,00	50 000,00	150 000,00	Training material, Training material costs, Travel & staff time for training event, trainer's fees, participants travel and accommodation, training venue, stationary. Training to be rolled out to 250 livestock extension officers and veterinary officials in the relevant specified basins
		Training on Good Emergency Management Practice (GEMP) for Animal health/veterinary officials		50 000,00	50 000,00	100 000,00	Training material, Training material costs, Travel & staff time for training event, trainer's fees, participants travel and accommodation, training venue, stationary. Training to be rolled out to 250 livestock extension officers and veterinary officials in the relevant specified basins
		Tailor-made Agro-pastoral trainings on Community-based Rangeland Condition Monitoring and early warning		100 000,00	100 000,00	200 000,00	Training material, Training material costs, Travel & staff time for training event, trainer's fees, participants travel and accommodation, training venue, stationary. Training will be rolled out using farmer field school approach to 500 farmers

		Guidelines and baseline analysis of current national drought and flood risk management strategies in the region and best practices worldwide	50 000,00			50 000,00	Establish a baseline analysis on currently adopted disaster management and climate risk management strategies in the SADC region and a review of best practices worldwide
		Training of governmental agencies and parliamentarians on flood and drought risk management strategies		100 000, 00		100 000,00	Strengthening capacities of decision makers to adopt effective climate risk management strategies at the national level in the SADC countries
		Subtotal				**600 000,00**	
	1.4.3 Establish and operationalize a Regional Knowledge Policy Action Platform on Climate Resilience for Southern Africa	Design and validate the Knowledge Action Platform on Climate Resilience for Southern Africa (Regional KAPP) , with particular attention to pro-active flood and drought risk management strategies	15 000,00			15 000,00	Cost of design of ToRs, operational system, modalities and sustainability plan Cost of meetings for key KAPP stakeholders for year one(approximately two meetings)
		Operationalize the KAPP		5 000,00	5 000,00	10 000,00	Cost of meetings for the KAPP for year two and three
		Subtotal				**25 000,00**	
Subtotal Component I						**3 650 000,00**	
Outcome 2: Diversified, strengthened and increased adaptive capacities, livelihoods and sources of income for vulnerable people in targeted areas							

Output 2.1: Targeted population groups participating in adaptation and risk reduction awareness activities	2.1.1 Support platforms for joint planning, implementation, coordination to build adaptive capacities and resilience to climate change	Promote inter basin and transboundary learning, sharing and planning using the PCCP approach	75 000,00	75 000,00	75 000,00	**225 000,00**	Cost of inter basin exchange visits and learning journeys: 3 in each year for 50 farmers from each basin. Design plan for exchange, with beneficiary selection criteria, areas to be visited and content
		Support evidence based adaptation information in the region through demonstration, documentation and reporting of good practices, lessons learned and success stories	25 000,00	30 000,00	40 000,00	**95 000,00**	Costs of documentation, brochures, posters and Setting up community sites for demonstrating adaptive crop pathways and practices in year 1, documentation and reporting of good practices, lessons learned and success stories in years 2 and 3
		Support to activities of interbasin and transboundary joint planning, implementation , coordination committees initiatives using the PCCP approach	10 000,00	10 000,00	10 000,00	**30 000,00**	Costs of intra and interbasin cross border joint planning and coordination of water, and natural resources management activities(planning, coordinating, communication, monitoring)
		Subtotal				**350 000,00**	
Output 2.2: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	a) Identify priority value chains and non-agricultural sources of income opportunities for upgrading into inclusive climate smart and business driven activities	Identification and selection of key value chains and non-agricultural opportunities in each basin	50 000,00			50 000,00	Cost of consultative community level dialogue and application of FAO methodology to determine the value chains and activities with greatest economic, social and environmental value to the community
		Identify aggregators (Private Buyer) for the identified commodities in the project sites	50 000,00			50 000,00	Cost of technical expertise to manage call process. This will involve the launch of a process to select aggregators/Private Buyer at all sites through design of a call (terms of reference), its advertisement, adjudication and awarding to the successful aggregators. The call will define parameters such as number of famers, type location, goods and services, alliances and competencies that

						the project will be expecting from the aggregator/buyer.
	Subtotal				**100 000,00**	
b) Develop profiles and upgrading plans/proposals for i) priority value chains and ii) non-agricultural livelihoods and income sources	Multi-stakeholder capacity development on the new VC soft methodology development approach for each site	125 000,00			125 000,00	Five three day learning sessions for all potential business partners for the selected potential VCs in each basin. Travel & staff time for event, VC expert fees, participants travel and accommodation, venue, stationary. approximately 100 participants per site
	Modern GIS referenced Profiling and registration of farmers (and their farms) to participate in the upgraded business model (all farm and farmer characteristics-economic, geographic, agro ecological etc.)	500 000,00			500 000,00	This will be part of the Terms of Reference of the Aggregator/Buyer and will be clearly defined as part of the Good and services to be provided. The Aggregator will however agree and comply with FAO on the specific methodology, and templates to be used so that the project maintains a standard and uniform farm and farmer profiling and registration process across all the projects sites in the basins. target is 8000 farmers for all the sites
	Establish Digital system for managing start up inputs, extension, marketing and climate information	100 000,00			100 000,00	

		Detailed Profiling of commodity value chain for the priority commodities jointly identified by the communities and the business partners-----starting out from VC soft methodology sessions, followed by status quo then lastly the upgraded climate smart business model with clear definition of all underlying business relationships	200 000,00			200 000,00	Separate service providers/consultants with the technical guidance of FAO and close collaboration with the Aggregator will profile selected commodity value chains. Terms of reference and continuous technical guidance throughout the commodity profiling process will be developed. The profiling will start with a VC training using soft methodology provided by FAO, the commissioning of the profiling of status quo and upgraded model. The upgraded model is the one with the innovative business relationships and business arenas and which takes into account new climate smart technologies.
		Subtotal				**925 000,00**	
	c) Facilitate business alliances/partnerships for communities and individuals in priority VCs and non-agricultural livelihoods	Assess farmers' needs within the upgraded business model	25 000,00			25 000,00	Under the guidance and supervision of FAO, the Aggregator and the VC profiling consultants will assess and report the farmers' needs within the upgraded business model.
		Support the setting-up of farmer organization (producer level)-Youth farmer Field and Adult farmer field Schools	150 000,00			150 000,00	Using the Registers created, a service provider (aggregator, consultant, NGO) will facilitate the setting-up or restructuring of farmer organizations (producer level) into viable identified business clusters, according to the adopted business model. These will be comprised of one or more Farmer Field Schools

		Facilitate farmer organizations' to develop business relationship	150 000,00			150 000,00	Through structured FFS approach, capacitate farmer organizations(clusters) and support them to meet and form business relationships---through MoUs, Contracts, Offtake agreements etc.---- with the aggregator and other value chain players, and to ensure their members' access to required quantity and quality goods and service
		Assist vulnerable individual, community, and VC actors to access resources/funds -through a 30% de-risking matching grant for farmers needs	3 000 000,00			3 000 000,00	Matching grant of 30% to be included in the blended PPP smallholder farmer financing scheme. Farmers cannot access the grant if they are not part of no aggregation agreement, which compels them to apply specific climate smart technologies.
		Subtotal				**3 325 000,00**	
	a) Facilitate rehabilitation, construction and establishment of strategic livelihood and climate smart value chain infrastructure provided through various forms of partnerships	Specify the business infrastructure and equipment needs for the upgraded business models	50 000,00			50 000,00	40 consultancy days, plus travel costs across basins for profiling and specifying the upgraded climate smart infrastructure, including processing needs, and opportunities for value addition and product improvement for the value chains at the sites in the basins.
		Provide funding for establishment of strategic climate smart value chain infrastructure	2 800 000,00			2 800 000,00	100% grant for communal infrastructure as defined in the upgraded business model with priority infrastructure including 1) solar powered deep borehole smart irrigation schemes, 2) water storage infrastructure 3) Livestock Dips, water troughs and other handling infrastructure 4) climate smart processing and storage infrastructure 5) minimal rehabilitation works on medium scale infrastructure
		Subtotal				**2 850 000,00**	

	Subtotal component II					**7 550 000,00**	
	Grant Total Direct costs					**11 200 000,00**	

Detailed Execution Budget Cost Breakdown

No	Description	Description of activity	r	Unit	Qty/Yr1	Qty/Yr2	Qty/Yr3	Total Qty	Cost /Unit	Cost Yr1	Cost Yr2	Cost Yr3	Total cost
UNESCO	Staff P5	Manager/Director	1	month	3	3	3	9	18 000,00	54 000,00	54 000,00	54 000,00	162 000,00
UNESCO	Staff P3	Programme Officer	1	Month	12	12	12	36	9 800,00	117 600,00	117 600,00	117 600,00	352 800,00
UNESCO	Staff	Finance and Administration	1	Month	12	12	12	36	1 200,00	14 400,00	14 400,00	14 400,00	43 200,00
UNESCO	Travel	PSU Travel to programme sites	1	Lumpsum	1	1	1	3	15 000,00	15 000,00	15 000,00	15 000,00	45 000,00
UNESCO	Equipment	Office Furniture	1	Lumpsum	2	0	0	2	3 000,00	6 000,00	-	-	6 000,00
UNESCO	Equipment	accessories)	1	Lumpsum	1	0	0	1	3 000,00	3 000,00	-	-	3 000,00
UNESCO	Oprating	General Oprating expenses	1	Lumpsum	4	4	4	12	1 850,00	7 400,00	7 400,00	7 400,00	22 200,00
UNESCO	and Visibility	Communication and Visibility	1	Lumpsum	1	2	2	5	3 000,00	3 000,00	6 000,00	6 000,00	15 000,00
FAO	Maintanace	Vehicle maintance	5	Limpsum	1	1	1	3	5 000,00	5 000,00	5 000,00	5 000,00	75 000,00
FAO	Staff P5	Manager/Director	1	month	3	3	3	9	18 000,00	54 000,00	54 000,00	54 000,00	162 000,00
FAO	Staff P3	Focal point	1	month	12	12	12	36	9 800,00	117 600,00	117 600,00	117 600,00	352 800,00
FAO	Staff P2	National Project officers	5	month	7	7	7	21	4 000,00	28 000,00	28 000,00	28 000,00	420 000,00
FAO	Staff	adminitration Support	1	month	6	6	6	18	2 000,00	12 000,00	12 000,00	12 000,00	36 000,00
FAO	Travel	Travel to Project Sites	1	Lumpsum	1	1	1	3	15 000,00	15 000,00	15 000,00	15 000,00	45 000,00
FAO	Equipment	Office Furniture	1	Lumpsum	1	0	0	1	3 000,00	3 000,00	-	-	3 000,00
FAO	Equipment	accessories)	1	Lumpsum	1	0	0	1	4 000,00	4 000,00	-	-	4 000,00
FAO	Oprating	Internet, Airtime, Stationary	1	Lumpsum	1	1	1	3	1 500,00	1 500,00	1 500,00	1 500,00	4 500,00
FAO	Oprating	Communication and Visibility	1	Lumpsum	1	1	1	3	1 500,00	1 500,00	1 500,00	1 500,00	4 500,00
FAO	support services	Reporting Cost	1	Lumpsum	1	1	1	3	6 000,00	6 000,00	6 000,00	6 000,00	18 000,00
FAO	Oprating	Rent, Security	1	Lumpsum	1	1	1	3	15 000,00	15 000,00	15 000,00	15 000,00	45 000,00
FAO	Maintanace	Vehicle maintance	5	Limpsum	1	1	1	3	5 000,00	5 000,00	5 000,00	5 000,00	75 000,00
FANRPAN	Staff	Part time Director	1	month	2	2	0	4	6 500,00	13 000,00	13 000,00	-	26 000,00
FANRPAN	Staff	Part Time Policy officer	1	month	5	5	5	15	2 700,00	13 500,00	13 500,00	13 500,00	40 500,00
FANRPAN	Staff	Part time Admin and Finance	1	month	2	2	2	6	1 100,00	2 200,00	2 200,00	2 200,00	6 600,00
FANRPAN	GoE	chagres	3	Lumpsum	1	1	1	3	1 200,00	1 200,00	1 200,00	1 200,00	10 800,00
	costs									517 900,00	504 900,00	491 900,00	1 977 900,00

Detailed Implementing Entity Fee Budget Breakdown

Activity	UNESCO Fee	Description
Oversight and management of project development and project implementation	387 100.00	Project coordination: project planning, day to day project management and implementation, Final project Evaluation
Financial management, including accounting, fiduciary standard monitoring, financial audits	300 000.00	Financial management practices complying with AF requirements ensuring financial reporting, efficient procurement processes. Estimation of bank costs for transfer operations and other transaction costs
Project staff functions	135 000.00	Technical support in risk management
Total	**822 100.00**	

Overall Project summary budget

Budget Breakdowns by component			
Budget Element	Unit	Allocation	Percentage
Component 1	UNESCO / FAO/ FANRPAN	3 650 000.00	26%
Component 2	FAO/ UNESCO	7 550 000.00	54%
	Sub-total Direct Costs	**11 200 000.00**	**80%**
Execution costs	UNESCO/FAO//FANRPAN	1 977 900.00	14%
IE Fee	UNESCO	822 100.00	6%
	Sub-total In-direct Costs	**2 800 000.00**	**20%**
	Grand TOTAL	**14 000 000.00**	**100%**

G. Include a disbursement schedule with time-bound milestones

	Upon Agreement & signature	One year after project commencement and on submission/acceptance of 1st year report	At end of 2nd year and on submission/acceptance of 2nd year report	At end of 3rd year and on submission/acceptance of 3rd year report	Total
Scheduled Date	2019/04/01	2020/12/01	2021/12/01	2022/12/01	Total
Direct costs	4915000	4310000	1900000		11200000
Executions costs (%)	672300	659300	646300	0	1977900
IE Fee (%)	0	274 033,33	274 033,33	274 033,33	822100
Total Disbursements	**5 587 300.00**	**5243333.33**	**2820333,33**	**274033,33**	**14 000 000.00**

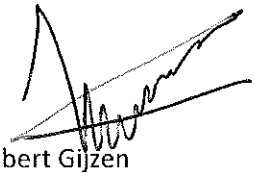
PART IV: ENDORSEMENT BY GOVERNMENTS AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. **Record of endorsement on behalf of the government**[26] *Provide the name and position of the government official and indicate date of endorsement for each country participating in the proposed project / programme. Add more lines as necessary. The endorsement letters should be attached as an annex to the project/programme proposal. Please attach the endorsement letters with this template; add as many participating governments if a regional project/programme:*

Paula Francisco Coelhom Minister of Environment Ministry of the Environment, Government of Angola	Date: *04 January 2018*
Teofilus Nghitila, Acting Permanent Secretary, Ministry of Environment and Tourism, Government of Namibia	Date: *12 December 2018*
Sheilla Santana Afonso, Permanent Secretary, Ministry of Land Environment and Rural Development, Government of Mozambique	Date: *24 December 2018*
South Africa:	Date: Pending
Zimbabwe:	Date: Pending

6. Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

B. Implementing Entity certification *Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address*

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.
 Professor Hubert Gijzen Regional Director and Representative UNESCO Regional Office for Southern Africa Implementing Entity Coordinator

Date: January 07, 2019	Tel.: + 263-4-776775/9 Email: h.gijzen@unesco.org
Project Contact Person: Dr Koen Verbist, Programme Specialist UNESCO Regional Office for Southern Africa	
Tel. : + 263-4-776775/9 And Email: k.verbist@unesco.org	

Republic of Angola
Ministry of the Environment

To:
The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Luanda, 4th January 2019

Subject: Endorsement for Strengthening Adaptive Capacities for Smallholder Farmers in Water Stressed River Basins in Southern Africa

Excellences,

In my capacity as designated authority for the Adaptation Fund in Angola, I confirm that the above Regional project/programme proposal is in accordance with the government's Angola priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the (select country or region).

Accordingly, I am pleased to endorse the above project/programme proposal with support from the Adaptation Fund. If approved, the project/programme will be implemented by FAO and executed by Ministry of Environment.

Sincerely,

PAULA FRANCISCO COELHO
(Minister of Environment)

ADAPTATION FUND

Letter of Endorsement by the Government of Mozambique

24 December 2018

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 324/5

Subject: Endorsement for the capacity building Project for smallholder farmers in Water Catchment Areas in Southern Africa

In my capacity as designated authority for the Adaptation Fund in Mozambique, I confirm that the above regional project proposal is in accordance with the government´s priorities in implementing adaptation activities to reduce adverse impacts of risks, posed by climate change in the region.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by UNESCO, FAO.

Sincerely

Sheilla Santana Afonso
Permanent Secretary
Ministry of Land Environment and Rural Development

REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT AND TOURISM

Tel: (00 26461) 284 2111
Fax: (00 26461) 232 057
Enquiries: P Muteyauli

Cnr Robert Mugabe &
Dr Kenneth Kaunda Street
Private Bag 13306
Windhoek
Namibia

6 December 2018

The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for the FAO / UNESCO regional proposal to the Adaptation Fund titled *"Strengthening Adaptive Capacities for Smallholder Farmers in Water Stressed River Basins in Southern Africa"*

In my capacity as Designated Authority for the Adaptation Fund in Namibia, I confirm that the above regional project is in accordance with our national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Namibia as well as the broader region.

Accordingly, I am pleased to endorse the regional project proposal for submission to the Adaptation Fund. If approved, the project will be implemented by the FAO and UNESCO.

Please accept the assurances of my highest consideration.

Yours Sincerely,

Ministry of Environment & Tourism
12 -12- 2018
Office of the SECRETARY
REPUBLIC OF NAMIBIA

Teofilus Nghitila
Acting Permanent Secretary

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Date: 14/12/2018
File No. PR-11/2

"Stop the poaching of our rhinos"

All official correspondence must be addressed to the Permanent Secretary

Actual. 17 Outubro 018
Lista de convidados

NATIONAL LEVEL CONSULTATIVE WORKSHOP FOR
DEVELOPMENT OF UNESCO/FAO REGIONAL PROPOSAL TO ADAPTATION FUND
Sala Magna do Governo Provincial. Ondjiva, 22 October. Angola

	NOME	E TAIL	TELEF.	ASSINAT
1	Provincial Government of Cunene **(Governor, Excellency)**	Oliveira A. da Cruz	924889553	
	Provincial Government of Cunene **(Environmental Director)**	Cirilo Nomolo Mwalenge	937862479	
	Provincial Government of Cunene **(Agriculture Director)**	Sr.Tibério Pedro Tibério Tulitileni	945870326	
	Provincial Government of Namibe **(Environmental** Director)	Sr.Penelas Osvaldo Penelas	73945239	
5	Provincial Government of Namibe **(Agriculture** Director)	GABRIEL T. FELIX gabytelex25@hotmail.com	923579964	
	Provincial Government of Huila **(Environmental** Director)	Hugo M.A. Serfa - Chefe de Departamento hugomserfa@hotmail.com	923744598	
	Ministry of Environment (General Director for Mayombe Iniciative)	Olivio Panda OLIVIO PANDA	923821618	
	Ministry of Agriculture and Forestry (IDA - Agricultural Development Institute)			
	ADPP ONG (www.adpp-angola.com)	Geraldo Chivala	925836062	
10	UNESCO United Nation	João Bubuzi	927739126	

ANNA JOHANSSON anna.johanssan@adpp.org

Projecto Apicultura	Eng.º Chipa	945515444	[illegible]
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INRH (Instituto Nacional dos Recursos Hídricos)	Eng. Quintino manuel.quintino@inrh.gv.ao	924 986 232	
Civil Protection department Ministry of Internal Affairs (Police)			
Instituto Superior Politécnico do Cunene (Polytechnic Institute of Cunene)			
Development Workshop ✓			
World Vision ✓			
Associação ANO (Private sector value chain) ✓	Pe Gaudêncio YAKULEINGE Gfyakuleinge@gmail.com	934533761	
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Paulina Raunawoje	(Associação ANO)	921335004	

Food and Agriculture Organization of the United Nations

SOUTH AFRICA NATIONAL LEVEL CONSULTATIVE MEETINGS FOR DEVELOPMENT OF UNESCO/FAO REGIONAL PROPOSAL TO ADAPATATION FUND
5TH NOVEMBER 2018

Consultation Register

	Name of Delegate	Role	Institution	Email Address	Signature
1.	Muchaneta Mpanagh		UNESCO	m.mpanagh@unesco.org	
2	Norman Maiwashe		ARC	norman@arc.agric.za	
3	Nomvuzo Mjadu	DDirector	DAFF	PatriciaMJ@daff.gov.za	
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8	Lot Mlati	Architect Rep	FAO	Lot.Mlati@fao.org	
9	Johan Malherbe	Researcher	CSIR	jmalherbe@csir.co.za	
10	David Obonyo	Nutrition officer	FAO	david.obonyo@fao.org	
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12	Sina Luchen	Reg Agronomist	FAO	Sina.Luchen@fao.org	
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15	Khethukuthula Nzuza	FAO Reader	FAO	Khethukuthula.nzuza@fao.org	
16	Zacarey Khunou	FAO-Programme	FAO	Zacarey.Khunou@fao.org	
17	Cuthbert Kanlaye	FAO-Programme	FAO	Cuthbert.Kanlaye@fao.org	
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23	Jannie Maree	Prof Water & Sanitation	Univ Limpopo	maree-jannie@gmail.com	
24	Kingsley Ayisi	Professor: Agro Ecosystems Research	University of Limpopo	kwabena.ayisi@ul.ac.za	

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SOUTH AFRICA NATIONAL LEVEL CONSULTATIVE MEETINGS FOR DEVELOPMENT OF UNESCO/FAO REGIONAL PROPOSAL TO ADAPATATION FUND

5TH NOVEMBER 2018

25 Richard Sekmela	Director: NRM	Limpopo Dept of Agriculture	selemelam@agric.limpopo.gov.za	
26 Maboko Mphosi	Director	UL - LATS	Maboko.mphosi@ul.ac.za	
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NAMIBIA NATIONAL LEVEL CONSULTATIVE WORKSHOP

FOR DEVELOPMENT OF UNESCO/FAO REGIONAL PROPOSAL TO THE ADAPATATION FUND

18th October 2018 – UN House

Participants' registration form

	NAMES	INSTITUTION	EMAIL ADDRESS	SIGNATURE
1.	Cuthbert Kambanje	FAO - SA	Cuthbert.Kambanje@fao.org	
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32.				

United Nations Educational, Scientific and Cultural Organization

Food and Agriculture Organization of the United Nations

Zimbabwe National Level Consultative Workshop for Development of a UNESCO/FAO Regional Proposal to Adaptation Fund

Workshop Programme

25 October 2018

REGISTRATION FORM

NAME	DESIGNITION	ORGANISATION	CONTACT	SIGNATURE
TIRIVANHU MUTHWATI	Deputy Director, Climate Change	Ministry of Agriculture	0772776623	
Gerald T. Mundondwa	Hydrologist	Department of water	0772 253 241	
BEN NYIKADZINO	Hydrologist	ZINWA MZINGWANE	0778265417	
E Mafongo	CC Scientist	MLAWCRR	0773200082	
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K KAMIRASORA	HYDROLOGIST	WATER	6719 227065	
Y Chingarande	Principal Natural Resources Officer	Ministry of Environme	0773852147	
C. CHIRATIRA	PROJECT MANAGER	UNDP	0772270349	
S. NAZOMBE	Catchment Manager	ZINWA	0772395060	
I. NHAPI	CONSULTANT	UNESCO	0772114487	
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I. TARAKIDZWA	VAM OFFICER	WFP	0773 469328	
Hui XU.	Intern	UNESO	0784579598	徐慧 Hui XU.

REGISTRATION FORM

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Muchaneta Munanga		UNESCO	m.munanga@unesco.org	
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Handsome Nyoni	Researcher	ZINWA	0717929527	
Fedson Gandiwa	Professor & Dean	Chinhoyi University of Technology	0773490202	
Kuda Manyenga	Principal Researcher	Climate change mgt Dept	0716780112	
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P. Magwaza	Projects officer	EMA	0712744618	

REGISTRATION FORM				
NAME	DESIGNITION	ORGANISATION	CONTACT	SIGNATURE