FULLY DEVELOPED PROPOSAL FOR REGIONAL PROJECT

PART I: PROJECT INFORMATION

Title of Project:	**Building Inclusive Resilience to Climate Change for Semi-Nomadic Agro-Pastoral Communities in the Transboundary Kunene River Basin**
Countries:	**Angola and Namibia**
Thematic Focal Area[1]:	**Disaster risk reduction and early warning systems**
Type of Implementing Entity:	**Multilateral Implementing Entity**
Implementing Entity:	**International Fund for Agricultural Development**
Executing Entities:	**Ministry of Environment, Angola, Ministry of Environment, Forestry and Tourism, Namibia**
Amount of Financing Requested:	**14,000,000.00 USD**

Letters of Endorsement (LOE) signed for all countries: Yes ☒ No ☐

NOTE: LOEs should be signed by the Designated Authority (DA). The signatory DA must be on file with the Adaptation Fund. To find the DA currently on file check this page: https://www.adaptation-fund.org/apply-funding/designated-authorities

Stage of Submission:

☒This proposal has been submitted before including at a different stage (pre-concept, concept, fully developed proposal)

☐ This is the first submission ever of the proposal at any stage

In case of a resubmission, please indicate the last submission date: 10/08/2023.

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

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A. Project Background and Context

Provide brief information on the problem the proposed project/programme is aiming to solve, including both the regional and the country perspective. Outline the economic social, development and environmental context in which the project would operate in those countries.

Introduction to the proposed project

1. This project intends to enhance the climate resilience of semi-nomadic agro-pastoral communities in the Kunene River basin, a transboundary basin shared by Angola and Namibia, in Southern Africa. The Kunene River basin is the seventh largest transboundary river basin in Southern Africa. It's course encompasses three large ecosystem areas: the Upper Kunene, the Middle Kunene and the Lower Kunene (see Figure 1 below); from its source in the Sierra Hencoco Mountains, on the Angolan *planalto* (Central highlands) at about 2,000 metres above sea level, it drops in its middle section through rolling hills, reaching the flatland at the border with Namibia, then turns west winding along the border between the two countries in its semi-arid lower section and reaches the Atlantic Ocean in the Namib Desert, part of the Iona – Skeleton Coast Transfrontier Conservation Area[2]. Whereas the *planalto* receives more consistent rain patterns and can still guarantee surface water supply, the same cannot be said for the middle and lower regions, which are predicted to become drier in the next decades, because of climate change.

2. The Kunene River Basin is jointly managed by the two countries through the Permanent Joint Technical Commission established in 1969, as the advisory body on the management and use of the river. Its role is centred on the identification and management of studies necessary for the countries to effectively manage the basin, however the capacity to commission and fund such studies and evaluations is often limited by the available resource and supporting donor programmes. Consequently, there have been few country-level studies conducted in the two countries but there is no up-to-date regional assessment of ground and surface water resources, or on water and ecosystem goods and services, which would help any climate change adaptation strategy and strengthen sustainable programming. In so far as infrastructure for data collection and analytics, weather monitoring stations are few and sparse, thus not providing a real indication of weather patterns for the entire basin both at regional and local scale (micro-climate). This makes it very difficult for national and regional planners to create climate change mitigation and adaptation solutions that can cater for the communities in the Kunene River Basin at both basin and village scales. This project aims to overcome this barrier.

3. National and community level consultations conducted in the two countries to inform the scope and suitability of interventions in this proposal reported that these countries are experiencing increasing water scarcity associated with climate variabilities and change. This affects the economies of these countries in various ways, such as the reduction in agricultural yields/production, damage to ecosystems (compromising goods and services that they provide), increased migration, reduced social capital and heightened gender disparities in the provision and management of water. Furthermore, the Kunene River Basin requires unique adaptation measures for the semi-nomadic agro-pastoralist communities who live in this basin.

Background: Climate change in southern Africa

4. The Southern African region is particularly vulnerable to the changing climate due to its low adaptive capacity and vulnerability[3]. Climate-related disasters are the most damaging to the region, in terms of

[2] The Kunene River Assessment Toolkit. (2010). Basins of Southern Africa. http://www.kunene.riverawarenesskit.com/kunenerak_com/EN/RIVER/GEOGRAPHY/BASINS_OF_SOUHERN_AFRICA.HTM

[3] Intergovernmental Panel on Climate Change. (2022). Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press. Cambridge University Press, Cambridge, UK and New York, NY, USA, 3056 pp., doi:10.1017/9781009325844.

frequency of occurrence and impact. According to the IPCC Special Report on Global Warming of 1.5°C, the region is warming at twice the global rate[4]. Climate change poses several risks to Southern African countries in achieving their national goals, as well the Sustainable Development Goals. The rise in air temperature and increased frequency of floods, cyclones, and droughts damage infrastructure, adversely affect crop and livestock production, reduce energy generation, disrupt livelihoods, and cause loss of life. The impacts of climate on the food and nutrition security of the region, that mostly depends on rain-fed agriculture, are experienced through the impacts of climate change on water resources. The region needs strengthened capacities to anticipate these climate impacts, as well as develop sustainable response measures that build resilience at local community and river basin levels.

5. Climate change projections for the Southern African region show that the greatest impacts will mostly be experienced through changes in the availability of water resources, which could severely affect food production, energy generation and sources of livelihood for the communities[5]. Annual rainfall is expected to decrease by 20% by 2080 in Southern Africa, and that could worsen the challenges of water and food insecurity[6] especially in countries already facing resource scarcities. The challenges are exacerbated by population increase and growth in industrial demand for water. Improving management of transboundary resources of the target riparian countries presents an opportunity for regional cooperation in resource planning and management as a pathway to promote climate resilience and reduce vulnerabilities.

6. The Southern African Development Community (SADC) recognises that climate change poses disproportionately more severe threats to availability of water resources, with access to water predicted to become more challenging with the continued onset of climate change.[7] Water scarcity is increasingly becoming a limiting factor for economic development across the majority of 15 river basins in the region, These basins are at the epicentre of projected climate change impacts which are affecting these water resources in four major ways: (a) increased temperature, which increases evaporation and negatively affects water quality; (b) increasing aridity; (c) more frequent and intense droughts and floods; and (d) increasing seasonal and inter-annual variability. Already, this is evident in the Kunene River Basin targeted by the project, where the economic systems (agriculture, energy, industry), livelihoods (smallholder cropping, pastoralism, rural water supply), and ecosystems (ecosystem goods and services, catchment land quality) highly dependent on water, have become vulnerable to climate impacts[8].

7. The potential climatic impacts on the availability, quality and use of water resources are projected to increase in magnitude, diversity, and severity, given the already large spatial and temporal variability of climate factors in the region[9]. There is a marked increase in the frequency of droughts: for example, five of the seven rainy seasons in the period 2013/14 – 2019/20 were poor agricultural seasons, with inadequate and erratic rainfall in most parts of the region. The severity of the droughts has increased with the 2015/16

[4] Intergovernmental Panel on Climate Change. (2018). Global Warming of 1.5°C: An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, 616 pp. https://doi.org/ 10.1017/9781009157940.

[5] Scholes, R., & Engelbrecht, F. (2021). Climate impacts in southern Africa during the 21st Century. Report for Earthjustice and the Centre for Environmental Rights. University of the Witwatersrand, Global Change Institute.https://cer.org.za/wp-content/uploads/2021/09/Climate-impacts-in-South-Africa_Final_September_2021.FINAL_.pdf

[6] Conway, D., Van Garderen, E. A., Deryng, D., Dorling, S., Krueger, T., Landman, W., & Dalin, C. (2015). Climate and southern Africa's water–energy–food nexus. *Nature Climate Change*, *5*(9), 837-846. https://www.nature.com/articles/nclimate2735

[7] Southern African Development Community. (2015). SADC Climate Change Strategy and Action Plan. https://www.sadc.int/sites/default/files/2021-11/SADC_Climate_Change_Strategy_and_Action_Plan-English.pdf

[8] Kusangaya, S., Warburton, M. L., Van Garderen, E. A., & Jewitt, G. P. (2014). Impacts of climate change on water resources in southern Africa: A review. *Physics and Chemistry of the Earth, Parts a/b/c*, *67*, 47-54.

[9] ibid.

El Nino-induced drought leaving over 40 million people food-insecure[10]. In addition, the region experiences a myriad of other supply and demand pressures such as land degradation, pollution and urban population growth affecting water resources, and climate variabilities and change are projected to exacerbate these pressures in Southern Africa.

8. Local communities in rural and peri-urban areas, particularly women, find it hard to grapple with the changing climate due to their poor adaptive capacities, coupled with the lack of gendered considerations in climate change adaptation[11] and this affects sustainability as over 60% of women actively participate in provision and management of water. If resilience is not strengthened, climate impacts are likely to increase food and water insecurity, reverse poverty alleviation gains and slow economic growth in the region, while causing loss of biodiversity and degradation of the natural resources.

9. Furthermore, agriculture is a source of livelihood (directly and indirectly) for over 60% of the population of the Southern African region. Thus, the performance of this sector significantly affects economic growth, poverty reduction, and food security[12]. Agriculture also contributes an average of 17% to the regional Gross Domestic Product (GDP). However, despite its strategic regional importance, the average growth rate of the sector of about 2.6% per annum is far below the Regional Indicative Strategic Development Plan (RISDP) and Africa-wide Comprehensive Africa Agricultural Development Programme (CAADP) targets of at least 7% and 6% respectively[13]. The low growth rate is attributed to recurrent drought events and prolonged dry periods, incidences of floods, poor agronomic practices, and lack of access to credit and inputs by smallholder farmers, coupled with limited infrastructure for water harvesting and irrigation development[14].

Climate trends in the Kunene River Basin

10. According to the Köppen Climate Classification System, the climate for the upper half of the basin 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). The middle section of the basin is class BSh climate denoting a semi-arid steppe with the average temperature in the coldest month above 0 °C. The Lower Kunene is classified as BWh climate characterised by a dry desert climate[15]. This is depicted in Figure 2, below.

[10] Southern African Development Community. (2016). Regional Humanitarian Appeal. https://www.sadc.int/sites/default/files/2021-08/SADC_Regional_Humanitarian_Appeal_June.pdf
[11] Southern African Development Community. (2016). Regional Humanitarian Appeal. https://www.sadc.int/sites/default/files/2021-08/SADC_Regional_Humanitarian_Appeal_June.pdf
[12] ibid.
[13] ibid.
[14] ibid.
[15] National Geographic Society. (1996.) The Köppen Climate Classification System. https://education.nationalgeographic.org/resource/koppen-climate-classification-system/

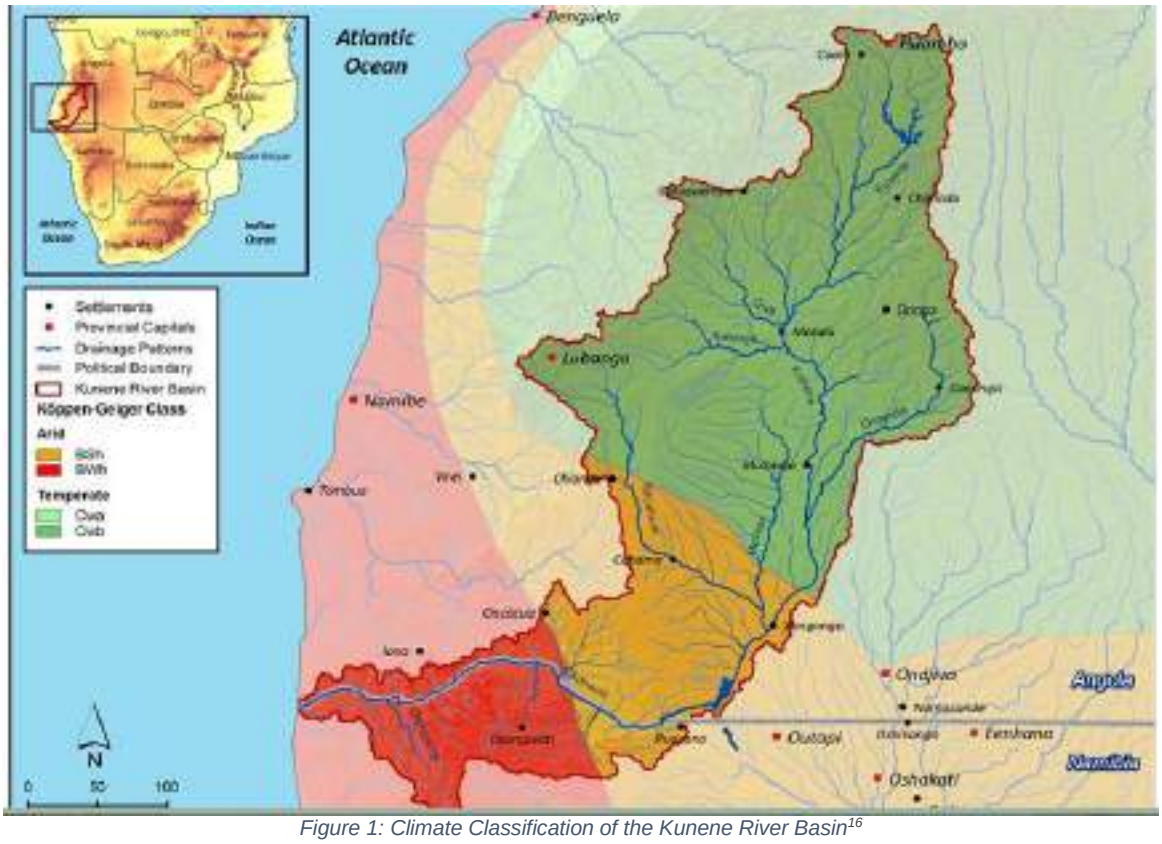


Figure 1: Climate Classification of the Kunene River Basin[16]

11. **Precipitation:** Mean annual precipitation varies across the basin, with over 1 000 mm/year falling on the plateau in the northeast of the Upper Kunene and decreasing dramatically to below 100 mm/year at the coast in the southwestern reaches of the Lower Kunene. Around 75 % of the entire flow of the Kunene is generated in the Upper Kunene sub-catchment. Rainfall is seasonal with around 90 % of the annual volume falling in the five-month rainy period from December to April, with the main season occurring between February and March. Total rainfall from 1961-2019 shows a decrease characterised by prolonged drought conditions. The mean average annual temperatures across the basin vary between 20°C and 23 °C, with average temperatures generally increasing moving from the Upper to the Lower Kunene. Maximum temperatures greater than 40°C can occur between September and April in the Lower Kunene[17].

[16] The Kunene River Assessment Toolkit. (2010). Basins of Southern Africa. http://www.kunene.riverawarenesskit.com/kunenerak_com/EN/RIVER/GEOGRAPHY/BASINS_OF_SOUTHERN_AFRICA.HTM
[17] ibid.

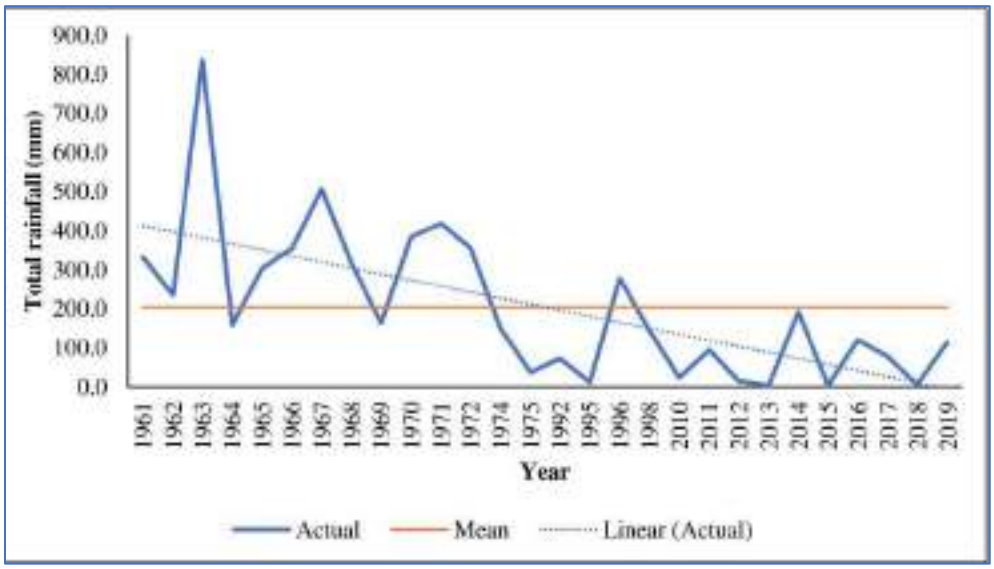


Figure 2: Total annual rainfall at Opuwo, Namibia, 1961-2019[18]

12. Across all of Angola except for northern areas where these may increase there is generally a precipitation decrease predicted. Greater rainfall variability is predicted with much shorter and more intense rainy season[19].

13. **Temperature:** Observational data reflects a rise in mean temperature over the 20th century that is three times that of the global average across Angola and Namibia. Temperatures are predicted to rise in the region by between 2°C to 6°C in the 21st century. The projected increases in temperature will result in an increase in the potential evaporation rate, resulting in the overall water balance declining. Soil moisture is thus expected to decrease, and desertification is expected to increase[20]. Figure 4 below shows a rise in annual mean temperature in the basin over the period 1901-2022.

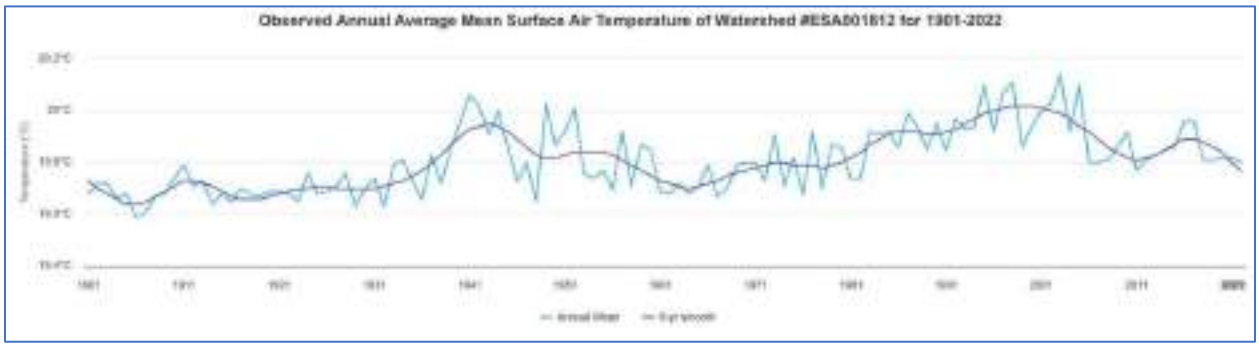


Figure 3: Observed annual mean surface air temperature of the KRB, 1901-2022[21]

[18] Inman, E.N., Hobbs, R.J., & Tsvuura, Z (2020). No safety net in the face of climate change: The case of pastoralists in Kunene Region, Namibia. *PLoS ONE* 15(9): e0238982. https://doi.org/ 10.1371/journal.pone.0238982
[19] ibid.
[20] Inman E.N., Hobbs R.J., & Tsvuura Z (2020) No safety net in the face of climate change: The case of pastoralists in Kunene Region, Namibia. PLoS ONE 15(9): e0238982. https://doi.org/ 10.1371/journal.pone.0238982
[21] World Bank. (2021). Climate Change Knowledge Portal. https://climateknowledgeportal.worldbank.org/watershed/esa001812/climate-data-historical

Current and future impacts of climate change in the Kunene River Basin

14. Further information on climate risk in the Kunene River basin is provided in Annex H, Climate Risk Analysis. The risks and their likely impacts are discussed in this section. Climate change is impacting agriculture in the Kunene River basin, as well as water supply for domestic use. Vulnerability to drought is high in the southern provinces of Angola and drought leads to increase in severity of poverty, increased food insecurity and child malnutrition[22]. Strong dry spells are constantly hampering the rainy seasons and the hydrological years in Angola, and especially the southern provinces. Reportedly, the humanitarian situation is dire: men and women are fleeing the most affected areas and food security issues are spreading. The droughts are hitting at the core of the growing seasons, affecting crops and rangelands. Most men and women are employed in small-scale subsistence agriculture, with no access to modern agronomic technologies and irrigation. Poverty is widespread and food insecurity is a concern. The movement of pastoralists and agro pastoralists following the rain has traditionally made their livelihoods resilient, but the recurrent droughts are causing longer transhumance periods (cattle transhumance starts earlier and lasts longer than usual) affecting productivity of livestock. The southern provinces are thus exposed chronically to drought which, in addition to the national socio-economic issues, minimises the coping and recovery capacity of population and the local economy.

15. **Agriculture:** Agricultural output in the basin is extremely sensitive to climatic conditions, particularly in the areas with lower rainfall. Periodic droughts cause considerable livestock losses and reduce grain production. In the Kunene River Basin, agricultural production is based on subsistence family food crop and livestock production. The main crops grown are sorghum and millet, and livestock rearing (cattle, sheep, and goats) provides a source of income. Pigs and poultry are mainly owned by women. Women are active in both food and cash crop production resulting in a huge workload (land preparation, planting, weeding, cultivation, harvesting, etc) and for livestock 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.

16. **Subsistence agriculture:** A decrease in soil moisture and increased inter-annual rainfall variability would result in a greater variability in yield of millet and thus decrease food security. Due to drought, pastoralists and indigenous women and children are faced with food insecurity and hunger. In the affected communities, adolescent girls may be kept out of school to help with increased care challenges in the face of climate change. Young boys are also kept out of school to look after livestock which track long distances in search of grazing.

17. **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. The decrease in maize yield results in food insecurity, for which there are gender differences in the availability of food. Women and girls tend to have less access while female-headed households are worse off.

18. **Irrigation:** Plans to vastly expand irrigation areas along the Kunene River in Angola along with moderate expansion of irrigation areas in Namibia are dependent upon the availability of water for irrigation. Allocations for irrigation 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. Water scarcity necessitates the introduction of water-efficient technologies such as drip irrigation for use by subsistence and smallholder farmers. Although drip irrigation reduces time use for women, they are rarely trained to install, operate, and

[22] Serrat-Capdevila, A., Limones, N., Marzo-Artigas, J., Marcus, W., & Petrucci, B. (2022). *Water security and drought resilience in the South of Angola*. World Bank.

maintain irrigation systems, nor do they have access to or control over the necessary financial resources to ensure the longevity of the irrigation systems benefit them.

19. **Livestock production:** 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 livestock poisoning as animals are forced to eat toxic plants that are the first to emerge on overgrazed rangelands. Drought lowers the availability of water and forage, reduces milk production, 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 for men and women 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[6].

20. **Water supply:** 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 in communities, for women who must walk for long distances to fetch water. In Namibia, drinking water supply is the priority user and as such will have first rights to any water taken from the Kunene River for Namibia.

21. **Gender impacts and the barriers to adaptation:** Women in semi-nomadic agro-pastoral communities face specific challenges due to unequal access to resources, including land, water, and financial services. A recent study by the United Nations Development Programme (UNDP) in Southern Africa found that women in rural areas, particularly those engaged in agriculture, spend up to 6 hours daily collecting water, compared to 2-3 hours for men[23]. Women often take on the responsibility of water fetching, agriculture, and household food security, and their adaptation capacity is constrained by limited access to technology and information. Furthermore, they face significant barriers to participation in decision-making processes, which impacts the sustainability of climate adaptation measures. Therefore, this project aims to integrate gender-responsive strategies that ensure women have equal access to resources, knowledge, and leadership opportunities in climate adaptation planning and implementation.

The project's target population

22. The Kunene River Basin, located in South-West Africa, spans an area of 106,500 km², with 14,700 km² (13.3%) in Namibia and 95,300 km² (87.7%) in Angola. It is home to approximately 3 million people and between 3 to 5 million livestock. The Kunene River, one of the few perennial rivers in the region, stretches 1,050 km with a mean annual discharge of 5.5 km³ at its mouth. In Angola, the river flows through Matala Municipality in Huila Province and Ombadja and Curoca Municipalities in Kunene Province before emptying into the Namib Desert and the Atlantic Ocean. In Namibia, the river borders the Kunene and Omusati Regions. Initial consultations for the project design report took place during the concept note stage in Matala and Ombadja, Angola, and in Epupa and Ruacana Districts, Namibia. Further consultations at the proposal stage were conducted in Chitado commune (Kutanga and Mandave communities) in Curoca Municipality, Angola, as well as in Epupa district (Okanguati and Epupa) and Opuwo in Namibia.

23. In Angola, Huila Province has a projected population of 3,185,244 in 2022 and consists of 14 municipalities, including Matala Municipality, with a population of 335,118. Kunene Province has a population of 1,271,638, with Ombadja Municipality reporting 391,528 residents (184,913 males and 206,715 females) in 2022, while Curoca Municipality has a smaller population of 52,781[24].

[23] UNDP. (2020). "Gender and Climate Change in Southern Africa." United Nations Development Programme

[24] Angola: Administrative Division (Provinces and Municipalities) - Population Statistics, Charts and Map (citypopulation.de)

24. The Kunene region in Namibia has a total population of 120,762 inhabitants, representing 4% of the Namibian population (2023 census), 60,573 males and 60,189 females[25]. Epupa Constituency has a population of 26,491, with a gender distribution of 12,491 males and 14,035 females, and a low population density of 1.122 people per square kilometre. Ruacana Constituency, also in Kunene, has a population of 27,261, with a nearly balanced gender split. The Omusati Region stands out with a population of 316,671, featuring a higher number of females (169,406) compared to males (147,265). The selected sites are in the southwestern lower reaches of the basin where extensive subsistence pastoralism is predominant and an important way of life for more than 100,000 people. The main crops grown in both Angola and Namibia are millet, sorghum, and maize, with some intercropping of pumpkin, bean, and groundnut, combined with the rearing of cattle, sheep, and goats.

25. In the Kunene River Basin, spanning Southern Angola and Northern Namibia, several climatic hazards significantly impact the region. Severe droughts, especially during El Niño events, lead to extreme water shortages and disrupt agriculture and livestock. Conversely, intense rainfall can cause sudden and severe flooding, damaging infrastructure, and communities. The region also faces temperature extremes, with intense heat exacerbating drought conditions and increasing water demand. Desertification, driven by frequent droughts and unsustainable land use, degrades land quality and reduces agricultural productivity. Additionally, strong winds contribute to soil erosion, further compromising land fertility. These climatic challenges collectively strain the resilience of communities in the Kunene River Basin, underscoring the need for effective adaptation and mitigation strategies.

26. **Angola**: The frequency and intensity of climate related hazards has increased in recent times. Since 2008 recurrent cycle of droughts and floods are affecting southern Angola with Cunene province the most affected. For example, during the 2021 El Nino, high levels of acute food insecurity were reported in the municipalities of Cahama, Curoca and Ombadja (Cunene), Gambos (Huila), and Virei and Camucuio (Namibe) which had the highest prevalence of their population in IPC Phase 3 or 4, with more than 60% of the total population in these two phases between July and September 2021[26]. There have been high agricultural and livestock losses mostly affecting pastoralist populations. Agro pastoralist communities have lost the capacity to cope with compounding environmental hardships, such as a decrease in the quality of pasture and rangeland, decreased access to water for human and animal consumption, livestock health and losses, and related lack of capacity to cultivate fields, and degradation of soils fertility and water. This has resulted in food insecurity and prolonged transhumance.

27. At concept stage, consultations in two sites namely Matala and Ombadja municipalities were identified through the consultation at national, provincial/district and community levels. The Matala Municipality in Huila Province 180 kilometres east of Lubango and has an estimated population of more than 335,118 inhabitants. The Huila Province is dry, with rainfall ranging from 100 to 1,000 mm per year[27]. Ombadja and Curoca municipalities are in Cunene Province. Although these areas are dry and highly susceptible to drought, they hold tremendous agriculture potential with fertile soils, abundant underground water, and a favourable climate[28]. The farmers however have limited use of purchased seeds, plants, or cuttings. The Chitado commune in Curoca municipality has been selected due to the relatively high population of semi-nomadic agro-pastoralists resident in the area. The commune has a population of approximately 27,700 inhabitants.

28. **Namibia:** The two areas selected Ruacana Constituency in Omusati Region and Epupa Constituency in the Kunene Region have been selected. In Omusati region, an estimated 95 percent of the population lives

[25] Kunene Regional Profile - Kunene RC - GRN Portal (gov.na)
[26] IPC_Angola_FoodSecurity&Nutrition_2021July2022Mar_Snapshot_English.pdf (ipcinfo.org)
[27] Revermann, R., Krewenka, K.M., Schmiedel, U., Olwoch, J.M., Helmschrot, J. & Jürgens, N. (eds.) (2018) Climate change and adaptive land management in southern Africa – assessments, changes, challenges, and solutions. Biodiversity & Ecology, 6, Klaus Hess Publishers, Göttingen & Windhoek
[28] https://www.citypopulation.de/en/angola/admin/cunene/1603__ombadja/

in the rural areas and are mainly engaged in mixed farming. The Ruacana Constituency is a semi-arid and characterized by the high temperatures ranging between 25-37°C. The average rainfall per year is about 350-500 mm between November to April[29]. The Kunene region is considered one of the poorest regions with multidimensional poverty at 64.1%[30]. The incidence of multidimensional poverty is higher among female-headed households (with a rate of 46%), than male-headed households (with a rate of 41%). Majority (56%) of the employed population is in the agricultural sector and depend on subsistence farming, predominantly nomadic pastoralism, as their main source of livelihood and income. The selection of Epupa Constituency was determined by several factors, including the high prevalence of poverty, the region's relative security and low conflict levels, the extent of degradation in the natural resource base, indicators of climate change vulnerability and the area's significant productive potential. Additionally, the chosen constituency exhibits vulnerabilities related to food and nutrition, further justifying its selection as a focal point for project implementation. Epupa is home to around 26,500 inhabitants, most of whom are semi-nomadic agro pastoralists.

29. **Nomadic pastoralists groups**: The southern part of the Kunene River Basin is inhabited by last nomadic groups of Southern Africa, collectively known as the Himba[31], who live among a larger group of sedentary Herero-speaking agro-pastoralists, on both sides of the border. The Himba are an indigenous minority group of about 50,000 people, located in Namibia and Angola. As a nomadic tribe, the men's tasks include tending livestock farming, herding where men are away from the family for an extended period, animal slaughtering, construction and holding council with traditional village heads. The women and girls perform more labour-intensive work than the men, such as: carrying water to the village, earthen plastering of their homes, collecting firewood, cooking, and making clothing. The women and girls also take care of younger children.

30. A history of government attempts to sedentarise the Himba, including inappropriate adaptation strategies to drought, as well as the impact of weather fluctuations through the El Niño/La Niña cycles, have lessened their ability to attain sustainable livelihoods and maintain their traditional lifestyle[32]. In the past two decades, the groups originating in Namibia have been involved in the creation and management of Wildlife Conservancies near the Skeleton Coast National Park and have been helped with the signature of Traditional Intellectual Knowledge Contracts with international beauty and health companies to supply sustainably grown indigenous plants: however, none of these interventions have improved the livelihoods of the Himba, whose main economic strategy still is livestock production, also an indicator of social status, proving more and more financially unsustainable[33].

31. The primary constraint faced by both nomadic and sedentary populations in the Kunene region is the lack of sustainable and consistent access to safe water, especially in the middle and lower sections of the Basin. In the 1960s, the Namibian government created artificial water points to provide water and encourage sedentarisation, leading to severe land degradation as pastoralists increased their herds under a false sense of security. This has also resulted in conflicts with new settlers claiming exclusive access to these water points, which were originally intended for seasonal use by migratory groups. Community members in both countries have identified livelihood security hazards driven by extreme weather events (floods, droughts, lightning, wind, and excessive heat), with Namibian communities additionally noting pests and diseases, while Angolan communities highlight human-wildlife conflict. A 2019 independent door-to-door survey confirmed these hazards, revealing that all interviewed communities recognized changing climate

[29] http://www.omusatirc.gov.na/documents/550777/552716/Omusati_Regionall_Profile/15467267-7686-429c-a7fc-a18651d9184c
[30] Namibia launches national MPI to guide poverty reduction | MPPN
[31] The Kunene River Assessment Toolkit. (2010). Ethnic Groups. http://www.kunene.riverawarenesskit.com/kunenerak_com/EN/PEOPLE/PEOPLE_OF_THE_BASIN/CULTURAL_DIVERSITY/ETHNIC_GROUPS.HTM
[32] Inman EN, Hobbs RJ, Tsvuura Z (2020) No safety net in the face of climate change: The case of pastoralists in Kunene Region, Namibia. PLoS ONE 15(9): e0238982. https://doi.org/ 10.1371/journal.pone.0238982
[33] ibid.

patterns but lacked understanding of the reasons behind them or how to adapt. These climate change risks have differentially impacted livelihoods and adaptive capacities among women, men, boys, and girls, exacerbating gender inequalities.

32. The Kunene Basin faces multiple national and regional drivers that exacerbate the socio-ecological impacts of climate change, particularly affecting minority groups in the area. However, these challenges could be addressed through the implementation of a socially inclusive Disaster Risk Reduction (DRR) Framework centered on Ecosystem-based Adaptation (EbA), which focuses on water security and sustainable development.

Project area selection process

33. Consultations took place at the national level with government departments responsible for agriculture and climate change, civil society organizations, and communities. The national consultations were followed by engagements with political and traditional leaders at the provincial and district levels, who selected the target areas within their jurisdictions. The third and most important step in the consultation process involved engaging with communities in the target areas to gather their views on the impacts of climate change and potential solutions. The project will be implemented in the geographical areas outlined in the table below and Figure 4, targeting 54,200 direct beneficiaries, comprising 50% women and 20% youth. It is envisaged that the whole population of the target districts, approximately 833,279 people, will benefit indirectly from the project, as their districts will be covered by the DRR Plan and Muti-Hazard Early Warning System, and they will also benefit from increased access to food produced by the direct beneficiaries.

Table 1: Proposed sites and target beneficiaries in Angola and Namibia

Country	Province/Region	Municipality	Population	Targeted beneficiaries
Angola	Huila	Matala Municipality	335 118	13 968
	Cunene	Ombadja Municipality	391 628	13 970
		Curoca Municipality	52 781	8 754
Namibia	Kunene region	Epupa Constituency	26 491	8 754
	Omusati region	Ruacana Constituency	27 261	8 754
Total			833 279	54 200

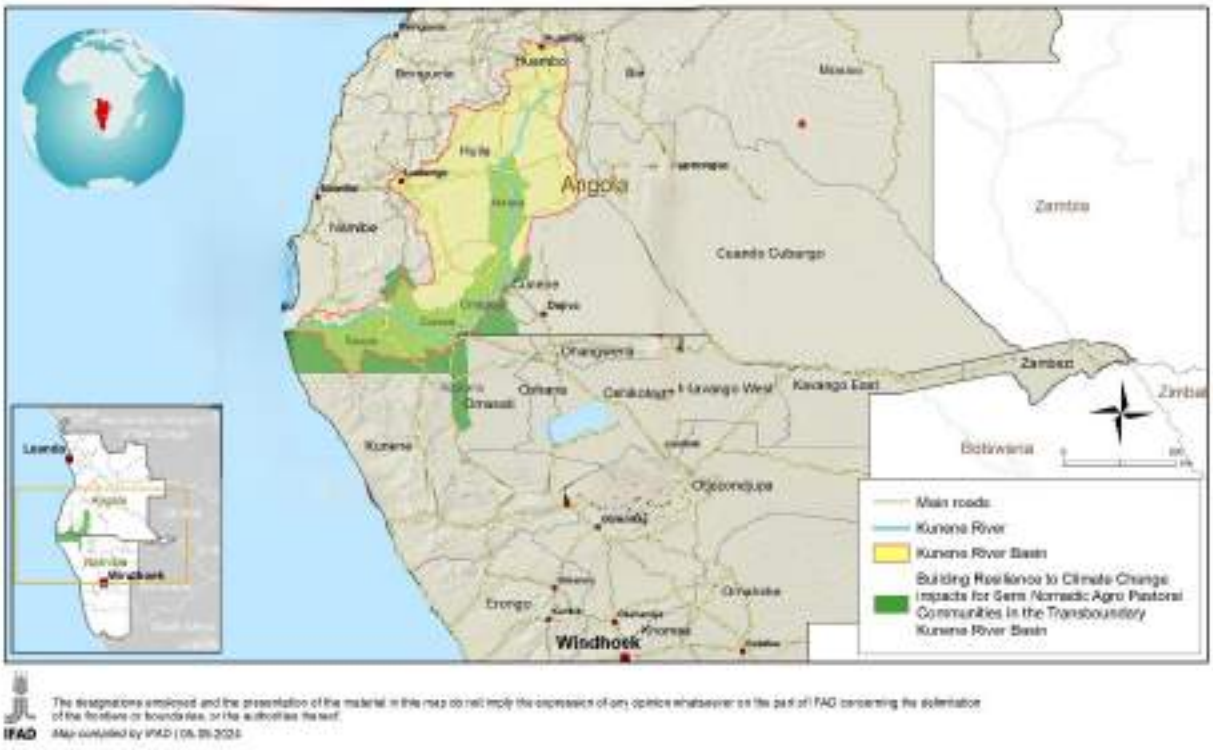


Figure 4. Map of the project

B. Project Objectives

List the main objectives of the project/programme.

34. The goal of the project is to support the climate change adaptation and resilience of the semi-nomadic agro-pastoral populations of the Kunene River Basin.

35. Within this overarching goal, four key objectives have been identified, through engagement with UN, Government and Non-Governmental Organisations working locally, nationally regionally and/or internationally in and around the target areas. Intended beneficiaries of the project were also consulted, to ascertain their adaptation needs and priorities. The findings were triangulated through desktop review of existing academic and grey literature sourced from various stakeholder entities.

36. The four key objectives are underpinned by three cross-cutting multi-scale objectives, designed to deliver benefits at local, regional, national, and transboundary levels. The objectives are presented in Table 1 below.

Table 2: Key objectives and cross-cutting multi-scale objectives

Key Objective 1	Key Objective 2	Key Objective 3	Key Objective 4
To ensure that the aspirations and needs of the nomadic men and	To improve adaptive capacity of male and female inhabitants of the Basin	To reduce the maladaptation caused by existing infrastructure and activities	To enhance the capacity of the Kunene Permanent Joint Technical Commission,

women are fulfilled in balance with ecosystem requirements identified through a gender-inclusive ecosystem-based adaptation approach for disaster risk reduction	through a Multi-Hazard Early Warning System	through inclusive community-based and gender-responsive adaptation actions	the relevant national and local government entities, and other stakeholders to build climate resilience in the Basin
CCMO1: To promote water security[34] in the Kunene River Basin			
CCMO2: To promote collaborative governance through multi-scale hydro diplomacy processes			
CCMO3: To promote inclusive basin-wide sustainable natural resource planning and management			

37. To ensure that the project objectives are met inclusively, a specific gender-targeted objective is integrated, aimed at increasing women's leadership roles in climate adaptation activities, ensuring their active participation in the decision-making processes at the community, national, and regional levels. A study by the World Bank[35] found that women's participation in climate governance significantly improves the effectiveness and sustainability of adaptation strategies. The project will incorporate gender-responsive strategies in every aspect of the implementation, from designing infrastructure to monitoring and evaluation.
38. The Programme focuses primarily on building the resilience of the nomadic agro-pastoralist groups by supporting the co-design and implementation of a gender inclusive Disaster Risk Reduction Strategy for Nature-based Adaptation. In so doing, it will also impact on the sedentary communities sharing natural resources with the nomadic groups along the routes. The location and type of activities have been defined through in-depth desktop review as well as interviews with key informants with extensive experience in the areas, and with the target beneficiaries including women and other gender subgroups.

39. The direct beneficiaries of the project will be the semi-nomadic agro-pastoral indigenous community members that are poor and highly vulnerable to current and projected climate risks. It is anticipated that the project would benefit an overall **54,200 beneficiaries** directly (approximately 6,377 households)[36] through various adaptation interventions. This is the combined population of Chitado Commune in Angola and Epupa Constituency in Namibia. It is estimated that a further 119,400 people, i.e., the broader population of Curoca Municipality in Angola and the Kunene Region of Namibia, will indirectly benefit from awareness campaigns on climate change adaptation and disaster risk reduction, as well as early warnings of extreme or unfavourable weather conditions/events.

C. Project Components and Financing

Fill in the table presenting the relationships among project components, outcomes, outputs, and countries in which activities would be executed, and the corresponding budgets.

The project's components expected results and budgetary allocations are presented in the table below.

Table 3: Project components and budget allocations

[34] UN-Water proposes the following definition for water security: "The capacity of a population to safeguard sustainable access to adequate quantities of and acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability." UN Water. (2013). *What is water security?* https://www.unwater.org/sites/default/files/app/uploads/2017/05/unwater_poster_Oct2013.pdf

[35] World Bank. (2019). "The Role of Women in Climate Change Governance." World Bank Group.

[36] https://www.researchgate.net/figure/The-size-of-pastoral-Himba-households_tbl1_238489569

Programme Components	Expected Outcomes	Expected Outputs	Amount for Angola (USD)	Amount for Namibia (USD)
Component 1. Co-design with beneficiary communities and stakeholders, and implementation of a Plan for Disaster Risk Reduction through Ecosystem-based Adaptation in the Kunene River Basin (KRB: EbA-DRRP)	**1.1** An improved DRR Plan co-designed and implemented by beneficiary communities and all stakeholders	**1.1.1** Knowledge gaps for the preparation of the KRB: EbA-DRRP identified and filled, through a Water Security Assessment and an Ecosystem Goods and Services Valuation 1.1.2 A Basin-wide Gender inclusive DRR Plan focused on Ecosystem-based Adaptation is developed.	500 000	500 000
	1.2 Improved dialogue and co-planning of the Kunene River Basins by the stakeholders (government, civil society, private sector, and beneficiary communities)	1.2.1 Report on full stakeholder engagement with the beneficiary communities, including all gender and ethnic subgroups and other stakeholders of the KRB.		
Component 2. Implementation of a satellite-based Multi-Hazard Early Warning System for the Kunene River Basin (KRB: MH-EWS)	2.1 Enhanced skills to define weather patterns at micro-climate scale to support inclusive locally-led adaptation	2.1.1 Weather stations for micro-climates in the basin installed, in collaboration with national meteorological agencies 2.1.2 Hydrometric stations installed along the Kunene River, in collaboration with the national hydrological agencies	2 019 000	811 000
	2.2 Approved KRB: MH-EWS in place for use by governments, beneficiaries' communities, and other stakeholders	2.2.1 Multi-level KRB: MH-EWS designed and validated by governments in collaboration with local communities, integrating indigenous knowledge 2.2.2 Big Data Analytics tool for EWS data capturing and monitoring, including a user-friendly system for data access and usage developed 2.2.3 KRB MH-EWS operationalised using a cross-border, multi-level, multi-sectoral and multi-disciplinary approach 2.2.4 Data translated into user-friendly weather forecasts for local communities to understand and act upon		
Component 3. Inclusive community-based adaptation actions are co-designed and implemented	3.1 Agreed climate change adaptation interventions by communities and government implemented	3.1.1 Rainwater retention infrastructure constructed or rehabilitated to increase access to water for domestic and agricultural use. 3.1.2 Improved access to groundwater for gardening and domestic use, to build adaptive capacity by improving health, hygiene, and nutrition 3.1.3 Value addition initiatives identified and supported, to increase adaptive capacity by securing livelihoods 3.1.4 Drought-tolerant crop varieties promoted for sustenance during dry periods 3.1.5 Rangeland restoration to ensure increased production of drought-resistant fodder, higher species diversity and more abundant soil cover	3 319 773	3 319 773
	3.2 Improved collaboration amongst development partners and stakeholders in the project area of the Kunene River Basin	3.2.1 An inclusive forum for development partners in the project area of the Kunene River developed.		
Component 4. Raise awareness and improve knowledge on climate change adaptation in the Kunene River ecosystem	4.1 Knowledge of the Kunene River System enhanced	4.1.1 Awareness raised and knowledge shared on gender-responsive locally-led climate change adaptation measures 4.1.2 Kunene River Awareness Kit online portal updated and reactivated, using the data and knowledge generated by the project 4.1.3 Case studies from the project for submission to IFAD and FAO knowledge systems, SADC-GMI and WaterNet, developed and further disseminated	492 500	492 500
	4.2 Enhanced institutional capacity at local and regional	4.2.1 Strengthened capacity of partner institutions in the Kunene River Basin, through skills and organisational		

	level on gender-responsive locally-led adaptation, for effective management of project activities and outputs	development, to address challenges such as water scarcity, climate change impacts and competing interests among stakeholders		
Total				11 454 546
Project Execution cost (up to 10% of the Total Project Cost)			703 475	569 252
Total Project Cost				12 727 273
Project Cycle Management Fee charged by the Implementing Entity (up to 10% of the Total Project Cost)				1 272 727
Amount of Financing Requested				14 000 000

D. Projected Calendar

Table 4: Projected calendar for project implementation

Milestones	**Expected Dates**
Start of Project Implementation	July 2025
Mid-term Review	January 2028
Project/Programme Closing	June 2030
Terminal Evaluation	September 2030

PART II: PROJECT JUSTIFICATION

A. Description of the project components

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.

40. This section focuses on the concrete adaptation activities proposed, 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. All the activities are targeted at the indigenous peoples of the KRB, as they are the target group of the project.

Component 1: Co-design with beneficiary communities and stakeholders, and implementation of a Plan for Disaster Risk Reduction through Ecosystem-based Adaptation in the Kunene River Basin (KRB: EbA-DRRP)

41. Effective management of the Kunene River Basin requires strategic planning to mitigate current disasters and reduce the risks of future disasters resulting from climate change and maladaptation. This can be achieved by improving local human and ecosystem resilience. Thus, this component aims at creating a gender-inclusive Disaster Risk Reduction Plan (DRRP) for the Kunene River Basin, co-designed with the beneficiary communities, and embedded in the national and local planning processes in both countries.

42. The KRB EbA-DRRP will be a first of its kind in the Southern African Region and will enable the Kunene Permanent Joint Technical Commission and the Governments of Angola and Namibia, as well as their International Cooperating Partners, to plan for and implement gender-responsive ecosystem-based adaptation activities which bring together scientific and indigenous knowledge, facilitating enhanced disaster preparedness and risk reduction, as well as ecosystem restoration, conservation and management.

Outcome 1.1 An improved DRR Plan co-designed and implemented by beneficiary communities and all stakeholders:
The DRRP will be designed to respond to the needs and aspirations of the residents of the project area, considering gender-differentiated exposure, vulnerabilities, preparedness, and coping capacities. The implementation of the DRRP will apply an ecosystem-based approach (EbA) to climate change adaptation, to ensure that all activities designed will promote both ecosystem restoration and sustainable livelihoods[37] through addressing gender differences in access to and control over natural resources.

Output 1.1.1 Knowledge gaps for the preparation of the KRB: EbA-DRRP identified and filled, through a Water Security Assessment and an Ecosystem Goods and Services Valuation:

Developing a DRR Plan that is effective in reducing climate risk requires complete and up-to-date information on water resources and other ecosystem services. Furthermore, detailed design of the water infrastructure rehabilitation activities proposed under Component 3 require mapping of the existing infrastructure. Quantification of the ecosystem services in the Basin will facilitate detailed design of EbA measures that support DRR, such as retention ponds for floodwater. Quantification of

[37] Lo, V. (2016). *Synthesis report on experiences with ecosystem-based approaches to climate change adaptation and disaster risk reduction*, Technical Series No.85. Secretariat of the Convention on Biological Diversity.

the ecosystem services demonstrates the catalytic impact of the investments made through this project, as it facilitates comparison of the baseline value of the ecosystem services with their post-project value.

Activity 1.1.1.1 Undertake a Water Security Assessment in the Kunene River Basin: This assessment will determine the quality, quantity and sustainable yield of groundwater and surface water resources in the migratory rangelands used by the semi-nomadic groups. Mapping of natural and man-made water resources infrastructure, as well as modelling for forecasting purposes will be undertaken by FAO in collaboration with relevant Ministries and partners in Angola and Namibia.

Activity 1.1.1.2 Undertake Ecosystem Goods and Services quantification and valuation: This will be done throughout the Basin, including Protected Areas and Conservancies, communal areas, and private ranches, to determine the status and drivers of environmental degradation, conservation and land use planning, opportunities for restoration of indigenous species, as well as opportunities for alternative ecosystem-based livelihoods. Local NGOs and CBOs will lead this activity in consultation with line Ministries.

Output 1.1.2 A Basin-wide gender-inclusive DRR Plan focused on Ecosystem-based Adaptation is developed: This DRR Plan will integrate existing DRR plans for different parts of the KRB and ensure that there is a harmonised approach towards DRR throughout the Basin. It will also prioritise the implementation of EbA measures that reduce disaster risk under the changing climate.

Activity 1.1.2.1 Develop a basin-wide gender-inclusive Disaster Risk Reduction Plan focused on Ecosystem-based Adaptation: This Plan shall be informed by full stakeholder engagement with the beneficiary communities and other stakeholders of the Basin about the project. Stakeholder engagement among different gender and ethnic subgroups including women, men, boys, girls, people with disabilities, indigenous people, and elderly, will be facilitated using the Scenario Planning approach, which raises participants' understanding of how their choices and behaviours lead to different future outcomes, and enables them to make choices consistent with the future scenario they prefer.

Outcome 1.2 Improved dialogue and co-planning of the Kunene River Basin by the stakeholders (government, civil society, private sector, and beneficiary communities): There is limited interaction between the intended beneficiaries and other stakeholders because of the remoteness of the areas in which the beneficiaries live. Road access is poor and telecommunication access is limited to non-existent. However, participation of the beneficiaries in planning and implementing this project is critical to its success in enhancing their adaptive capacity. Thus, the project will endeavour to overcome the travel and communication barriers, to ensure effective dialogue and joint planning among the stakeholders.

Output 1.2.1 Report on full stakeholder engagement with the beneficiary communities, including all gender and ethnic subgroups and other stakeholders of the KRB: Stakeholder engagement has been undertaken during the design phase of the project, to understand the challenges faced by the targeted beneficiaries and how to effectively support them in adapting their livelihoods in response to climate change. However, as the context, needs and priorities of the beneficiaries continually evolve, there is need for ongoing stakeholder engagement during the implementation of the project. This will be documented for future reference.

Activity 1.2.1.1 Facilitate engagement and co-planning of the Kunene River Basin by its stakeholders: This activity centres on raising awareness about the project with all stakeholders of the basin, at national, provincial, municipal and community levels, and ensuring that all subsequent activities are informed by thorough consultation. This will commence at project inception and continue throughout the project implementation period. Dialogue will be facilitated between beneficiary gender subgroups and stakeholders with competing needs and priorities.

Activity 1.2.1.2 Facilitate development of a Free, Prior and Informed Consent (FPIC) Plan: This activity is critical requirement for empowering local and particularly indigenous communities to decide whether to approve or reject proposed investment and development programs that may impact their rights, lands, resources, and livelihoods. FPIC involves consultations with community-endorsed institutions, ensuring their participation in decision-making processes. The project will engage a

consultant or NGO to come up a FPIC plan according to the process outlined in Annex C, in consultation with indigenous people. Consultations will be held throughout the life cycle of the project.

Activity 1.2.1.3 Facilitate dialogue between beneficiary gender and ethnic subgroups through scenario planning: The purpose of this exercise is to foster understanding and collaboration among the gender and ethnic subgroups within the basin, to ensure that each group's needs and priorities are taken into consideration in the joint implementation of the project. This will be fostered through dialogue-building meetings within the communities. The scenario planning approach aims to ensure that communities understand the impact of their decisions on the future status of their environment.

To achieve gender equity, specific budget allocations are designated for gender-responsive activities, including capacity-building workshops, leadership training for women, and the integration of gender-sensitive data into the monitoring and evaluation systems. A dedicated fund (approximately 10% of the total budget) will also support women's participation in community-based adaptation actions, ensuring that gender inequalities are addressed throughout the project's lifecycle

Component 2: Implementation of a satellite-based Multi-Hazard Early Warning System for the Kunene River Basin (KRB: MH-EWS)

43. It has been established that an important infrastructural need of the KRB is the installation of weather stations in each micro-climate of the Basin. Such infrastructural intervention would facilitate the establishment of a multi-hazard EWS for the Kunene Basin,[38] to alert communities including the different gender groups: indigenous women, men, girls, boys and PWD to different hazards such a riverine or flash flooding, heatwaves, dry spells, wildfires, disease outbreaks, pest outbreaks and pollution events. This requires enhanced meteorological and hydrological observation, including water quality monitoring. With a focus on the project area, the rangeland of nomadic groups, this activity will benefit decision-makers and stakeholders at all levels, as well as improved science-based decision-making and promote data sharing:
    - By translating the data into easily understood weather forecasts, local communities, including women and marginalised gender subgroups will be able to discuss the current status quo and options for adaptation strategies, based on actualised knowledge and review the planning according to data (disaggregated by gender subgroup).
    - By collecting and sharing data across countries, the programme will contribute to the fulfilment of the requirement on data sharing under the Revised Protocol on Shared Water Courses (2000) and support integrated planning activities under the other Components of this programme.
    - By collecting harmonised datasets and making them available to the Joint Management Committee and to the public through the improved Kunene River Assessment Toolkit, the Programme shall contribute to knowledge development and sharing for research and further national/regional planning.
44. This component will be implemented with the meteorological and hydrological agencies of the two countries, to collect and harmonise the data, provide user-friendly visualisation tools, and disseminate warnings to communities at risk. Efforts will be made to specifically target marginalised subgroups through use of simplified data sharing tools and language.

45. The gender-differentiated impacts of climate change on women and men highlight disparities in access, utilisation, and benefit from technology and information. Men typically have greater access to technology and training, using weather data for large-scale agricultural decisions and economic planning. In contrast, women often face barriers such as limited technological access and training, relying more on traditional knowledge for household-level decisions like planting, harvesting, and water management. This unequal access to information can impede women's ability to adapt to climate variability and extreme weather events effectively, compromising their roles in food security and

[38] This component is based on the approach created and implemented by the World Meteorological Organization as part of its contribution to Disaster Risk Reduction [WMO. (2018). *Multi-hazard Early Warning Systems: A checklist*.] and endorsed by the UN and its agencies [e.g., United Nations Development Programme. (2018). *Five approaches to build functional early warning systems*.]

household resilience. The project will address these disparities through inclusive approaches that involve women in the design, deployment, and dissemination of weather data, alongside gender-sensitive GALS training and accessible information formats, to ensure equitable resilience-building across differentiated gender groups including indigenous women, men, boys, and girls.

Outcome 2.1 Enhanced skills to define weather patterns at micro-climate scale to support inclusive locally led adaptation: The activities under this outcome will involve women in the design and implementation of weather information systems that can lead to more effective and user-friendly services, while providing training and education empowers women to make informed decisions based on weather forecasts. Through the promotion of women in leadership within local organisations that are providing and disseminating weather information services and addressing structural barriers that restrict women's access to information and resources, the project contributes to achieving gender inclusivity in weather services, ultimately enhancing resilience to climate change, and supporting sustainable development.

Output 2.1.1 Weather stations for micro-climates in the basin installed, in collaboration with national meteorological agencies: Installation of automatic weather stations in the KRB will add to the existing weather observation network, providing additional data points that will increase the accuracy of weather forecasting and climate monitoring in the Basin.

Activity 2.1.1.1 Installation of 24 automatic weather stations across the Kunene River Basin, in collaboration with the national meteorological agencies: The recommended minimum density of weather stations in arid areas is 10,000 km^2 per station[39]. Thus, to provide at least the minimum degree of accuracy in forecasting hazards in the Kunene River Basin, which has a surface area of 106,500 km^2, the project will install a total of 24 automatic weather stations, 18 of them in Angola and 6 in Namibia, in line with the proportion of the basin lying in the two countries.

Output 2.1.2 Hydrometric stations installed along the Kunene River, in collaboration with the national hydrological agencies: Installation of hydrometric stations in the KRB will add to the existing hydrological observation network, providing additional data points that will increase the accuracy of flood forecasting and streamflow monitoring in the Basin. Water quality sensors shall also be included, to monitor climate change impacts on water quality.

Activity 2.1.2.1 Installation of 16 hydrometric stations along the Kunene River, in collaboration with the national hydrological agencies: In both countries, hydrometric stations will be installed at key points along the river to measure water levels and flow rates. This is essential information for determining water availability and flood or drought risk. Water quality monitoring will also be undertaken at these stations to ensure consistency, i.e. samples are taken at the same locations at regular time intervals. Monitoring water quality will facilitate forecasting of disease outbreaks and pollution events.

Sixteen stations are planned for, but the exact number of stations to be installed will be determined based on the number and location of existing stations, informed by a baseline inspection of the basin during the water security assessment to be undertaken as Activity 1.1.1.1, as well as by the actual cost per station as per the procurement bids received from equipment providers.

Outcome 2.2 Approved KRB: MH-EWS in place for use by governments, beneficiaries' communities and other stakeholders: A multi-hazard early warning system for climate-related hazards in the Kunene River Basin will enable the various governmental and non-governmental organisations to foresee potential hazardous events or conditions and support the local communities in preparing adequately. The system will be designed to be compatible with early warning systems existing in other parts of the region.

Output 2.2.1 Multi-level KRB: MH-EWS designed and validated by governments in collaboration with local communities, integrating indigenous knowledge: Through a series of consultative workshops, the MW-EWS will be co-developed with the relevant stakeholders to ensure ownership and

[39] Chacon-Hurtado, J. C., Alfonso, L., & Solomatine, D. P. (2017). Rainfall and streamflow sensor network design: a review of applications, classification, and a proposed framework. *Hydrology and Earth System Sciences*, *21*(6), 3071-3091.

appropriateness. The beneficiary communities will be mobilised to provide input in terms of indigenous knowledge on weather prediction, which will be integrated with the scientific knowledge provided by the meteorologists and hydrologists from the responsible agencies.

Activity 2.2.1.1 Design the multi-hazard early warning system in consultation with beneficiary communities: A participatory design process, facilitated through technical-level, community-level and combined design workshops, will ensure that the resultant MH-EWS meets the needs and expectations of the beneficiary communities including all gender and ethnic subgroups. This activity will be led by FAO, drawing from experience from the Global Information and Early Warning System (GIEWS).

Output 2.2.2 Big data analytics tool for EWS data capturing, monitoring and analysis, including a user-friendly interface for data access and usage developed: Weather data capturing, monitoring and analysis can mostly be done by ICT-based systems. A big data analytics tool processes various types of input from weather stations, radars, satellites, weather buoys and weather balloons, producing forecasts that help users issue advisories and warnings on adverse weather events and conditions.

Activity 2.2.2.1 Procure suitable data platform and user interface for the MH-EWS: The meteorological and hydrological agencies require systems that can process data received from the meteorological and hydrological stations, into usable information for forecasting and dissemination. The project will support the agencies in identifying suitable providers or developers of such systems, as well as procurement and installation thereof.

Output 2.2.3 KRB MH-EWS operationalised using a cross-border, multi-level, multi-sectoral and multi-disciplinary approach: Meteorological and hydrological observation networks are operated by national agencies, but the phenomena they measure are influenced by geographical factors. A river basin is a natural unit for measurement of these phenomena because similar conditions a likely to exist across a transboundary basin. Thus, the KRB MH-EWS aims to harmonise EWS across the Kunene River Basin.

Activity 2.2.3.1 Operationalise a multi-hazard early warning system for the Kunene River Basin: Informed by the range of hazards that affect the inhabitants and ecosystems of the basin, multiple sources of information will be integrated, to facilitate issuance of warnings prior to forecasted extreme events. Existing meteorological and hydrological stations will be rehabilitated to ensure that they provide data for forecasting of extreme events such as riverine or flash floods, heatwaves, dry spells, wildfire risk, lightning, strong winds, or cold spells. The meteorological and hydrological agencies of both countries will lead this activity and will be supported to ensure that they have the servers to receive the data from the observation stations, as well as the software to process the data into meaningful forecasts and warnings, for dissemination to the stakeholders.

Output 2.2.4 Data translated into user-friendly weather forecasts for local communities to understand and act upon: By improving gender inclusivity in weather information services, the project will ensure equitable access and benefit for both men and women. The project will enhance gender inclusivity by conducting gender-specific research to understand the distinct ways men and women use weather information and their specific needs. Gender-sensitive tools and methodologies will consider factors like literacy levels and preferred formats and can ensure that weather services are accessible and useful to all genders.

Activity 2.2.4.1 Support meteorological agencies to simplify, translate and disseminate seasonal, weekly and daily weather forecasts in local languages spoken in the KRB: Seasonal forecasts, weekly or 10-day weather bulletins and daily weather forecasts will be produced in the official languages of the two countries and translated into local languages spoken in the Basin, as use of local languages is crucial, particularly for reaching gender subgroups that may have limited literacy. The project will also ensure accessible dissemination through diverse channels such as mobile phones, radio, and community meetings.

Component 3: Inclusive community-based adaptation actions are co-designed and implemented

46. Using the outputs of the two previous components, the programme will consolidate the co-design and implementation of specific activities to support the adaptive capacity of the ecosystems, the target

communities, and related communities. It will also include development, promotion and strengthening gender considerations in climate change adaptation planning, implement gender-responsive and climate-smart agricultural practices and technologies to increase access to assets and services. It is foreseen that this mixed approach will contribute to development of cooperative dialogue between the parties as a medium to long term output of the programme.

47. By applying the Gender Action Learning System (GALS) approach, this component will address social barriers that restrict women's access to resources, through tackling power imbalances. The project will also empower women with skills in ecological management, support women's groups and promote women's leadership in rangeland management, natural resources, and water management committees.

Outcome 3.1 Agreed climate change adaptation interventions by communities and government implemented: Conservation agriculture has been recognised as the most suitable response to climate change in the project area, as it enhances retention of water and organic matter in the soil, thereby enhancing agricultural productivity. To ensure adoption of conservation agriculture in the project area, the project will build upon the existing farmer field schools (FFS) established by the FRESAN programme in Angola, extending their reach and establishing additional ones. This participatory education approach brings together groups of neighbouring small-scale farmers to solve production problems through sustainable agricultural methods. The management committees for the FFS will ensure equal representation of women and gender subgroups. Leveraging FAO's vast technical expertise and experience in climate-smart agriculture practices for community adaptation through FFS programmes, this Activity will be implemented by FAO in coordination with the national extension services, government climate adaptation institutions and local NGOs.

Output 3.1.1 Rainwater retention infrastructure constructed or rehabilitated to increase access to water for domestic and agricultural use: As the project area often experiences intense rainfall events followed by extended periods without rain, water access can be improved by building rainwater retention infrastructure that captures and stores rainwater for use during dry periods.

Activity 3.1.1.1 Rehabilitate existing earth or sand dams: Existing earth or sand dams in the project area will be rehabilitated, to increase access to water for domestic and agricultural use. It is estimated that 20 existing earth/sand dams are to be rehabilitated. These earth/ sand dams retain excess streamflow during the rainy season for use during drier periods. In coordination with national local entities and NGOs, FAO will support the development water retention models.

Activity 3.1.1.2 Construct new rainwater retention ponds: The project will also establish rainwater retention ponds, an ecosystem-based infrastructure that facilitates ground storage of rainwater. These are simply excavations where rainwater collects during the rainy season. These retention ponds, called '*chimpaca*' in Angola, reportedly hold water for several months after the rainy season. The chimpacas will be fenced to prevent direct access by livestock and wild animals, to prevent contamination of the water and disease transmission. Livestock watering troughs will be installed adjacent to the chimpacas so that pastoralists can access water for their animals. It is estimated that 20 rainwater retention ponds will be constructed in both countries.

Activity 3.1.1.3 Install rooftop rainwater harvesting systems on public buildings for community use: Rooftop rainwater harvesting will be introduced on buildings that have suitable roofs, such as government offices, schools, health centres and religious buildings. These will provide a secondary source of water for the communities, mainly the women and girls who must walk long distances during dry periods, in search of water and fuelwood.

Output 3.1.2 Improved access to groundwater for gardening and domestic use, to build adaptive capacity by improving health, hygiene, and nutrition: This output will particularly benefit women and children, alleviating their domestic responsibilities and enabling the establishment of household gardens for vegetable cultivation. Improved access to water and nutritious vegetables will enhance dietary diversity and nutrition outcomes. Additionally, the project will prioritise equal representation of women and men in the water point committees, offering leadership training and skills in operation and maintenance. To further improve hygiene and sanitation, ventilated improved pit (VIP) latrines will be constructed at a safe distance from each water point to discourage open defecation and mitigate the spread of diseases within the community.

Activity 3.1.2.1 Rehabilitate existing boreholes for vegetable gardens and domestic use: Informed by a groundwater assessment in the area, the project will focus on constructing new multipurpose boreholes or rehabilitating existing ones, ensuring they can provide water for horticulture, livestock troughs and domestic use. These boreholes will be equipped with appropriate solar pumps that allows borehole recharge and will utilise drip irrigation, aiming to save water and reduce the workload typically borne by women for water fetching. Sustainable yield from the boreholes will be determined during the water security assessment, and the communities will be advised of this to prevent over-abstraction of groundwater. This activity will be led by FAO in collaboration with line Ministries of both countries.

Output 3.1.3 Value addition initiatives identified and supported, to increase adaptive capacity by securing livelihoods: Women often encounter barriers in accessing technology and receiving training compared to men, limiting their engagement in value-added activities essential for economic resilience. The disruption of supply chains and raw material availability exacerbates these challenges, impacting women more severely in small-scale processing enterprises they typically manage. Involving women in decision-making regarding equipment acquisition and operation is crucial for addressing these disparities and ensuring their perspectives are integrated into climate adaptation strategies.

The project aims to address specific challenges and opportunities faced by women, men, and youth men in adapting to climate change. Additionally, it aims to raise community awareness about labour-saving, value-adding equipment that can enhance food security, thereby enhancing the adaptive capacity of the beneficiaries. Through Gender Action Learning Systems (GALS) training, the project will advocate for equity in resource access, decision-making processes, market facilitation and benefit sharing. This approach aims to enhance resilience in value addition and processing within the project area, fostering sustainable economic opportunities and empowerment for all community members, particularly women.

Activity 3.1.3.1 Procure and install processing equipment for selected value chains: The main crops grown in the project area is sorghum and millet, with maize only grown by a few households. Farmers however lack access to machinery to mill or produce value-added products from these grains. Support of the sorghum and millet value chain boosts climate resilience because both crops are drought-resistant and highly nutritious, compared with other grains. Collaboration with farmers cooperatives to establish milling plants will ensure that the value derived from these drought-resilient crops is maximised. Training for the technical and financial management of the farmers' organisations will be provided by FAO in close collaboration with extension services. Women and youth will be targeted and empowered to establish and manage their own cooperatives.

Another emerging crop in the project area is cassava. This tuber crop is also drought-resistant and has the added advantages of its leaves being edible as a vegetable. Cassava requires thorough drying and peeling before it is milled; thus, mechanising this process will reduce the labour-intensity of this crop, thereby making it more attractive to farmers.

A third value chain to be supported is groundnuts, because certain cultivars of this crop can grow well under arid conditions. Groundnuts are a protein-rich legume. Supporting the groundnut value chain therefore enhances nutrition security of the beneficiary population.

The table below details the value chains to be supported. These were selected through observation of the existing agricultural activities in the project areas, as well as consultation with the intended beneficiaries. It is envisaged that supporting these value chains will increase food security and income of the beneficiaries, thereby enhancing their adaptive capacity.

Table 5: Agricultural value chains to be enhanced by the project

Crop	Value chain activities to be supported	Number of equipment for each activity	Estimated number of direct beneficiaries
Sorghum/ millet	Threshing	24 threshers	960
	Milling	6 milling plants	3000
Cassava	Milling	6 milling plants	3000

Groundnuts	Grinding	24 peanut butter machines	960

Activity 3.1.3.2 Provide training and labour-saving technologies for conservation agriculture: By minimising disturbance to the soil, practising crop mixing and rotation, and maintaining soil cover throughout the growing season, farmers can preserve soil quality and improve agricultural productivity. These practices are not yet widespread among the predominantly pastoralist population of the project's target area. However, due to declining availability of forage, the pastoralists need to start cultivating fodder crops to sustain their livestock. These crops, as well as crops for human consumption, can be grown sustainably using conservation agriculture methods. Leveraging on FAO's experience on conservation agriculture in Southern Africa, training will be provided to men, women and youth interested in conservation agriculture, and labour-saving equipment, such as manual jab planters, manual seeders, and animal-drawn rippers, will be provided to enable them to implement this method of farming.

Women in pastoralist societies are primarily responsible for agriculture, and face increased burdens as climate change intensifies droughts and depletes natural resources, limiting their time for education and economic activities. Men, traditionally involved in livestock rearing, may migrate due to changes in pasture availability and water scarcity, disrupting family dynamics and leaving women with added responsibilities. Boys often experience interrupted schooling to support agricultural work or fill roles left by migrating fathers, impacting their educational outcomes and prospects. Girls, typically tasked with domestic chores such as fetching water, bear escalated duties during environmental stresses, contributing to higher school dropout rates and limiting their future opportunities. Therefore, the provision of labour-saving technologies for conservation agriculture will go a long way in alleviating the workloads of women and children and increasing crop productivity.

Output 3.1.4 Drought-tolerant crop varieties promoted for sustenance during dry periods: This output is intended to enhance agricultural resilience by promoting drought-resistant varieties of sorghum and millet, staples that thrive well in the local climate. These crops are intended to ensure reliable harvests even during drought periods, crucial for sustaining farmers' livelihoods. Additionally, supporting expanded production of drought-resilient crops such as cassava and groundnuts, which are integral to women-led value chains, will further bolster food security. Also, vegetables suitable for gardening in the semi-arid conditions in the project area include okra, eggplant, leafy vegetables, and some varieties of beans. Introducing these will have the added benefit of increasing the nutritional status of the targeted communities.

Activity 3.1.4.1 Promote drought-tolerant food crop varieties: Through Farmer Field Schools (FFS), both men and women and differentiated gender subgroups will receive extension training in the cultivation of drought-resistance crops, as well as integrated crop-livestock production and fostering community resilience through a comprehensive value chain approach. Special attention will be given to establishing vegetable gardens at project-established water points, primarily benefiting women, and contributing to household nutrition. This activity will be implemented by FAO, building on the ongoing FFS related activities in the focal area.

Output 3.1.5 Rangelands restored to ensure increased production of drought-resistant fodder, higher species diversity and more abundant soil cover: Ecological infrastructure such as rangelands, are critical to maintain under the changing climate. This is especially true for communities whose livelihoods are directly dependent on ecosystem services. Women in rural areas often rely more on biomass for energy and livelihoods and depend heavily on ecosystem services for food security, making them particularly vulnerable to climate impacts due to limited decision-making power and resource access.

Activity 3.1.5.1 Create nurseries for drought-resistant fodder crops, adjacent to the water retention ponds: This activity aims to advance gender equality in ecological infrastructure management for sustainable and inclusive development. This will be achieved through securing land rights for women so that they have access to resources and decision-making power. The secured land will be used by women's groups to establish nurseries for drought-resistant fodder crops, which will be transplanted to the rangelands targeted for restoration. Inclusive decision-making processes will be promoted by ensuring women participate in resource assessment and management.

Activity 3.1.5.2 In collaboration with the local traditional leaders, identify and secure 20,000 hectares of land for rangeland restoration: For pastoralists, the most critical ecological infrastructure are rangelands and water sources. Thus, the project will introduce rangeland restoration to ensure increased production of drought-resistant fodder, higher species diversity and abundant soil surface cover. Enhancements to water sources are covered under Output 3.1.1 and 3.1.2 above.

Rangeland restoration will require fencing of selected areas to allow the rangeland to recover. To enhance recovery fodder crops from the nursery will be transplanted and grown to maturity before they are harvested by the community members to feed their livestock.

Activity 3.1.5.3 Establish 2,000 hectares of multipurpose tree plantations to be owned and managed by women's groups: An example of a drought-tolerant tree crop that provides multiple benefits is moringa. As moringa is a highly nutritious food ingredient for both humans and livestock, women's groups in the area will be supported to obtain secure access to land and establish moringa tree plantations. Moringa trees have the benefit of being fast-growing and can provide shade to other crops growing beneath them. Other trees that provide fruit or nuts could also be planted in the same plantations, to support nutritional variety. This activity will be led by the relevant Ministries responsible for Environment and Forestry.

Outcome 3.2: **Improved collaboration amongst development partners and stakeholders in the project area of the Kunene River Basin**: As the Kunene River Basin is rather remote, especially the lower Basin where the nomadic pastoralists live, coordination of development work in the area can be challenging. Communities have limited contact with one another and with development partners located in the provincial and national capital cities. This outcome aims to strengthen collaboration within the project area by establishing and coordinating a collaborative forum for development partners and building their capacity in climate change adaptation.

Output 3.2.1: **An inclusive forum for development partners in the project area of the Kunene River developed**: To ensure consistent oversight of activities at the local level, the local partners in implementation of the project and related activities – local government, CSOs, NGOs, local private businesses, traditional leaders, community representatives and the Project Implementation Units in both countries – will be convened into a forum organised and funded by the project.

Activity 3.2.1.1 Convene quarterly development partners meetings in the project area: The Project Implementation Units will convene quarterly meetings of the local development partners' forum. These meetings will enable local actors to discuss progress and lessons learned from their various projects and collaborate to ensure synergies and cost-effectiveness in implementation of their projects. The meetings will be minuted, for reference in the annual project implementation progress reports as well as the mid-term and terminal evaluations.

Component 4: Raise awareness and improve knowledge on climate change adaptation in the Kunene River ecosystem

48. This component will facilitate the creation of knowledge to support adaptation planning, as well as inform co-design and implementation of adaptation activities. Both scientific and traditional knowledge are fundamental to the success of this project and its long-term sustainability, as is the knowledge created during the stakeholder engagement process through the Scenario Planning approach. This Component will be concerned with the use of this knowledge to inform the internal Monitoring, Evaluation and Learning (ME&L) process, including gender-sensitive indicators, and to share the learnings of knowledge on gender and adaptation through exchange of good practice and experiences with other interested parties regionally and globally.

Outcome 4.1 Knowledge of the Kunene River System enhanced: Increasing knowledge about the Kunene River Basin is essential for sustainable management and conservation of its unique ecosystems and biodiversity. This transboundary river is crucial for local communities, providing water for agriculture, drinking, and fisheries. Understanding the Basin's hydrology, geology, and ecological dynamics will help stakeholders address challenges such as climate change, water scarcity, and habitat degradation. Enhanced research and collaboration among governments, NGOs, and local populations

will foster effective resource management strategies, ensuring the river's health and the well-being of the communities that depend on it. Promoting awareness and education about the Basin's importance will also support conservation efforts and sustainable development initiatives.

Output 4.1.1 Awareness raised, and knowledge shared on gender-responsive locally led climate change adaptation measures: Raising awareness and sharing knowledge on gender-responsive, locally-led climate change adaptation measures is vital for fostering resilience in vulnerable communities. By emphasising the distinct impacts of climate change on different genders, initiatives will be designed to empower women and marginalised groups, ensuring their voices are heard in decision-making processes. Workshops, community meetings, and educational campaigns will be instrumental in disseminating information about effective adaptation strategies that reflect local needs and cultural contexts. These efforts not only enhance community resilience but also promote equitable participation, enabling all members to contribute to and benefit from climate adaptation initiatives. As knowledge spreads, communities become better equipped to tackle climate challenges, ultimately leading to sustainable development and improved livelihoods.

Activity 4.1.1.1 Raise awareness and share knowledge on locally appropriate climate change adaptation measures: Early in the project, awareness campaigns will be undertaken to sensitise the beneficiary communities on the importance of their active participation in designing and implementing projects aimed to support them in adapting to climate change. The documented experience and knowledge gained from implementing similar projects will be used to raise awareness on gender-responsive adaptation with the target and related communities, the government, private sector, and all relevant stakeholders, thus informing the project activity co-design and implementation processes.

Activity 4.1.1.2 Provide nutrition and literacy training to the beneficiary communities, to enhance community adaptive capacity: Improved nutrition leads to improved health status, which raises the community's ability to adapt to a changing climate and recover from climate shocks. Enhanced literacy improves the community's ability to access and use information that may be useful to them in mitigating climate risks. Thus, these activities are included in the project, building upon the foundation laid by previous similar initiatives in the KRB. The training will be particularly aimed at women and youth. Working in close collaboration with Health Ministries and Nutrition partners, FAO will lead this activity through the established FFS within the intervention areas and other awareness raising activities.

Output 4.1.2 Kunene River Awareness Kit online portal reactivated and updated, using the data and knowledge generated by the project: The Kunene River Awareness Kit is an educational and informational online resource that was designed to promote understanding and sustainable management of the Kunene River, which flows between Angola and Namibia. It provides a comprehensive overview of the river's ecosystem, hydrology, and socio-economic significance, highlighting the challenges and opportunities related to water use, conservation, and transboundary cooperation. The kit is a vital tool for policymakers, researchers, and local communities, offering interactive content, maps, data, and case studies to support informed decision-making and encourage collaborative efforts to ensure the river's long-term health and sustainability. It has been inactive for some time; thus, this output is centred on reactivating and updating it.

Activity 4.1.2.1 Reactivate and update the online Kunene River Awareness Kit: This will be done by updating the content already present and enhancing it using the data and knowledge created by the programme. By collaborating with the owners of the online Toolkit, namely the Kunene Permanent Joint Technical Commission (PJTC), possibilities will be explored to create an active bilingual (English and Portuguese) interface portal for the Kunene River Basin, linked to the regional governance structures such as the SADC Water Division under the Directorate for Infrastructure and Services, the SADC Groundwater Management Institute, as well as the National Water Ministries in Angola and Namibia. The programme will also explore the possibility of creating a real-time map for water monitoring in the Kunene River Basin using the data collected from the activities under Component 2.

Output 4.1.3 Case studies from the project developed and submitted to IFAD and FAO knowledge management systems, SADC-GMI and Water Net, for further dissemination: As part of the project's knowledge-sharing efforts, comprehensive case studies will be developed and submitted to the knowledge management systems of the International Fund for Agricultural Development (IFAD) and the Food and Agriculture Organization (FAO). These case studies will showcase best practices, lessons learned, and innovations in project implementation, with a focus on climate change adaptation

disaster risk reduction. Additionally, the case studies will be shared with the Southern African Development Community Groundwater Management Institute (SADC-GMI) and Water Net, two key regional platforms for capacity-building and water research. This dissemination will ensure that valuable insights from the project can be accessed by a wider audience, facilitating knowledge exchange, and supporting the scaling-up of successful approaches across the region.

Activity 4.1.3.1: Case study development: Case studies from the project for submission to IFAD and FAO knowledge systems, SADC-GMI and Water Net will be developed and further disseminated. These will focus on the innovative aspects of the project, such as incorporation of ecosystem-based adaptation into disaster risk reduction, integrating scientific and traditional knowledge on climate change adaptation, and establishment of a multi-hazard early warning system. This activity will be implemented by the executing entity.

Outcome 4.2 Enhanced institutional capacity at local and regional level on gender-responsive locally led adaptation, for effective management of project activities and outputs: Building institutional capacity at local and regional levels is essential for fostering gender-responsive, locally led adaptation in the face of climate change. Strengthening these capacities ensures that project activities and outputs are managed effectively, with attention to both gender equity and climate resilience. By integrating gender perspectives into adaptation strategies, institutions can empower women and marginalized groups, who are often disproportionately affected by climate impacts, to actively participate in decision-making processes. This approach not only addresses vulnerability but also enhances the sustainability of adaptation efforts. Training, policy reform, and resource allocation at local and regional levels enable institutions to better plan, implement, and monitor climate projects, ensuring they meet diverse community needs while fostering inclusivity and resilience.

Output 4.2.1 Strengthened capacity of partner institutions in the Kunene River Basin: Capacity building of partner institutions in the Kunene River Basin is vital for fostering sustainable water management and transboundary cooperation between Angola and Namibia. Through targeted capacity-building initiatives, including technical training, resource allocation, and knowledge exchange, these institutions will be better equipped to manage water resources, address climate challenges, and promote equitable access to water for local communities. Enhanced institutional capacity will enable more effective implementation of policies, monitoring of river health, and coordination of cross-border efforts. By empowering local and regional organisations with the tools and knowledge needed to address water scarcity and environmental concerns, these efforts will contribute to the long-term resilience and sustainability of the Kunene River Basin. This will be achieved through skills training and organisational development, to address challenges such as water scarcity, climate change impacts and competing interests among stakeholders. The Project Implementation Units will identify suitable trainers and materials for this exercise.

Activity 4.2.1.1 Institutional capacity building and strengthening for effective management of gender-responsive climate change adaptation initiatives: Institutional capacity building in the Kunene River Basin is crucial for sustainable management and equitable distribution of water resources across its diverse landscapes. Effective institutions are essential to address challenges such as water scarcity, climate change impacts, and competing interests among stakeholders. Strengthening institutional capacity will involve enhancing the skills, resources, and organisational structures of governing bodies, water authorities, and local communities. This process will facilitate better coordination, data management, and policy implementation, ensuring that water-related decisions are informed, inclusive, and geared towards long-term environmental and socio-economic sustainability in the region. International expertise will be engaged to design and deliver tailored training courses for the different institutions responsible for the Basin.

B. How the project would promote innovative solutions to climate adaptation

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

49. This programme is founded on collective lessons learnt by partners working in the KRB, with government agencies in Angola and Namibia, and with the inhabitants of the basin. The innovative

solutions identified reflect an optimisation of the knowledge acquired on the climate risks faced by the environment and its users, with a focus on the specific vulnerabilities of the nomadic groups, triangulated with the understanding of the river basin and its ecosystems.

Innovation 1: Integrating Science with Indigenous Traditional Knowledge

50. Adaptation projects and programmes that are built upon the balance between scientific and indigenous traditional knowledge are still uncommon[40]. For instance, women tend to have considerable knowledge in managing and conserving natural resources in their surroundings, but this knowledge is rarely utilised in projects and programmes. This programme seeks to show how integrating scientific and indigenous knowledge leads to better and more sustainable adaptation outcomes. This will be rolled out by adapting Scenario Planning for Natural Resources Management. This innovation is expected to lead to an inclusive planning process for Disaster Risk Reduction in the Kunene River Basin, which may be adapted for use in other regional transboundary basins, particularly in those which have similar characteristics as the KRB, with semi-nomadic inhabitants who cross national borders regularly.

Innovation 2: Multi-Hazard Early Warning System

51. Systems that collate data from multiple sources and issue warnings for multiple types of hazards (flood, fire, dry spells, etc) are recent. Such systems facilitate understanding of how climate change impacts a specific locality, elaboration of solutions, as well as development of preparedness strategies. Lessons learnt from applying similar systems are already available, specifically within the UNDRR network and the Global Platform for Disaster Risk Reduction. This project will contribute towards global knowledge and experience with such systems.

52. The MH-EWS is intended to cover the whole basin, benefitting both the nomadic and the sedentary groups, with special consideration for the needs of the nomadic groups in the lower section of the basin. Informed by the Vulnerability Assessment already successfully undertaken by WWF and IRDNC in some of the communities in Namibia, as well as consultation with the meteorological and hydrological agencies of both countries, the project will roll out the MH-EWS with the help of local partners. The system will combine the data collected from fieldwork with that transmitted by the weather and hydrometric stations, to provide early warnings on a range of hazards.

Innovation 3: Integrating Ecosystem-based Adaptation into DRR planning

53. The link between DRR and EbA is nascent in the international agenda, and only in 2018 did the Convention on Biological Diversity develop guidelines for donors, practitioners, and decision-makers on integrating the two[41]. The connection between the two is transformative for climate change adaptation in Southern Africa, especially in dry and arid ecosystems with multiple land uses, such as the Kunene River Basin. The proposed DRR plan will be unique in the region and may be replicated in other Transboundary River Basins in the region, which experience similar tensions between use and conservation of resources. Development of the DRR Plan will involve consultation amongst users and between users and decision-makers, while the integration of EbA will enhance the ecosystem base, to avoid environmental and socio-economic collapse. Whilst this component will be rolled out in year 1, the enabling environment created for multi-stakeholder dialogue will be used throughout the programme to co-design innovative adaptation projects and solutions. EbA solutions will be designed with consideration of gender differences in access to and control over natural resources, as well as gender-specific knowledge in ecosystem restoration and management. For instance, in Namibia, both men and women have access to communal land, but men are more privileged[42]. Women are responsible for gathering forest products: fuelwood, raw materials for crafts and wild fruits. There is a need to enhance

[40] Makondo, C. C., & Thomas, D. S. (2018). Climate change adaptation: Linking indigenous knowledge with western science for effective adaptation. *Environmental science & policy*, 88, 83-91. https://doi.org/10.1016/j.envsci.2018.06.014

[41] Convention on Biological Diversity. (2018). *Guidelines for Ecosystem-based Approaches to Climate Change Adaptation and Disaster Risk Reduction*, draft available at https://www.cbd.int/sbstta/sbstta-22-sbi-2/EbA-Eco-DRR-Guidelines-en.pdf

[42] Mwetulundila, P. (2022). Gender perspectives in Namibia's communal land: Exploring women's hindrances to equitable land ownership. *Journal of Asian and African Studies, 57*(3), 481-496.

representation of women and other marginalised groups in natural resources management, as well as ensure equitable benefit to all gender groups from actions taken to protect the ecosystem.

Innovation 4: Planning for sustainable financing and income generation

54. The project is designed with a focus on sustainability for all activities implemented and this includes providing opportunities for sustainable financing and income generation. This will be done through two streams of activities: Dissemination of knowledge on existing mechanisms to create financial incentives for natural resources management, such as Payment for Ecosystem Services, and to create security for losses, such as Disaster Risk Insurance, as may be applicable to the communities. Fostering opportunities for partnership with the private sector, including profiling suitable gender-sensitive value chains linked to the existing markets for indigenous plant products and commodity-based trade in livestock products.

Innovation 5: Gender responsive adaptation

55. The community consultation process identified female-headed households as the most vulnerable to climate change. The project therefore aims to reduce vulnerability and improve adaptive capacity of this group, to respond effectively to the impacts of climate change. The project will mainstream gender into adaptation planning and decision-making. A focus on gender issues concerning access to and control over natural resources and involvement of stakeholders at the front end of the project cycle, including attention to how gender-specific barriers can be addressed, will build wider ownership for project activities and broader replication. The project will conduct gender-responsive consultation through consulting women and men separately, ensuring the timing and venues of meetings allow access to all gender groups, ensuring the use of local language in communication, selection of female facilitators to conduct meetings to increase women participation, and inclusion of women's organisations representatives to bring in a broader gender perspective. The project will ensure that women comprise at least 50 % of the beneficiaries and constitute most leadership positions. As a principle, the project will also ensure that women are included in management structures for the community-level productive cooperatives.

C. How the project would provide economic, social, and environmental benefits

Describe how the project/programme would provide economic, social, and environmental benefits, with 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.

56. 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. Any potential negative impacts because of this project are believed to be small in scale, limited to the project area, reversible and can be either avoided, minimi**s**ed, or addressed using recogni**s**ed good environmental and social management practices. On the other hand, the project will deliver several positive economic, social, and environmental benefits, discussed below.

57. **Economic benefits:** The Early Warning Systems (EWS) and training courses in using weather information to prioritise adaptation options will provide the means for informed decision-making and implementation of measures to protect assets and services exposed to flood disasters in the Kunene basin. The economic benefits include the reduction of economic losses and social impacts due to these disasters. The actions targeting the development of water resources in Component 3 will increase the availability of water for economic activities (small-scale agriculture and irrigation, livestock farming, etc.) but also the preservation of ecosystems through Ecosystem based Adaptation (EbA). These activities will not only contribute to increasing access to ecosystem services but will also substantially strengthen the livelihoods and economy of the populations, especially the vulnerable communities such as the women and different gender subgroups. Importantly, the reduction of women's workload to collect water, especially in rural areas, will free up their time and energy for productive activities.

58. **Social benefits**: The programme will place specific emphasis on co-designing activities meaningfully with beneficiary communities and stakeholders in a gender-responsive way. The gender analysis informed the formulation of gender-responsive approaches and activities, with a dedicated targeting approach for vulnerable groups, women, and youth, leading to several social benefits, including the following:

- **More equitable access to natural resources**. Co-designing concrete adaptation activities with the beneficiary communities, including vulnerable groups, will empower the communities to adapt to climate change. Across the project areas in the two countries, nature-based water infrastructure will be enhanced, with 20 earth dams rehabilitated and 20 water retention ponds excavated and secured. Furthermore, 20,000 hectares of rangelands will be restored, to ensure that the pastoralists have access to more fodder for their livestock. Additionally, 2,000 hectares will be afforested with multipurpose trees that provide fruit or nuts for consumption, shade for plants growing beneath them, and timber for construction.
  The project is expected to ensure increased access to water, improved ecosystem services, reduced vulnerability, as well as enhanced natural resources management. Any potential negative impacts for the semi-nomadic agro-pastoral communities in the transboundary Kunene River Basin will be mitigated against.

- **Strengthened social cohesion**. Semi-nomadic agro-pastoral communities will be better coordinated and in a stronger position to sustainably manage natural resources as well as respond to climate extremes. Community cohesion will be strengthened through participatory conservation planning and land-use, climate-driven risk reduction and emergency preparedness. Youth and women will be fully engaged in the process, with participation targets of 30% and 50% respectively, and will be represented equitably in natural resources management committees. The better communities are organised, the less likely a "tragedy of commons" scenario will occur where individual community members act independently according to their own self-interest, causing the degradation of ecosystems and increasing climate vulnerability. Furthermore, beyond the planning processes and capacity building activities, the project will also implement awareness campaigns on climate change adaptation, which are intended to reach all 54,200 beneficiaries of the project.

- **Increased awareness and knowledge on climate change adaptation**. Training will increase knowledge and capacity of stakeholders, communities, and different gender subgroups to participate effectively in disaster risk reduction and ecosystem management. Communities will be more aware of the impacts of unsustainable activities on natural resources, so that they choose more sustainable responses to climate change impacts. The project creates opportunities for 7,700 community members and 2,400 institutional staff[43] to be trained in various aspects of climate change adaptation. Through the capacity-building activities, the project will empower vulnerable community members, including women and marginalised groups such as indigenous propel, people, persons with disabilities and youth, to make their own decisions about the investments, mitigation measures, sharing of resource benefits and opportunities and implementation issues in enhancing the resilience of their livelihoods.

59. **Environmental benefits:** Conserving, restoring and sustainably managing ecosystems through EbA can deliver on several national and international development priorities and obligations, including enhancing people's resilience to climate change and disasters, supporting biodiversity, mitigating climate change, and protecting food, water, and livelihood security especially of vulnerable populations, including women and different gender subgroups. Such actions can also help enhance

[43] As some people might attend more than one training workshop, this does not necessarily translate into the number of people that will be trained.

the effectiveness of disaster risk reduction strategies. Improved ecosystems have a greater capacity to adapt to a drier, hotter, and more variable climate in the lower Kunene. Several environmental benefits are envisaged:

- **Improved pasture health.** Better grazing management, effective pasture recovery periods, pasture improvement measures will lead to pastures that are more productive and in a better condition.
- **Soil erosion management**. Soil conservation through improved grazing management, improved management of water points, gully rehabilitation planting of trees will reduce soil loss and increase soil fertility.
- **Improved ecosystem services.** A valuation of ecosystem goods and services in Protected Areas and Conservancies, communal areas and private ranches will assist in environmental restoration and livelihood enhancement. EbA and Disaster Risk Reduction (DRR) will deliver multiple benefits including restoration and conservation of vegetated ecosystems, which also enhances carbon sequestration as well as community engagement and livelihood opportunities. A focus on the rangeland for the semi-nomadic population will reduce overstocking or mismanagement and improve ecosystem services associated with grazing.
  Protection of sensitive habitats. Natural resource management plans will lay out areas with measures (e.g., grazing restrictions or fencing) to protect habitats of high ecological value such as wetlands and other protected areas. These areas are important for emergency feed reserves, water quality, and biodiversity as habitats for plants and animals.

D. Analysis of the cost-effectiveness of the proposed project

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

60. This project aims to ensure cost-effectiveness through partnership with other projects existing in or planned for the Kunene River Basin. This will enable the target communities to adapt to the changing climate and its impacts beyond the lifespan of the project.

61. The total project investment of 14,000,000 USD from the Adaptation Fund will directly benefit 54,200 beneficiaries, by reducing disaster risk, improving access to climate information and early warnings of extreme weather events, increasing access to water, land, and equipment for climate-smart agriculture, and raising adaptive capacity through improved literacy, nutrition, and natural resources management. A further 119,400 indirect beneficiaries will gain more awareness of how to overcome the effects of climate change on their livelihoods, as well as access to publicly broadcasted warnings of extreme weather conditions/events and related hazards.

The table below compares the 'with' and 'without' scenarios of each project component.

Table 6: 'With' and 'without' project scenario comparison

Component	'Without' scenario (Current situation)	'With' scenario (Intended post-project situation)	Alternatives
1. Applying Ecosystem-based Adaptation in Disaster Risk Reduction	Angola has a national DRR strategy and Namibia has a national DRR policy, but these have not been downscaled into DRR plans at the local level. Thus, DRR planning for the project area is not robust, leaving the communities vulnerable to	A DRR Plan for the Kunene River Basin is developed, with responsibilities of the various stakeholders clarified. Furthermore, EbA measures are incorporated into DRR, enhancing the resilience of the beneficiary communities and	There is no viable alternative to DRR planning, as it is essential to safeguarding communities, ecosystems, and infrastructure from the potential impacts of weather-related hazards.

	the impacts of extreme weather events as well as slow-onset hazards. Furthermore, the difficulty in accessing the areas due to their remoteness and lack of infrastructure impedes delivery of disaster relief.	the ecosystems they depend on.	
2. Multi-Hazard Early Warning System	The community does not receive advance warning of extreme weather events or related hazards such as wildfires. This results in loss of human life, livestock, crops, and other valuable resources.	The beneficiary and surrounding communities receive sufficient advance warning of all adverse weather conditions, extreme weather events and related hazards, enabling them to take preparatory action. The increased density of meteorological and hydrological observation stations in the Basin leads to more accurate forecasting of floods, droughts and other adverse weather conditions or events.	There is no viable alternative to an early warning system, as these systems are essential to disaster risk reduction, as well as preparedness for altered weather patterns or extreme weather events.
3. Inclusive community-based and gender-responsive adaptation actions	Availability of water, food and fodder are declining, particularly in the lower Basin, which is becoming increasingly arid. Under these conditions, the semi-nomadic agro-pastoralist communities in the lower Basin are unable to sustain their traditional lifestyle, leading to migration of men and boys to urban areas in search of work, while women and girls are left behind in the rural areas, with limited economic opportunities.	Approximately 54,200 inhabitants of the lower Kunene River Basin have increased access to water, food, and fodder to sustain themselves and their livestock. 20 earth/sand dams and 60 boreholes are rehabilitated, while 20 new water retention ponds and 40 rooftop rainwater harvesting units are constructed. Cultivation of drought-tolerant crop varieties using conservation agriculture techniques leads to increased production of food. Furthermore, 20,000 hectares of rangeland are restored, and 2,000 hectares of multipurpose tree plantations are established, enhancing ecosystem heath of the Basin.	Alternatives to enhancing availability of water, food and fodder are limited in the project area, due to lack of local capacity to manage complex technology and infrastructure. Thus, interventions proposed are like what the communities are familiar with and able to manage. Nature-based solutions are proposed for enhancing availability of water and fodder, while simple technologies are proposed for implementing conservation agriculture and value addition to drought-tolerant crops. These interventions build upon the target beneficiaries' current way of life, rather than introducing new activities that would disrupt their lifestyle and livelihoods.
4. Awareness raising, learning and knowledge management on climate change adaptation	Communities observe the changes that are affecting their livelihoods and wellbeing but lack the knowledge and capacity to overcome these challenges or take maladaptive actions that worsen the situation. Local institutions also lack capacity to help the communities.	The beneficiary communities and the institutions that support them have the knowledge and capacity to overcome the climate-related challenges that they experience. Lessons learned are shared with other projects and documented for future reference.	The alternative to capacitating beneficiary communities and local stakeholders would be a non-consultative top-down approach towards managing the people and resources of the Basin.

62. Disaster risk reduction (DRR) and early warning systems (EWS) are essential responses where extreme climatic events threaten community livelihood security. Collaboration with the national meteorological and hydrological agencies and the local communities will ensure that data will be continuously collected, and the climatic hazards monitored. Community-based DRR and EWS systems that involve women and marginalised subgroups enable more localised information on vulnerability and capacity to be gathered, leading to decisions and actions better suited to the local context. An approach which draws on all sectors, contexts, levels, and actors, from government officials and climate scientists

to vulnerable people including marginalised subgroups, recognises the contribution of the different knowledge, capacities, and experiences of each. The resultant interventions will be co-owned, easier to implement, and therefore more cost-effective than conventional top-down interventions.

63. In addition, liaison with regional organisations such as the SADC Water Division, the SADC Groundwater Monitoring Initiative and Water Net will build cost-effectiveness in data collection and sharing for regional planning, as well as institutional capacity building and knowledge sharing. The reactivation of the existing information portal on the Kunene River Basin means funds will only be spent to update the portal and include new data and knowledge, instead of building a new competing product.

64. To ensure cost-effectiveness of the community-based adaptation practices under Component 3, the following considerations were applied in selecting them:

- Adaptation rationale - clarity of concrete adaptation benefits for semi-nomadic agro-pastoralists
- Gender - how easily the intervention reaches large numbers of women; gender responsive mitigation strategies, equitable access to DRR resources by the different gender subgroups, community training for EWS/DRR targeting women and marginalised subgroups.
- Sustainability of interventions - ensuring that the interventions continue providing benefits after project closure
- Minimal potential for maladaptation.

65. The project deliberately steers away from implementing costly top-down interventions that may not be fully utilised and maintained by the communities due to lack of ownership or capacity. Such interventions might undermine the current coping strategies of the communities and fail to build upon their indigenous traditional knowledge. DRR planning, EWS and capacity building (Components 1,2 and 4) are essential to effective climate change adaptation and do not have comparable substitutes. The agricultural activities (Component 3) build upon the target beneficiaries' current way of life, rather than introducing new activities that would disrupt their lifestyle and livelihoods.

66. The project deploys an innovative intervention framework which combines scientific knowledge with indigenous traditional knowledge, deployment of a multi-hazard early warning system; integration of DRR planning with ecosystem-based adaptation, planning for sustainable financing and income generation, as well as gender-responsive adaptation. This is a fundamental departure from the usual responses to climate-induced hazards in the target area, which tend to focus on emergency relief, such as food distribution, cash transfers and other forms of subsidies. Emergency relief programs in pastoral areas of Africa do little to sustainably relieve the fundamental effects of climate-induced emergencies such as drought and floods. This is because traditional mechanisms of coping to drought are often disrupted by food aid programmes and other emergency-oriented interventions. Instead, to be more effective in meeting the primary needs of pastoralists following severe drought/floods, this project focuses on restoring their herds and rangelands, ensuring gender-responsiveness in access to productive resources, and other mechanisms which are co-created with the communities, including the different gender subgroups.

67. The regional approach to this project supports cost-effectiveness through sharing of data, information, and experiences among the stakeholders in the two countries and reducing duplication of effort. For example, automatic weather stations on either side of the border will provide information that improves weather forecasting and early warning for both countries. Two separate country projects might result in automatic weather stations being installed by both projects, very close to each other on opposite sides of the border, which would be a waste of resources. Furthermore, it is important to bear in mind that the nomadic communities migrate across the border between the two countries frequently, so having separate projects targeting them in each country would be duplicative.

The overall cost per beneficiary of this project is compared with other climate-financed projects in Angola and Namibia, in the table below.

Table 7: Comparison of cost per direct beneficiary with ongoing projects in the region[44]

Project name	Project budget (USD)	Number of direct beneficiaries	Cost per direct beneficiary (USD)
Proposed project	14,000,000	54,200	258
Resilience building as climate change adaptation in drought-struck south-west African communities (ADSWAC)	11,914,038	42,500	280
Integrating Climate Resilience into Agricultural and Agropastoral Production Systems through Soil Fertility Management in Key Productive and Vulnerable Areas Using the Farmers Field School Approach	30,287,412	25,000	1,211
Enhanced Water Security and Community Resilience in the Adjacent Cuvelai and Kunene Transboundary River Basins (CUVKUN)	176,618,691	19,000	9,296
Climate Resilient Agriculture in three of the Vulnerable Extreme northern crops growing regions (CRAVE) Namibia	10,000,000	8,000	1,250
Improving rangeland and ecosystem management practices of smallholder farmers under conditions of climate change in Sesfontein, Fransfontein, and Warmquelle areas of the Republic of Namibia	10,000,000	30,366	329
Building resilience of communities living in landscapes threatened under climate change through an ecosystems-based adaptation approach, Namibia	9,100,000	60,000	152
Namibia Integrated Landscape Approach for Enhancing Livelihoods and Environmental Governance to Eradicate Poverty (NILALEG)	84,936,588	20,818	4,080

The analysis presented in the table above also shows that in comparison with the seven ongoing projects funded by the multilateral climate funds in the same region, the cost per direct beneficiary of this project is among the lowest, despite the broad range of interventions proposed.

68. The cost-effectiveness of this project is not only measured by its direct economic impact but also by its ability to empower vulnerable groups, particularly women. According to a report by the Global Gender and Climate Alliance[45] (GGCA, 2017), integrating gender-responsive interventions into climate projects improves resilience and returns on investment. By incorporating gender-sensitive interventions and ensuring women's participation in adaptation planning and decision-making, the project maximizes its long-term sustainability. Additionally, the project integrates cost-effective, locally appropriate technologies such as rainwater harvesting systems (estimated to reduce water costs by up to 50%) and low-cost, scalable agricultural innovations that have been proven to increase resilience in semi-arid environments.

[44] Sources: https://www.thegef.org/projects-operations/database and https://www.adaptation-fund.org/projects-programmes/ and https://www.greenclimate.fund/countries/namibia

[45] Global Gender and Climate Alliance (GGCA). (2017). Gender and Climate Change: Why Integrating Gender Makes Financial Sense.GGCA

E. Consistency with national or sub-national sustainable development strategies

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.

69. At regional level, the 2020 Revised SADC Protocol on Shared Watercourse prompts the Member States to identify and adopt strategies for the integrated management of shared water bodies, including planning, data collection and sharing, as well as implementation support. This project would contribute towards the SADC poverty eradication agenda included in the SADC Drought Disaster Resilience Strategy (2021 – 2031).[46] The Kunene River Basin has a Joint Technical Committee (JTC) tasked to enact the Protocol, but it lacks sufficient resources. This project will support the JTC by developing the EbA DRR Plan that will contain recommendations for high-level management activities of the JTC including fund-raising. Furthermore, the project also responds to the SADC Climate Change Adaptation Strategy for the Water Sector[47].

70. The national legislation, policies and strategies of Angola and Namibia in respect of climate change, transboundary water management and Disaster Risk Reduction are in line with the regional and international agenda, and this project fits into the national directives on supporting sustainable socio-economic development opportunities for vulnerable communities. In both countries, furthermore, different sectors and legislation are of relevance to the interventions proposed here, as discussed below:

Angola

71. This project is aligned with Angola's NDC which focuses on reducing vulnerability, strengthening resilience, and increasing the country's adaptive capacity to protect ecosystems, people, livelihoods, strategic sustainable development, and economic investment. The project achieves these objectives by enhancing ecosystem management in the Kunene River Basin through rangeland restoration, as well as supporting the semi-nomadic agro pastoralists in sustaining their livelihoods through increased access to water, food, and fodder.

72. Furthermore, the project is aligned with the National Strategy for Climate Change 2020-2035, Long-Term Development Strategy for Angola 2025 aimed at 'transforming Angola into a prosperous, modern country, without poverty and with a growing insertion in the world and regional economy" by alleviating poverty in the Basin and reducing loss of assess through improved EWS and DRR. Consistent with the country's Medium-Term Development Plan for the Agrarian Sector 2018-2022 and National Action Program to Combat Desertification, the project fosters conservation agriculture and reforestation of degraded areas.

73. In alignment with the National Development Plan (PDN) 2023-2027 that aims to reduce poverty and social inequality, and to widen in a sustainable way the productivity of regions subject to drought, the project aims to increase agricultural output from the Basin by fostering adoption of drought-tolerant crops varieties and increasing retention of water for use during dry periods. In addition, the Strategic Plan for Disaster Risk Prevention and Reduction of Drought in Angola includes priority actions and sectors for medium- and long-term drought recovery, which include agriculture and ecosystem management, both addressed by this project.

Namibia

[46] Dlamini, T.S., Manyatsi, A.M., Dlamini, W.M., & Hlanze, Z. (2021). *The SADC Drought Disaster Resilience Strategy (2021 – 2031)*. SADC/IUCN, Gaborone, Botswana.

[47] SADC. (2011). *Climate Change Adaptation in SADC: A Strategy for the Water Sector*. Gaborone, Botswana.

74. Namibia's Nationally Determined Contribution (NDC), updated in 2021, emphasises further improvement in adaptation and developing climate resilience to reduce climate risk to the populations and their livelihoods. Ambition to achieve resilient growth is evidenced by a range of ongoing initiatives, such as the Community Based Adaptation programmes focusing on agricultural and pastoral communities in the north-central and far north-east region of the country, undertaking community-based projects to build resilience to climate change by increasing resilience against climate-induced land degradation. The NDC encourages efforts to achieve the government's vision for a green economy that encourages balanced economic development while safeguarding the environment. The proposed project contributes towards achieving these goals, through involvement of the beneficiary communities in design and implementation of concrete adaptation activities, as well as building the capacity of local institutions in the Basin to effectively implement adaptation interventions.

75. Namibia promulgated the National Climate Change Policy in 2011 and the National Climate Change Strategy and Action Plan 2013-2020 (NCCSAP), now replaced by the NDC Implementation Strategy and Action Plan for 2021-2030. According to this Plan, "Namibia has placed more focus on adaptation, that is currently implemented under four key critical themes, namely, food security and sustainable biological resources; sustainable water resources base; human health and wellbeing; and infrastructure development".[48]The project contributes towards all four of these themes. DRR planning and MH-EWS under Components 1 and 2 safeguard human health and wellbeing, the rehabilitation and development of water resources infrastructure under Component 3 enhances the water resources base and overall infrastructure development in the Basin, the agricultural activities under Component 3 sustain food security and biological resources, and the capacity building under Component 4 builds adaptive capacity of the local institutions and the population they serve.

76. In addition to Namibia's current medium-term policy framework, the country's fifth National Development Plan (NDP5), acknowledges the potential contribution of agriculture towards economic growth, social transformation, and environmental sustainability. The centrality of agriculture is further articulated in the Harambee Prosperity Plan (HPP) which focuses on raising agricultural production and productivity to address poverty and hunger in rural communal areas. The GoN has also identified broader rural economic development as a key driver of economic progression in the country. The outcomes of this proposed project clearly align with these priorities, by supporting agricultural development in rural areas as a means of adapting to the changing climate.

77. It is important to note the alignment with the National Drought Policy and Strategy, which encourages and supports farmers to adopt self-reliant approaches to drought risk. The Namibia Water Policy White Paper includes Shared Watercourses Principles and Water Use and Conservation Principles, which underpin the transboundary approach of this project; while the Water Supply and Sanitation Policy aims at contributing to improved public health, reducing the burden of collecting water, and promoting community-based social development, taking the role of women into special account. Thus, this project will assist the Namibian government in implementing priority areas for adaptation and the most vulnerable sectors, namely water resources, agriculture, human health, and disaster risk management.

F. Compliance with national technical standards

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.

Adherence to the following standards will be assured during implementation of all relevant project activities:

[48] Republic of Namibia. (2021). Namibia's Updated Nationally Determined Contribution 2021. https://unfccc.int/sites/default/files/NDC/2022-06/Namibia's%20Updated%20NDC_%20FINAL%2025%20July%202021.pdf

78. **Environmental Assessment Standards**: The project will comply with the environmental assessment regulations of both Angola and Namibia. This involves conducting comprehensive Environmental and Social Impact Assessments (ESIA) in accordance with the Environmental Management Act of Namibia (2007) and Basic Environmental Law No. 5/98 and Decree No. 51/04 on Environmental Impact Assessment of Angola. The ESIA was carried out to identify potential environmental impacts and propose mitigation measures to minimise negative effects on the environment. It also included public consultations to ensure that the views and concerns of the affected communities were considered.

79. **Building Codes and Infrastructure Standards**: All construction developments within this initiative will adhere to the national building codes and standards. In Namibia, this means following the National Building Regulations and Building Standards Act No. 103 of 1977, which guarantees that construction activities meet safety, health, and structural integrity requirements. In Angola, the project will abide by the General Regulations on Urban Buildings (Decree No. 1/92) to ensure conformity with national construction norms and standards. Moreover, the project will make sure that all buildings and structures are resilient to climate conditions, integrating design elements that can withstand severe weather occurrences such as floods and droughts.

80. **Water Management Standards**: The project will adhere to national water management standards to promote the sustainable use and conservation of water resources. In Namibia, this will involve compliance with the Water Resources Management Act (2013), while in Angola, adherence to Law No. 6/02 on Water use will guide the sustainable management of water resources within the Kunene River Basin. The project will introduce integrated water resource management (IWRM) practices, encouraging efficient water use and minimising water wastage through modern irrigation techniques and water harvesting systems.

81. **Agricultural Practices and Livestock Management**: The project will promote sustainable agricultural practices and livestock management in line with national guidelines. In Namibia, this involves complying with the Agricultural (Commercial) Land Reform Act (1995) and the Communal Land Reform Act (2002), ensuring that land use practices are sustainable and equitable. In Angola, the project will align with the Development Plan of the Agriculture Sector (2018 - 2022) to enhance agricultural resilience and productivity. Sustainable practices will include agroforestry, conservation agriculture, and rotational grazing to maintain soil health and prevent land degradation.

82. **Health and Safety Standards**: The project will ensure that all workers and community members 79. involved in project activities comply with national health and safety standards to protect their well-being. This will involve following occupational health and safety regulations, providing the necessary training and protective equipment to workers, and implementing safety protocols during both the construction and operational phases.

83. The project is committed to upholding the Environmental and Social Policy of the Adaptation Fund, implementing robust safeguard measures to prevent, mitigate, and manage environmental and social risks. This includes ensuring environmental sustainability, prioritising social equity and inclusion, and developing a strong risk management plan. In line with the Adaptation Fund's Gender Policy, the project will integrate gender considerations throughout its design and implementation. Efforts will focus on engaging a wide range of stakeholders, establishing a robust monitoring and evaluation framework, and fostering collaboration and partnerships to build inclusive resilience to climate change for semi-nomadic agro-pastoral communities in the Kunene River Basin.

The table below gives an overview of the most pertinent laws and acts for each proposed intervention and their relevance to the project in both countries.

Table 8: Compliance with national regulations, policies, strategies, and standards

Proposed concrete adaptation activity	National Regulations, Policies, Strategies and Standards to be complied with	
	Angola	**Namibia**
Undertake a Water Security Assessment in the Kunene Basin	Water Law (Law no. 6/02 of 21 June); Decree No. 82/14 of 21 April; Environmental Law (Law No. 5/98 of 5 June); EIA Decree (Decree No. 51/04 of 23 July); National Biodiversity Strategy and Action Plan (Resolution n.º 42/06 de 26 de July); National Institute of Meteorology and Geophysics (INAMET) (Presidential Decree 230/14 of 4 September)	Water Resource Management Act 13 of 2013; Water Cooperation Act 12 of 1997; Environmental Management Act 7 of 2007; National Policy on Climate Change for Namibia 2011; National Water Policy 2003; National Water Act 12 of 1997
Undertake Ecosystem Goods and Services quantification and valuation in Protected Areas and Conservancies, Communal Areas, and private ranches	Water Law (Law no. 6/02 of 21 June); Decree No. 82/14 of 21 April; Environmental Law (Law No. 5/98 of 5 June); EIA Decree (Decree No. 51/04 of 23 July); National Biodiversity Strategy and Action Plan (Resolution n. º 42/06 de 26 de July); Law of Forest and Wildlife (6/17 of 24 January); Strategic Plan of Conservation Areas; The Iona/Skeleton Coast Transfrontier Conservation Area (Resolution 41/06 24 July)	Water Resource Management Act 13 of 2013; Water Cooperation Act 12 of 1997; Environmental Management Act 7 of 2007; National Policy on Climate Change for Namibia 2011; National Water Policy 2003; Water Act 12 of 1997 Forest Act 12 of 2001, National Rangeland Management Policy & Strategy 2012; National Development Forestry Policy 2001; World Meteorological Organization Standard
Develop a basin-wide gender-inclusive Disaster Risk Reduction Plan focused on Ecosystem-based Adaptation	Basic Environmental Law, 1998 (Law No. 5/98), Water Law, 2002 (Law No. 6/02), Civil Protection Basic Law, 2003 (Law No. 28/03), National Policy on Gender Equality and Equity, 2013, National Biodiversity Strategy and Action Plan, 2007-2012, National Strategy for Climate Change, 2018-2030, Land Law, 2004 (Law No. 9/04), Forestry Law, 2010 (Law No. 6/10), National Plan for Agricultural Development, 2018-2022, General Labor Law, 2015 (Law No. 7/15)	Management Act, 2013 (Act No. 11 of 2013), Disaster Risk Management Act, 2012 (Act No. 10 of 2012), National Gender Policy, 2010-2020, Nature Conservation Ordinance, 1975 (Ordinance No. 4 of 1975), National Policy on Climate Change, 2011, Urban and Regional Planning Act, 2018 (Act No. 5 of 2018), Forest Act, 2001 (Act No. 12 of 2001), National Agriculture Policy, 2015, Occupational Health and Safety Act, 2007 (Act No. 11 of 2007), National Occupational Safety & Health Policy November 2021; National Resilience Building Strategy and Costed Action Plan for Namibia
Facilitate engagement and co-planning of the Kunene River Basin by its stakeholders	Law on Territorial Organization and Urbanization, 2015 (Law No. 3/04), Law on Local State Administration, 2007 (Law No. 2/07), Traditional Authorities Law, 2001 (Law No. 9/01), Environment Framework Law, 1998 (Law No. 5/98), Water Law, 2002 (Law No. 6/02), Civil Protection Basic Law, 2003 (Law No. 28/03)	Regional Councils Act, 1992 (Act No. 22 of 1992), Local Authorities Act, 1992 (Act No. 23 of 1992), Traditional Authorities Act, 2000 (Act No. 25 of 2000), Environmental Management Act, 2007 (Act No. 7 of 2007), Water Resources Management Act, 2013 (Act No. 11 of 2013), Disaster Risk Management Act, 2012 (Act No. 10 of 2012)
Facilitate the development of Free, Prior, Informed Consent (FPIC) Plan.	Traditional Authorities Law, 2001 (Law No. 9/01), Environment Framework Law, 1998 (Law No. 5/98), Water Law, 2002 (Law No. 6/02), Civil Protection Basic Law, 2003 (Law No. 28/03), Law on Local State Administration, 2007 (Law No. 2/07)	Traditional Authorities Act, 2000 (Act No. 25 of 2000), Environmental Management Act, 2007 (Act No. 7 of 2007) - Water Resources Management Act, 2013 (Act No. 11 of 2013), Regional Councils Act, 1992 (Act No. 22 of 1992), Local Authorities Act, 1992 (Act No. 23 of 1992)
Facilitate dialogue between beneficiary gender and ethnic subgroups and related stakeholders	Traditional Authorities Law, 2001 (Law No. 9/01), Basic Environmental Law, 1998 (Law No. 5/98), Water Law, 2002 (Law No. 6/02), Civil Protection Basic Law, 2003 (Law No. 28/03), Law on Local State Administration, 2007 (Law No. 2/07)	Traditional Authorities Act, 2000 (Act No. 25 of 2000), Environmental Management Act, 2007 (Act No. 7 of 2007) - Water Resources Management Act, 2013 (Act No. 11 of 2013), Regional Councils Act, 1992 (Act No. 22 of 1992), Local Authorities Act, 1992 (Act No. 23 of 1992)
Develop localised climate-smart conservation, climate risk and adaptation assessment tools	Basic Environmental Law, 1998 (Law No. 5/98), Water Law, 2002 (Law No. 6/02), Forestry Law, 2010 (Law No. 6/10), National Strategy for Climate Change, 2018-2030, National Biodiversity Strategy and Action Plan, 2007-2012	Environmental Management Act, 2007 (Act No. 7 of 2007), Water Resources Management Act, 2013 (Act No. 11 of 2013), Forest Act, 2001 (Act No. 12 of 2001), National Policy on Climate Change, 2011, Nature Conservation Ordinance, 1975 (Ordinance No. 4 of 1975)

Installation of automatic weather stations across the Kunene River Basin	The National Institute of Meteorology and Geophysics (INAMET) (Presidential decree 230/14 of 4 September), Basic Environmental Law, 1998 (Law No. 5/98) - Water Law, 2002 (Law No. 6/02)	World Meteorological Organization Standard, Environmental Management Act, 2007 (Act No. 7 of 2007), Water Resources Management Act, 2013 (Act No. 11 of 2013
Installation of hydrometric stations along the Kunene River	Water Law (Law no. 6/02 of 21 June); Environmental Law (Law No. 5/98 of 5 June), Traditional Authorities Law, 2001 (Law No. 9/01)	National Water Policy 2003; Water Act 12 of 1997; Water Resource Management Act 13 of 2013, Traditional Authorities Act, 2000 (Act No. 25 of 2000),
Design the multi-hazard early warning system in consultation with beneficiary communities	Basic Environmental Law, 1998 (Law No. 5/98), Water Law, 2002 (Law No. 6/02), Forestry Law, 2010 (Law No. 6/10), National Strategy for Climate Change, 2018-2030, Law on Territorial Organization and Urbanization, 2015 (Law No. 3/04), Law on Local State Administration, 2007 (Law No. 2/07), Traditional Authorities Law, 2001 (Law No. 9/01)	Disaster Risk Management Act, 2012 (Act No. 10 of 2012), Environmental Management Act, 2007 (Act No. 7 of 2007), Water Resources Management Act, 2013 (Act No. 11 of 2013), Forest Act, 2001 (Act No. 12 of 2001), National Policy on Climate Change, 2011, Regional Councils Act, 1992 (Act No. 22 of 1992), Local Authorities Act, 1992 (Act No. 23 of 1992), Traditional Authorities Act, 2000 (Act No. 25 of 2000)
Identify and select providers of suitable data platform and user interface for the MH-EWS	Telecommunications Law, 2001 (Law No. 8/01), Electronic Communications and Transactions Law, 2011 (Law No. 7/11), Law on Local State Administration, 2007 (Law No. 2/07), Traditional Authorities Law, 2001 (Law No. 9/01)	Communications Act, 2009 (Act No. 8 of 2009), Electronic Transactions Act, 2019 (Act No. 4 of 2019), Regional Councils Act, 1992 (Act No. 22 of 1992), Local Authorities Act, 1992 (Act No. 23 of 1992)
Operationalise a multi-hazard early warning system for the Kunene River Basin	Basic Environmental Law, 1998 (Law No. 5/98), Water Law, 2002 (Law No. 6/02), Forestry Law, 2010 (Law No. 6/10), National Strategy for Climate Change, 2018-2030, Law on Territorial Organization and Urbanization, 2015 (Law No. 3/04), Law on Local State Administration, 2007 (Law No. 2/07), Traditional Authorities Law, 2001 (Law No. 9/01)	Disaster Risk Management Act, 2012 (Act No. 10 of 2012), Environmental Management Act, 2007 (Act No. 7 of 2007), Water Resources Management Act, 2013 (Act No. 11 of 2013), Forest Act, 2001 (Act No. 12 of 2001), National Policy on Climate Change, 2011, Regional Councils Act, 1992 (Act No. 22 of 1992), Local Authorities Act, 1992 (Act No. 23 of 1992), Traditional Authorities Act, 2000 (Act No. 25 of 2000)
Support meteorological agencies to simplify, translate and disseminate seasonal, weekly, and daily weather forecasts in local languages spoken in the KRB	Basic Environmental Law, 1998 (Law No. 5/98), Telecommunications Law, 2001 (Law No. 8/01), Law on Local State Administration, 2007 (Law No. 2/07), Traditional Authorities Law, 2001 (Law No. 9/01)	Environmental Management Act, 2007 (Act No. 7 of 2007), Communications Act, 2009 (Act No. 8 of 2009), Regional Councils Act, 1992 (Act No. 22 of 1992), Local Authorities Act, 1992 (Act No. 23 of 1992), Traditional Authorities Act, 2000 (Act No. 25 of 2000)
Rehabilitate existing earth dams and construct new rainwater retention ponds	Basic Environmental Law, 1998 (Law No. 5/98), Water Law, 2002 (Law No. 6/02), Soil Conservation Law, 2010 (Law No. 17/10), Law on Local State Administration, 2007 (Law No. 2/07), Traditional Authorities Law, 2001 (Law No. 9/01), EIA (Decree No. 51/04 of 23 July)	Environmental Management Act, 2007 (Act No. 7 of 2007), Water Resources Management Act, 2013 (Act No. 11 of 2013), Soil Conservation Act, 1969 (Act No. 76 of 1969), Regional Councils Act, 1992 (Act No. 22 of 1992), Local Authorities Act, 1992 (Act No. 23 of 1992), Traditional Authorities Act, 2000 (Act No. 25 of 2000), Water Cooperation Act 12 of 1997
Rehabilitation of existing boreholes for vegetable gardens and domestic use	National Biodiversity Strategy and Action Plan (Resolution n. º 42/06 de 26 de July); Strategic Plan of Conservation Areas; Law of Forest and Wildlife (6/17 of 24 January), The Iona/Skeleton Coast Transfrontier Conservation Area (Resolution 41/06 24 July)	Water Resource Management Act 13 of 2013, Water Cooperation Act 12 of 1997
Procure and install processing equipment for selected specific value chains	Export Diversification and Import Substitution (PRODESI - Presidential Decree 169/18); Program to Support Agriculture Credit (PAC) (Presidential Decree No. 159/19)	National Policy on Climate Change for Namibia 2011; Agricultural Marketing & Trade Policy & Strategy 2011; National Agricultural Policy (MAWF 1995); Forest Act 12 of 2001
Provide training and labour-saving technologies for conservation agriculture	Development Plan of the Agriculture Sector (2018 - 2022), Law on Professional Training 21-A/92:	Comprehensive CA Programme for Namibia 2015-2019; Namibia Agricultural Policy (MAWF 2015); National Policy on Climate Change for Namibia 2011, National Rural Development Policy – March 2012
Promote drought-tolerant food crop varieties	Decree No. 15/18 of 25 January on animal breeds and crop varieties; Executive Decree 574/17; Executive Decree No. 388/17; Executive Decree No. 387/17; Executive Decree No. 386/17; Decree that	Seed and Seed Varieties Act 23 of 2018; Plant Breeder & Farmer Right Bill 2006; National Policy on Climate Change for Namibia 2011

	approves the Biosafety Regulation (Decree No. 62/11 of 14 April)	
Create nurseries for drought-resistant fodder crops, adjacent to the *chimpacas*	Basic environment Law, 1998 (Law No. 5/98), Water Law, 2002 (Law No. 6/02), Forestry Law, 2010 (Law No. 6/10), Land Law, 2004 (Law No. 9/04), Soil Conservation Law, 2010 (Law No. 17/10), Law on Local State Administration, 2007 (Law No. 2/07), Traditional Authorities Law, 2001 (Law No. 9/01)	Environmental Management Act, 2007 (Act No. 7 of 2007), Water Resources Management Act, 2013 (Act No. 11 of 2013), Forest Act, 2001 (Act No. 12 of 2001), Agricultural (Commercial) Land Reform Act, 1995 (Act No. 6 of 1995), Soil Conservation Act, 1969 (Act No. 76 of 1969), Regional Councils Act, 1992 (Act No. 22 of 1992), Local Authorities Act, 1992 (Act No. 23 of 1992), Traditional Authorities Act, 2000 (Act No. 25 of 2000)
In collaboration with the local traditional leaders, identify and secure 20,000 hectares of land for rangeland restoration	Basic Environmental Law, 1998 (Law No. 5/98), Land Law, 2004 (Law No. 9/04), Soil Conservation Law, 2010 (Law No. 17/10), Traditional Authorities Law, 2001 (Law No. 9/01), Law on Local State Administration, 2007 (Law No. 2/07), Forestry Law, 2010 (Law No. 6/10)	Environmental Management Act, 2007 (Act No. 7 of 2007), Land Reform Act, 1995 (Act No. 6 of 1995) - Soil Conservation Act, 1969 (Act No. 76 of 1969) - Traditional Authorities Act, 2000 (Act No. 25 of 2000) - Regional Councils Act, 1992 (Act No. 22 of 1992) - Local Authorities Act, 1992 (Act No. 23 of 1992) - Forest Act, 2001 (Act No. 12 of 2001)
Establish plantations of multi-purpose trees, e.g., moringa plantations, to be owned and managed by women's groups	Basic Environmental Law, 1998 (Law No. 5/98), Forestry Law, 2010 (Law No. 6/10), National Policy on Gender Equality and Equity, 2013, Land Law, 2004 (Law No. 9/04) - Soil Conservation Law, 2010 (Law No. 17/10), Law on Local State Administration, 2007 (Law No. 2/07), Traditional Authorities Law, 2001 (Law No. 9/01)	Environmental Management Act, 2007 (Act No. 7 of 2007), Forest Act, 2001 (Act No. 12 of 2001), National Gender Policy, 2010-2020, Agricultural (Commercial) Land Reform Act, 1995 (Act No. 6 of 1995), Soil Conservation Act, 1969 (Act No. 76 of 1969), Regional Councils Act, 1992 (Act No. 22 of 1992), Local Authorities Act, 1992 (Act No. 23 of 1992), Traditional Authorities Act, 2000 (Act No. 25 of 2000)
Awareness raising and knowledge sharing on locally appropriate climate change adaptation measures	Basic Environmental Law (Law No. 5/98 of 5 June); National Strategy for Climate Change (Resolution No. 120/17 of 7 June); National Environmental Education Strategy (Decree No. 190/12 of 24 August)	National Climate Change Strategy & Action Plan 2013-2020; Environmental Management Act 7 of 2007; Education Act 16 of 2001; National Environmental Education Policy of 2012
Provide nutrition and literacy training to the beneficiary communities, to enhance community adaptive capacity	Education Law, 2016 (Law No. 17/16) Public Health Law, 2015 (Law No. 21/15), National Policy on Climate Change, 2018, National Policy on Gender Equality and Equity, 2013, Law on Local State Administration, 2007 (Law No. 2/07) Traditional Authorities Law, 2001 (Law No. 9/01)	Education Act, 2001 (Act No. 16 of 2001), Public Health Act, 2015 (Act No. 36 of 2015), National Policy on Climate Change, 2011, National Gender Policy, 2010-2020, Regional Councils Act, 1992 (Act No. 22 of 2), Local Authorities Act, 1992 (Act No. 23 of 1992), Traditional Authorities Act, 2000 (Act No. 25 of 2000)
Reactivate and update the online Kunene River Awareness Kit	Information and Communication Technologies Strategy (Presidential Decree No. 31/18)	National ICT Policy (2009); Electronic Transactions Act 4 of 2019; Environmental Management Act 7 of 2007
Case studies from the project for submission to IFAD and FAO knowledge systems, SADC-GMI and WaterNet will be developed and further disseminated	Basic Environmental Law, 1998 (Law No. 5/98), Scientific Research Law, 2001 (Law No. 5/01)), Traditional Authorities Law, 2001 (Law No. 9/01), National Strategy for Climate Change, 2018-2030, Water Law, 2002 (Law No. 6/02), Civil Protection Basic Law, 2003 (Law No. 28/03), Law on Local State Administration, 2007 (Law No. 2/07)	Environmental Management Act, 2007 (Act No. 7 of 2007), Research, Science and Technology Act, 2004 (Act No. 23 of 2004), Traditional Authorities Act, 2000 (Act No. 25 of 2000), National Policy on Climate Change, 2011, Water Resources Management Act, 2013 (Act No. 11 of 2013), Disaster Risk Management Act, 2012 (Act No. 10 of 2012), Regional Councils Act, 1992 (Act No. 22 of 1992), Local Authorities Act, 1992 (Act No. 23 of 1992)
Institutional capacity building and strengthening	Science, Technology and Innovation Policy, Law on the National System of Education and Training (Law No. 17/16 of 7 October); Public Administration Reform Strategy (Decree No. 09/13 of 7 June)	Training Policy of Public Service of Namibia 1999; Human Resource Development Policy Framework 2012
Convene quarterly development partners meetings in the project areas	Traditional Authorities Law, 2001 (Law No. 9/01), Law on Territorial Organisation and Urbanization, 2015 (Law No. 3/04), Law No. 1/11 on the Basic General Regime of the National Planning System	Regional Councils Act, 1992 (Act No. 22 of 1992, Local Authorities Act, 1992 (Act No. 23 of 1992), Traditional Authorities Act, 2000 (Act No. 25 of 2000), Public Service Act, 1995 (Act No. 13 of 1995), National Planning Commission Act, 2013 (Act No. 2 of 2013)

G. Avoidance of duplication with other projects in the target area

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

84. This project seeks to complement and build on existing and past programmes of work being undertaken by government agencies, development partners, NGOs, and other relevant stakeholders by placing stronger emphasis on building the resilience of the nomadic agro-pastoralist groups, by co-designing and implementing an inclusive Disaster Risk Reduction Plan that applies Ecosystem-based Adaptation. The project will contribute towards the meteorological and hydrological observation system in the KRB, complementing what is already in place from the responsible agencies and development partners. Furthermore, the proposed concrete adaptation activities prioritise rehabilitation and upgrading of existing infrastructure, restocking or reintroduction of indigenous plant and livestock breeds, and integrating scientific knowledge with indigenous knowledge, to enhance the existing adaptive capacity of the target communities, rather than introduce totally new initiatives. Operationally, the project will engage experienced civil society organisations active in the project area to scale their successful approaches to inclusive natural resource management.

Figure 5: Circular drip irrigation garden at a Farmer Field School in Ondjiva, Angola

85. The project will build on the experiences and lessons learned from past and ongoing initiatives and inform ongoing policy and learning processes, within the Kunene basin as well as beyond. These regional and national current projects have been reviewed to eliminate the possibility of duplication and to capitalise on lessons learning and possible up-scaling of successful interventions as part of this proposed project. Synergies and opportunities for collaboration will be defined at project inception and pursued during implementation.
86. The identification and design of sub-projects will be coordinated with ongoing initiatives in the region to avoid duplication. Key projects such as CREW Angola, CUVKUN, and others will be consulted to ensure that activities complement existing efforts and that data collected by these projects, such as water resources assessments, are shared to avoid replication and maximize synergies. Collaborative efforts with agencies such as UNDP, FAO, and the Ministry of Environment will ensure the project builds on prior knowledge and addresses existing gaps.

Below is a table summarising the ongoing projects and the assessment of duplication risk.

Table 9: Avoidance of duplication with ongoing initiatives

Ongoing projects	Project duration	Budget and funder	Implementing and executing entities	Project objective	Potentially duplicative activity	Solution
Empowering Women Groups to Build Resilience to Climate Impacts in the Province of Cunene in Southwest Angola (CREW Angola)	2025-2030	10 million USD, GCF and ADPP	Sahara and Sahel Observatory (OSS) and Ajuda de Desenvolvimento de Povo para Povo Angola (ADPP)	To build climate-resilience in targeted rural communities in all six municipalities in Cunene Province, Angola. The project will apply a gender-transformative approach, integrating the key, climate-vulnerable sectors of agriculture, environment, water, and nutrition, with a focus on enabling factors, through investing in financial literacy, improved farming technologies and education.	Water resources assessment, small-scale water infrastructure, tree cultivation	At project inception, the implementers of the CREW Angola project will be invited to share the data collected by the project's water resources assessment, to ensure that the data collection exercise is not duplicative. Plans for rehabilitation and/or construction of small-scale water infrastructure will be aligned between the two projects so that they benefit different communities. Tree cultivation activities will also be coordinated between the two projects to ensure that different locations are covered.
Enhanced Water Security and Community Resilience in the Adjacent Cuvelai and Kunene Transboundary River Basins (CUVKUN)	2024-2029	11.2 million USD, Global Environment Facility	United Nations Development Programme (UNDP) and Global Water Partnership - Southern Africa (GWP-SA)	Enhancing water resources management in the basin through basin-wide e-flows assessment; modelling of water resources development; detailed Transboundary Diagnostic Analysis; flood early warning system; finalisation of a long-term Integrated Water Resources Management (IWRM) Plan and a five-year investment programme.	Water resources assessment. flood early warning system,	The purpose of the CUVKUN project is fundamentally different, as it is a water resources management project, while the proposed AF project is a is primarily a livelihoods project, focused on the semi-nomadic agro-pastoralist indigenous inhabitants of the lower Kunene Basin. Engagement with UNDP and GWP-SA has commenced during the project development phase and will be continued throughout the project implementation period, to ensure that the water resources assessments conducted are not replicated, and the flood early warning system is synergised and integrated into the proposed multi-hazard early warning system.

Building resilience of communities living in landscapes threatened under climate change through an ecosystems-based adaptation approach, Namibia	2020-2026	9.1 million USD, Green Climate Fund	Environmental Investment Fund (EIF)	This project applies Ecosystem-based Adaptation (EbA) to enhance ecosystem integrity to support food production and income generation, to reduce the severity of negative socio-economic impacts of climate change on vulnerable rural households.	Ecosystem-based adaptation activities	Coordination will be facilitated between the projects' PMUs during implementation to ensure that EbA activities are complementary, not overlapping in the same areas.
Improving rangeland and ecosystem management practices of smallholder farmers under conditions of climate change in Sesfontein, Fransfontein, and Warmquelle (Kunene Region), Namibia (IREMA)	2019-2024	10 million USD, Green Climate Fund	Environmental Investment Fund (EIF)	This project addresses the impacts of increasing temperature and higher water evaporation on crop production and bush encroachment on land and livestock productivity. It increases the efficiency with which rainfall is used to maintain agricultural and rangeland production.	Early warning systems	This project is targeted at three settlements in the Kunene Region of Northern Namibia, while the proposed project covers the whole river basin, across both Angola and Namibia. Collaboration with EIF will ensure that the weather stations and other EWS procured and installed by the two projects are compatible, and that the data from all the stations are integrated into the multi-hazard early warning system.
Namibia Integrated Landscape Approach for Enhancing Livelihoods and Environmental Governance to Eradicate Poverty (NILALEG)	2019-2025	10 million USD, Global Environment Facility	UNDP and Ministry of Environment, Forestry and Tourism (MEFT)	To promote an integrated landscape management approach in key agricultural and forest landscapes, reducing poverty through sustainable nature-based livelihoods, protecting, and restoring forests as carbon sinks, and promoting Land Degradation Neutrality	Reforestation activities	Coordination will be facilitated between the projects' PMUs during implementation to ensure that reforestation activities are complementary, not overlapping in the same areas.

Smallholder Resilience Enhancement Project (SREP)	2019-2026	150 million USD; IFAD, Arab Bank for Economic Development in Africa (BADEA) and Agence Française de Development (AFD)	IFAD	Strengthening capacity for improved extension services, investing in public rural infrastructure for climate resilience and market access, investment in family farming	Rural infrastructure investment (nature-based water infrastructure)	As IFAD will be the implementer of both projects, IFAD will ensure complementarity and alignment of the investments.
Fortalecimento da Resiliência e da Segurnça Alimentar e Nutricional em Angola (FRESAN)	2018-2025	65 million EUR, European Union,	FAO, UNDP, Instituto Camões, Vall d'Hebron Institut de Recerca	Reduction of hunger, poverty and vulnerability to food and nutrition insecurity in the southern provinces of the country most affected by climate change - Cunene, Huíla and Namibe – by strengthening sustainable family farming, improving the population's nutritional situation, access to water, strengthening information systems on food and nutrition security, and supporting capacity building in institutions.	Water access, nutrition education, institutional capacity building	At inception phase, the PMU will engage extensively with the FRESAN PMU to ensure that this project builds upon rather than duplicates what FRESAN has achieved.

H. Learning and knowledge management

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

87. This project aims to (1) create valuable knowledge to support adaptation planning and (2) use such knowledge to inform co-design and implementation of adaptation activities. Both scientific and traditional knowledge are fundamental to the success of this programme and its sustainability, as is the knowledge created during the stakeholder engagement process, applying a Scenario Planning approach. Component 4 will be concerned with the use of this knowledge to inform the internal Monitoring, Evaluation and Learning (ME & L) Process and to share the learnings with other interested parties regionally and globally. The information generated will be used to update the Kunene River Assessment Toolkit.

88. IFAD and FAO have significant experience and systems in place for knowledge management, documentation, and dissemination across countries through publications, events, websites, as well as through social media accounts. IFAD and FAO will use their networks of Country and Regional Offices in Africa to disseminate the knowledge and the lessons learnt through the project.

89. Knowledge products to be developed such as case studies, training manuals, training reports, practical guidelines on natural resources management in climate change vulnerable contexts, community engagement reports as well as videos and photos from the field where the project activities will be implemented, will be useful tools for future projects. Good practices and key lessons from project interventions will be identified and documented as case studies.

90. Knowledge management activities will ensure that lessons learned are shared in a gender-responsive manner, highlighting the experiences and needs of women and marginalized groups in climate adaptation. The project will develop case studies that focus on gender-inclusive adaptation strategies, ensuring that the learning materials are accessible to all community members, including those with limited literacy. These case studies will be shared with regional and international platforms to encourage the scaling of gender-responsive climate adaptation strategies.

I. Stakeholder consultation

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

91. Consultations were guided by the international good practice and principles in accordance with Adaptation Fund requirements, harmonised with those of the implementing and executing entities, and captured a broad range of information and perspectives on climate change vulnerabilities, impacts and adaptation.

92. Stakeholder consultation for this project was conducted in two phases, a conceptualisation phase in November 2019 when the project was first designed, and a validation phase in May-June 2024 to support the finalisation of this proposal. Findings from these two phases are presented below.

Stakeholder consultation phase 1: project conceptualisation, November 2019

93. **Step 1 - Meetings with regional stakeholders**: A series of meetings were held with the SADC Secretariat and the Kunene PJTC, some of which were held on the sidelines of the Southern African Regional Climate Outlook Forum (SARCOF). 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. Consultation was also done with the Climate Resilient Infrastructure Development Facility (CRIDF), a FCDO-funded programme working in the 12 mainland countries in Southern Africa that share water resources, to provide long-term solutions to water issues that affect the lives of the inhabitants of the region.

94. **Step 2 - Meetings with national stakeholders**: This was conducted in the capital cities in both countries, where one-day consultative workshops were held. 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 compliance with national and local policies, rules, regulations as well as alignment with ongoing programmes and projects, in line with the AF's requirements. The selection of stakeholders was based on the activities of the stakeholders in the climate change, water, and agricultural sectors. In both cases, the government led the identification of key national stakeholders involved in these sectors.

95. **Step 3 - Consultation with provincial and district-level stakeholders:** Provincial and district level stakeholders were informed of the proposed programme objectives, and they provided guidance on the target sites. The criteria for selecting the sites were the need for adaptation interventions, complementarity with ongoing initiatives, and potential for success. These consultations provided more insights about the target sites as well as expert opinion on the availability, use, management, distribution, and historical trends in critical ecosystem services. Highlights were made on some of the actual and potential adaptation responses to the decline in local ecosystem services and the effects of climate and other drivers on ecological conditions, as well as agricultural innovations for increasing productivity. This information was critical for formulating the project, especially for understanding the impacts and trade-offs resulting from climate-induced spatial, temporal, and seasonal changes in the availability of local ecosystem services, and the adaptive capacity of the local communities to climate-induced changes.

96. **Step 4 – Community consultations**: This was one of the most important and intensive parts of the consultation process where target direct and indirect beneficiaries on the ground within the selected geographical areas provided their views on impacts of climate change on their livelihoods and proposed solutions for adaptation. Community level consultations in both countries were held in November 2019, using the Community Vulnerability Assessment and Adaptation Planning (CVAAP) approach. 266 community members were consulted in Angola and 191 in Namibia. The consultations were gender-inclusive, with over 50% female participation at each site. The consultation process sought to understand the differential impacts of climate change on women, men and youth and their adaptation solutions. The process captured community perspectives regarding their natural environment, ecosystem services locations as well as assessing the effect of drivers of change on ecological conditions hence service provision and adaptation responses.

97. The community-level consultations mainly informed the development of the concrete adaptation actions that are presented in this proposal. The community consultations facilitated participatory decision-making processes in climate adaptation planning by bringing diverse stakeholders into a common process. It expanded the inclusion of often marginalised populations and particularly women, youth, persons with disabilities, the elderly, and ethnic minorities with other stakeholders, such as traditional leaders, local NGOs and CBOs, government line ministries. The primary purpose of these consultations was to work with the beneficiaries to identify and co-design suitable adaptation responses, pathways and interventions that are informed by their respective local context, including indigenous knowledge and citizen science, to build resilience and reduce poverty associated with climate-induced hazards, as well as identify needs and priorities for different gender subgroups. Importantly, local government's representatives also attended the consultations and gained greater credibility with their constituencies.

98. **Feedback from stakeholder consultations, especially from women:** The preliminary consultation process identified water, grazing land, livestock, and crops as the main livelihood assets. Unfortunately, due to the El Niño induced drought and climate change, these livelihood assets have been threatened over the years. Consequently, most of the community depends on the public social protection programme (grants, subsidies, food parcels). The communities identified drought and floods as key climate hazards that threatened their livelihoods the most. Lightning, wind, pests and diseases of crops and livestock were also identified as potential hazards, though not at the same impact level as drought and floods.

99. Furthermore, climate change has had an impact on exacerbating malnutrition due to crop failure and reduced yields in the target area. Since most of the agriculture is rainfed, this makes it sensitive to climate change. Livestock production has been affected through reduced forage and water availability as well as increased pests and disease. Women tend to be more vulnerable to climate change than men due to underlying power relations, structures, and gender inequities. Rural women have low adaptive capacity due to lack of ownership and control over resources such as land, livestock, technologies, and assets to increase their adaptive capacity; as well as limited access to finance/credit. Women also have a huge workload of fetching fuelwood and water, in addition to reproductive and childcare roles. Women have less opportunities for training in relation to climate change adaptation and climate smart agriculture, and limited participation in decision-making.

100. **Step 5 – Validation workshop**: After the community consultations, a validation workshop was held on 27-29 November 2019 to present the findings to the project stakeholders, with participants from government departments and civil society organisations operating in the target communities. Recommendations pointed to the need to unify interventions at catchment/transboundary level for sustainable and impactful outcomes. The workshop also screened the communities' proposed interventions for gender, environmental and social suitability. This analysis was critical for formulating the project's concrete adaptation activities.

Stakeholder consultation phase 2: proposal formulation, May-June 2024

101. During the proposal formulation stage, missions in Angola and Namibia were conducted, to verify or update the findings from the missions held in 2019.

Angola mission part 1: 20-27 May 2024

102. The project design team met with the Designated Authority and executing entity of this proposed project, namely the National Directorate for Climate Action and Sustainable Development (DNACDS), Ministry of Environment. The DNACDS described the Government's investment in the Cafu canal in Kunene Province, a 160km canal which provides irrigation water for the people living along it. The main intervention needed is to support the local small-scale farmers to acquire solar pumps and drip irrigation equipment that will enable them to access and use the water from the canal.

103. challenge discussed was the need to ensure that all meteorological and hydrological equipment installed in the basin can transmit data, as this is currently not happening. The Government intends to operationalise a National observatory on Climate Change and Environmental management, which will host an online platform for climate information and early warning systems.
104. DNACDS also highlighted the need for capacity building to enable its staff to fully understand project documents so that they can implement all projects effectively. Furthermore, the project design team was advised to collaborate with the Civil Protection Service in development of the EbA DRR Plan, to build upon existing DRR plans for the project area.
105. Thereafter, the project design team had a series of meetings with UN entities active in and around the basin, to discuss their current projects and how this project could build upon or complement them. Meetings were held with WFP, UNDP, FAO and WHO. In addition, the project design team met with ADPP, an international NGO serving as implementing partner of various developmental projects in the country.

Angola mission part 2: 11-16 June 2024

106. The project design team had meetings at provincial level, which included the provincial office of the Ministry of Environment, the provincial office of the National Institute for Agricultural Development, and the provincial representative of FAO. The project design team described the project, and the provincial officers gave guidance on the community consultations. Thereafter, the project design team proceeded to the target area, Chitado Commune, and met with the local officials, including the Communal Administrator, traditional leaders, religious leaders, police, firefighters, and teachers. The local officials described the developmental challenges in the area and how these have been exacerbated by climate change. Thereafter, the project design team visited two of the targeted communities, namely Kutanga and Ndaveva, and held consultations with them. All participants in the community consultations were from the Himba ethnic group.

Please see the stakeholder engagement report in Annex F for further details on these meetings.

Namibia mission: 27 May – 3 June 2024

107. The Namibia mission proceeded similarly to the Angola ones, with meetings held at national, provincial, local and community levels. At national level, the Ministry of Environment, Forestry and Tourism, Ministry of Agriculture, Water and Land Reform, Ministry of Works, and Transport - Meteorology Directorate, National Planning Commission, as well as several development partners, were consulted. Similar sets of stakeholders were met at provincial and local levels. Farmers Representatives and Community consultations were thereafter conducted in Okanguati and Epupa areas of Epupa Constituency. Almost all the participants in the community consultations were of the Himba ethnic group. Please see the stakeholder engagement report in Annex F for further details on these meetings.
108. Further to this, follow-up consultative activities will be undertaken during the inception phase of this proposed project, to strengthen community ownership of the interventions. Consultations will also be done at community level during socio-economic and environmental baseline studies at the inception phase.

J. Justification for funding requested

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

109. This proposal requests 14,000,000 USD from the Adaptation Fund to increase the climate resilience of the semi-nomadic agro-pastoralist people of the Kunene River Basin. The Kunene River Basin is in critical need of adaptation interventions because its water and ecosystems serve a large area of rural and peri-urban settlements, whose survival has been progressively threatened by climate change. Both Angola and Namibia have limited capacity to address the needs of the river basin's population, as well as prepare them for increased heat, reduced rainfall (in the middle and lower sections) as well as reduced water availability, if groundwater is used unsustainably. Under the current scenario, if there is no intervention, the people of

the Kunene will soon have no choice but to urbanise and add to the poverty landscape of urban areas in both countries. Notwithstanding the risk of continuous reliance on government food banks for survival, as it is currently the case due to climate change refugees in Namibia from Angola[49], increase in urban slums where water insecurity and malnutrition are rife will lead to disease and death, and lack of access to education will leave children, especially girls, without the means to address their future needs and at the mercy of human trafficking and exploitation. This scenario is unfortunately common in the urban areas of Southern Africa and in peri-urban areas along commercial routes but can be avoided by planning for sustainable rural development in the context of a changing climate.

110. Annex H presents the full Climate Risk Analysis, discussing the various climate hazards affecting the project area, as well as their observed current and potential future impacts. The main effect of climate change in the project area is drought, which reduces access to drinking water for the people and their livestock, as well as to agricultural water for growing food for the people and fodder for their livestock. These core challenges are addressed by Component 3, while the other components are supportive of enhanced adaptive capacity. The table below presents the impacts of drought in the project area, and which activities have been designed to address them.

Table 10: Project outputs and activities designed to address the impacts of drought

Drought impact	**Relevant project outputs and activities**	**Adaptation results**
Decreased food security: Water scarcity and declining soil quality reduce the quantity and quality of food produced. The already marginal agricultural conditions in the lower basin are expected to deteriorate further. Yields of drought-resistant crops such as sorghum and millet could decrease by 20-30% under severe climate scenarios. The viability of rain-fed agriculture may be threatened in many areas, potentially necessitating a shift towards more resilient pastoral systems or irrigated agriculture where feasible[50].	Output 3.1.1; Activities 3.1.1.1, 3.1.1.2 Output 3.1.2; Activity 3.1.2.1 Output 3.1.3; Activities 3.1.3.1, 3.1.3.2 Output 3.1.4; Activity 3.1.4.1	Rehabilitation of 20 earth/sand dams and construction of 20 new rainwater retention ponds will facilitate irrigation of crops during dry spells. Rehabilitation of 60 boreholes will enable the surrounding communities to establish vegetable gardens. Procurement of labor-saving devices for conservation agriculture will help increase agricultural output even under harsh climatic conditions. Promotion of drought-tolerant crop varieties will improve yield of staple food crops. Value chain support will prevent loss and waste of agricultural produce, enabling more of it to be processed and sold. This improves food security for the surrounding communities as well.
Child malnutrition: Beyond yield reductions, climate change may also affect crop quality. Higher CO_2 levels could reduce the protein content of some cereal crops by 5-10%, potentially exacerbating nutritional challenges in the region.[51] Children who do not receive sufficient variety and quantity of	Output 3.1.3; Activities 3.1.3.1, 3.1.3.2 Output 3.1.4; Activity 3.1.4.1	Food quality will be enhanced through support to conservation agriculture, which facilitates conservation of organic matter and water in the soil. Value chain support through the establishment of six milling plants each for sorghum and cassava, as well as distribution of 24 sorghum threshers and 24 peanut butter machines to women's groups, will

[49] United Nations Office for the Coordination of Humanitarian Affairs (2021). Update on Angolan migrants in Namibia (Etunda/Opuwo), a presentation to the Namibia United Nations Country Team meeting of 16 December 2021.

[50] Government of Namibia. (2022). Second National Communication on Climate Change. United Nations Framework Convention on Climate Change. Retrieved from https://unfccc.int

[51] Intergovernmental Panel on Climate Change. (2021). Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press. https://www.ipcc.ch/report/ar6/wg1

nutritious food end up both physically and mentally underdeveloped.	Output 4.1.1; Activity 4.1.1.2	ensure that the full nutritional value of the crops is utilised.
Loss of livestock productivity: Drought reduces the availability of water and forage for livestock, which lowers milk production, growth rates and the health status of livestock. In cases of extreme water scarcity, livestock die of dehydration and hunger. Livestock production, particularly important in the middle and lower basin, faces multiple climate-related challenges: Heat Stress: Increased temperatures and more frequent heat waves will impact animal health and productivity. Milk production in dairy cattle could decrease by 10-20% during severe heat waves. Growth rates in beef cattle may reduce by 5-15% due to increased metabolic stress from higher temperatures.[52] Forage Availability: Changes in precipitation patterns and increased aridity will affect pasture and forage availability. In the middle basin, pasture productivity could decrease by 10-25% due to reduced rainfall and increased evapotranspiration. The lower basin may see reductions in rangeland carrying capacity of 20-40% under severe climate scenarios, potentially forcing significant changes in pastoral practices[53] .	Output 3.1.5; Activities 3.1.5.1, 3.1.5.2, 3.1.5.3	The restoration and sustainable management of 20,000 hectares of rangelands using drought-tolerant fodder crops will increase availability of fodder for livestock. The establishment of 2,000 hectares of multipurpose tree plantations will also increase availability of food for livestock, as some tree products such as moringa leaves can be used as animal feed. Furthermore, the rehabilitation of 20 earth/sand dams and construction of 20 new rainwater retention ponds will provide more drinking water for livestock. Rehabilitation of 60 boreholes will enable watering of small livestock during dry spells.
Declining water supply: Drought decreases the availability of water for domestic purposes, resulting in reduced hygiene, increased amount of time spent on fetching water, as well as consumption of poor-quality water. The distance that pastoral communities need to travel to water sources during dry seasons could increase by 30-50% in some areas of the lower basin. Increased competition for water resources between livestock, crops, and other uses may lead to conflicts and forced migration of pastoral communities.	Output 3.1.1; Activities 3.1.1.1, 3.1.1.2, 3.1.1.3 Output 3.1.2; Activity 3.1.2.1	Increased water availability from the 20 earth/sand dams, 20 rainwater retention ponds, 20 rooftop rainwater harvesting units and 60 boreholes will increase water availability for the target beneficiaries' domestic use and consumption. The distance that pastoral communities need to travel to water sources will also be reduced by the interventions proposed. With more water available for all users, competition or conflict over water resources may decrease, leading to greater community cohesion.

111. This project offers the opportunity to the Ministries of Environment of Angola and Namibia to establish a systematic process for designing, planning and implementation of strategies and actions for climate change adaptation, in collaboration with local stakeholders. It does so by promoting collaborative dialogue among parties, developing skills in negotiation and conflict resolution, providing timely scientific information to discuss and plan for adaptation and reduction of negative impacts from climate hazards, and by enhancing the one-stop portal for knowledge on the Kunene River Basin. The project aims at providing required knowledge, goods, and services, and in doing so, demonstrating how to deliver on the national, regional, and international commitments for climate change and transboundary water management, piloting a set of methodologies that can be applied elsewhere in the region and beyond in transboundary water systems.
112. Thus, the scale of funding required to address all the climate-related challenges in the Basin requires that this proposal requests the maximum amount of funding available from the Adaptation Fund for a regional project.

[52] Ministry of Environment, Forestry and Tourism. (2020). *Namibia National Climate Change Strategy and Action Plan*. Retrieved from https://www.met.gov.na/services/environmental-management/climate-change

[53] CRIDF. (2020). Climate Resilient Infrastructure Development Facility Report. Retrieved from https://www.cridf.com

K. Sustainability of the project outcomes

Describe how the sustainability of the project/programme outcomes has been considered when designing the project/programme.

113. This project is conceived as a multi-scale intervention to secure sustainable livelihoods for the semi-nomadic groups of the Kunene River basin facing consistent and severe risks of drought due to climate change. In so doing, the programme approaches its activities from the EbA-DRR planning perspective for sustainability in response to the Sustainable Development Goals on climate action and water, primarily. It also provides a framework for cooperative governance to be established and implemented between the target communities including women and different gender subgroups and other stakeholders, including sedentary communities, local and national government, donor agencies and the private sector. The co-design of concrete adaptation actions is chosen as a methodology to ensure that proposed actions continue through direct interventions of the stakeholders in time, beyond the lifespan of the project. Building the project on both indigenous traditional knowledge and scientific knowledge, for the nomadic agro-pastoralist groups and including preferable adaptable solutions of these stakeholders enhances the project's sustainability.
114. To ensure sustainability of gender considerations and outcomes beyond completion of the project, the project will appoint a gender expert within the PIU. The project's staff will be made aware of gender mainstreaming and provide backstopping for gender-sensitive project implementation. The executing agencies are also expected to appoint gender focal points. This team of gender expertise will train different gender subgroups impacted by the project, to elaborate their needs and take advantage of the opportunities that the project will generate for them. The team will also carry out regular review meetings with men and women beneficiaries in support of gender equity and social inclusion. Monitoring identifies constraints to gender responsive implementation and informs efforts to address and mitigate them during implementation, through adaptive management. The gender action plan and gender-responsive measures will be reviewed and adjusted as needed. The inclusion of women in the decision-making processes through quotas, especially women from marginalised communities, will ensure gender balance. Planned activities will be adjusted based on lessons learned.

115. Emphasis on capacity building and dialogue will ensure that the structures established, as well as the interventions implemented, will continue beyond the scope and the duration of the project. The project's components and activities are built upon national and sub-national strategies and priorities and will be integrated in national and sub-national programmes. The programme will establish and institutionalise linkages between communities, representatives of traditional leadership and local government officials, as well as a cross-sectoral and cross-border platforms that will monitor the continuation of the programme's achievements. The project's exit strategy will be developed together with all stakeholders considering environmental, economic, technical, social, and institutional sustainability.

116. This project will facilitate long term action by supporting the entrenchment of inclusive climate-smart livelihoods and climate informed decision making. Through value chain support, the beneficiaries will be empowered to go beyond subsistence agriculture to producing finished products, which they are likely to sustain beyond the lifespan of the project.

117. 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. 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 project.

118. The project will also entrench the interventions within existing regional, national, and private sector institutions. At the regional level, the Southern Africa Regional Climate Outlook Forum (SARCOF) process will be key in ensuring sustainability of measures to reduce exposure to climate-related risks and enhance people's resilience. At the River Basin level, the Kunene Permanent Joint Technical Commission (PJTC) will be the main institution through which implementation will take place. At the national level, the Ministries of Agriculture and Ministries of Environment, National Meteorological and Hydrological Services (NMHS) and National Climate Outlook Forums (NACOF) will be engaged and capacitated in various activities through the project.

119. Long-term sustainability will be further ensured by focusing on existing extension staff, field workers and community focal points and building their capacity in climate change adaptation. This will be enhanced by making use of institutions that are already in that field of specialisation, so that when the project comes to an end, activities continue. In addition, by taking advantage of IFAD and FAO's global modalities for knowledge dissemination in agriculture, food and nutritional security, the reach and spread of project outcomes will be enhanced. This will lay the foundation for the widespread scaling up of inclusive climate adaptation in the region and globally by IFAD, FAO, and the participating international NGOs.

120. Sustainability will be ensured through the active involvement of local communities in the management of the adaptation measures. Specific attention will be given to ensuring that women's groups are empowered with the knowledge, skills, and resources to sustain the initiatives. Training in leadership, land rights, and water management for women will be integral to building community ownership and ensuring that the project's benefits are maintained after its completion. The project will aim for at least 60% of water management committees to be led by women by the end of the project[54].

L. Environmental and social risks

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

121. The project has been categorized as Risk Category B due to its potential environmental and social impacts being site-specific, reversible, and manageable with appropriate mitigation measures. The proposed interventions focus on enhancing climate resilience through sustainable land and water management, small-scale infrastructure, and livelihood improvements. There is moderate environmental and social risk associated with some of the activities under Components 2 and 3.

122. No significant negative environmental impacts are foreseen under Component 1, which is dedicated to optimising procedures at the regional level through Ecosystem-based Adaptation in Disaster Risk Reduction Planning (DRRP). This component aims to enhance the resilience of local communities and ecosystems by incorporating a gender responsive DRRP for the Kunene River Basin. This strategy is not solely tailored for the recipient communities but co-created with them to ensure their active participation and impact on the process. The DRRP will advance ecosystem recovery and sustainable means of living while addressing gender disparities in natural resource access and management.

123. Component 2, which focuses on establishing a Multi-Hazard Early Warning System (MH-EWS), requires meticulous attention due to potential adverse environmental impacts. The core activities involve setting up automatic weather stations and hydrometric stations, necessitating thorough environmental evaluations to mitigate risks such as habitat disturbances and pollution and adherence to all national regulations and technical standards. A key highlight is the proactive approach to address the gender-specific impacts of

[54] Leadership in Water Management: Gender Equality in Action." United Nations Women

climate change on automated weather stations. This involves actively engaging women in the design and dissemination of weather data, ensuring equitable access and benefits for all gender groups, and making everyone feel included and valued in the process.

124. Component 3, which focuses on inclusive community-based adaptation actions, merges the outcomes of the preceding sections to bolster the adaptability of ecosystems and target populations. Initiatives within this segment encompass constructing and restoring water storage facilities, rehabilitating existing boreholes, providing processing tools, promoting conservation farming, and introducing drought-resistant food and fodder crop varieties. These efforts strengthen agricultural resilience, enhance water availability, and sustain livelihoods. Expected environmental impacts include potential hazards to water quality and soil integrity, to be addressed through sustainable methodologies and climate-conscious agriculture. Social concerns will be alleviated through comprehensive dialogues and gender-inclusive strategies, making the audience feel reassured and involved, with particular attention to disadvantaged and at-risk demographics.
125. No significant negative environmental impacts are foreseen under Component 4, which focuses on creating awareness, fostering learning, and effectively managing knowledge. Its primary goal is to encourage knowledge sharing to enhance adaptation planning and execution. Key activities include increasing awareness and sharing information about climate change adaptation measures, revitalising and enhancing the Kunene River Assessment Toolkit, and strengthening institutional capabilities. While there are no or few environmental and social risks associated with this component, the focus lies on promoting gender-sensitive metrics, ensuring comprehensive stakeholder participation, and combining scientific and traditional knowledge to shape adaptation approaches.
126. To manage all foreseeable risks associated with the project, an Environmental and Social Risk Management Plan has been developed, presented in Annex G. Various parties, including marginalised communities, have been and will be engaged during the project execution. A quota system and focused evaluations will be enforced to prevent bias and promote fair participation. Inclusion discussions will be held to address any possible negative impacts on marginalised and vulnerable communities. At the same time, gender disparities will be tackled using in-depth examination and gender-aware decision-making platforms. Efforts to minimise risks to ecosystems and biodiversity will involve adopting nature-based adaptation strategies and cultivating native plant species. Steadfastly following international norms and carrying out additional evaluations will help address the challenges related to pollution and inefficient resource use. Promoting indigenous knowledge and performing focused studies will be key in safeguarding both the physical and cultural legacy. Sustainable methodologies, along with climate-resilient agricultural techniques, will be employed to mitigate the risks associated with land and soil degradation.
127. The project will implement a robust Environmental and Social Risk Management Plan that incorporates gender-sensitive considerations. Risks such as gender inequality, cultural displacement, and unequal access to resources will be actively managed through regular consultations, a Free, Prior, and Informed Consent (FPIC) process, and the establishment of community-driven grievance mechanisms. Special attention will be given to avoiding the exacerbation of gender disparities in access to water, land, and decision-making. In cases of risk to indigenous women's rights, the project will adopt measures outlined in the Indigenous Peoples Plan[55].
128. Environmental and Social Impact Assessments (ESIAs) will be conducted for all high-risk activities, and their results will be incorporated into the project design and implementation processes. The PMUs, with the support of IFAD, will ensure compliance with the Environmental and Social Policy of the Adaptation Fund, including the application of the FPIC process for affected communities. Regular monitoring and evaluation of these safeguards will be integrated into the project's overall M&E framework to ensure compliance.

Potential environmental and social risks associated with the project are presented in the table below. They are discussed in more detail in Annex F, the Environmental and Social Impact Assessment.

[55] World Bank. (2018). "Indigenous Peoples and Climate Change: A Framework for Action." World Bank Group.

Table 11: Environmental and social risks identified as relevant to the project

Checklist of environmental and social principles	No further assessment required for compliance	Potential risks – further assessment and management required for compliance
1. Compliance with the Law	x	**Low risk:** Limited risk of non-compliance with laws due to ongoing consultations with local authorities and adherence to national legal frameworks. Relevant national, regional, and district authorities have been and will continue to be consulted throughout project implementation to ensure compliance with all relevant laws and technical standards. In addition to consultations with national and regional authorities, local regulatory bodies will be engaged regularly to ensure ongoing compliance with specific legal requirements related to land use, water access, and climate resilience, as prescribed by national laws
2. Access and Equity	x	**Low risk:** Potential risks include inequitable distribution of resources or benefits, exclusion of marginalised groups (women, elderly, indigenous people), potential conflicts over resource allocation, and users may not receive the necessary information, leading to a lack of awareness and unwillingness to cooperate. The location of the weather stations might not also be accessible. This could result in unmet needs and exclusion from key decisions on adaptation strategies. These are addressed as follows: The consultative exercise provided a basis for identifying interventions that ensure access and equity. In addition, at Inception and throughout project implementation (particularly for Component 2), in-depth consultations with communities and stakeholders this project will ensure that no activity will interfere with access to basic services or exacerbate existing inequities. This project will promote equitable access to activities and assets for youth, elders, and women in targeted communities. When designing and planning the activities, the project will ensure that activity with community's targets at least 50% of women and includes marginalised and vulnerable groups such as the elderly, youth, indigenous people, and disabled. The project will also ensure that the weather stations are in accessible areas through consultations with stakeholders and gender subgroups. A gender-sensitive approach will be integrated into the monitoring and evaluation (M&E) framework to track progress on equitable access and resource distribution, ensuring that marginalized groups, particularly indigenous people and the elderly, are fully included in the project's decision-making processes
3. Marginalised and Vulnerable Groups	x	**Low risk:** Potential risks include overlooking the specific needs of marginalised groups, the potential for increased vulnerability if not properly addressed, and social exclusion. Additionally, marginalised, and vulnerable groups, including indigenous people, men, women, and gender subgroups, might not be represented in the consultations and may be unaware of how to access value addition projects. This has been addressed as follows: Marginalised and vulnerable groups – especially women and indigenous people - were consulted during the development of the proposal and will be further consulted at the project inception phase to ensure that their identified needs and priorities are reflected. This project will empower vulnerable groups to make decisions on concrete adaptation actions, valuing their traditional and local knowledge. The project will ensure the representation of vulnerable people and the differentiated gender subgroups during meetings, including at least 50% representation of women.
4. Human Rights	x	**Low risk:** This project affirms the rights of all people and does not violate any pillar of human rights. The project design relied on a consultative approach involving various stakeholders. No activities are identified whose execution does not align with established international human

		rights. Project objectives promote basic human rights for fair and equitable access to resources to enhance resilience to climate change. To further uphold human rights, the project will incorporate land and water access safeguards, especially in relation to indigenous and vulnerable groups, ensuring their rights to land, water, and resources are respected throughout implementation
5. Gender Equity and Women's Empowerment	x	**Low risk:** Potential risks include reinforcing existing gender disparities if not properly managed, exclusion of women from decision-making processes, and insufficient support for women's empowerment initiatives. Additionally, women and marginalised groups may have limited participation due to social norms or restricted access to resources and decision-making forums. This has been addressed as follows: The consultative exercise provided a basis for the identification of interventions that ensure gender equity and women's empowerment. Additionally, through targeted consultations with women, upgraded business model design and implementation will ensure that gender considerations are integrated into each activity. This project will promote women's leadership in public spaces and decision-making power for climate change adaptation, food security, and nutrition. Women will be encouraged to participate in the field schools, and the programme will draw on FAO's experience in promoting the role of women and gender equality within the farmer field school setting. in addition to ensuring 50% female participation, the project will actively promote **women's leadership** in decision-making processes, especially in areas related to climate adaptation and resource management. Gender-sensitive indicators will be integrated into the M&E framework to track participation and empowerment outcomes.
6. Core Labour Rights	x	**Low risk:** Potential risks include labour rights violations, exploitation of workers, and inadequate working conditions if not properly monitored. This will be addressed as follows: The project will ensure respect for international and national labour laws and codes for both countries. All labour related matters will be conducted as per the relevant laws. Furthermore, both countries are signatories to the International Labour Organisation (ILO) Conventions on labour rights. The project will include regular audits of labour practices and ensure that all contractors and partners adhere to international and national labour standards. A designated labour rights focal point will oversee compliance during implementation
7. Indigenous Peoples		**Moderate risk:** Potential risks include impacts on indigenous peoples' rights and livelihoods, insufficient engagement with indigenous communities, and potential conflicts over resource use. This was addressed as follows: The consultative exercise provided a basis for identification of interventions that ensure respect of indigenous peoples. In addition, during project implementation, extensive consultations and participatory planning events will ensure that the project appropriately incorporates the priorities and needs of the population at the sites. When designing and planning the activities in the upgraded model, it will be ensured that any activity considers the priorities and needs of indigenous people such as agro-pastoralists and includes them in any participatory approach and in project activities. The programme will apply IFAD and FAO policies on the inclusion of indigenous groups. Indigenous communities will be involved in ongoing monitoring and evaluation activities to ensure that their traditional knowledge is respected and incorporated into project strategies, particularly in the areas of agro-pastoral practices and resource management.
8. Involuntary Resettlement		**Low risk:** Potential risks include community displacement, social and economic disruptions, health issues due to dust and noise, and restricted access to homes, schools, and businesses. The project is committed to selecting sites that avoid crowded areas and sensitive ecosystems. Existing infrastructure sites will be used, when possible, to reduce new disturbances. Local communities will be involved in the planning process to understand their needs and minimise negative impacts on their lives. Engaging with affected communities early and throughout the project helps gather input, address

		concerns, and build trust. In the event of any temporary disruption to livelihoods, the project will provide support through alternative livelihoods initiatives, ensuring no adverse socio-economic impacts on affected communities.
9. Protection of Natural Habitats	x	**Low risk:** Potential risks include habitat degradation or loss, negative impacts on local biodiversity, and unintended ecological consequences. These are addressed as follows: Project activities are designed to protect and conserve natural habitats. The project will ensure the protection of natural habitats by implementing ecosystem-based adaptation activities such as agroforestry and water conservation efforts. In addition, consultations with government stakeholders, community leaders, and communities will ensure that the conversion or degradation of critical natural habitats (including those that are legally protected, officially proposed for protection, recognized for their high conservation value, or recognized as protected by traditional or indigenous local communities) is avoided. the project will integrate ecological monitoring to track the health of local habitats and biodiversity, ensuring that all infrastructure projects avoid critical habitats and use best practices for habitat preservation
10. Conservation of Biological Diversity		**Low risk:** Potential risks include loss of biodiversity, introduction of invasive species, negative impacts on ecosystem services, and damage to critical habitats. Road construction and maintenance may disrupt local wildlife habitats. To ensure this risk is addressed, this project will prioritise local species and multi-species plantations and avoid the use of non-native and invasive species. The introduction of any new breeds and varieties will be done in strict adherence to national standards, and in prioritisation of improved local species. The project will incorporate wildlife crossings and minimize habitat disruption during road construction to protect local fauna. Long-term biodiversity monitoring protocols will be established to track the impacts of restoration activities, ensuring that any potential negative effects on local species and ecosystems are mitigated.
11. Climate Change	x	**Low risk:** Potential risks include unintended negative impacts on local climate resilience and maladaptation practices. This will be addressed as follows: The project will not generate any significant emissions of greenhouse gases and will not contribute to climate change in any other way. 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. Climate resilience assessments will be conducted periodically to ensure that all activities continue to enhance adaptive capacity and do not inadvertently contribute to maladaptation.
12. Pollution Prevention and Resource Use Efficiency	x	**Low risk:** Potential risk includes noise and dust pollution due to construction. Energy efficiency, optimisation of material resource use, and minimisation of waste generation will be embedded in project design. Installing noise barriers, using low-noise machinery, and scheduling construction activities to limit noise pollution, especially during sensitive times. The project will prioritize **sustainable building materials** and ensure that waste is minimized, recycled, or repurposed during infrastructure development to reduce the environmental footprint
13. Public Health	x	**Low risk:** Potential risks include unintended public health impacts such as water and air pollution, insufficient awareness and education efforts, and increased vulnerability to health risks if not properly managed. The project could lead to risk from water-borne, zoonotic or vector-borne diseases as a result of stagnant water in the small-scale water collection infrastructures. This will be addressed as follows:

		The programme aims to have indirect public health benefits by improving the water and food security situation of the beneficiaries. The project will be designed and implemented in a way that avoids any negative impact on public health. Attention will be given to activities related to water harvesting and storage and communities will be sensitised on how to use and store the water in a safe and efficient way. The project will install effective drainage systems and use permeable materials to manage runoff and safeguard water quality. The project will apply water, dust suppressants, or alternative materials to control dust pollution The project will incorporate **public health education** campaigns focused on safe water storage and hygiene practices to minimize health risks, especially for vulnerable groups The project will implement proper infrastructure design and maintenance (e.g., drainage, sealed covers), biological and chemical controls (e.g., larvicolous fish, safe larvicides), community education on hygiene and safe water handling, as well as regular health surveillance and integrated vector management can help mitigate water-borne, zoonotic, or vector-borne disease risks associated with stagnant water in small-scale water collection infrastructures.
14. Physical and Cultural Heritage	x	**Low risk:** Potential risks include damage to or destruction of cultural or historical sites during water infrastructure development, loss of cultural heritage, and conflicts with local communities over heritage conservation. This will be addressed as follows: Project activities respect and protect physical and cultural heritage sites. Traditional and local knowledge will be understood and enhanced with scientific information for environmental management and food security and nutrition. Any physical cultural heritage present on the project sites will be identified together with the local stakeholders and potential negative impacts avoided during design of concrete adaptation actions at the sites. Furthermore, both countries are signatories to the UNESCO Convention Concerning the Protection of the World Cultural and National Heritage, and the project area does not encompass any protected cultural heritage sites. Cultural heritage assessments will be included in the Environmental and Social Impact Assessments (ESIA) for all activities that could affect cultural sites, ensuring that these areas are respected and preserved
15. Lands and Soil Conservation	x	**Low risk:** Potential risks include soil degradation, loss of agricultural productivity, and negative impacts on local ecosystems if not properly managed. This will be addressed as follow: Project activities promote sustainable land and soil management practices. The agricultural management practices proposed will include management techniques to improve soil conservation and prevent land degradation. This project will aim to rehabilitate and restore degraded lands and restore degraded soils through natural regeneration, planting of native nitrogen -fixing plants, agroforestry, and water harvesting. The project will ensure the stabilisation of loose soil, controlled excavation, preservation of vegetation cover, controlled transportation of raw materials, and appropriate landscaping. The project will establish **soil health monitoring systems** to assess the long-term effectiveness of conservation techniques and adjust practices based on results.

PART III: IMPLEMENTATION ARRANGEMENTS

A. Arrangements for project management at the regional, national, and local level

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.

129. **Implementing Entity:** The International Fund for Agricultural Development (IFAD) will be the implementing entity of the project and will provide fiduciary and project management oversight and participate in the Regional Project Steering Committee. Funds will flow from Adaptation Fund to IFAD facilitated through a financing agreement. IFAD will transfer direct programme costs and execution costs to Ministry of Environment in Namibia and Ministry of Environment Forestry and Tourism through a financing agreement which will be signed by both countries. IFAD will report and account to Adaptation Fund in strict adherence to Adaptation Fund and IFAD rules.

130. **Executing Entities**: Ministries of Environments in both countries- Ministry of Environment, Angola, and Ministry of Environment, Forestry, and Tourism, Namibia will be the Executing Entities (EE). The EE will liaise with the respective Ministry of Finance to set up a Designated Account for the disbursement of project funds, subject to independent audit. Dedicated staff will be recruited to spearhead implementation of the project at both regional and nationals' scales. The Ministries or Agencies responsible for agriculture, water, disaster management, public works and meteorological services responsible for facilitating execution of the activities under their respective areas of responsibility. The government ministries will engage specific service providers including other national execution partners through different types of agreements depending on the required services. FAO will provide technical support to the EE in both countries. The EE will report and account to IFAD in adherence to IFAD and Adaptation Fundas well as provisions which govern collaboration between FAO and IFAD

131. **Food and Agriculture Organisation** - Shall have contractual engagements with the Ministries of Environment in both countries who will be accountable to the Implementing Entity. FAO will be responsible for overall technical coordination and implementation at country level as well as ensure coordination with other participating government departments and agencies, through their network of national, regional/provincial, and constituency/municipal offices. FAO will provide technical oversight of the project in collaboration with the Implementing entity and relevant Government partners. In addition FAO will support regional project co-ordination through the regional co-ordinating committee. In collaboration with IFAD and the government ministries will ensure that special reports such as technical reports, publications, press releases and updates, policy briefs, relevant to the project are communicated to the Adaptation Fund and the Regional Project Steering Committee, and when they are issued.

132. **Regional Project Coordinating Committee (RPCC):** IFAD and FAO in collaboration with the Ministries of Environment and Agriculture as well as the PJTC will set up a Regional Project Steering Committee (RPSC) whose role will be to provide direction in implementation of all the project's activities, to ensure that the intended outputs are delivered, and outcomes achieved. The RPCC will be co-chaired by Senior level Representatives from Government as well as IFAD on a rotational basis and will have representation from the Kunene Permanent Joint Technical Committee (PJTC), FAO, all the government Ministries and Agencies involved in project oversight, as well as Non-Governmental Organisations, Civil Society Organisations and Community-Based Organisations operating in the Basin. Representatives from all other projects identified to have synergies/complementarities will be co-opted into the Coordinating Committee

when issues under discussion include those where synergies and complementarities are envisaged, such as t early warning systems and knowledge management.

133. The RPCC provides the framework for coordination with other existing initiatives and development partners. Through their inclusion in this committee, partners will be able to identify areas of potential collaboration, synergies, complementarities and overlaps. It will also provide the opportunity and mechanism for pooling resources across various concurrent projects and programmes. At the inception of the project, an elaboration of the terms of reference of the Regional Project Coordinating Committee (RPCC) will be done as part of inception activities and work planning to address issues of composition, frequency of meetings, appointments inter alia.

134. **National Implementation and coordination teams:** National Implementing and coordination teams will be set up to facilitate implementation at national level. In Angola the NIT will be comprised of representatives of Ministries of Agriculture and Environment as well as public works Urban Planning and Housing. Other members include FAO Country office staff and INAMET. In Namibia it will include the same ministries, FAO country office and DDRM, MWT Namibia Meteorological service. The PMU will be the secretariat to the NIT. The NIT will report to the Regional Project Coordinating Committee (RPCC)

The following staff will be hired to manage the project:

135. **Project Management Units (PMU):** At national level, a Project Manager will be recruited competitively by the Ministry of Environment in each country. The National Project Managers for Angola and Namibia will be based in Luanda and Windhoek respectively. They will each have a Financial and Administrative Officer and a Driver as support staff. These three staff members per country may be seconded from the Ministry of Environment.

136. Prior to project inception, the National Project Managers will prepare the Terms of Reference for and coordinate the recruitment of qualified, experienced Project Implementation Unit staff, as well as the engagement of consultants and contractors for specific activities.
137. During project implementation, the National Project Managers will ensure coordination among the various government ministries and agencies involved and represent the project in meetings with entities based in the capital cities. The two National Project Managers will collaborate to compile the two national annual progress reports into a consolidated annual progress report.
138. The coordination between national and regional levels will be managed by the PMUs under the oversight of the Ministries of Environment in both countries. These units will work closely with ministries such as Agriculture, Finance, and Water to ensure smooth communication, resource allocation, and timely execution of activities. IFAD will provide technical and financial oversight to ensure that all project activities meet the standards required by the Adaptation Fund, with a focus on transparency, accountability, and coordination at all levels.
139. To ensure that the project addresses the needs of marginalized groups, particularly women and indigenous communities, a Gender and Social Inclusion Specialist will be part of each PMU. This role will oversee the integration of gender-sensitive activities across all components, ensuring that gender-based vulnerabilities and adaptation capacities are adequately considered. The Gender and Social Inclusion Specialist will also coordinate with the Community-Based Natural Resource Management (CBNRM) organizations and other stakeholders to promote women's participation in decision-making at the community level.
140. Environmental and Social Impact Assessments (ESIAs) will be conducted for all high-risk activities, and their results will be incorporated into the project design and implementation processes. The PMUs, with the support of IFAD, will ensure compliance with the Environmental and Social Policy of the Adaptation Fund, including the application of the FPIC process for affected

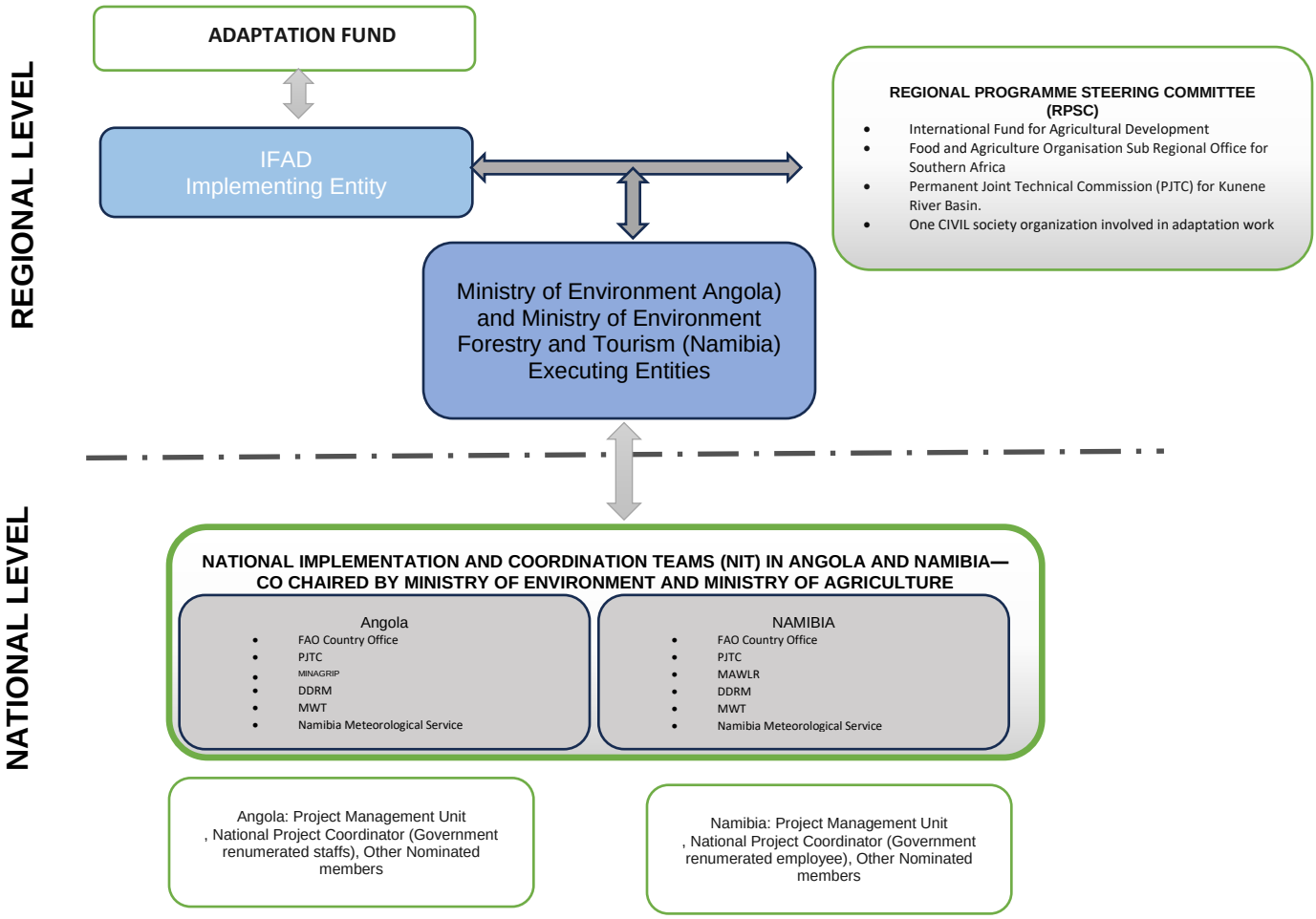
communities. Regular monitoring and evaluation of these safeguards will be integrated into the project's overall M&E framework to ensure compliance.

141. The project's Monitoring, Evaluation, and Learning (MEL) system will be aligned with the Adaptation Fund's Results Framework, ensuring that the project's outcomes and outputs are consistently measured against the agreed indicators. The PMUs will collect data on both climate adaptation results and socio-economic impacts, with a specific focus on gender-sensitive indicators. A knowledge management system will be established to facilitate the sharing of lessons learned and best practices, both within the project and across similar regional initiatives.
142. Sustainability strategies will be developed in the early stages of the project, ensuring that local communities, government agencies, and partners are fully involved in planning for the long-term maintenance and governance of the interventions. The project will create exit strategies that focus on empowering national institutions and local communities to continue the adaptation efforts after the project ends.
143. **Project Implementation Units (PIU):** In each country, a PIU supervised by the National Project Manager will be established. The PIUs will be based in the project areas, namely Chitado Commune in Angola and Epupa Constituency in Namibia. Each PIU will comprise of:

- Project Coordinator
- DRR and EWS Technical Specialist
- Gender and Social Inclusion Specialist
- Climate Smart Agriculture Specialist

144. The PMUs will provide the managerial and administrative coordination required for execution of the project activities, while the PIUs will be responsible to execute the activities. The PMUs will also coordinate other local partners implementing project activities (see section on other partners, below), prepare quarterly reports on project implementation, and compile them into annual progress reports, to be consolidated by the National Project Managers for submission to the Implementing Entity.
145. **Ministries of Environment and Agriculture:** The two ministries will nominate members to sit in the Regional Project Coordinating Committee (RPCC), the NITs as well as the PMUs. These will be Government renumerated personnel. Through the Representatives in the RPCC and the NIT, the Ministries will provide government oversight of activities at country level, as well as ensure coordination with other participating government departments and agencies, through their network of national, regional/provincial and constituency/municipal offices.
146. The Agencies responsible for disaster management will be included in the NITs and the PMU for the activities under Outcome 1.1. These are Angola's National Commission for Civil Protection (CNPC), and Namibia's Directorate of Disaster Risk Management (DDRM) under the Office of the Prime Minister.
147. The Ministries responsible for public works will be included in the NITs and the PMU to facilitate the activities under Output 1.3.3. These are the Ministry of Public Works, Urban Planning and Housing of Angola and the Ministry of Works and Transport (MWT) of Namibia
148. The Agencies responsible for meteorological services will facilitate the activities under Component 2. These are the National Institute of Meteorology (INAMET) of Angola and the Namibia Meteorological Service.
149. The Ministries responsible for agriculture will oversee the activities under Component 3 of the project, with technical assistance from the Food and Agriculture Organization of the United Nations (FAO). These are the Ministry of Agriculture and Fisheries (MINAGRIP) and the Ministry of Energy and Water (MINEA) of Angola, and the Ministry of Agriculture, Water and Land Reform (MAWLR) of Namibia.

The implementation arrangements are presented in the diagram below.



Other Partners: During the stakeholder consultation exercise undertaken to inform the development of this proposal, several organisations were identified that could participate in implementing the project's activities. serve as part of the NIT in each country. The roles of the participants at country and local levels will be aligned with their mandates and will be further defined during the project inception workshop in each country. The national level stakeholders and institutions with potential roles in project implementation, identified during the stakeholder consultations, are presented in Table 11 below.

Table 9: National stakeholders with potential roles in project implementation

Angola	Namibia

Agriculture Development Institute (IDA) National Water Resources Institute (INRH) Forest Development Institute (IDF) Artisanal Fishers Institute (IPA) ADPP (NGO) CODESPA (NGO) UNDP ADRA (NGO) World Vision (NGO) Polytechnic Institute of Cunene Gabinete de Administración de las Cuencas Hidrográficas de los ríos Cunene, Cubango Cuvelai (GABHIC) Irrigated Perimeters Development Society (SOPIR) **Private sector participants** ANO Association Farmers Associations and Cooperatives Commercial Banks Telecommunications Companies	Desert Research Foundation of Namibia (DRFN) Ministry of Industrialisation, Trade and SME Development Ministry of Fisheries and Marine Resources Ministry of Urban and Rural Development Ministry of Poverty Eradication and Social Welfare University of Namibia Namibia Water Corporation (NamWater) Namibia University of Science and Technology National Commission on Research, Science and Technology National Climate Change Committee Development partners including various NGOs **Private sector participants** Namibia National Farmers Union Local Farmers' Associations and Cooperatives Agro-Marketing and Trade Agency Agricultural Business Development Agency (AgriBusDev) Local millers and food processors Agricultural and Commercial Banks Telecommunications companies

B. Project and financial risk management

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

150. As the implementing entity, IFAD will assume the role of fund manager for this project, ensuring value for investment by the Adaptation Fund. Letters of Agreement and other appropriate agreements will be signed with each of the executing entities. These agreements will follow the standard IFAD format, and include provisions on financial management, accountability, procurement, and reporting deadlines and templates. Both PMUs will submit progress reports to IFAD every six months, including certified financial statements on project expenditure. If from the reports, it emerges that there are some issues posing potential risks to the successful implementation of activities, these will be brought to the attention of the RPSC for resolution.
151. The project shall be subject exclusively to the internal and external auditing procedures laid down in the Financial Rules and Regulations of IFAD. The internal audit regime in IFAD operates as an integral part of the organisation's system of internal controls, following best practices, under policies established by senior management. The internal audit strategy of IFAD is comprehensive, embodying financial, compliance, performance, and value-for-money features. It provides assurance that operations in the field are managed in an economical, efficient, and effective manner.

Table 12: Project risk management

Risk	Level of risk	Risk mitigation measure(s)
Different pace of project implementation for each country may delay overall project implementation	Low	Regional Inception, Annual Planning and Biennial Review as well as reflective and experiential learning meetings will facilitate synchronisation of pace of implementation of activities between the two countries. IFAD and the executing entities will establish appropriate project oversight, management, and coordination structures at regional, national, and local levels to monitor, report on and review progress on a regular basis, and take corrective action where needed to ensure that the project moves at the required pace in both countries.

Uneven speed of implementation and expenditure rate among the partners may hamper overall project performance	Medium	The project design ensures a joint management set-up where the partners will jointly steer and manage the intervention through the RPSC. Through this mechanism, it will be possible to spot at an early stage any potential delays among any of the partners, and thus enable early corrective action.
Non-formalised relationships between executing and implementing bodies	Low	The relationship between IFAD and each executing entity will be detailed in a formal agreement. Standard and well-proven formats will be used for fund disbursement between IFAD and the Ministries of Environment, including formats and standards for reporting and financial accounting.
National, subnational governments and river basin institutions might have alternative implementation approaches	Low	The project will espouse a multi-stakeholder participatory approach, to ensure that all stakeholders including national, subnational governments and river basin institutions work in a harmonised 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, to aid resolution should any conflict arise.
Occurrence of a major natural disaster in the project area	Medium	Since the project focuses directly on supporting climate resilience, its main interventions are not likely to be disrupted 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 priority initiatives continue alongside any potential emergency work that could result from occurrence of a major natural disaster.
Inter-community differences regarding adaptation planning priorities	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 prioritised based on agreement of the community.
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 other ongoing adaptation initiatives in the target countries	Low	A thorough review of ongoing initiatives has already been conducted and partners will be continually consulted to ensure that there is alignment with these and other initiatives in the target countries.

Financial risks and the proposed mitigation measures thereof are presented in the table below.

Table 13: Financial risk management

Risk	**Level of risk**	**Risk mitigation measure(s)**
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 are to be developed in line with the project work plan to ensure timely availability of inputs.
General financial risks	Low	Financial Rules and Regulations of IFAD will be utilised throughout project implementation to minimise financial risks. This includes the internal and external auditing procedures laid down in these regulations.

Delays in financial disbursements	Low	Executing entities will be engaged through agreements, under which funds for project activities will be disbursed timeously, while ensuring provisions on financial management, procurement, and minimising risk of corruption are adhered to.

152. 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 actions can be taken before risks spiral.

C. Environmental and social risk management

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

(i) Screening and Categorisation

153. The project is an environmentally positive project with no potentially adverse impacts, and it is aligned with the Adaptation Fund's Environmental and Social Policy and Principles. Following the environmental and social risk assessment detailed in section, the project corresponds to a 'category B' due to some minor risks relating to the construction of water infrastructure and use of fertilisers for which mitigation measures have been taken, the national safeguard procedures will be followed, additionally significant negative impacts on society and the environment are unlikely since the scope of the activities, which are numerous, at small scale and very localised. The project will use participatory approaches to engage the beneficiaries to get their consent on planned activities, to mitigate social risks and impacts.
154. The main risks relate to the earth and sand dams under Output 3.1.1, as well as the risks posed by water extraction activities under Output 3.1.2. Annex F provides an overview of the potential risks the project poses, in relation to the 15 Environmental and Social Principles.

(ii) Environment and Social Management Plan (ESMP)

155. The project has been designed in full compliance with Angola and Namibia laws and relevant safeguard procedures that have been fully mainstreamed into the project. A consolidated ESMP for the whole project is presented in Annex G, with specific measures designed to ensure the compliance with national laws and approval processes. All infrastructure construction or rehabilitation (earth dams, boreholes, wells, and retention ponds) will be subjected to topographical surveys and hydrogeological investigations to assess the water availability and sustainability of water harvesting and groundwater extraction activities. In addition to these safeguard mechanisms, the project will also comply with national environmental impact assessment requirements.
156. The project will furthermore map all the project activity areas and regularly report on all the ESMP and Gender Action Plan indicators, identifying those indicators that are not meeting their targets and proposing the corrective measures being taken by the PMUs. Annex G contains a consolidated EMSP table synthesising project safeguard for each activity.

Consultation

157. The design for the project started with the concept note which was approved in April 2023 and subsequently a wide range of stakeholders have been consulted during the design phase. The proposed project has throughout the design process worked and consulted closely with the Ministry of Environment in Angola and in Namibia and has been developed through a gender and youth sensitive participatory approach. The field survey focus groups were instrumental in informing the development of project interventions and the activities were subsequently designed based on local community concerns and needs.

158. The stakeholder consultations have been gender and youth focused with meetings being arranged with smallholder farmers, indigenous people, pastoralist and agro pastoralists, women indigenous people and youth, that were timed to be sensitive to their respective needs as well as farmer's needs more generally. Representatives of women groups, NGOs with programmes focused on women and international agencies focused on gender concerns have all been consulted. Women were also interviewed separately from men, this produced the desired effect as women felt freer to open about their issues, which otherwise would not have been possible.
159. Access to water was one of the main challenges facing the daily lives of local communities. All reported access to sufficient clean water as being a critical problem. Villagers depend mainly on traditional hand-dug wells during the dry season, a situation that becomes critical around April – June when many of the wells dry up or the water level becomes very deep. Small earth dams (chimpacas) are critical although insufficient to meet the needs of everyone as most of these sources are either poorly functioning or not functioning at all. Women traditionally travel long distances to collect water and even longer distances to collect firewood and charcoal at times reporting 30 km distances over 24 hours with heightened risks to their personal safety. Consultations with women groups highlighted the importance of access to basic tools for agricultural production and transport to the market as well as training in small income-generating activities (IGA) which key in reducing extreme poverty and reducing malnutrition.
160. The project has been designed to have minimal to no social and environmental impacts with mitigation measures and safeguards taken for all applicable Environmental and Social Principles. Additionally, project consultations will be gender-sensitive and inclusive of vulnerable and marginalised groups, during the extensive consultations that have been planned. The beneficiaries will be consulted throughout the lifecycle of the project. The project will conduct wider dissemination of project information in local language, and in locations that promote the participation by people from remote areas. The engagement will be held at appropriate times considering the work schedules and commitments of different household members and gender groups. The project will facilitate childcare to allow for women participation. Training will be provided for local community facilitators; the sessions will be captured and documents for learning purposes and adaptive adjustments of project interventions. The sessions will also be used to disseminate grievance mechanisms.
161. The project aims to enhance water security in the Kunene River Basin through several key initiatives. It includes conducting a comprehensive water security assessment, quantifying, and valuing ecosystem goods and services in the project area and developing a gender-inclusive disaster risk reduction (DRR) plan focused on ecosystem-based adaptation strategies. Additionally, the project will install automatic weather stations and hydrometric stations to support a multi-hazard early warning system. Inclusive adaptation actions will involve the rehabilitation of existing boreholes for irrigation and domestic water use, providing value addition and processing equipment for specific agricultural value chains, and training in labour-saving technologies for conservation agriculture. The project will also promote indigenous drought-resilient livestock breeds and improve ecosystem infrastructure such as rangelands and water access points. Furthermore, efforts will be made to raise awareness through learning and knowledge management, ensuring stakeholders are informed and engaged in the co-design and implementation of adaptation activities, including sharing successful climate change adaptation measures through the Kunene River assessment Toolkit.
162. Beneficiaries will be consulted in a sequence of one exploratory visit and 4 additional phases including fixing times and dates for subsequent meetings, the identification of lead community persons for the selection of farmers for Farmer Field Schools (FFS), Water User Associations (WUAs), women and youth groups. The third phase will agree on the terms of partnership, and to agree on activities. Finally, in phase four a lesson learned assessment to receive feedback from the beneficiaries.

Unidentified sub-projects

163. The project will undertake the following studies to finalise the locations, quantities, and scale of the intended concrete adaptation activities:

- A Water Security Assessment to determine the quantity, quality, and access to groundwater and surface water resources in the migratory range used by the semi-nomadic groups, including mapping and modelling for forecasting.
- An Ecosystem Goods and Services valuation, including Protected Areas and Conservancies, Communal Areas and (as possible) private ranches, to determine the extent of environmental degradation, its natural and anthropogenic drivers, and identify opportunities for environmental restoration and livelihood enhancement.

164. The location of physical investments for community-based adaptation measures, such as water retention infrastructure (earth dams, ponds and rainwater harvesting systems), rehabilitated boreholes, communal gardens, and rangelands, are yet to be determined and are classified as partly unidentified sub-projects with uncertain risk status. Each physical investment will be assessed for social and environmental risks prior to implementation. A local environmental management committee at municipal level will screen all possible sub-projects against standardised checklists to determine the risks, their likelihood and magnitude. Where appropriate, mitigation measures will be applied and a site-specific social and environmental management plan will be prepared, or alternatives will be sought if the risks of non-compliance are too great. The National Project Coordinators will be ultimately responsible for ensuring that unidentified sub-projects comply with environmental and social safeguards. All location coordinates of investment sites will be mapped. Standardised checklists for each type of intervention will be developed in the first months of the project. Annual progress reports will include screening results and list all sub-projects.
165. The identification of sub-projects will be completed within the first year of project implementation. Following the Water Security and Ecosystem Goods and Services assessments, the physical locations, and designs of interventions such as water retention infrastructure, rehabilitated boreholes, and rangeland restoration will be finalized. The community consultation process, including gender-sensitive participatory methods, will be conducted in tandem with this timeline.
166. Community consultations, including with women and marginalized groups, will be integral to the selection process for these sub-projects. A gender-responsive approach will be taken to ensure that the needs and priorities of women and vulnerable groups are addressed in the planning, design, and implementation phases of these sub-projects. Additionally, training will be provided to local stakeholders, with a focus on women's empowerment and leadership in community-based water management and rangeland restoration.

The table below presents the physical investments of the project that may be classified as unidentified sub-projects, examples of the risks for which they will be examined, as well as mitigation measures against such risks.

Table 14: Physical investments that may be classified as Unidentified Sub-Projects

Physical interventions	Examples of potential risks	Responsibility for risk screening	Risk mitigation measures	Responsibility for implementing risk mitigation measures
Construction or rehabilitation of water infrastructure (e.g., earth sand dams, retention ponds, boreholes) to improve water capture, retention, and distribution for agriculture, domestic, livestock rangelands	Water supply to downstream users disrupted Damage of critical habitats Vulnerable users do not benefit from developments	Local environmental management committee (at municipal level)	Provide conservation works upstream Selective clearing of project sites, reforestation, preservation of protected plant species, use of alternative sources of energy, use of environmentally friendly technologies, awareness campaigns. Stabilisation of loose soil, controlled excavation, preservation of vegetation cover, controlled transportation of raw materials, appropriate landscaping Engage local communities in particular the different gender differentiated groups and indigenous people through FPIC	PMU
Afforestation	Use of species that are not adapted or suitable to a site	Local environmental management committee (at municipal level)	Discourage cutting of mature trees by awareness raising Ensure protection of buffer zones along rivers by awareness raising Promote agroforestry through technical training Promote use of energy saving stoves Promote afforestation, reforestation, and agroforestry in public forests and on farmlands promote drought resilient species implement practices that balance the needs of agriculture and forestry Engage local communities in forest management to improve conservation and sustainable practices	PMU
Fencing of rangelands	Blocking transhumance routes Possible conflicts on boundaries Impeding wildlife migration Vulnerable users do not benefit from development	Local environmental management committee (at municipal level)	Plant nitrogen fixing plants as fodder bushes Design fences that allow wildlife to pass through, such as using smooth wire with gaps at required intervals Implement a maintenance and repair schedule Design fences that minimise injuries such as flexible wire Minimise environmental disruptions such as water flow Engage local communities in erecting the fence as employment n alignment with the FPIC process, affected communities, particularly indigenous groups, and women, will be fully informed about the potential impacts of sub-projects. Their consent will be sought prior to any physical investments	PMU

Grievance Mechanism

167. The project's grievance redress mechanism (GRM) will utilise both existing formal and informal GRMs, supplemented or strengthened as necessary with project-specific arrangements tailored to the risks and impacts involved. At the local level, various committees like Water User Associations (WUAs) and community leaders (Sobas) will serve as the initial points of contact for receiving complaints and attempting informal resolutions. These committees and leaders will also play roles in co-managing the project and

raising awareness about the availability of grievance mechanisms. Issues that cannot be resolved locally, especially those involving secondary stakeholders or beyond local capacities, will be escalated to the PMU for further action, such as transmission to district or municipal authorities or contractors. If disagreements persist following PMU involvement, matters can be escalated to Local Authorities or even the court system as a final recourse. Throughout this process, timely decision-making, and effective communication of grievance resolutions to complainants will be crucial to foster community trust and positive perceptions of the project's interventions.

168. Timely Decision-Making:

To ensure that grievances are addressed promptly and efficiently, the following timeframes will be established for the GRM process:

a. Initial Response: The project team will provide an initial response to a grievance within 30 days of receiving it.
b. Resolution: A resolution will be provided within 60 days from the filing of the grievance. In cases where further investigation or action is needed, the complainant will be informed of the delay, and revised timelines will be communicated.
c. Transparency: Any delays will be communicated clearly, and the reasons for the delay will be provided to the complainant, ensuring transparency and trust in the process.

169. Effective Communication:

a. Clear and accessible communication channels will be established to ensure that the status of grievances is regularly shared with complainants and affected communities. These channels will include:
b. Community Meetings: Regular community meetings will be organized to provide updates on the status of grievances.
c. Social Media Platforms: Updates and important information related to the GRM will be communicated through social media platforms.
d. Local Radio Broadcasts: Information will be disseminated via local radio, ensuring that even remote community members are informed.
e. SMS Notifications and Notice Boards: SMS notifications will be sent to community members, and notice boards in public spaces will provide updates on the grievance status.

These communication channels will be available to all stakeholders, ensuring inclusivity, especially for those in rural areas and those without internet access.

170. Feedback Loops:

Once a grievance has been resolved, a **feedback loop** will be implemented to ensure the complainant is informed of the outcome and any actions taken:

a. Notification of Outcomes: The complainant will receive written feedback detailing the resolution and the actions taken to address their grievance.
b. Follow-Up Surveys: A follow-up survey will be conducted to assess the effectiveness of the grievance process and gather feedback on how the process could be improved.
c. Community-Wide Updates: Regular public meetings will be held to inform the wider community about the grievances resolved and the lessons learned from the process.
d. These feedback mechanisms will provide continuous input from the affected communities and help improve the overall effectiveness of the GRM.

171. GRM Evolution:

172. The **GRM will be regularly reviewed** and adapted to meet the changing needs of the communities throughout the project lifecycle. As the project progresses into different phases, the GRM will be adjusted based on community feedback, evolving project dynamics, and emerging risks. The following steps will be taken to ensure the GRM evolves effectively:

a. Bi-Annual Assessments: A dedicated team will conduct bi-annual assessments to evaluate the effectiveness of the GRM. These assessments will involve community members, stakeholders, and the project team.

b. If necessary, the GRM process will be adjusted to improve accessibility for vulnerable groups, expand communication channels, or modify response timeframes based on the feedback received from communities.
c. Continuous Stakeholder Engagement: Communities will be continuously engaged to ensure that their concerns are adequately addressed and that the GRM remains responsive and effective.

173. In addition to the GRM, stakeholders can utilise IFAD's complaints procedure via SECAPcomplaints@ifad.org for addressing concerns related to alleged non-compliance with IFAD's environmental and social policies, including the mandatory aspects of the SECAP (Special Environmental and Social Performance Enhancement Procedures). This procedure provides affected parties with a channel to voice their concerns and seek resolution through an impartial and independent process. It ensures that complaints are handled fairly and promptly, contributing to accountability and transparency in project operations aligned with IFAD's policies and guidelines.

Monitoring and reporting

174. As described in the subsequent section of the proposal, the project will have a comprehensive monitoring and reporting programme that will include quarterly reports, technical reports, annual project reports, the AF PPR tracking, annual IFAD supervision mission reports, a Mid-Term Review (MTR) and a final evaluation and impact assessments. The monitoring and reporting of the ESMP will be commensurate with the limited ESMP required for the project. The project will through the annual Project Performance Report (PPR) to the AF and supervision missions report on financial data; procurement; risk assessment; Environmental and Social Policy compliance; Gender Policy compliance; rating; project indicators, lessons learned; and results tracker.

D. Monitoring, Evaluation and Reporting

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

175. A simple, user-friendly monitoring and evaluation system will be developed that will operate parallel to the existing M&E systems of the executing entities, to better facilitate reporting and implementation of the project. The M&E system will be developed in consultation with the lead executing entities, namely, the Ministries of Environment of the two countries. The Regional Project Coordinating Committee (RPCC) will provide oversight to the detailed M&E framework to be developed jointly by the implementing and executing entities. The M&E framework will describe objectives, performance indicators and the methodologies for data collection.
176. During the inception phase, relevant stakeholders will be engaged to review and validate the M&E framework. The main monitoring and evaluation processes will include:

i) **Inception and planning workshop:** The project will commence with an inception phase during which preliminary activities of establishing systems for project implementation will be undertaken. Inception activities will include developing and signing agreements with the relevant stakeholders and partners; planning and stakeholder engagement for setting up the relevant coordination mechanisms; the PMU; holding an inception workshop to launch the project; redefining implementation and targeting approaches; and developing systems/tools including for M&E, community engagement and clarifying roles of the stakeholders.

ii) **Baseline surveys:** to be conducted at the inception phase 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 four project components.

iii) **Annual Work Planning:** Work plans will be reviewed annually during annual review and planning meetings to redefine activity implementation and targets based on performance.

iv) **Continuous monitoring and technical backstopping:** Technical backstopping will 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 representatives from the implementing and executing entities, other project partners, host governments and communities.

v) **Monitoring short-term outcome results:** Periodic monitoring will be conducted mid and end-of-season to assess the extent to which farmers utilise 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.

vi) **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 will deliver the following reports:

i) 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.

ii) Periodic Progress Reports: The progress reports will be submitted to the donor either on bi-annual or annual basis, as will 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/annual report will include the following:

- planned vs. achieved in terms of implementing planned activities.
- main constraints encountered, solutions sought and recommendations for the next mid-term activities.
- Reference should be made against achieving the expected outputs in each of the bi-annual reports.
- Fundamental changes which may affect project performance should be detailed. Adaptation Fund monitoring and reporting guidelines, schedules and templates will be adhered to (e.g., Project Performance Report (PPR), results tracking and reporting on Core Indicators).

iii) Special Technical Reports: IFAD 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 Adaptation Fund and the Regional Project Steering Committee, as and when they are issued.

iv) 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 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 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.

The table on the next page shows the budget for M&E activities. These costs are split across the implementing entity fee and the project execution cost, as they are incurred by the implementing entity and the lead executing entity.

Table 15: Monitoring, Evaluation and Reporting budget

Activity	Responsible parties	Budget (USD)	Notes																				Notes
			Year 1				Year 2				Year 3				Year 4				Year 5				
			Quarters				Quarters				Quarters				Quarters				Quarters				
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Inception workshop and report	IFAD, FAO and Ministries of Environment	20 000																					Inception workshops in both countries, with all stakeholders
Baseline and end line data collection	FAO and Ministries of Environment (70% IFAD and 30% Ministries of Environment)	50 000																					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	Regional Project Coordinating Committee, National Project Managers and M&E specialists	120 000																					Under the supervision of the IFAD Regional M&E officer
Routine project implementation monitoring	PMU	85 000																					Regular monitoring of value chain and community investments
IFAD Project Reporting	PMU	20 000																					
Quarterly joint monitoring missions	Ministries of Environment (50%) IFAD (50%)	40 000																					This will be done once per quarter
Monitoring short-term results	Ministries of Environment (50%) IFAD (50%)	40 000																					This will be done annually at end of year 1 and year 2.
Mid Term Evaluation	External M&E expert	20 000																					This will be done by a hired External M&E consultant
Final project evaluation	External M&E expert	40 000																					This will be done by a hired External M&E consultant
Total M & E budget		**435 000**																					

E. Results Framework

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

Table 16: Project Results Framework

Results	**Indicators**	**Baseline**	**Milestone**	**End of project target**	**Means of verification**	**Responsible parties**	**Risks and assumptions**
Increased resilience of semi-nomadic agro-pastoral populations of the Kunene River basin.	Percentage of targeted population with sustained climate-resilient alternative livelihoods (disaggregated by sex)	0	25% at midterm, of which 50% women	50% by end of project, of which 50% women	Survey	FAO, Ministries of Environment, PJTC	Marginal dropout rates among targeted groups. Community buy-in for collective action and communal investment projects. Availability of productive resources e.g., land, illiteracy levels may restrict audience of some climate advisory products.
Output	**Indicators**	**Baseline**	**Milestones**	**Target**	**Means of Verification**	**Responsible parties**	**Assumptions**
1.1.1 Knowledge gaps for the preparation of the KRB: EbA-DRRP identified and filled, through a Water Security Assessment and an Ecosystem Goods and Services Valuation	Number of studies conducted to fill knowledge gaps for the preparation of the KRB: EbA-DRRP.	0	Water security assessment and ecosystem services evaluation conducted by end of Year 1	All knowledge gaps on KRB filled	Progress reports	FAO, in close collaboration with Ministries of Environment, PJTC, Angola National Commission for Civil Protection (CNPC) and Namibia Directorate of Disaster Risk Management (DDRM)	All stakeholders are committed and participate in the planning meetings. Buy-in from all stakeholders including the community.
1.1.2 A Basin-wide gender-inclusive DRR Plan focused on	Number of joint DRR planning meetings for the KRB held	0	Annual planning meetings, 2 per	5 per country	Progress reports	FAO, in close collaboration with Ministries of	Willingness of stakeholders to work together.

Ecosystem-based Adaptation is developed			country by midterm			Environment, PJTC, Angola National Commission for Civil Protection (CNPC) and Namibia Directorate of Disaster Risk Management (DDRM)	Availability of all stakeholders including the community to attend meetings.
	Number of stakeholders participating in DRR planning (disaggregated by gender and sector).	0	50 participants per meeting, on average, 50% women	50 participants per meeting, on average, 50% women	Progress reports	FAO, in close collaboration with Ministries of Environment, PJTC, Angola National Commission for Civil Protection (CNPC) and Namibia Directorate of Disaster Risk Management (DDRM)	
Output	**Indicators**	**Baseline**	**Milestones**	**Target**	**Means of Verification**	**Responsible parties**	**Assumptions**
1.2.1 Report on full stakeholder engagement with the beneficiary communities, including all gender and ethnic subgroups and other stakeholders of the KRB.	Number of community members and other stakeholders participating in multi-stakeholder dialogues	0	500 by midterm, 50% women	1,000 by end of project, 50% women	Progress reports	PMU	Willing community members and buy-in from community leaders and other stakeholders.
Output	**Indicators**	**Baseline**	**Milestones**	**Target**	**Means of Verification**	**Responsible parties**	**Assumptions**
2.1.1 Weather stations for micro-climates in the basin installed, in collaboration with national	Number of automatic weather stations installed (disaggregated by country).	0	12 meteorological stations installed by midterm	24 meteorological stations installed in the basin and fully operational	Progress reports	FAO in close collaboration with Angola National Institute of Meteorology (INAMET) and	

meteorological agencies						Namibia Meteorological Service	
2.1.2 Hydrometric stations installed along the Kunene River in collaboration with the hydrological agencies in both countries.	Number of hydrometric stations installed (disaggregated by country).	0	8 hydrometric stations installed by midterm	16 hydrometric stations installed in the basin and fully operational	Progress reports	FAO in close collaboration with Angola National Institute of Meteorology (INAMET) and Namibia Meteorological Service	
Output	**Indicators**	**Baseline**	**Milestones**	**Target**	**Means of Verification**	**Responsible parties**	**Assumptions**
2.2.1 Multi-level KRB: MH-EWS designed and validated by governments in collaboration with local communities, integrating indigenous knowledge	Number of EWS data capturing and monitoring tools developed.	0	2 (1 community tool, 1 supervisor tool)	Both tools will be developed at inception phase.	Progress reports	FAO in close collaboration with Angola National Institute of Meteorology (INAMET) and Namibia Meteorological Service	Training workshops will be conducted in the local languages. EWS is operational.
	Number of community watchers trained in EWS data capturing and monitoring.	0	10 in each country.	20 Community watchers trained for all manual weather and hydrometric stations	Progress reports	FAO in close collaboration with Angola National Institute of Meteorology (INAMET) and Namibia Meteorological Service	
Output	**Indicators**	**Baseline**	**Milestones**	**Target**	**Means of Verification**	**Responsible parties**	**Assumptions**
3.1.1 Rainwater retention infrastructure constructed or rehabilitated (20 existing earth/sand dams rehabilitated, 20 rainwater retention ponds	Number of existing earth/sand dams rehabilitated.	0	10 by midterm	20	Progress reports	FAO in close collaboration with Ministry of Agriculture and Fisheries (MINAGRIP) and the Ministry of Energy and Water (MINEA) of Angola,	Target area has been identified. Community has agreed for the projects to be implemented.

established) to increase access to water for domestic and agricultural use.						and the Ministry of Agriculture, Water and Land Reform (MAWLR) of Namibia	
	Number of rainwater retention ponds established	0	10 by midterm	20	Progress reports	FAO in close collaboration with Ministry of Agriculture and Fisheries (MINAGRIP) and the Ministry of Energy and Water (MINEA) of Angola, and the Ministry of Agriculture, Water and Land Reform (MAWLR) of Namibia	
	Number of community members benefiting from rainwater retention projects (disaggregated by sex, project, and country).	0	10,000 by midterm, 50% women	20,000, 50% women	Progress reports	FAO in close collaboration with Ministry of Agriculture and Fisheries (MINAGRIP) and the Ministry of Energy and Water (MINEA) of Angola, and the Ministry of Agriculture, Water and Land Reform (MAWLR) of Namibia	
3.1.2 Improved access to groundwater for gardening and domestic use, to build adaptive capacity by improving health, hygiene, and nutrition	Number of existing boreholes rehabilitated	0	30 by midterm	60	Progress reports	FAO in close collaboration with Ministry of Agriculture and Fisheries (MINAGRIP) and the Ministry of Energy and Water (MINEA) of Angola, and the Ministry of	

						Agriculture, Water and Land Reform (MAWLR) of Namibia	
	Number of community members benefiting from borehole rehabilitation (disaggregated by sex, and country).	0	3,000 by midterm, 50% women	6,000, 50% women	Progress reports	FAO in close collaboration with Ministry of Agriculture and Fisheries (MINAGRIP) and the Ministry of Energy and Water (MINEA) of Angola, and the Ministry of Agriculture, Water and Land Reform (MAWLR) of Namibia	
3.1.3 Value addition initiatives identified and supported.	Number of community members trained in the use of value addition technologies.	0	50% of community members participating in the sub-projects	100% of all community members participating in the sub-projects.	Progress reports	FAO in close collaboration with Ministry of Agriculture and Fisheries (MINAGRIP) and the Ministry of Energy and Water (MINEA) of Angola, and the Ministry of Agriculture, Water and Land Reform (MAWLR) of Namibia	
	Number of community members benefiting from value addition initiatives (disaggregated by sex)	0	13,550 by end of Year 3, 50% women	27,100, 50% women	Progress reports	FAO in close collaboration with Ministry of Agriculture and Fisheries (MINAGRIP) and the Ministry of Energy and Water (MINEA) of Angola, and the Ministry of Agriculture, Water	

						and Land Reform (MAWLR) of Namibia	
3.1.4 Drought-tolerant crop varieties promoted, for sustenance during drought periods	Percentage of target community members farming with drought-tolerant breeds and crop varieties	0	40% by midterm	80%	Community surveys	FAO in close collaboration with Ministry of Agriculture and Fisheries (MINAGRIP) and the Ministry of Energy and Water (MINEA) of Angola, and the Ministry of Agriculture, Water and Land Reform (MAWLR) of Namibia	Target area has been identified. Community has agreed for the projects to be implemented.
3.1.5 Rangeland restoration to increase production of drought-resistant fodder, species diversity and soil cover	Hectarage of rangelands restored by project	0	10,000ha by midterm	20,000ha	Site surveys	FAO in close collaboration with Ministry of Agriculture and Fisheries (MINAGRIP) and the Ministry of Energy and Water (MINEA) of Angola, and the Ministry of Agriculture, Water and Land Reform (MAWLR) of Namibia	Target area has been identified. Community has agreed for the projects to be implemented.
Output	**Indicators**	**Baseline**	**Milestones**	**Target**	**Means of Verification**	**Responsible parties**	**Assumptions**
4.1.1 Awareness raised and knowledge shared on locally-led gender-responsive climate change	Number of knowledge products developed on locally-led gender responsive adaptation	0	2 by midterm	4	Progress reports	FAO in close collaboration with Ministries of Environment in Angola and Namibia	Awareness material is translated into local languages. There are trained community members

adaptation measures.	Number of awareness creation campaigns held on climate change adaptation.	0	1 per year p/country	10	Progress reports	FAO in close collaboration with Ministries of Environment in Angola and Namibia	disseminating information.
4.1.2 Kunene River Awareness Kit online portal updated and reactivated, using the data and knowledge generated by the project	Number of community members trained in the KRA Kit.	0	10% of beneficiaries	20% of beneficiaries	Progress reports	FAO in close collaboration with Ministries of Environment in Angola and Namibia	
	KRA Kit translated in local languages	0	KRA Kit translated in all major local languages	KRA Kit translated in all major local languages	Progress reports	FAO in close collaboration with Ministries of Environment in Angola and Namibia	
4.1.3 Case studies from the project for submission to IFAD and FAO knowledge systems, SADC-GMI and WaterNet, developed and further disseminated.	Case studies on the learnings from the Kunene Basin project, on EbA in DRR, MH-EWS and integration of scientific and traditional knowledge for climate change adaptation	0	2 case studies by midterm	5 case studies	Case studio documents, audio recordings or videos	FAO in close collaboration with Ministries of Environment in Angola and Namibia	Willingness of respondents to participate in the study.
Output	**Indicators**	**Baseline**	**Milestones**	**Target**	**Means of Verification**	**Responsible parties**	**Assumptions**
4.2.1 Strengthened institutional capacity of governing bodies, water authorities, and local communities through skills development, resource development, and organisational development to	Number of training courses developed to build local and institutional capacity of governing bodies, water authorities, and local communities.	0	Depending on training needs	All identified trainings conducted	Progress reports	FAO in close collaboration with Ministries of Environment in Angola and Namibia	Training will be conducted in local languages in local languages. Community members are identified and willing to be trained.
	Number of stakeholders and community members trained.	0	250 by midterm	500	Progress reports	FAO in close collaboration with Ministries of Environment in	

address challenges such as water scarcity, climate change impacts and competing interests among stakeholders.						Angola and Namibia	
	Number of stakeholder training sessions delivered	0	10 training sessions by midterm	20	Progress reports	FAO in close collaboration with Ministries of Environment in Angola and Namibia	Projects have been identified and agreed upon with communities and other stakeholders.

The M&E framework will incorporate gender-sensitive indicators, such as the percentage of women participating in decision-making roles and the number of gender-focused adaptation measures implemented. Data disaggregation by gender will be used to track the impacts of the project on women and marginalized groups. Regular gender audits will ensure that the project maintains its commitment to gender equality, and corrective actions will be taken if gender imbalances are identified. For instance, the project will aim for at least 40% female participation in leadership positions within community-based water management committees.

F. Alignment with Adaptation Fund Results Framework

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

Table 17: Project contribution to the core indicators of the Adaptation Fund

Impact level results	**Core indicators**	**Project contribution**
Increased adaptive capacity of communities to respond to the impacts of climate change	Number of beneficiaries (direct and indirect)	54,200 direct beneficiaries, 833,279 indirect beneficiaries
	Number of Early Warning Systems	5 (3 municipalities in Angola and 2 constituencies in Namibia)
	Assets produced, developed, improved, or strengthened	24 automatic weather stations installed , 16 hydrometric stations installed, 20 earth/sand dams rehabilitated, 20 rainwater retention ponds established, 20 rooftop rainwater harvesting units installed on public buildings, 60 boreholes rehabilitated, 3 sorghum milling plants established, 3 cassava milling plants established, 24 sorghum threshers and 24 peanut butter machines distributed to women's groups
	Increased income, or avoided decrease in income	Estimated annual income of 150 USD per direct beneficiary per year (8.13 million USD per year in total), from sale of additional agricultural output and products from the supported value chains

Increased ecosystem resilience in response to climate change-induced stresses	Natural assets protected or rehabilitated	20,000 hectares of rangeland restored, and 2,000 hectares of forest established

Table 18: Project alignment with the Results Framework of the Adaptation Fund

Project Objective(s)	***Project Objective Indicator(s)***	***Fund Outcome***	***Fund Outcome Indicator***	***Grant Amount (USD)***
Overall goal: *The goal of the project is to support the climate change adaptation and resilience of the semi-nomadic agro-pastoral population of the Kunene River Basin.*	*Number of beneficiaries (direct and indirect)*	*Increased adaptive capacity of communities to respond to the impacts of climate change*	*AF Impact Level Results Core Indicator: Number of beneficiaries (direct and indirect)*	*11,705,000 (Project Activity Cost)*
Key Objective 1: *To ensure that the aspirations and needs of the nomadic men and women are fulfilled in balance with ecosystem requirements identified through a gender-inclusive ecosystem-based adaptation approach for disaster risk reduction*	*DRR Plan co-designed and implemented by beneficiary communities and all stakeholders differentiated by gender groups and gender subgroups.*	*AF 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*	*1,000,000*
Key Objective 2: *To enhance adaptive capacity of male and female inhabitants of the Kunene River Basin through a Multi-Hazard Early Warning System*	*Number of beneficiaries covered by MH-EWS.*	*AF 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*	*2,830,000*
Key Objective 3: *Reduce the maladaptation caused by existing infrastructure and activities, through inclusive, community-based and gender-responsive adaptation actions*	*Percentage of beneficiaries benefiting from identified sub-projects.*	*AF Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas*	*AF Outcome Indicator 6.2. Percentage of targeted population with sustained climate-resilient alternative livelihoods*	*6,639,546*
Key Objective 4: *To enhance the capacity of the Kunene Permanent Joint Technical Commission, the relevant national and local government entities, and other stakeholders to build climate resilience in the Basin*	*Increased awareness, knowledge, and action on climate change adaptation.*	*AF 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*	*985,000*
Programme Outcome(s)	*Programme Outcome Indicator(s)*	*Fund Output*	*Fund Output Indicator*	
Component 1. Co-design with beneficiary communities and stakeholders, and implementation of a Plan for Disaster Risk Reduction through Ecosystem-based Adaptation in the Kunene River Basin (KRB: EbA-DRRP)				

1.1 An improved DRR Plan co-designed and implemented by beneficiary communities and all stakeholders *1.2 Improved dialogue and co-planning of the Kunene River Basins by the stakeholders (government, civil society, private sector, and beneficiary communities)*	*Number of beneficiaries and other stakeholders participating in disaster risk reduction planning and implementation* *Number of studies conducted to fill knowledge gaps for the preparation of the KRB: EbA-DRRP.* *Number of stakeholder engagements/dialogues held by the project.* *Number of stakeholders participating in joint planning and stakeholder engagements/dialogues (disaggregated by gender and sector).*	*AF 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*	*1,000,000*
Component 2. Implementation of a satellite-based Multi-Hazard Early Warning System for the Kunene River Basin (KRB: MH-EWS)				

2.1 Enhanced skills to define weather patterns at micro-climate scale to support inclusive locally-led adaptation. *2.2 Approved KRB: MH-EWS in place for use by governments, beneficiaries' communities, and other stakeholders*	*Percentage of households using tailored seasonal climate forecasts to plan their activities or enterprises.* *Number of stakeholder institutions trained in the usage of the MH-EWS.* *Number of community members trained in early action using EWS data (disaggregated by sex and country).* *Number of EWS data capturing and monitoring tools developed.* *Number of automatic weather stations installed (disaggregated by country).* *Number of hydrometric stations installed (disaggregated by country).*	*AF 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*	*2,830,000*
Component 3. Inclusive community-based adaptation actions are co-designed and implemented				
3.1 Agreed climate change adaptation interventions by communities and government implemented *3.2 Improved collaboration amongst development partners and stakeholders in the project area of the Kunene River Basin*	*Number of existing earth dams rehabilitated.* *Number of rainwater retention ponds established* *Number of community members benefiting from water retention projects (disaggregated by sex, project, and country)* *Number of existing boreholes rehabilitated* *Number of community members trained in the use of value addition technologies*	*AF Output 8: Viable innovations are rolled out, scaled up, encouraged and/or accelerated.*	*AF Output Indicator 8.1. No. of innovative adaptation practices, tools and technologies accelerated, scaled-up and/or replicated*	*6,639,546*

	Number of community members benefiting from value addition initiatives *Percentage of target community members farming with drought-tolerant breeds and crop varieties* *Hectarage of rangelands restored by project*			
Component 4. Raise awareness and improve knowledge on climate change adaptation in the Kunene River ecosystem				
4.1 Knowledge of the Kunene River System enhanced	*Number of community members reached during awareness creation campaigns.* *Number of community members trained in gender-responsive climate change adaptation measures.* *Number of knowledge products developed on locally-led gender responsive adaptation.* *Number of awareness creation campaigns held on climate change adaptation.* *Case studies on the learnings from the Kunene Basin project, on EbA in DRR, MH-EWS and integration of scientific and traditional knowledge for climate change.*	*AF Output 3.1: Targeted population groups participating in adaptation and risk reduction awareness activities*	*AF Output Indicator 3.1 No. of news outlets in the local press and media that have covered the topic*	*985,000*

4.2 Enhanced institutional capacity at local and regional level on gender-responsive adaptation for sustainable management.	*Number of gender-responsive adaptation plans developed.* *Number of gender-responsive adaptation initiatives funded.* *Number of training courses developed to build local and institutional capacity of governing bodies, water authorities, and local communities.* *Number of stakeholders and community members trained.*	*AF Output 3.2: Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning*	*AF Output Indicator 3.2.2 No. of tools and guidelines developed (thematic, sectoral, institutional) and shared with relevant stakeholders*	

G. Project Budget

Include a detailed budget with budget notes, broken down by country as applicable, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs.

Table 19: Detailed project budget for Angola

Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Total Amount	Notes
Component 1: Co-design with beneficiary communities and stakeholders, and implementation of a Plan for Disaster Risk Reduction through Ecosystem-based Adaptation in the Kunene River Basin (KRB: EbA-DRRP)							
1.1.1.1 Undertake a Water Security Assessment of the Kunene River Basin	100 000	0	0	0	0	100 000	Water Security Assessment (consultancy) at $100,000 lump sum
1.1.1.2 Undertake ecosystems goods and services quantification and valuation	75 000	0	0	0	0	75 000	Ecosystem Goods and Services Study at $75,000 lump sum
1.1.2.1 Develop a basin-wide gender-inclusive Disaster Risk Reduction Plan focused on EbA	150 000	50 000	0	0	0	200 000	DRR plan at 200,000 lump sums

1.2.1.1 Facilitate engagement and co-planning of the KRB by its stakeholders	10 000	10 000	10 000	10 000	10 000	50 000	1 KRB stakeholder workshop per year, $10,000/workshop x 5 years
1.2.1.2 Facilitate development of a Free, Prior and Informed Consent (FPIC) Plan	25 000	0	0	0	0	25 000	Lump sum
1.2.1.3 Facilitate dialogue between beneficiary gender and ethnic subgroups through Scenario Planning	10 000	10 000	10 000	10 000	10 000	50 000	1 community-level dialogue building meeting per year (5 meetings X $10,000/meeting)
Subtotal for Component 1						**500 000**	
Component 2: Implementation of a satellite-based Multi-Hazard Early Warning System for the Kunene River Basin (KRB: MH-EWS)							
2.1.1.1 Install 24 automatic weather stations (20 in Angola and 4 in Namibia) across the Kunene River Basin, in collaboration with the national meteorological agencies	60 000	364 000	364 000	312 000	60 000	1 160 000	Siting of 20 weather stations at $3,000 per station; Procurement, installation and fencing of 20 automatic weather stations at $52,000/station; O&M costs at $3,000 per station
2.1.2.1 Install 16 hydrometric stations (13 in Angola, 3 in Namibia) along the Kunene River, in collaboration with the national hydrological agencies	39 000	110 000	110 000	66 000	39 000	364 000	Siting of 13 hydrometric stations at $3000 per station, installation and fencing of 13 hydrometric stations at $22,000 per station, O&M costs at $3,000 per station
2.2.1.1 Design multi-hazard EWS in consultation with beneficiary communities	20 000	20 000	0	0	0	40 000	2 technical level KRB: MH-EWS workshops X $10,000/workshop; 2 community level KRB: MH-EWS workshops X $10,000/workshop
2.2.2.1 Identify and select providers of suitable data platform and user interface for MH-EWS	0	115 000	40 000	40 000	40 000	235 000	Procurement of software and licencing fees for Big Data Analytics platform and user interface for EWS data = $40,000/year X 4 years (from Year 2 onwards); Procurement of servers, computers, and display units for forecasting centres = $75,000, in Year 2
2.2.3.1 Operationalise a multi-hazard early warning system for the Kunene River Basin	0	30 000	30 000	30 000	30 000	120 000	Fees payable to mobile telecommunications companies for meteorological and hydrological data transmission and dissemination of forecasts and warnings = $ 30,000 per year, from Year 2
2.2.4.1 Support meteorological agencies to simplify, translate and disseminate seasonal, weekly, and daily weather forecasts in local languages spoken in the KRB	20 000	20 000	20 000	20 000	20 000	100 000	Annual training on simplification and interpretation of weather information, for meteorologists and broadcasters, at $20,000 per training course
Subtotal for Component 2						**2 019 000**	

Component 3: Inclusive community-based adaptation actions are co-designed and implemented							
3.1.1.1 Rehabilitate existing 20 earth / sand dams (10 per country)	100 000	100 000	100 000	100 000	100 000	500 000	Rehabilitate and expand 10 earth dams at $50,000/dam
3.1.1.2 Construct 10 new rainwater retention ponds (chimpacas)	40 000	40 000	40 000	40 000	40 000	200 000	Excavate 10 retention ponds at $20,000/pond
3.1.1.3 Install rooftop rainwater harvesting systems on public buildings for community use	40 000	40 000	40 000	40 000	40 000	200 000	Install 20 rooftop rainwater harvesting systems at $10,000 each
3.1.2.1 Rehabilitate 60 existing boreholes for vegetable gardens and domestic use	150 000	150 000	150 000	150 000	150 000	750 000	Impact assessment for borehole rehabilitation at $15,000; rehabilitation of 30 boreholes at $24,000 each, O&M costs at $500 per borehole
3.1.3.1 Procure and install processing equipment for selected value chains	0	45 000	45 000	60 000	60 000	210 000	Establish 3 sorghum milling plants at $15,000 per plant; including O&M and securing the machinery in sheltered structures; establish 3 cassava milling plants at $15,000 per milling plant, including O&M and securing the machinery in sheltered structures; procure 12 peanut butter machines for women's groups at $5,000 each; procure and distribute 12 sorghum threshers for women's groups at $5,000 each
3.1.3.2 Provide training and labour-saving devices for conservation agriculture	10 000	60 000	60 000	60 000	0	190 000	Training workshops for women on conservation agriculture and labour-saving agricultural technologies, 2 workshops per country at $5,000/workshop; Procure and distribute labour saving technologies (jab planters, manual seeders and rippers) for conservation agriculture by female-headed households at $180,000
3.1.4.1 Promote drought-tolerant food crop varieties	150 000	150 000	100 000	100 000	100 000	600 000	Establish 10 Farmer Field Schools for drought-tolerant crop production, set-up costs at $30,000/FFS, and $10,000 per FFS per year for training and inputs from year 3
3.1.5.1 Create nurseries for drought-resistant fodder crops, adjacent to the water retention ponds	31 955	31 955	31 955	31 955	31 955	159 773	Purchase and distribute seed for drought resistant fodder at $134,773; Provide leadership training for women in community rangeland management committees: 5 training workshops at $5,000/workshop
3.1.5.2 Identify and secure 20,000 hectares of land for rangeland restoration (10,000 ha per country)	10 000	125 000	125 000	5 000	5 000	270 000	Land surveying and mapping for rangeland restoration, four 5km*5km plots at $10,000; Fencing of selected areas (80km of fencing at $3,000 per km) to allow rangeland to recover and planted fodder crops to grow to maturity, transplanting of forage crops from nurseries at $5,000 per year from Year 2
3.1.5.3 Establish multipurpose tree plantations to be owned and managed by women's groups (1,000 ha per country)	20 000	50 000	50 000	50 000	50 000	220 000	Hold dialogue workshops on securing land rights for women at $10,000 x 2 workshops; tree nurseries for women's groups established adjacent to retention ponds: 10 nurseries at $5,000/nursery, secure 1,000 hectares of communal land for plantations at $150 per hectare

3.2.1.1 Convene quarterly development partners meetings in the project area	4 000	4 000	4 000	4 000	4 000	20 000	Quarterly development partners meetings $1000/meeting X 5 years
Subtotal for Component 3						**3 19 773**	
Component 4: Raise awareness and improve knowledge on climate change adaptation in the Kunene River ecosystem							
4.1.1.1 Raise awareness and build capacity on locally led gender-responsive adaptation	20 000	20 000	20 000	20 000	20 000	100 000	Training of community development facilitators (ADECOs) at $5,000/year X 5 years; Annual awareness campaigns, 5 campaigns at $15,000/campaign
4.1.1.2 Provision of nutrition, literacy, and GALS training, to enhance community adaptive capacity	36 000	36 000	36 000	36 000	36 000	180 000	Nutrition education at $12,000/year X 5 years; Literacy classes targeting women and gender subgroups = $12,000/year X 5 years; Community Gender Action Learning System (GALS) approach training = $12,000/year X 5 years
4.1.2.1 Reactivating and updating the online Kunene River Assessment Toolkit	7 500	7 500	7 500	7 500	7 500	37 500	Lump sum for annual web portal licensing and updating of the data - joint activity between the two countries with each country to contribute an equal amount
4.1.3.1 Develop case studies on EbA DRR planning, MH-EWS, integration of scientific and indigenous knowledge in climate change adaptation, and locally led gender-responsive adaptation; and use them in awareness campaigns	15 000	15 000	15 000	15 000	15 000	75 000	Development and dissemination of case studies in different media formats (print, audio, video), lump sum of $15,000 per year
4.2.1.1 Institutional capacity building for effective management of climate change adaptation initiatives	20 000	20 000	20 000	20 000	20 000	100 000	20 Tailored training workshops to build institutional capacity (1 workshop per half-year in each country, including cost of training material development) at $10,000 per workshop
Subtotal for Component 4						**492 500**	
Project Activity Cost	1 163 455	1 623 455	1 428 455	1 227 455	888 455	6 331 273	
Project Execution Cost (up to 9.5% of total project cost)							
Project staff costs	National Project Manager (PMU)					78 000	Salary top-up for National Project Manager seconded from government, at 1300 USD each per month for 5 years
	Finance and Administrative Officer (PMU)					60 000	Salary top-up for Finance and Administrative Officer seconded from government, at 1000 USD each per month for 5 years

	Driver (PMU)	18 000	Salary top-up for Driver seconded from government, at 300 USD each per month for 5 years
	Project Coordinator (PIU)	75 000	Salary for Project Coordinator at 1250 USD each per month for 5 years
	DRR and EWS Specialist (PIU)	66 000	Salary for DRR and EWS Technical Specialist at 1100 USD each per month for 5 years
	Climate Smart Agriculture Specialist (PIU)	66 000	Salary for Climate Smart Agriculture Specialist at 1100 USD each per month for 5 years
	Gender and Social Inclusion Specialist (PIU)	66 000	Salary for Gender and Social Inclusion Specialist at 1100 USD each per month for 5 years
Office operating expenses		36 000	Lumpsum for stationery and other consumables for the project offices in Windhoek and Epupa, at 3000 USD per office, plus internet and telephone lines at 500 USD per office per month for 60 months
Accounting software		20 000	Purchase of accounting software for the project in year 1
Annual audits		50 000	Annual audits at 10,000 USD per year
Office equipment and furniture		10 000	Equipment and furniture for offices in Luanda and Chitado at 5,000 USD per office
Project vehicles		114 475	3 field vehicles for PIU at 33,000 USD each
Inception workshop		10 000	One inception workshop in year 1 at 10,000 USD
Midterm evaluation		10 000	Consultancy to conduct midterm evaluation in year 3 (joint consultancy for both countries; contribution from Angola)
Terminal evaluation		24 000	Consultancy to conduct terminal evaluation at project completion (joint consultancy for both countries; contribution from Angola)
Project execution cost		703 475	
Total project cost		7 034 748	
Implementing Entity Fee (up to 8.5% of total project cost)			
Policy support, reporting, outreach, and knowledge management		203 475	
Technical support, implementation support, supervision missions and reports, completion report, evaluation oversight		300 000	
Financial management and legal support		200 000	

Implementing Entity Fee	**703 475**	
Total Amount of Financing Requested for Angola	**7 738 223**	

Table 20: Detailed project budget for Namibia

Project Budget - Namibia

Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Total Amount	Notes
Component 1: Co-design with beneficiary communities and stakeholders, and implementation of a Plan for Disaster Risk Reduction through Ecosystem-based Adaptation in the Kunene River Basin (KRB: EbA-DRRP)							
1.1.1.1 Undertake a Water Security Assessment of the Kunene River Basin	100 000	0	0	0	0	100 000	Water Security Assessment (consultancy) at $100,000 lump sum
1.1.1.2 Undertake ecosystems goods and services quantification and valuation	75 000	0	0	0	0	75 000	Ecosystem Goods and Services Study at $75,000 lump sum
1.1.2.1 Develop a basin-wide gender-inclusive Disaster Risk Reduction Plan focused on EbA	150 000	50 000	0	0	0	200 000	DRR plan at 200,000 lump sums
1.2.1.1 Facilitate engagement and co-planning of the KRB by its stakeholders	10 000	10 000	10 000	10 000	10 000	50 000	1 KRB stakeholder workshop per year, $10,000/workshop x 5 years
1.2.1.2 Facilitate development of a Free, Prior and Informed Consent (FPIC) Plan	25 000	0	0	0	0	25 000	Lump sum
1.2.1.3 Facilitate dialogue between beneficiary gender and ethnic subgroups through Scenario Planning	10 000	10 000	10 000	10 000	10 000	50 000	1 community-level dialogue building meeting per year (5 meetings X $10,000/meeting)
Subtotal for Component 1						**500 000**	
Component 2: Implementation of a satellite-based Multi-Hazard Early Warning System for the Kunene River Basin (KRB: MH-EWS)							
2.1.1.1 Install 24 automatic weather stations (20 in Angola and 4 in Namibia) across the Kunene River Basin, in collaboration with the national meteorological agencies	12 000	72 800	72 800	62 400	12 000	232 000	Siting of 4 weather stations at $3,000 per station; Procurement, installation and fencing of 4 automatic weather stations at $52,000/station; O&M costs at $3,000 per station

2.1.2.1 Install 16 hydrometric stations (13 in Angola, 3 in Namibia) along the Kunene River, in collaboration with the national hydrological agencies	9 000	22 000	22 000	22 000	9 000	84 000	Siting of 3 hydrometric stations at $3000 per station, installation and fencing of 3 hydrometric stations at $22,000 per station, O&M costs at $3,000 per station
2.2.1.1 Design multi-hazard EWS in consultation with beneficiary communities	20 000	20 000	0	0	0	40 000	2 technical level KRB: MH-EWS workshops X $10,000/workshop; 2 community level KRB: MH-EWS workshops X $10,000/workshop
2.2.2.1 Identify and select providers of suitable data platform and user interface for MH-EWS	0	115 000	40 000	40 000	40 000	235 000	Procurement of software and licencing fees for Big Data Analytics platform and user interface for EWS data = $40,000/year X 4 years (from Year 2 onwards); Procurement of servers, computers, and display units for forecasting centres = $75,000, in Year 2
2.2.3.1 Operationalise a multi-hazard early warning system for the Kunene River Basin	0	30 000	30 000	30 000	30 000	120 000	Fees payable to mobile telecommunications companies for meteorological and hydrological data transmission and dissemination of forecasts and warnings = $ 30,000 per year, from Year 2
2.2.4.1 Support meteorological agencies to simplify, translate and disseminate seasonal, weekly, and daily weather forecasts in local languages spoken in the KRB	20 000	20 000	20 000	20 000	20 000	100 000	Annual training on simplification and interpretation of weather information, for meteorologists and broadcasters, at $20,000 per training course
Subtotal for Component 2						**811 000**	
Component 3: Inclusive community-based adaptation actions are co-designed and implemented							
3.1.1.1 Rehabilitate existing 20 earth / sand dams (10 per country)	100 000	100 000	100 000	100 000	100 000	500 000	Rehabilitate and expand 10 earth dams at $50,000/dam
3.1.1.2 Construct 20 new rainwater retention ponds	40 000	40 000	40 000	40 000	40 000	200 000	Excavate 10 retention ponds at $20,000/pond
3.1.1.3 Install rooftop rainwater harvesting systems on public buildings for community use	40 000	40 000	40 000	40 000	40 000	200 000	Install 20 rooftop rainwater harvesting systems at $10,000 each
3.1.2.1 Rehabilitate 60 existing boreholes for vegetable gardens and domestic use (30 per country)	150 000	150 000	150 000	150 000	150 000	750 000	Impact assessment for borehole rehabilitation at $15,000; rehabilitation of 30 boreholes at $24,000 each, O&M costs at $500 per borehole
3.1.3.1 Procure and install processing equipment for selected value chains	0	45 000	45 000	60 000	60 000	210 000	Establish 3 sorghum milling plants at $15,000 per plant; including O&M and securing the machinery in sheltered structures; establish 3 cassava milling plants at $15,000 per milling plant, including O&M and securing the machinery in sheltered structures; procure 12 peanut butter machines for women's groups at $5,000 each; procure and distribute 12 sorghum threshers for women's groups at $5,000 each

3.1.3.2 Provide training and labour-saving devices for conservation agriculture	10 000	60 000	60 000	60 000	0	190 000	Training workshops for women on conservation agriculture and labour-saving agricultural technologies, 2 workshops per country at $5,000/workshop; Procure and distribute labour saving technologies (jab planters, manual seeders and rippers) for conservation agriculture by female-headed households at $180,000
3.1.4.1 Promote drought-tolerant food crop varieties	150 000	150 000	100 000	100 000	100 000	600 000	Establish 10 Farmer Field Schools for drought-tolerant crop production, set-up costs at $30,000/FFS, and $10,000 per FFS per year for training and inputs from year 3
3.1.5.1 Create nurseries for drought-resistant fodder crops, adjacent to the water retention ponds	31 955	31 955	31 955	31 955	31 955	159 773	Purchase and distribute seed for drought resistant fodder at $134,773; Provide leadership training for women in community rangeland management committees: 5 training workshops at $5,000/workshop
3.1.5.2 Identify and secure 20,000 hectares of land for rangeland restoration (10,000 ha per country)	10 000	125 000	125 000	5 000	5 000	270 000	Land surveying and mapping for rangeland restoration, four 5km*5km plots at $10,000; Fencing of selected areas (80km of fencing at $3,000 per km) to allow rangeland to recover and planted fodder crops to grow to maturity, transplanting of forage crops from nurseries at $5,000 per year from Year 2
3.1.5.3 Establish multipurpose tree plantations to be owned and managed by women's groups (1,000 ha per country)	20 000	50 000	50 000	50 000	50 000	220 000	Hold dialogue workshops on securing land rights for women at $10,000 x 2 workshops; tree nurseries for women's groups established adjacent to retention ponds: 10 nurseries at $5,000/nursery, secure 1,000 hectares of communal land for plantations at $150 per hectare
3.2.1.1 Convene quarterly development partners meetings in the project area	4 000	4 000	4 000	4 000	4 000	20 000	Quarterly development partners meetings $1000/meeting X 5 years
Subtotal for Component 3						**3 319 773**	
Component 4: Raise awareness and improve knowledge on climate change adaptation in the Kunene River ecosystem							
4.1.1.1 Raise awareness and build capacity on locally led gender-responsive adaptation	20 000	20 000	20 000	20 000	20 000	100 000	Training of community development facilitators at $5,000/year X 5 years; Annual awareness campaigns, 5 campaigns at $15,000/campaign
4.1.1.2 Provision of nutrition, literacy, and GALS training, to enhance community adaptive capacity	36 000	36 000	36 000	36 000	36 000	180 000	Nutrition education at $12,000/year X 5 years; Literacy classes targeting women and gender subgroups = $12,000/year X 5 years; Community Gender Action Learning System (GALS) approach training = $12,000/year X 5 years
4.1.2.1 Reactivating and updating the online Kunene River Assessment Toolkit	7 500	7 500	7 500	7 500	7 500	37 500	Lump sum for annual web portal licensing and updating of the data - joint activity between the two countries with each country to contribute an equal amount

4.1.3.1 Develop case studies on EbA DRR planning, MH-EWS, integration of scientific and indigenous knowledge in climate change adaptation, and locally led gender-responsive adaptation; and use them in awareness campaigns	15 000	15 000	15 000	15 000	15 000	75 000	Development and dissemination of case studies in different media formats (print, audio, video), lump sum of $15,000 per year
4.2.1.1 Institutional capacity building for effective management of climate change adaptation initiatives	20 000	20 000	20 000	20 000	20 000	100 000	20 Tailored training workshops to build institutional capacity (1 workshop per half-year in each country, including cost of training material development) at $10,000 per workshop
Subtotal for Component 4						**492 500**	
Project Activity Cost	1 085 455	1 244 255	1 049 255	933 855	810 455	5 123 273	
Project Execution Cost (up to 9.5% of total project cost)							
Project staff costs	National Project Manager (PMU)					75 000	Salary top-up for National Project Manager seconded from government, at 1250 USD per month for 5 years
	Finance and Administrative Officer (PMU)					54 000	Salary top-up for Finance and Administrative Officer seconded from government, at 900 USD each per month for 5 years
	Driver (PMU)					15 000	Salary top-up for Driver seconded from government, at 250 USD per month for 5 years
	Project Coordinator (PIU)					72 000	Salary for Project Coordinator at 1200 USD each per month (1 per country) for 5 years
	DRR and EWS Specialist (PIU)					60 000	Salary for DRR and EWS Technical Specialist at 1000 USD each per month (1 per country) for 5 years
	Climate Smart Agriculture Specialist (PIU)					60 000	Salary for Climate Smart Agriculture Specialist at 1000 USD each per month (1 per country) for 5 years
	Gender and Social Inclusion Specialist (PIU)					60 000	Salary for Gender and Social Inclusion Specialist at 1000 USD each per month for 5 years
Office operating expenses						36 000	Lumpsum for stationery and other consumables for the project offices in Windhoek and Epupa, at 3000 USD per office, plus internet and telephone lines at 500 USD per office per month for 60 months

Accounting software	20 000	Purchase of accounting software for the project
Annual audits	50 000	Annual audits at 10,000 USD per year
Office equipment and furniture	8 740	Equipment and furniture for offices in Luanda and Chitado at 4370 USD per office
Project vehicles	31 000	One field vehicle for PIU at 31,000 USD
Inception workshop	7 512	One inception workshop at 7512 USD
Midterm evaluation	10 000	Consultancy to conduct midterm evaluation in year 3(joint consultancy for both countries; contribution from Namibia)
Terminal evaluation	10 000	Consultancy to conduct terminal evaluation at project completion (joint consultancy for both countries; contribution from Namibia)
Project execution cost	**569 252**	
Total project cost	**5 692 525**	
Implementing Entity Fee (up to 8.5% of total project cost)		
Policy support, reporting, outreach, and knowledge management	200 000	
Technical support, implementation support, supervision missions and reports, completion report, evaluation oversight	179 252	
Financial management and legal support	190 000	
Implementing Entity Fee	**569 252**	
Total Amount of Financing Requested for Namibia	**6 261 777**	

H. Disbursement Schedule

Include a disbursement schedule with time-bound milestones.

Table 22: Disbursement schedule (all figures in USD)

Disbursement schedule						
	Upon signature of Agreement	**One Year after Project Start (a)**	**Year 2 (b)**	**Year 3**	**Year 4 (c)**	**Total**
Scheduled date	Jul-25	Jul-26	Jul-27	Jul-28	Jul-29	
Total Project Cost	2 660 063,18	3 063 264,45	2 693 400,27	2 366 538,97	1 944 006,13	12 727 273,00
Implementing Entity Fees	266 006,26	306 326,37	269 339,96	236 653,84	194 400,57	1 272 727,00
Total	**2 926 069,44**	**3 369 590,82**	**2 962 740,24**	**2 603 192,81**	**2 138 406,70**	**14 000 000,00**

PART IV: ANNEXES

Annex A. Record of endorsement on behalf of the governments

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 as possible if a regional project/programme.

Namibia: Mr Teofilus Nghitila Executive Director Ministry of Environment, Forestry and Tourism, Namibia	Date: 17 July 2024 

REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM

17 July 2024

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

Subject: Endorsement for the regional project proposal titled **'Building Inclusive Resilience to Climate Change for Semi-Nomadic Agro-Pastoral Communities in the Transboundary [illegible] River Basin.'**

In my capacity as designated authority for the Adaptation Fund in Namibia, I confirm that the above-mentioned regional proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Namibia.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the Implementing Entity for the project will be the International Fund for Agriculture Development.

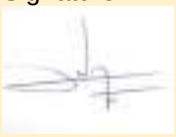
Yours Sincerely,

Teofilus Nghitila
EXECUTIVE DIRECTOR

Angola: Mrs Carla Esperança Narciso Pompilio da Silva Balça Senior Climate Change Specialist Ministry of Environment, Angola	Date 19 July 2024  ADAPTATION FUND Letter of Endorsement by Government Republic of Angola Ministry of Environment To: The Adaptation Fund Board c/o Adaptation Fund Board Secretariat Email: Secretariat@Adaptation-Fund.org Fax: 202 522 3240/5 Subject: Endorsement for the regional project titled 'Building Inclusive Resilience to Climate Change for Semi Nomadic Agro Pastoral Communities in the Transboundary Kunene River Basin' In my capacity as designated authority for the Adaptation Fund in Angola, I confirm that the above-mentioned regional proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Angola. Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the implementing Entity for the project will be International Fund for Agriculture Development. Sincerely, Carla Esperança Narciso Pompilio da Silva Balça The Focal Point of Adaptation Fund

Annex 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 Angola and Namibia 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.	
Implementing Entity Co-ordinator: Mr Pierre Yves Guedez, Lead, Multilateral Climate and Environmental Funds ECG Division, IFAD	Email : p.guedez@ifad.org Signature: 
Director Juan Carlos Mendoza Casadiegos Director Environment, Climate, Gender, and Social Inclusion Division	

Date: (20.01.2025)	email: ecgmailbox@ifad.org
Project Contact Person: Mr Claus Reiner Regional Climate and Environment Specialist East and Southern Africa, ECG Division, IFAD Tel : +254 793 484 367 Email : c.reiner@ifad.org	
Country Directors Francesco Rispoli Country Director for Namibia, ESA, IFAD f.rispoli@ifad.org Custodio Mucavele Country Director for Angola, ESA, IFAD c.mucavele@ifad.org	

Annex C: Free, Prior and Informed Consent (FPIC)

1. Introduction

Free, prior, and informed consent (FPIC) is an operational principle empowering local communities to give or withhold their consent to proposed investment and development programmes that may affect their rights, access to lands, territories, resources, and livelihoods (IFAD, 2015). Communities' rights are at times infringed upon by new investments in their area resulting in negative impacts.

FPIC should be solicited in a manner that ensures all affected community members—regardless of gender, age, or socio-economic status—are fully informed and have an equal opportunity to provide consent. Information should be provided in formats and languages that are accessible to all community members, including visual aids or oral presentations for those who may not be literate. The project will ensure that consultations are culturally appropriate and timed to respect community customs and schedules. The information shared must be comprehensive and sufficiently detailed, covering potential environmental, social, and economic impacts, and should include any long-term commitments the community will need to make

Potential rights infringed upon	Negative Impacts
· Right of physical access · Right to food · Rights to secure land tenure including · Right to natural resources · Right to decision making and self-determination · Right to work · Right to a healthy environment including social amenities	· Loss of culture and natural heritage · Loss of land tenure · Exclusion and/or undermined participation in decision making · Forced participation (at times in exploitative systems) · Loss of income and/or employment · Exacerbation of poverty · Reduced food and nutritional security · Weakened local governance system · Increased inter and intra conflict

FPIC is a principle protected by international human rights standards that state, 'all people have the right to self-determination' and linked to the right to self-determination – 'all people have the right to freely pursue their economic, social and cultural development'. This guide is deeply rooted in a human rights-based

approach and is designed to assist the project implementing team to respect the right to FPIC when developing and implementing the project.

The Guide is also supported by the Policy on Environment and Natural Resource Management (2011): "Respecting the principle of free, prior and informed consent, IFAD supports indigenous peoples in enhancing the resilience of the ecosystems in which they live and in developing innovative adaptation measures and emerging opportunities for indigenous peoples' engagement in carbon sequestration and the provision of other environmental services."
FPIC is solicited through consultations in good faith with the representative institutions endorsed by communities. It ensures that they participate in decision-making processes concerning a given development project.

All elements within FPIC are interlinked, and they should not be treated as separate elements. The first three elements (free, prior, and informed) qualify and set the conditions of consent as a decision-making process. In short, consent should be sought before any project, plan or action takes place (prior), it should be independently decided upon (free) and based on accurate, timely and sufficient information provided in a culturally appropriate way (informed) for it to be considered a valid result or outcome of a collective decision-making process.
Consent should be sought in a way that is "free, prior and informed" [1]:

- Free implies no coercion, intimidation, or manipulation.
- Prior implies that consent has been sought sufficiently in advance of any decision point or commencement of activities.
- Informed implies that information provided covers all relevant issues to make decision maker fully enlightened.

Consent is the expected outcome of the consultation, participation, and collective decision-making process by the local communities.

2. General Guiding Principles

a) Responsibility and institutional capacity for seeking FPIC

The IFAD general policies and procedures, stipulate that the borrower or grant recipient is responsible for programme and project preparation, including social, environmental and climate assessments and seeking FPIC. In this case, the Government of Angola and Namibia represented by the Ministries of Environment will be responsible for seeking the FPIC from affected communities. However, the project's **implementing entity**, IFAD, will play a supportive role in facilitating this process. IFAD will provide technical assistance in the design and execution of FPIC processes, ensuring that community engagement is done transparently and inclusively. IFAD will also support the Ministries in aligning the FPIC process with international human rights standards and best practices.

The first step is for the Governments to identify the laws that regulate the rights to land, sea, and other resources. If regulations and boundaries are not clearly known or if the process was never done, this can be rectified by conducting early consultations with concerned communities and inclusion in project implementation design of the measures, approaches, and resources for ensuring demarcation and recognition of territorial and communal rights.

b) Identifying representative institutions

To ensure legitimacy, it is crucial that FPIC be obtained from the representative institutions of local communities. Understanding how communities make decisions is the first important step in the FPIC process. The important criteria are that representation should be determined by the concerned people and communities themselves to avoid misrepresentation or manipulation. This can be done in line with the community structure for representation, in accordance with the table below.

Table 21: Local governance structures

Level of Governance	Institutions
Central Government	Government Ministries and Departments
Local Government	Provincial and District Delegations Chief of Administrative Post
Traditional/Community Authority	Traditional Chiefs Head of Ten Households Village Committees Water Point Committees, Farmer Field Schools

In general, representative institutions must strive to adhere to the principles of inclusive consultation, participation, and consent in their internal decision-making processes. The FPIC process at design and implementation phases is intended to ensure that the project does not negatively affect the future beneficiaries. Solutions should be found during the consultation on how to maximize benefits expected from local communities.

c) Consultation, participation, and consent

Consultation is an important feature of any project design process. The project is expected to follow the IFAD participatory approach to ensure that local communities are included in project design. It will give appropriate attention to women and young people in these consultations.
Besides the initial Impact assessments of the project at design stage, Governments of Namibia and Angola will institute a continuous consultation process during implementation.
Consent to the project or to a project component or specific activity under a component, will be an outcome of the collective decision-making process by the local communities. GoA and GoN will seek recorded consent agreements with the concerned communities through their freely chosen representative bodies to engage in the FPIC process.

The consent agreement and record will document the outcome(s) of the process and terms and conditions agreed upon. It will also document any dissent to the overall project or project activities. The agreement must be independently verified as fair and true by the communities and follow the process agreed by them. The procedures and rules of the FPIC process will be largely determined by the communities affected and those who have the right to give or withhold consent. The FPIC process must be in harmony with their own governance and internal collective process for taking decisions.

Consultation processes will be designed to align with the cultural values and practices of the communities involved. Special consideration will be given to **Indigenous knowledge systems**, ensuring that consultations are held in locations and at times that respect traditional structures. The project will involve **traditional leaders** and community elders in the consultation process, alongside modern governance representatives, to ensure inclusivity and respect for community traditions. The project will also facilitate consultations using language and formats that are accessible to all community members, including oral and visual methods for those who may not be literate.

In addition to ensuring the inclusion of **women** and **youth** in the FPIC process, the project will integrate gender-sensitive approaches to consultation and decision-making. Special efforts will be made to ensure that women's voices are heard and that they have an equal role in the decision-making processes. This will be facilitated through targeted community sessions focused on women, as well as ensuring that women are well-represented in community leadership roles related to the FPIC process. The project will also engage with vulnerable groups such as the elderly, people with disabilities, and marginalized communities to ensure that their perspectives are included in the consultation and consent process.

d) Documenting consultation, participation and FPIC

GoA and GoN will undertake to document all consultations, participations, and consents in the following manner:

- Keep record of consultations undertaken: - how participants were selected and invited; what documentation/information they received beforehand and in which language; who participated; what was discussed; and what was agreed.
- Keep record of participation: when did representatives of indigenous peoples and local communities participate; how they were selected; what institutional roles or accountability links to constituents do they have; what commitments do they assume; and what agreements were made.
- Document specific instances that express FPIC: often FPIC is expressed as an agreement between the borrower (or the duly designated implementing agency) and the concerned local communities. These agreements should clearly articulate what has been agreed (issues, commitments, time frames, budgets, roles, responsibilities, etc.); who entered into the agreement (clearly identifying the individuals involved as well as their title and role); and what mechanisms have been set up to maintain dialogue and address disagreements.
- In addition to documenting FPIC agreements, a Grievance Redress Mechanism (GRM) will be implemented to address any complaints or concerns that arise during the consultation and implementation phases. The GRM will allow community members to voice concerns, lodge complaints, and track the resolution of their issues. Any withdrawal of consent by a community during project implementation will be formally addressed through this mechanism, and steps will be taken to understand the reasons behind the withdrawal and resolve any issues identified. The GRM will be accessible in both rural and urban areas and will ensure that communities are informed of the steps to take if they feel their rights are infringed upon.
- A feedback loop will be integrated into the FPIC process to ensure continuous communication with the affected communities. This feedback loop will include regular follow-up consultations, where community members can provide ongoing input into the implementation of the project. This will ensure that any concerns or changes in the community's needs are addressed in a timely manner. The feedback will be documented and acted upon by the project management team, with an open and transparent process for resolving any issues that arise.
- To ensure that FPIC is adequately and timely solicited, the project will establish a clear timeline for each stage of the FPIC process. This includes timelines for:

- Sociocultural and land tenure assessments (to be completed within three months of project initiation).
- Community consultations (to take place during the first six months of the project).
- FPIC decision-making (to be formalized within nine months).
- These timelines will be outlined in the FPIC plan and communicated to the community, ensuring that all stakeholders are informed of the process and its key milestones.

3. Where to seek FPIC

FPIC is not so much a safeguard principle, rather a proactive approach to identify development pathways with local communities and it is applied in two scenarios (IFAD, 2015):

- Investment projects that may have an impact on the land access and use rights of rural communities,
- Projects targeting indigenous peoples or rural areas that are home to indigenous and tribal peoples and ethnic minorities.

The first scenario refers to the type of investment project and the second to the type of project area and target groups. The table below outlines the FPIC requirements according to these two criteria.

Table 212: FPIC requirements based on project type and areas of intervention

No.	Location	Project likely to affect land access and/or use rights of communities	Agricultural and rural development projects unlikely to affect land rights (agricultural technologies and production, value chain development, social infrastructure)	Project supporting demand-driven services to individuals (rural finance, small and medium-sized enterprise development)
1.	Rural areas without indigenous peoples or minorities.	· YES	· NO	· NO
2.	Rural areas with some indigenous peoples and minorities' communities.	· YES	On a case-by-case basis	· NO
3.	Indigenous people's territories or tribal areas	· YES	· YES	· YES

In projects that affect land access and use rights of communities, the principle of FPIC is applied to local communities in a broad sense, i.e., the local communities that will potentially be affected, are identified during project design and in application of SECAP.
However, there is a general requirement for FPIC [2]. in areas that are home to indigenous and tribal peoples and ethnic minorities.

4. Seeking FPIC at design phase

When the precise nature and specific location of an investment is known and well defined, FPIC must be solicited at design stage. In the case of this project the precise nature and specific locations of the potential investment were not known, thus GoA and GoN were not expected to directly seek FPIC at this stage.
However, the project was required to carry out an Environmental, Social and Climate Management Framework (ESCMF) study using the IFAD Social, Environmental and Climate Assessment Procedures (SECAP). IFAD Social, Environmental and Climate Assessment Procedures (SECAP) is a key mechanism to identify requirements for FPIC at the design stage. The ESCMF identifies project components with potential direct and significant impact on local communities, which require FPIC of national or subnational representative institutions of local communities during the design phase.

5. Seeking FPIC at implementation stage

FPIC of investments is sought during the implementation phase when:

- The project, or some of its component, is likely to affect land access and use rights of local communities, and/or
- The project area is home to indigenous and tribal peoples and ethnic minorities.
- Communities are not identifiable at project design stage.
- Specific investments in specific communities are not predefined during the project design phase, but open to communities' demand during the project implementation period.

If at design stage the specific locations and communities to be affected were not identifiable, the project documents will include the FPIC implementation plan describing how the participatory and consultation process for seeking communities' consent would be conducted. The FPIC would then be sought during implementation before a specific investment is decided in each community.

Since investments in specific communities and territories were not identifiable during the project design stage, FPIC will further be solicited during the implementation phase.

The outline for the FPIC plan includes the following steps:

- Sociocultural and land tenure assessment

- Identification of decision-making institutions and representatives to ensure full, effective, and equal participation of stakeholders.
- Consultation process leading to FPIC.
- Formalised consent agreement.

The FPIC implementation plan indicates:

- When and how the sociocultural and land tenure assessment will be undertaken.
- When and how consultations will be carried out to identify decision-making institutions.
- When and how consultations leading to FPIC will be carried out.
- By when the consent agreement will be formalised with the local communities.

The FPIC implementation plan will outline the following steps:

- Sociocultural and land tenure assessment: This assessment will identify the governance structures, land tenure systems, and potential risks to community rights.
- Identification of decision-making institutions: This step will ensure that the relevant local authorities, traditional leaders, and community representatives are included in the FPIC process.
- Consultation process leading to FPIC: The process will include a series of consultations, meetings, and public discussions that will allow for community-wide input into the project.
- Formalized consent agreement: The outcome of the FPIC process will be documented in a formal consent agreement that outlines the terms and conditions agreed upon by the community. This will be signed by community representatives and the project implementing team and will be kept on record as evidence of community consent.

Annex D. Gender Assessment

With the launch of the Sustainable Development Goals (SDGs) in 2015, the international community committed to providing inclusive and equitable quality education for all (SDG4), as well as achieving gender equality and the empowerment of all women and girls (SDG5), the Global Goals also emphasise the need to "leave no one behind", focusing first on those who are furthest behind, such as those affected by the crisis. In this regard, SDG goal 2 is to combat hunger and poverty by 2030, double the agricultural productivity and income of smallholder food producers, particularly women, indigenous peoples, subsistence farmers, pastoralists, and fishers, by ensuring equal access to land and other productive resources such as knowledge, financial services, markets and opportunities for value addition and non-farm employment. The main objective of gender mainstreaming policies and tools is to reduce the long-term eradication of poverty, which is perceived not only as a scarcity of income and financial resources, but also includes the notion of inequalities in access to and control of material and immaterial benefits in a project.

Gender equality as a fundamental value that must be reflected in development choices and institutional practices. One of the important aspects is the increased involvement of women in decision-making processes (formal and informal) on social values and development directions.

Gender mainstreaming ensures equitable access to society's resources, including socially valuable goods, rewards, and opportunities. It also means women being able to influence on an equal footing with men in what is valued by society, defining what direction development should take and how opportunities should be distributed.

The primary goal of gender mainstreaming is to ensure that gender-sensitive practices become routine in all aspects of project activities and institutions, rather than consigning gender equality concerns to specific

project-based interventions. Integration has been targeted because it is the ideas and practices of integration that determine who gets what and motivate the distribution of resources and social opportunities, such as recognition and personal security.

This requires more than just focusing on aspects developed by an organisation; it also requires a deliberate effort on the part of the institution (project) as a whole, and an understanding of how it works, to identify gender-specific vulnerabilities and opportunities related to climate change impacts in the target communities.

Gender considerations have been factored into this project's stakeholder consultation process, identification of adaptation solutions and in the design of the project. The community consultations were undertaken using focus group discussions where, separately and in mixed groups, men and women groups were facilitated to better understand and articulate their specific climate change concerns and resilience needs. The timing and the location of the consultation meetings took into consideration the participation of women. Consultations were held close to villages to ensure easy transportation and reduce disruption to childcare, as well as to accommodate the elderly who are less mobile. The communication during meetings was in local languages, to facilitate understanding by the less literate.

There will be ongoing consultation throughout the implementation of the project, to ensure that it remains aligned with the expressed needs of the different gender groups. Use of radio broadcasts and picture leaflets are planned, for the less literate. Consultation will be well balanced for both men and women (50% women participation). Consultation meetings will be co-facilitated by female staff to attract women participation, to bring a balanced gender perspective and broader gender expertise. Stakeholders such as the national Ministries for women and/or youth, gender equality CSOs/NGOs, local women's groups, and community-based organisations, will be invited to participate in the stakeholder consultative process.

This gender assessment considers intersectionality of existing gender inequality and exclusion, through collection data disaggregated by sex, age, disability, and economic status. Consultations considered the priorities, opportunities, needs, constraints and knowledge of both women and men. During project implementation, the IFAD Gender Expert will work closely with the FAO Gender Officer at the regional level and the gender focal points of the Ministries of Environment of Angola and Namibia, to ensure that all activities and interventions comply with IFAD, FAO, Adaptation Fund, and national government gender guidelines. The project's Monitoring, Evaluation, Accountability and Learning Officer will ensure gender mainstreaming in the project's day-to-day activities, including the use of gender-disaggregated indicators. Furthermore, during project implementation, emphasis will be placed on ensuring outreach strategies that achieve active participation of women in project activities, committees, capacity building and policy discussions, which are the cornerstones of effective intervention. Resource management capacities of women will be explored as an essential basis for designing responses to climate change and disaster risk reduction.

Demography

Angola: Angola has a population of 36.7 million (2022) people of which the female population amounts to approximately 50.6%.[56] Angola's maternal mortality ratio is 241 per 100,000. As of February 2021, 29.6% of the seats in parliament were held by women. In 2018, 24.7% of the women aged 15-49 reported that they had been subjected to physical/or sexual violence by a current or former partners in the previous 12 months. The employed population below the international poverty line consist of 48.7%F and 45.4%M. Unemployment rate is 9.1%F and 10%M. The prevalence of food insecurity in the adult population is 66.5%F and 61.7%M. literacy rate is 66%F and 53%M. The proportion of women in managerial position is 29.8% and the proportion of women in senior and middle management is 18,2%. The mortality rate attributed to household air pollution was 78 deaths per 100000 population. The proportion of population with primary clean fuels and technology is 50%.[57] Angola life expectancy is 62 years (2022).[58]

[56] Population, female (% of total population) - Angola | Data (worldbank.org)
[57] Country Fact Sheet | UN Women Data Hub
[58] Life expectancy at birth, total (years) - Angola | Data (worldbank.org)

There is gender disparity in education, with higher illiteracy in women compared to men. The gap is attributed to gender-based discrimination, lack of access to education and poverty. Enrolment in primary education is slightly higher among boys than girls during 2018[59]. Gender disparities are pronounced in secondary education, where parity index is 0.89 for urban areas and 0.62 in rural areas.[60]

Angola HDI value for 2018 is 0.574 which puts the country in the medium HD category positioning it at 149 out of 189 countries. In 2018, the HDI value was 0.546 for females in contracts with 0.605 for males. Angola has a GII value of 0.578, ranking it 144 out of 162 countries in the 2018 index. In Angola, 30.5 percent of parliamentary seats are held by women, and 23.1 percent of adult women have reached at least secondary level of education compared to 38.1 percent of their male counterparts. For every 100,000 live births, 477.0 women die from pregnancy related causes; and the adolescent birth rate is 150.5 births per 1,000 women of ages 15-19. Female participation in the labour market is 75.4 percent compared to 80.1 for men [61]

Namibia: The population for Namibia is 2.6 million (2023) with 1.35 million female population. Namibia's maternal mortality ratio is 195 per 100,000. As of February 2021, 44.2% of the seats in parliament were held by women. In 2018, 15.9% of the women aged 15-49 reported that they had been subjected to physical/or sexual violence by a current or former partners in the previous 12 months. The employed population below the international poverty line consist of 10.7%F and 7.7%M. Unemployment rate is 18.6%F and 21.1%M. The prevalence of food insecurity in the adult population is 70.6%F and 66.4%M. literacy rate is 91.5%F and 91.4%M. The proportion of women in managerial position is 43.6% and the proportion of women in senior and middle management is 48.2 %. The mortality rate attributed to household air pollution is 102 deaths per 100000 population. The proportion of the population with primary clean fuels and technology is 46%. Namibia life expectancy is 62 years (2022)[62]

Namibia's Human Development Index (HDI) for 2018 is 0.645 - which put the country in the medium human development category - positioning it at 130 out of 189 countries and territories[63]. The proportion of seats held by women in parliament was 44.23% as of 2021, and 100% of girls and 92.2% of boys' complete lower secondary school in Namibia as of 2022 data.[64]

Legal status for women and laws on gender

Namibia's commitment to gender equality and non-discrimination is enshrined in its Constitution and supported by a robust framework of laws and policies. The Constitution guarantees equal citizenship rights regardless of gender, ensuring equality before the law and prohibiting discrimination based on various grounds including sex, race, and socioeconomic status (Articles 4, 10, and 23). Affirmative action measures aim to rectify past injustices, particularly towards women, while promoting equal opportunity policies (Article 95)[65].

The National Gender Policy (2010-2020)[66] is pivotal in this pursuit, guiding strategies to empower both women and men across various sectors. Key areas include poverty reduction, education parity, healthcare access, and combating gender-based violence. Legislative strides like the Married Persons Equality Act and the Combating of Domestic Violence Act further bolster these efforts.

Regarding LGBT rights, Namibia recognises legal disparities, with homosexuality unlawful for males but not for females. Efforts to combat discrimination based on sexual orientation are underway, albeit unevenly implemented.

[59] https://www.statista.com/statistics/1302193/primary-school-enrollment-in-angola-by-gender/
[60] https://www.unicef.org/angola/educacao
[61]https://www.undp.org/sites/g/files/zskgke326/files/migration/ao/5f4569884edb07088c252a5c58610e6fadd51b41cdbc5d127080a915a38d8b5f.pdf
[62] https://data.worldbank.org/indicator/SP.DYN.LE00.IN?locations=NA
[63] https://namibia.un.org/en/about/about-the-un
[64] genderdata.worldbank.org/en/economies/namibia
[65] Namibian Constitution (lac.org.na)
[66] NATIONAL GENDER PLAN OF ACTION 2010-2020 (1).pdf

In Angola, significant progress has been made alongside challenges in gender equality. Recent legal reforms have decriminalised same-sex relationships and prohibited employment discrimination based on sexual orientation. The Presidential Decree on National Gender Equality Policy (2013)[67] and subsequent legislative measures aim to advance gender parity in education, employment, and societal roles.

Both countries' commitments underscore their dedication to upholding human rights and fostering inclusive societies. Despite advancements, ongoing efforts are essential to address persistent disparities and ensure equitable opportunities for all citizens.

Gender context: the situation of women in the target communities and opportunities for greater social inclusion

In the project's target areas, women make up more than 70 per cent of the active agricultural workforce and dominate crop production and informal marketing channels.[68] Women are responsible for domestic food security and have few economic alternatives outside of agriculture. Gender differences identified in the agricultural sector include access to economic resources – land, money, machinery, and credit; access to market institutions and public infrastructure; access to agricultural inputs; technical knowledge; and participation in income-generating projects. Efforts are needed to help women improve their technical capacity and access to capital, enabling their transition to higher-value activities and increasing their participation in income-generating agriculture through farmer field schools.

The main barriers to women's empowerment stem from normalised discriminatory social customs and behaviours. Furthermore, lack of services such as clean water, basic education, literacy programmes, maternal and child health care, sexual and reproductive health education services, access roads, public transport, energy, decent housing, mobile telecommunications, hinder the quality of life of the target populations, in particular women. These challenges are exacerbated by climate change impacts.

The social environment in rural communities reflects conditions of underdevelopment, necessitating adaptations by the population due to prolonged delays in receiving solutions. Rural communities are adapting to climate change, albeit unevenly; however, women, children, and the elderly bear the brunt of these changes. Women and elderly individuals are often responsible for family care and household duties, while men migrate with livestock in search of pasture. This situation leaves elderly people, who may have limited mobility, confined to their homes without adequate living conditions.[69]

In Angola, the incidence rate of multidimensional poverty in rural areas (87.8%) is more than double that of urban areas (35.0%). Financial problems are more frequent among women in rural areas (76%) than in urban areas (58%). It was also found that the problem of distance to the nearest health facility is greater in rural areas (68%) than in urban areas (45%). The results of the 2015-2016 Multiple Indicators and Health Survey (IIMS) published in June 2017 state the following:

Water for drinking: Two-thirds of households in urban areas and one-third in rural areas have access to appropriate water sources for drinking.

Toilet facilities: About one third (32%) of households have appropriate, non-shared toilet facilities. However, 9% of households in urban areas and 63% in rural areas do not have any sanitation facilities.

Electricity: In only 21% of households had access to electricity.

[67] www.ecolex.org/details/legislation/presidential-decree-no-22213-on-the-nationa…

[68] An Overview of Women's Work and Employment in Angola – Decisions for Life MDG3 Project, Country Report #2:

[69] https://mercado.co.ao/opiniao/o-idh-esperanca-de-vida-escolaridade-e-diversificacao-LX1220409

Over time, the situation of extreme poverty has become worse in rural areas, reaching 63% of the population. This scenario is reflected in the reality of women in the rural communities visited in the commune of Chitado.[70]

In Angola, climate change disproportionately impacts women due to entrenched cultural norms and roles. Men typically hold dominant positions as household heads, reinforced by customary laws that often contradict gender equality standards. This perpetuates inequalities in economic participation and legal rights, leaving women vulnerable in agriculture and food production. Limited access to land, resources, and training intensifies their susceptibility to climate shocks such as droughts, undermining economic independence and food security. Meanwhile, men migrating for income during environmental crises increase women's household and agricultural responsibilities despite their limited rights. Boys may leave school for economic support, while girls take on more domestic duties, risking dropout or early marriage. Women and girls face greater health risks and gender-based violence due to compromised water and sanitation systems during climate events. These disparities highlight how climate change exacerbates gender inequality, hindering equitable development in Angola.

In the consultations conducted with communities in Chitado commune, Angola, it became evident that the population is dispersed, with families requiring extensive land for grazing purposes. Traditionally, men typically move across regions to locate suitable grazing areas and water sources for their livestock, while women remain behind to tend to small livestock and care for children. Importantly, women in this region do not inherit property or cattle. Due to limited access to services and healthcare facilities within Angola, many women migrate to Namibia seeking employment opportunities and better healthcare. Language barriers further complicate access to services within Angola, whereas across the border in Namibia, Himba people—who share the same language—often find services more accessible and accommodating.

Women migrating to Namibia for work often bring their children, but the Himba's polygamous practices sometimes leave women neglected as they care for their children alone. High divorce rates have increased households headed by women, breaking traditional collectivism as households manage independently on their farms.

Water accessibility is the primary challenge highlighted by communities. Women trek long distances for water, while men seek pasture and water for livestock in Namibia. Limited boreholes exist, with issues like saline water and unreliable natural springs and hand-dug wells due to droughts and safety concerns. Access to the Kunene River is restricted by commercial farmers, forcing risky bucket use for fetching water where possible. Communities stress that improved water access would support vegetable cultivation for food security.

Accessibility issues include poor roads hindering drought relief distribution to remote communities. Lastly, inadequate connectivity with no antennas for data transmission limits early warning systems. Electricity is sparse outside local authority offices, complicating staff retention due to isolation from basic amenities and families.

In Namibia, the impacts of climate change underscore the influence of established gender norms. Women, primarily responsible for water collection, food preparation, and agriculture, face heightened burdens as climate-induced droughts and resource depletion limit their time for education and economic activities. Men, traditionally involved in livestock rearing, may migrate due to changing pasture conditions and water scarcity, disrupting family dynamics, and increasing women's responsibilities. Boys often interrupt their schooling to support agricultural tasks or fill roles left by migrating fathers, impacting their educational achievements and future opportunities. Girls, typically tasked with domestic chores like water fetching, bear increased responsibilities during environmental stresses, leading to higher dropout rates and constraining their prospects. These impacts transcend economic impacts, affecting health, education, and overall well-

[70] Angola - Inquérito de Indicadores Múltiplos e de Saúde (IIMS) - 2015-2016 (gov.ao)

being, highlighting the necessity for adaptation strategies that address and accommodate gender roles for equitable outcomes in Namibia's communities.

The consultations with the women in Namibia revealed the challenges faced by the community mainly due to drought and the broader impacts of climate change. The loss of livestock, the mainstay of livelihoods, has left families without milk or food for their children. Despite social grants intended to support families, these funds are largely spent on school fees, leaving little for other essential needs.
The situation is exacerbated by livestock diseases, which are not responding to available treatments, further diminishing resources. Access to drinking water is a critical issue, with women often travelling long distances to fetch water from wells that lack proper safety measures, leading to tragic accidents.

Gender inequalities compound these hardships. Women, regardless of marital status, face significant disadvantages. They are often marginalised in decision-making processes and excluded from inheriting property or livestock. Economic opportunities are limited, and cultural norms such as polygamy perpetuate inequality, leaving many women and their children vulnerable.

The lack of support and the unequal distribution of resources within households place immense burdens on women, particularly single mothers who lack adequate social and economic protection. It's evident that addressing these complex issues requires comprehensive support, including improved access to safe water sources, better healthcare, and economic opportunities that empower women and promote gender equality.

Advocating for change in cultural norms and policies that uphold women's rights and economic independence is crucial. Communities and stakeholders must work together to ensure that women are included in decision-making processes and have equal access to resources. This holistic approach is essential for building resilience against climate impacts and promoting sustainable development that benefits everyone in the community.

Gender barriers and inequalities

- Women and young people crave better living conditions for their families. Men have opportunities to access employment in Namibia on commercial farms, but most women in the target group face many barriers due to lack of access to information, very high level of illiteracy, and many do not have any form of identification, which limits their mobility.
- The language of the pastoralist communities is not understood by everyone in the commune of Chitado, in the hospitals at the local level there are communication difficulties in addition to the lack of medicines, they resort to the neighbouring country of Namibia in the public hospital units there is always someone who understands the language and facilitates presentation of health problems affecting women and children in medical care.
- Women have limitations in terms of agronomic and environmental knowledge, financial and material means, which constitute difficulties in developing agriculture as a family subsistence activity.in addition the women lack secure land tenure to access finance.
- Women have limitations in the use of ICTs, and this considerably limits them in their access to information and lack of knowledge of the reality of the country and the place where they live.
- During transhumance, men move to other locations with pasture, and women and children are limited in access to animal milk and meat for food, leading to poorer nutrition.
- There are no social programmes to support the elderly, the elderly, children, and women, leaving them vulnerable against domestic violence.
- Women face psychological violence, often because their partner has more than one wife, and claim rights for mistreatment without any defence and knowledge about human rights and women's rights to inhibit certain problems.
- Raised concerns about polygamy in the community and its discontent in the way they live with their partners; in some cases, violence occurs in families.
- Widowed women are afraid to remarry, to avoid family problems.

- Customary traditions and weak legislative frameworks often deny women rights to land ownership and inheritance.
- Lack of access to care for pregnant women and treatment of children due to lack of maternity hospital in the locality. The non-existence of maternity hospitals has led to deaths of pregnant women and newborn infants.
- Transport and communication routes in poor condition do not facilitate the movement of the population, requiring long hours of travel from one location to another. People from the Angolan side of the border travel for up to 4 days to access social services in Namibia, which is closer than the provincial capital of Kunene.
- Many children in pastoral communities do not have access to school because they live too far away.
- Schools do not have access to teaching materials and cannot provide school meals, given the local context, to support children and prevent dropout.
- Lack of access to healthcare facilities places a particular burden on women, as they are primarily responsible for caring for the sick.
- Difficulties in accessing communication, due to the lack of telecommunications connectivity, means that forecasts and warnings issued by the responsible authorities may not be received by the communities. As women travel less into the urban centres, they have lower access to information than men.
- Hunger phenomenon due to drought and rainwater shortages.
- Cattle theft has been a constant problem, negatively impacting the livelihoods and nutrition of families.
- Cutting down trees without replacing them has led to deforestation, harming nature, and leading to a less supportive natural environment for human health, lack grazing for animals and fuelwood.
- Cases of violent crime and sexual abuse have occurred, with little response capacity of public services, due to the remoteness of the communities.
- There are no women in the local police force due to poor working conditions.
- In 2021 was the year that saw the highest emigration of rural people from Angola to Namibia, and many Angolans did not return to their homelands, as they found better living conditions in relation to their areas of origin.

Gender needs that the project could address in the target communities

The following needs were identified in consultation with the target communities, that they would like the project to address:

- Literacy and language learning programs in communities, to facilitate their effective participation in development projects
- Capacity building in the use of new agricultural and animal production technologies including rehabilitating rangelands through planting of fodder crops.
- Improving knowledge on climate change adaptation
- Inclusion of education services for children in the communities and access to school meals
- Installation of solar pumps for the irrigation of crops and access to water for family consumption
- Improving knowledge about reforestation and afforestation
- Leadership training for women, so that they can participate more effectively in decision-making at community level and empower women's participation in decision-making processes.
- Environmental education to improve knowledge on the potential impact of climate change and reduce vulnerability in the communities
- Reinforcement of knowledge about pest control in livestock and crop agriculture
- Access to the means for greater production in agriculture, such as access to finance.
- Promotion of technical and professional courses for young people
- Greater access to water through labour-saving technologies

- Awareness raising on human rights and women's rights, to curb discrimination and gender-based violence.
- Capacity building in the use of new agricultural and animal production technologies
- Access and reinforcement of knowledge to be able to use ICTs, to access climate information and early warnings.
- Secure land tenure: While there are legal frameworks supporting women's land rights in Angola, advocacy and reforms are necessary to fully realise and implement these protections.
- Special considerations for indigenous women, widows, and female-headed households include tailored support to address their diverse needs and challenges effectively, thereby ensuring that development efforts leave no one behind.

Annex E: Gender Action Plan

To ensure equitable participation and benefits for women and men in the project, the following activities are proposed. These activities are incorporated into the project results framework, and the budgets for them are incorporated into the project activity budget. Please note that as this project targets the semi-nomadic agro-pastoralist indigenous communities of the Kunene River Basin, it is intended that all the beneficiaries of the Gender Action Plan shall be from this category of stakeholders.

Table 23: Gender Action Plan

Impact statement Improve gender-responsive adaptive capacities and resilience to climate variability and change of rural crop/livestock smallholder farmers, agro pastoralists, and pastoralists in Kunene water basin.					
Component 1: Co-design with beneficiary communities and stakeholders, and implementation of a Plan for Disaster Risk Reduction through Ecosystem-based Adaptation in the Kunene River Basin (KRB: EbA-DRRP)					
Activities	**Indicators**	**Target**	**Timeline**	**Responsibilities**	**Costs**

Output 1.1.1 Knowledge gaps for the preparation of the KRB: EbA-DRRP identified, through a Water Security Assessment and an Ecosystem Goods and Services Valuation Activity 1.1.1.1 Undertake a Water Security Assessment in the Kunene Basin Consultation meetings held with indigenous women on water security in Kunene Activity 1.1.1.2 Undertake Ecosystem Goods and Services quantification and valuation Awareness and consultation meetings with indigenous people including women on EbA in Kunene Activity 1.1.1.3 Develop a basin-wide gender-inclusive Disaster Risk Reduction Plan focused on Ecosystem-based Adaptation Awareness and consultation meetings held with indigenous women on DRR plan in Kunene	A minimum of 10 meetings will be held in the first 3 months with the goal to reach 1000 indigenous women in 10 communities (30% of which are from female headed households and other vulnerable sub-groups (e.g., widowed, minorities, disabled, the elderly) in total (baseline at implementation start: 0). A minimum of 10 meetings will be held in the first 3 months with the goal to reach 1000 indigenous women in 10 communities (30% of which are from female headed households and other vulnerable sub-groups (e.g., widowed, minorities, disabled, the elderly) in total (baseline at implementation start: 0)	1000 indigenous women reached by project by the end of the water security assessment (year 1) 1000 indigenous women reached by project by the end of the EbS goods and services qualification assessment (year 1)	Start by year 1 6000 indigenous women by end of year 1	PIU Gender Specialist	$50,000 $50,000
Output 1.1.2 A Basin-wide Gender inclusive DRR Plan focused on Ecosystem-based Adaptation is developed.	A minimum of 10 meetings will be held in the first 3 months with the goal to reach 1000 indigenous women in 10 communities (30% of which are from female headed households and other vulnerable sub-groups (e.g., widowed, minorities, disabled, the elderly) in total (baseline at implementation start: 0)	1000 indigenous women reached by project by the end of the development of the inclusive DRR Plan focused on Ecosystem-based Adaptation (year 1)	Start by year 1 3000 indigenous women by year 1	PMU. Consultant, Gender Specialist	$50.000
Activity 1.1.2.1 Facilitate engagement and co-planning of the Kunene River Basin by its stakeholders: Hold consultative meetings with women at national, provincial,	A minimum of 2 KRB co-planning activities per year with the goal to reach 25000 indigenous women in 20 communities (30% of which are from female headed households and other vulnerable subgroups (e.g.,	15000 indigenous women reached by project mid-term (year3) 25000 indigenous women reached by project finalisation (year 5)	Start by year 1. activities conducted annually • By year 3 (15000 indigenous women reached) • By year 5 (total of 25000 indigenous women reached)	PMU, GoA, GoN	$40.000

municipal and community level on co-planning of the Kunene River basin	widowed, minorities, disabled, the elderly) in total (Baseline at implementation start: 0)				
Activity 1.1.2.2 Facilitate development of a: Free, Prior and Informed Consent (FPIC) Plan Hold awareness and consultation meetings with indigenous women on FPIC in Kunene River basin Activity 1.2.1.3 Facilitate dialogue between beneficiary gender and ethnic subgroups through Scenario Planning Conduct Scenario Planning during the FPIC consultations	A minimum of 2 FPIC consultations activities per year (one in Namibia and one in Angola) with the goal to reach 10000 indigenous women in 20 communities, 30% of whom are from female headed households and other vulnerable sub-groups (e.g., widowed, minorities, disabled, the elderly) in total (Baseline at implementation start: 0)	6000 indigenous women reached by project mid-term (year 3) 10000 indigenous women reached by project finalisation (year 5)	Start by year 1. activities conducted annually • By year 3 (6000 indigenous women reached) • By year 5 (total of 10000 indigenous women reached)		$75,000
Component 2: Implementation of a satellite-based Multi-Hazard Early Warning System for the Kunene River Basin (KRB: MH-EWS)					
Output 2.1.1 Weather stations for micro-climates in the basin installed, in collaboration with national meteorological agencies Activity 2.1.1.1 Installation of 24 automatic weather stations across the Kunene River Basin, in collaboration with the national meteorological agencies: Provision of training for women and differentiated gender groups in the design and implementation of weather information system	12 local weather stations per country under management by indigenous women's groups are established in the project area in total (progress goal: minimum of 2 by year 2) (Baseline at implementation start: 0)	By the end of the project 80% of indigenous women in the project area will have access to weather information (30% of whom are from FHH and other vulnerable subgroups) (baseline at implementation start: 0%)	21680 indigenous women by end of the project	GoN, GoA, PMU	$20,000
Output 2.1.2 Hydrometric stations installed along the Kunene River, in collaboration with the national hydrological agencies Activity 2.1.2.1 Installation of 16 hydrometric stations along the Kunene River:	16 hydrometric stations under management by indigenous women's groups are established in the project	By the end of the project 80% of indigenous women in the project area will have	21000 indigenous women by end of the project	GoN, GoA, PMU	$20,000

Provision of training for women and differentiated gender groups in the design and implementation of hydrometric stations	area in total (progress goal: minimum of 2 by year 2) (Baseline at implementation start: 0)	access to hydrometric information (30% of whom are from FHH and other vulnerable subgroups) (baseline at implementation start: 0%)			
Output 2.2.1 Multi-level KRB: MH-EWS designed and approved by governments in collaboration with local communities, integrating indigenous knowledge Activity 2.2.1.1 Design the multi-hazard early warning system in consultation with beneficiary communities Hold consultations with indigenous women on multi-hazard early warning system	A minimum of 4 community level workshops (2 for Angola, 2 for Namibia, in year 1 and 2) with the goal to reach 200 indigenous women in 10 communities (30% of which are from female headed households and other vulnerable sub-groups (e.g., widowed, minorities, disabled, the elderly) in total (baseline at implementation start: 0)	200 indigenous women reached by year 1	Start by year 1, activities 100 indigenous women reached by year 1 and 200 by year 2	PMU. Consultant, Gender Specialist	$40.000

Output 2.2.3 KRB MH-EWS operationalised using a cross-border, multi-level, multi-sectoral and multi-disciplinary approach **Activity 2.2.3.1 Operationalise a multi-hazard early warning system for the Kunene River Basin** **2.2.4 Data translated into user-friendly weather forecasts for local communities to understand and act upon** Activity 2.2.4.1 Support meteorological agencies to simplify, translate and disseminate seasonal, weekly, and daily weather forecasts in local languages spoken in the KRB Women in meteorological and broadcasters trained to simplify, translate, and disseminate seasonal, weekly, and daily weather forecasts in local languages	A minimum of 50 women in meteorological services and broadcasting trained per year with the goal to reach 150 women in 75 in Namibia and 75 in Angola in the first 3 years (baseline at implementation start: 0)	Expected number of women trained by year 3 is 150 • 150 women trained by project finalisation (year 5)	Start by year 1. activities conducted annually until year 3 • By year 3 (150 women trained) • By year 5, 150 women trained	Meteorological departments and radio and TV broadcasting stations in Namibia and Angola	$18,000
Component 3: Inclusive community-based adaptation actions are co-designed and implemented					

Output 3.1.1 Water retention infrastructure constructed or rehabilitated to increase access to water for domestic and agricultural use.					
Activity 3.1.1.1 Rehabilitate 20 existing earth/sand dams 3.1.1.2 Construct 20 new rainwater retention ponds (chimpacas) Include women in management committees for the earth dams and water retention ponds	A minimum of 20 indigenous women are co-opted into the water management committees per year with the goal to reach 100 women in 50 in Namibia and 50 in Angola in 5 years (30% of which are from female headed households and other vulnerable sub-groups (e.g., widowed, minorities, disabled, the elderly) in total (Baseline at implementation start: 0)	Expected number of indigenous women reached by year 3 is 60 • 100 indigenous women reached by project finalisation (year 5)	Start by year 1. activities conducted annually • By year 3, 60 women trained • By year 5, 100 women in dam/pond management committees	PMU	$100,000
Women are participating in O&M conservation works for the dams and ponds	A minimum of 200 indigenous women are trained and conducting O&M for dams and ponds per year with the goal to reach 1000 women in 500 in Namibia and 500 in Angola in the 5 years (30% of which are from female headed households and other vulnerable sub-groups (e.g., widowed, minorities, disabled, the elderly) in total (Baseline at implementation start: 0)	Expected number of indigenous women reached by year 3 is 600 • 1000 indigenous women reached by project finalization (year 5)	Start by 200 women year 1. activities conducted annually • By year 3 (600 women trained in O&M) • By year 5, 1000 women trained in O&M		
Women in income generating farming projects utilise water from the dams for watering small livestock and kitchen gardens	A minimum of 200 indigenous women are engaged in income generating projects from dams and ponds per year with the goal to reach 1000 women (500 in Namibia and 500 in Angola) in the 5 years (30% of which are from female-headed households and other vulnerable sub-groups (e.g., widowed, minorities, disabled, the elderly) in total (baseline at implementation start: 0)	Expected number of indigenous women reached by year 3 is 600 • 1000 indigenous women reached by project finalisation (year 5)	Start with 200 women in year 1. Activities conducted annually. • By year 3, 600 women in income generating enterprises • By year 5, 1000 women in income generating projects using dam/pond water		

Output 3.1.2 Improved access to groundwater for gardening and domestic use, to build adaptive capacity by improving health, hygiene, and nutrition					
Activity 3.1.2.1 Rehabilitation of existing boreholes for vegetable gardens and domestic use Provision of improved domestic water source for indigenous women	A minimum of 5600 indigenous women accessing safe potable water per year with the goal to reach 28000 women in 14000 in Namibia and 14000 in Angola in the 5 years (30% of which are from female headed households and other vulnerable sub-groups (e.g., widowed, minorities, disabled, the elderly) in total (baseline at implementation start: 0)	Expected number of indigenous women reached by year 3 is 16800 • 28000 indigenous women reached by project finalization (year 5)	Start by year 1. Activities conducted annually • By year 3 (16800 women in income generating enterprises) • By year 5, 28000 women with improved domestic water	PMU	$50,000
Establishment of kitchen gardens by indigenous women employing traditional and indigenous knowledge	A minimum of 30 indigenous women per borehole establish kitchen gardens reaching 450 women per year with the goal to reach 2250 women in 1125 in Namibia and 1125 in Angola in the 5 years (30% of which are from female headed households and other vulnerable sub-groups (e.g., widowed, minorities, disabled, the elderly) in total (Baseline at implementation start: 0)	Expected number of indigenous women reached by year 3 is 1350 • 2250 indigenous women reached by project finalisation (year 5)	Start by 450 women in year 1. Activities conducted annually • By year 3, 1350 women in income generating enterprises • By year 5, 2250 women practising kitchen gardening		
Outreach and awareness on nutrition, hygiene, GALS, GAPS/FFS and climate resilient agriculture for indigenous women	A minimum of 4500 indigenous women receives awareness training on nutrition, GALS, CSA GAPS per year with the goal to reach 22,500 women in 11250 in Namibia and 11250 in Angola in the 5 years (30% of which are from female headed households and other vulnerable sub-groups (e.g., widowed, minorities, disabled, the elderly) in total (Baseline at implementation start: 0)	Expected number of indigenous women reached by year 3 is 13500 • 22500 indigenous women reached by project finalization (year 5)	Start by 4500 women in year 1. Activities conducted annually. • By year 3 (13,500 women in income generating enterprises) • By year 5, 22,500 women with awareness in nutrition, hygiene, GALS, GAPS/CSA/FFS		

Women representation in water point management committees	A minimum of 60 indigenous women are co-opted into the management committees per year with the goal to reach 300 women in 150 in Namibia and 150 in Angola in 5 years (30% of which are from female headed households and other vulnerable sub-groups (e.g., widowed, minorities, disabled, the elderly) in total (baseline at implementation start: 0)	Expected number of indigenous women reached by year 3 is 180 • 300 indigenous women reached by project finalization (year5)	Start by 60 women in year 1; activities conducted annually • By year 3, 180 women trained • By year 5, 300 women in water point management committees		
Output 3.1.3 Value addition initiatives identified and supported, to increase adaptive capacity by securing livelihoods Activity 3.1.3.1 Procure and install processing equipment for selected specific value chains Activity 3.1.3.2 Provide labour-saving devices for conservation agriculture, and training in the use thereof for indigenous women and youth Establish 3 sorghum milling plants per country at $15,000 per plant: including O&M and securing the machinery in sheltered structures. Establish 3 cassava milling plants per country at $15,000 per milling plant, including O&M, and	A minimum of 200 indigenous women provided with conservation labour saving tools per year with the goal to reach 1000 women in 500 in Namibia and 500 in Angola in 5 years (30% of which are from female headed households and other vulnerable sub-groups (e.g., widowed, minorities, disabled, the elderly) in total (baseline at implementation start: 0) A minimum of 1000 indigenous women accessing sorghum milling per year with the goal to reach 3000 women (1500 in Namibia and 1500 in Angola) in 5 years (30% of which are from female headed households and other vulnerable sub-groups (e.g., widowed, minorities, disabled, the elderly) in total (baseline at implementation start: 0) A minimum of 1000 indigenous women accessing cassava per year with the goal to reach 3000 women (1500 in Namibia and		Throughout the project	PMU Gender Specialist and PMU CSA Specialist	$310,000

securing the machinery in sheltered structures Procure 24 peanut butter machines for women's groups at $5,000 each. Procure and distribute 24 sorghum threshers for women's groups at $5,000 each	1500 in Angola) in 5 years (30% of which are from female headed households and other vulnerable sub-groups (e.g., widowed, minorities, disabled, the elderly) in total (baseline at implementation start: 0) A minimum of 300 indigenous women group members with peanut butter machines per year with the goal to reach 960 women (480 in Namibia and 480 in Angola) in 3 years (30% of which are from female headed households and other vulnerable sub-groups (e.g., widowed, minorities, disabled, the elderly) in total (baseline at implementation start: 0) A minimum of 300 indigenous women group members owning sorghum threshers per year with the goal to reach 960 women (480 in Namibia and 480 in Angola) in 3 years (30% of which are from female headed households and other vulnerable sub-groups (e.g., widowed, minorities, disabled, the elderly) in total (baseline at implementation start: 0)				
3.1.5.1 Establish nurseries for drought-resistant fodder crops, to be managed by women's groups	The number of people in the community participating in nurseries to provide seedlings for certified saplings because of the project, with the numbers disaggregated for different gender sub-groups (such as by sex and age, ethnicity, economic class, widowed, female-headed household etc).	By the end of the project 80% of indigenous women In the project area will have access to improved drought resilient forage crops (40% of which are from FHH and other vulnerable subgroups) (baseline at implementation start: 0%)	By project midterm	PMU CSA Specialist	$319,546
3.1.5.3 Establish multipurpose tree plantations, to be owned and managed by women's groups	The number of people in the community participating in	By the end of the project 80% of indigenous women in the project area will have	By project midterm	PMU CSA Specialist	$340,000

	moringa plantations, with the numbers disaggregated for different gender sub-groups (such as by sex and age, ethnicity, economic class, widowed, female-headed household etc).	access to improved moringa plantations (40% of which are from FHH and other vulnerable subgroups) (baseline at implementation start: 0%)			
Component 4: Raise awareness and improve knowledge on climate change adaptation in the Kunene River ecosystem					
Activity 4.1.1.1 Facilitate dialogue between gender subgroups to ensure gender equity and social inclusion	Number and percentage of different sub-groups of women and men engaged in benefit-sharing discussions such as related to payment schemes for ecosystem services.	80% of indigenous women in the project area will have knowledge about gender equity and social inclusion (40% of which are from FHH and other vulnerable subgroups) (baseline at implementation start: 0%)	Throughout the project	PMU Gender Specialist	$200,000
Activity 4.1.1.2 Provide literacy, nutrition, and gender training, to enhance community adaptive capacity	Number and percentage of different sub-groups of women and men trained in Literacy, nutrition, and gender mainstreaming in adaptation	80% of indigenous women in the project area will have been trained in literacy, nutrition, and gender (40% of which are from FHH and other vulnerable subgroups) (baseline at implementation start: 0%)	Throughout the project	Service Provider	$360,000
Activity 4.1.3.1 Develop case studies on EbA DRR planning, MH-EWS, integration of scientific and indigenous knowledge in climate change adaptation, and locally led gender-responsive adaptation; and use them in awareness campaigns	Number and percentage of different sub-groups of women and men trained in adaptations to ecosystem-based land management practices,	80% of indigenous women in the project area will have awareness in adaptation (40% of which are from FHH and other vulnerable subgroups) (baseline at implementation start: 0%)	Throughout the project	PMU Gender Specialist with Service Provider	$150,000
Activity 4.2.1.1 Institutional capacity building for effective management of gender-responsive climate change adaptation initiatives	A minimum of 5 new activities per year with the goal to reach 80 indigenous women in 8 communities (60% of which are from female-headed households and other vulnerable sub-groups (e.g., widowed, minorities, disabled, the elderly)	75% of indigenous women in the project area will have knowledge about GALS (30% of which are from FHH and other vulnerable subgroups) (baseline at implementation start: 0%)	Throughout the project	PMU Gender Specialist and Service Provider	$200,000

Annex F. Environmental and Social Impact Assessment

Principle 1: Compliance with the Law
No further assessment of potential impacts and risks is required for compliance with the Angola and Namibia laws, since the project complies with all relevant national legislation and policies on agriculture, water management, climate change adaptation, among others as detailed in section II-F. Throughout the implementation of the project, ongoing consultations with relevant national, regional, and district authorities have been and will remain integral. These consultations are crucial to ensuring adherence to all pertinent laws and technical standards governing the project's activities. By maintaining this collaborative approach, the project aims to uphold regulatory compliance at all levels and effectively navigate any evolving regulatory landscapes that may impact its operations.

Principle 2: Access and Equity
The project is committed to equitable benefit distribution, following gender and age-based criteria established through stakeholder consultations. Component 3 will ensure that community engagement prevents disruptions to essential services and avoids worsening disparities. It aims to provide fair access to opportunities and resources for diverse groups, including youth, elders, women, and marginalised communities such as indigenous peoples and persons with disabilities. At least 50% of beneficiaries will be women, with outreach efforts tailored to be inclusive and gender sensitive. A grievance mechanism has been designed to address concerns fairly, while the project integrates Indigenous Traditional Knowledge and scientific expertise to achieve gender-differentiated adaptation outcomes and promote sustainable ecosystem-based adaptation for the Kunene River Basin and its communities.

The project ensures equitable access and inclusion through targeted interventions, providing equal access to training, equipment, infrastructure, and services for marginalized groups such as women, youth, indigenous peoples, and individuals with disabilities. Rehabilitation planning and design will involve consultations with these vulnerable groups to address their specific needs. Transparency in benefit distribution will be upheld to prevent discrimination, with gender and age quotas guiding targeting criteria. Public advertising and outreach will be extensive for all contracts, including those for staff and contractors. Local water users will be actively involved in all stages of infrastructure development, ensuring equitable access, and addressing gender dimensions throughout.

Principle 3: Marginalised and Vulnerable Groups
The project is dedicated to enhancing the livelihoods of marginalised and vulnerable groups, particularly the semi-nomadic agro-pastoralist communities and transhumance pastoralists (who identify as indigenous peoples), with a strong focus on inclusion and climate resilience. Specific quotas have been established to ensure the participation of vulnerable categories: 50% women, 25% youth, and 30% indigenous peoples, as detailed in the proposal's targeting section. Project activities are designed to directly strengthen the climate resilience of these groups. Non-discrimination across all vulnerable categories is a fundamental principle, with robust measures in place to prevent exclusion or bias during consultations and project implementation. Efforts will facilitate equitable access to project services, events, and activities for all vulnerable beneficiaries, ensuring their meaningful participation and benefit. Potential risks such as overlooking specific needs or increasing vulnerability have been addressed by consulting marginalised groups, particularly women and indigenous peoples, during proposal development, and further consultations will occur at project inception to align with their identified needs and priorities. The project aims to empower vulnerable groups in decision-making regarding adaptation actions, valuing their traditional and local knowledge.

Principle 4: Human Rights
No further assessment of potential impacts and risks is required for compliance with human rights since the project is designed to respect and adhere to the requirements of all relevant conventions on human rights in compliance with the ESP.

The project is committed to upholding human rights, aligning with Angola's progress in civil and political rights following conflict. Angola has enacted significant legal reforms, including a revised Criminal Code against torture, new laws on freedom of religion, and ongoing updates to the Ombudsman law. Key priorities include combating corruption and organized crime through initiatives like Operation Transparency, supporting refugees and asylum seekers, protecting against domestic violence, and safeguarding the rights of persons with disabilities, with a focus on women.[71].

In May 2021, Namibia received 283 recommendations during the OHCHR Universal Periodic Review, accepting 229 and noting 54 that require further consultation and potential reforms. The country faces challenges with increasing violence against women and children, including domestic and sexual violence, and is implementing the Prioritised National Plan of Action on Gender-Based Violence. Namibia has committed to enhancing inclusive education for children with disabilities, improving migration management and anti-trafficking efforts, and reforming its justice system. Although mechanisms for civil society engagement and rule of law monitoring have been established, there are ongoing concerns about rights violations against minority communities.[72]

To address OHCHR's concerns, the project will implement several key measures. It will integrate awareness of Gender-Based Violence (GBV) and sexual violence into all training activities and provide training in Gender Action Learning Systems (GALS) to household members to mitigate GBV. The project will specifically target internally displaced persons (IDPs) who lack adequate food, safe drinking water, and healthcare, addressing their vulnerability to GBV. Additionally, the project will promote human rights by raising awareness among all stakeholders — designers, executors, monitors, and evaluators — about the Universal Declaration of Human Rights, ensuring these principles guide every aspect of the project's implementation.

Principle 5: Gender Equality and Women's Empowerment
Gender equality and women's empowerment have been thoroughly assessed and included in the project design, no further assessment on this principle is needed. The project has conducted a Gender Assessment as required by the AF Gender Policy, presented in Annex D of the project proposal. The gender assessment analysed gender disparities in terms of food and nutrition security; gender-based violence; access to land; poverty; culture context of gender roles; gender legal and national strategies; gender and access to labour; differentiated climate change impacts on gender groups; and the gender-related issues raised from community consultations. The assessment assisted the project in taking proactive measures to integrate gender-focused development strategies that will ensure it will not pose a risk to the principle of gender equality and women's empowerment.

Constraints: Gender-differentiated impacts of climate change in Angola and Namibia reveal significant disparities rooted in cultural norms and gender roles. Men typically hold dominant positions as household heads, while women are responsible for caregiving and agriculture, facing heightened vulnerability to climate shocks like droughts due to restricted access to land, resources, and training. Customary laws, especially in rural areas, often conflict with gender equality standards, exacerbating inequalities in economic participation and legal rights. Environmental crises can lead men to migrate for alternative income, increasing women's household and agricultural burdens without corresponding legal rights or social authority. Boys may leave school to contribute economically during these crises, and girls often face increased domestic chores, leading to higher dropout rates or early marriages. Women and girls also experience greater health risks and vulnerability to gender-based violence, particularly when water and sanitation systems are compromised. These factors highlight how climate change deepens existing gender disparities, limiting opportunities for equitable development in the region.

During the design phase, the project engaged in separate consultations with women, men, and youth to accurately capture and address their distinct challenges and needs. It features specific gender objectives, activities, and disaggregated targets, with dedicated budget allocations. The selection criteria for service providers and project management and implementation units (PMU/PIU) staffing will include provisions to

[71] Human Rights Committee considers the report of Angola | OHCHR
[72] Human Rights Council adopts Universal Periodic Review outcomes of Namibia, Niger, and Mozambique | OHCHR

ensure women's participation, thereby promoting gender outreach and mainstreaming gender concerns throughout the project.

Activities proposed: The project targets 50% women, including indigenous women, and 30% youth. It will implement the Gender Action Learning System to address gender inequalities by transforming gender relations and promoting women's empowerment through inclusive, participatory approaches involving both men and women. Women will be promoted in decision-making roles, such as on water management committees. Specific gender-sensitive interventions include literacy programs, life skills development, leadership training, addressing gender-based violence, and nutrition education. The project will enhance women's economic empowerment by increasing their involvement in income-generating activities and providing labour-saving technologies, such as grain milling machines. These measures aim to promote gender equality, improve livelihoods, and foster sustainable development outcomes within the community.

Post-harvest activities such as food processing are pivotal for generating income and ensuring food security for women and their families. These activities enhance the value of harvested crops by extending their shelf life and creating marketable products that fetch higher prices. By processing surplus produce into finished products, the women can maintain a steady income throughout the year, even during off-seasons or market fluctuations. Moreover, these practices contribute to food security by providing communities and households with preserved foods that serve as a buffer against shortages and climate variability. Engaging in such activities not only boosts economic resilience but also empowers women with valuable skills in food processing, thereby supporting sustainable agricultural practices.

To mitigate potential risks such as reinforcing gender disparities and excluding women from decision-making, the project includes several measures: it addresses the gendered impacts of climate change with targeted strategies for women and girls; ensures 50% female participation to promote gender equality; and supports climate-resilient agricultural practices tailored to various groups, including small-holder farmers and indigenous women. The project also integrates participatory monitoring and evaluation to capture women's experiences, provides labour-saving technologies to reduce workloads, and ensures gender-inclusive infrastructure development. Partnerships with local organizations and community leaders, accessible early warning systems, and involvement in disaster risk reduction enhance women's preparedness and response. Additionally, the project promotes women's leadership in climate adaptation and economic empowerment through internal lending and savings clubs, and income-generating equipment, ensuring comprehensive support for women's empowerment and resilience.

Principle 6: Core Labour Rights

The potential risk of increasing exploitative labour practices (such as forced or child labour), gender-based violence, discrimination, and unsafe or unhealthy working conditions for individuals employed directly or indirectly by the project is assessed as low. The project will work with value chains that meet the national labour and international commitments and will ensure adherence to occupational safety and health standards. The project aligns with the International Labour Organization's (ILO) core labour standards as articulated in the 1998 ILO Declaration of Fundamental Principles and Rights at Work. These principles encompass four fundamental rights which are elaborated upon in eight core conventions: Freedom of association and the effective recognition of the right to collective bargaining (ILO Conventions 87 and 98); Elimination of all forms of forced or compulsory labour (ILO Conventions 29 and 105); Abolition of child labour in its worst forms (ILO Conventions 138 and 182); and Elimination of discrimination in respect of employment and occupation (ILO Conventions 100 and 111). These standards ensure that the project upholds principles of labour rights, providing a framework for protecting workers' rights, promoting decent work, and fostering equitable and inclusive employment practices.

Angola has been a member since 1976 and has ratified 35 ILO conventions, 29 of which are actively operational. The ILO supports initiatives in Angola aimed at extending social protection in the informal sector, enhancing capacity building for employees and worker organisations, and promoting labour administration to foster social dialogue[73]. These efforts contribute to maintaining fair and safe working conditions across various sectors, including those potentially involved in the project.

[73] Angola | International Labour Organization (ilo.org)

Namibia has been a member of the International Labour Organization (ILO) since 1978 and has ratified 17 conventions and one protocol of which 18 are in force. The country benefits from technical and financial support provided by the ILO to foster the creation of decent and productive employment opportunities. Additionally, the ILO assists Namibia in extending social protection coverage to all sectors of society. These efforts underscore the commitment to enhancing labour conditions and promoting inclusive economic development in Namibia with the support of international labour standards and practices facilitated by the ILO[74].

To address potential risks such as labour rights violations, worker exploitation, and inadequate working conditions, the project will comply with both international and national labour laws and standards in the involved countries. This includes adherence to legal requirements for wages, recruitment, and working conditions, as guided by ILO labour standards. The project aims to enhance income opportunities for marginalized groups, including indigenous women and youth. To overcome challenges related to remoteness and accessibility, the project will implement a "train the trainer" approach, equipping local community members to assist with the program's implementation and monitoring, thereby building local capacity and ensuring effective oversight.

While the project is committed to complying with national laws and international labour standards, the project will expand an approach to preventing child labour by implementing additional mechanisms, including:

- Stakeholder education and awareness programs targeting local communities to reduce incidences of child labour, particularly in project-related activities.
- Regular monitoring to identify and prevent child labour through community and project worker feedback.
- A clear reporting mechanism that allows community members to report suspected child labour cases anonymously.

Principle 7: Indigenous Peoples

The project will be implemented in areas inhabited by indigenous peoples, including those within its influence. It will operate on lands claimed by these communities, necessitating strict adherence to international standards and best practices for engaging with indigenous groups. This includes respecting their right to Free, Prior, and Informed Consent (FPIC) and safeguarding their cultural heritage, land tenure, and customary rights throughout the project's lifecycle. The project aligns with the UN Declaration on the Rights of Indigenous Peoples (UNDRIP) by raising awareness of indigenous rights and integrating them into project implementation. It is designed to avoid displacing communities or altering their traditional economic activities, with no resettlement required, whether economic or physical.

Neither Angola nor Namibia has ratified ILO Convention No. 169, which aims to protect the rights of indigenous and tribal peoples, including their self-determination, participation in decision-making, and the protection of their lands, cultures, and traditional knowledge. Despite this, international principles from Convention No. 169 influence advocacy and policy efforts to safeguard indigenous rights. Angola is a signatory to ILO Convention No. 107 (1957), which it ratified in 1976, and has committed to several relevant international treaties, including ICERD, CEDAW-OP, CRC, ICCPR, and CESCR. Additionally, Angola supported the UN Declaration on the Rights of Indigenous Peoples in 2007, signalling its alignment with the declaration's objectives despite its non-binding nature.

Angola's approach to ethnic diversity diverges from international legal frameworks for Indigenous Peoples. The country's Constitution and laws do not explicitly recognize Indigenous Peoples but refer to certain groups, including the San and pastoralist communities (Ovatwa, Ovatjimba, Ovazemba, Kwisi, Kwepe), as "vulnerable groups." These communities, along with people with disabilities, rural women, and the extremely poor, receive support through rural programs. Angola uses the term "autóctone" for these groups, which is similar but not identical to the international term "Indigenous Peoples." Local groups in southern

[74] Namibia | International Labour Organization (ilo.org)

Africa often prefer their own names to emphasize their unique identities. While Angola acknowledges and supports these communities through domestic programs managed by ministries such as Social Action and Assistance and Social Reintegration, and through provincial governments, the lack of comprehensive reporting hinders a unified national assessment of these interventions' impacts.

The project will align with the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), particularly regarding Free, Prior, and Informed Consent (FPIC) throughout its design, implementation, and evaluation phases. It will adhere to nine core principles from IFAD's Policy on Engagement with Indigenous Peoples, which include respecting cultural heritage, applying FPIC, fostering community-driven development, ensuring equitable access to resources, valuing indigenous knowledge, enhancing ecosystem resilience, facilitating market access, supporting empowerment, and promoting gender equality. Although FPIC could not be obtained during the project design phase, a detailed FPIC implementation plan has been developed. This plan outlines how FPIC will be sought during the early stages of implementation and before any investments are made, ensuring that it is accessible and executed promptly.

IFAD is committed to empowering indigenous peoples by involving them in determining their development priorities and strategies through collaborative project design and meaningful consultations. This approach aims to secure Free, Prior, and Informed Consent (FPIC) from indigenous communities, ensuring that they receive fair and equitable benefits from project activities. Projects are implemented in culturally sensitive and inclusive ways, respecting indigenous rights to their traditional lands, territories, waters, and resources. These principles ensure that IFAD's engagement with indigenous communities is both respectful and beneficial, aligning with their historical and cultural connections.

Expected outcomes from the FPIC process: The project is designed to prevent negative impacts on Indigenous Peoples (IPs) by ensuring no displacement or disruption of their traditional economic activities. It adheres to the Free, Prior, and Informed Consent (FPIC) process, enabling IPs to make informed decisions about project interventions in a culturally sensitive manner, with the ability to withdraw consent at any stage. This process ensures IPs' active involvement in all phases of the project—design, implementation, monitoring, and evaluation—while valuing perspectives across genders and generations. The project is expected to have significant positive impacts, particularly for rural households, women, and children who are most affected by food insecurity and malnutrition. It aims to enhance smallholder farming through improved water access, technology demonstrations, good agricultural practices, and conservation agriculture via Farmer Field Schools (FFS). By addressing the specific needs of IPs, including their reliance on key crops like cassava and sorghum, the project will support resilience against climate shocks, reduce food insecurity and poverty, and ensure that interventions are tailored to the unique technology and livelihood needs of IPs. Ongoing eligibility screening, consultation on Indigenous Peoples Plans, and adaptive project management will further ensure that potential impacts are effectively managed.

The involvement of indigenous peoples in the design and the implementation of the project/programme and outcomes of the consultation process of the indigenous peoples

The Kunene region, spanning the mountainous desert landscape along the Kunene River which divides Angola and Namibia, is inhabited by diverse ethnic groups including the Himba, Zemba, Tjimba, and Twa. Each group upholds its unique culture and traditions while collectively facing the challenges of adapting to a modern market economy. Predominantly semi-nomadic pastoralists, these communities often rely on rain-fed agriculture, growing crops such as maize which is highly dependent on seasonal water availability. Their diet mainly consists of sour milk and maize meal porridge, with wealthier individuals also owning livestock like goats and cattle.

The Himba, or OvaHimba, people are an ancient semi-nomadic pastoralist community residing along the Kunene River in Angola and Namibia. Known for their traditional cattle, sheep, and goat farming, they maintain substantial herds, often numbering up to 500 per family. Their economic independence is deeply intertwined with their land and livestock, driving their semi-nomadic lifestyle as they move between cattle posts in search of better grazing and water. Older women typically stay in permanent households while

other members of the community move with the herds. The Himba number around 50,000 and reside mainly in northern Namibia and southern Angola. They are known for their distinctive pastoral lifestyle and traditional practices, speaking OtjiHimba, a Bantu language closely related to Herero. The Himba maintain base homesteads for crop cultivation but move seasonally in response to rainfall and water resources, embodying one of the last semi-nomadic cultures in Namibia.

The San people, with approximately 5,000 individuals in Angola, are dispersed across the regions of Huila, Cunene, Moxico, and Cuando Cubango. Historically hunter-gatherers, many Sans in southern Africa have transitioned to a mix of subsistence agriculture, informal manual labour, and reliance on food aid. Despite this shift, they continue to maintain significant traditional practices, including gathering bush foods, hunting, and craft production.
The project's design phase involved thorough consultations with the Himba tribe and other stakeholders, including community organisations, government officials, and diverse groups in Namibia and Angola. Meetings were held in Okanguati and Epupa in Namibia, and with various ethnic groups in Curoca municipality, Angola, engaging 65 participants (27 males and 38 females), alongside traditional leaders. These consultations identified Indigenous Peoples' concerns and incorporated them into the project's design, adhering to IFAD's FPIC principles. Key challenges highlighted included irregular rainfall, food insecurity, water scarcity, high living costs, poor infrastructure, recurrent droughts, and social issues such as early marriages. Proposed solutions from the consultations included veterinary services, irrigation, improved communication, road access, school gardens, and environmental education. The region has been facing an eight-year drought, affecting agriculture, and prompting migration.

Evidence of the mutually accepted process between the project/programme and the affected communities and evidence of agreement between the parties as the outcome of the negotiations

The project acknowledges low to moderate potential risks to indigenous peoples' rights and livelihoods, including insufficient engagement and possible conflicts over resource use. To address these, it has integrated robust measures such as adhering to Free, Prior, and Informed Consent (FPIC) principles and employing participatory planning methods. Consultations with communities, including women, youth, and marginalized individuals, have informed the project's approach, ensuring that activities reflect the needs of indigenous groups like agro pastoralists. A grievance mechanism and feedback system are established to ensure accountability, and while FPIC could not be obtained during the design phase, an FPIC implementation plan has been developed to ensure transparency and community involvement from the outset of implementation. It is important to note that FPIC does not necessarily require unanimity and may be achieved even when individuals or groups within the community explicitly disagree.

Summary of reports, specific cases, or complaints that have been made with respect to the rights of indigenous peoples by the Special Rapporteur and that are relevant to the project/programme
The Kunene River, which forms the border between Namibia and Angola, has been the focus of various dam projects since the German occupation era. In 1991, a proposed hydropower project at Epupa faced strong opposition from the OvaHimba community and international resistance, leading to its cancellation. Instead, both nations explored alternative energy solutions, including importing electricity from South Africa. The Baynes Hydro Power Project, a collaborative effort between Namibia and Angola, aimed to generate 600MW from the Kunene River Basin and was initiated in 2009. Despite undergoing Environmental and Social Impact Assessments (ESIA) and strategic evaluations, the project faced delays and resumed in 2018 with updated ESIA and stakeholder engagement plans, including a Resettlement Action Plan (RAP). In January 2020, a scoping visit by International Rivers, Earthlife Namibia, and the Epupa Conservancy to Himba communities along the Kunene River highlighted strong opposition from residents. They voiced concerns about the project's potential negative impacts on water quality, vegetation, wildlife, and land inundation, emphasizing threats to their livelihoods and cultural practices dependent on ancestral lands and seasonal cattle migrations.

Principle 8: Involuntary Resettlement
There is a low to moderate risk of involuntary resettlement. Site selection and water access development will involve consultations with communities, traditional leaders, and local authorities to ensure transparency and consensus. Conflict management related to land allocation will be effectively addressed. The project

will undergo screening for environmental and social risks and will develop an Environmental and Social Management Plan (ESMP) to manage conflicts and guide Grievance Redress Mechanisms (GRM). The project commits to no involuntary resettlement. All consultations will adhere to the Free, Prior, and Informed Consent (FPIC) Principle. In the event of unforeseen resettlement or economic displacement during project implementation, the implementers and IFAD will engage in a consultation and negotiation process with potentially affected individuals, in line with FPIC and do-no-harm principles. If consensus cannot be reached, the project implementers will adjust or cease specific interventions associated with affected communities. Failure to conduct proper consultation and negotiation according to FPIC and do-no-harm principles may lead to the suspension of project activities, following IFAD's standard procedures for suspension.

Principle 9: Protection of Natural Habitats

The project area does not contain critical natural habitats including those that are (a) legally protected; (b) officially proposed for protection; (c) recognised by authoritative sources for their high conservation value, including as critical habitat; or (d) recognised as protected by traditional or indigenous local communities. No further assessment will consequently be necessary during project implementation. The project will employ ecosystem-based adaptation strategies, such as agroforestry and water conservation, to protect natural habitats and avoid converting or degrading critical natural areas. Consultations with government stakeholders, community leaders, and local communities will ensure that habitats of high conservation value or protected by legal or traditional means are safeguarded. Social and environmental screenings for Component 2 activities will further uphold these protections. While the project is not expected to impact critical natural habitats—confirmed during design consultations—it will still address potential risks, including habitat degradation, biodiversity loss, and unintended ecological consequences.

Principle 10: Conservation of Biological Diversity

No further assessment of potential impacts and risks is required for compliance as the project area has not been found to contain UNESCO biosphere reserves or RAMSAR sites applicable to this ESP. Although the consequences are minor, the project could lead to an increased human wildlife conflict (e.g., with baboons and monkeys) due to shared water sources and improved crop and livestock production. The project could also lead to endangered species reduction or encroachment through the clearance of land for farms and gardens. The project will aim to introduce nutrient dense drought resilient crops and improve on the local varieties. To mitigate biodiversity risks in agroforestry due to the introduction of improved varieties and breeds, this project prioritises local species and promotes multi-species plantations while strictly avoiding non-native and invasive species. All introductions of new breeds and varieties will adhere strictly to national standards, emphasising the use of improved local species exclusively. The project ensures no inclusion of species listed as endangered by the International Union for Conservation of Nature (IUCN). Social and environmental screening is conducted for activities under component 2 to uphold these principles.

The risk of habitat degradation or loss, negative impacts on local biodiversity, and unintended ecological consequences is low. The project area has not been found to contain UNESCO biosphere reserves or RAMSAR sites applicable to this ESP. The project will also not be introducing invasive species, the only species will be indigenous to the project area and the project area also does not contain any species red listed by the International Union for Conservation of Nature (IUCN). To prevent the loss of biodiversity, the project will: encourage the use of local and indigenous plant varieties, promote crop rotation, protect forests and wetlands that are crucial habitats for endangered species, and prohibit the introduction of exotic species.

Principle 11: Climate Change

The project is designed to have a minimal impact on climate change, with no significant greenhouse gas emissions or activities that contribute to climate change such as energy production, large-scale agriculture, or waste management. It aims to operate in a climate-neutral manner while enhancing smallholder adaptive capacity. The project will support investments in irrigation, water harvesting, and climate advisories to address erratic rainfall. To manage flood risks, it will provide tailored flood advice and standards for flood-proof infrastructure. For pest control, it will promote Good Agricultural Practices (GAP), Integrated Pest Management (IPM), pest-tolerant varieties, crop diversification, and pheromone traps. In response to

drought and heatwaves, the project will encourage climate-smart agriculture, shade nets, drought-resistant crops, and water management practices.

Principle 12: Pollution Prevention and Resource Efficiency
The project poses minimal risks regarding resource efficiency or pollution related to water, land, and fertilizer use; thus, no additional assessment is necessary. It will incorporate reafforestation, solar energy, construction of earth and sand dams, groundwater extraction, and support for livestock production. Expected environmental benefits include improved integrated water management and climate change adaptation, enhanced access to water, and reduced inefficiencies in water management. The project will map both surface and underground water availability to develop hydrological models and establish a natural resource monitoring network. These initiatives will contribute to a Regional Resource Management Plan aimed at increasing resource efficiency.

The project will enhance surveillance, monitoring, and control of crop diseases and pests. Additional measures include strategically locating micro-enterprises away from residential and commercial areas; minimizing the use of chemicals and hazardous materials; implementing water management systems that capture and dispose of wastewater at designated points; segregating solid waste and monitoring banned or hazardous substances; promoting renewable energy technologies; and encouraging the use of organic fertilizers and biocides.

Principle 13: Public Health
The project is designed to have no negative impacts on public health and aims to address existing issues such as guinea worm disease, which is aggravated by shared water sources between humans and animals. To mitigate this, the project will introduce separate, safe water sources for humans and animals. Its primary objectives include providing multipurpose water points and eliminating open defecation, which will improve health outcomes and enhance livelihoods. By ensuring access to clean water, promoting better nutrition practices, and raising awareness about hygiene, the project is expected to positively transform the community's well-being and living conditions.

The project acknowledges potential risks of waterborne and communicable diseases such as guinea worm, malaria, and cholera, as well as minor risks of exacerbating gender-based violence. To mitigate these risks, the project will implement several measures: promote safe work practices through Standard Operating Procedures, training, and awareness; enforce the use of personal protective equipment (PPE); provide first-aid boxes and basic training; list local village doctors for emergency contact; encourage regular workplace cleaning; and raise awareness about gender-based violence and reporting procedures. To prevent water contamination, the project will ensure safe distances between latrines and water sources, between livestock sheds and kitchens, promote hygienic practices like handwashing, and take corrective action if contamination occurs. Additionally, WASH (Water, Sanitation, and Hygiene) activities will be incorporated to further enhance health and safety.

Principle 14: Physical and Cultural Heritage

There is low risk of damage to or destruction of heritage sites, loss of cultural heritage, and conflicts with local communities over heritage conservation. There is low risk that the project will impose adverse impacts on the physical and cultural heritage. Both Angola and Namibia are signatories to the UNESCO World Heritage Convention. Angola accepted the UNESCO World Heritage Convention on November 7, 1991[75], and Namibia on April 6, 2000[76] and consultations confirm that the project area does not encompass any cultural heritage sites, nor is it listed as a UNESCO World Heritage site. Therefore, the project is designed to proceed without posing any threat to the physical or cultural heritage of the region. Any relevant risk will be addressed as follows:

[75] List of World Heritage Sites in Angola - Wikipedia
[76] List of World Heritage Sites in Namibia - Wikipedia

Project activities respect and protect physical and cultural heritage sites. Traditional and local knowledge will be understood and enhanced with scientific information for environmental management and food security and nutrition. Any physical cultural heritage present on the project sites will be identified together with the local stakeholders and potential negative impacts are avoided during design of concrete adaptation actions at the sites.

Principle 15: Land and Soil Conservation
The project is designed to ensure minimal impact on land and soil conservation, incorporating measures to mitigate any potential environmental risks. It is expected to not only avoid adverse effects but also contribute positively to land, soil, and water conservation efforts. Potential risks include soil degradation, loss of agricultural productivity, and negative impacts on local ecosystems if not properly managed.

Climate change is expected to worsen soil degradation in the Kunene basin, leading to increased soil erosion, reduced soil organic matter, and diminished soil health. The project's design includes comprehensive measures to mitigate these environmental risks. Additionally, the project is committed to promoting land, soil, and water conservation practices. These efforts are aimed at contributing positively to environmental sustainability while avoiding any adverse effects on land and soil conservation.

To address the risks of declining soil health, land degradation, and deforestation, the project will implement several mitigation measures:

- *Soil Health*: Encourage crop diversification, balanced fertilizer application, the use of bio-fertilizers or organic fertilizers, and conservation agriculture practices such as mulching. Additionally, plantation of leguminous varieties for nitrogen fixation will be promoted.

- *Land Degradation*: Use soil from existing borrow pits, plant grass, or use temporary fencing to regenerate vegetation, and incorporate residues from leguminous crops into the soil. Rangelands will be rehabilitated by planting drought-resistant, nitrogen-fixing fodder crops and nutrient-dense trees like moringa.

- *Deforestation*: Raise awareness to discourage cutting of mature trees and protect buffer zones along rivers. Promote agroforestry through technical training and encourage the use of energy-saving stoves. Additionally, the project will support afforestation, reforestation, and agroforestry efforts both in public forests and on farmlands.

Annex G: Environmental and Social Risk Management Plan

The table below presents the environmental and social risk management plan.

Output	Environmental / Social Risk	Risk mitigation measures	Indicators	Responsibility for implementing risk mitigation measures	AF principles	Means of Verification
Component 1: Co-design with beneficiary communities and stakeholders, and implementation of a Plan for Disaster Risk Reduction through Ecosystem-based Adaptation in the Kunene River Basin (KRB: EbA-DRRP)						
1.1.1 Knowledge gaps for the preparation of the KRB: EbA-DRRP identified and filled, through a Water Security Assessment and an Ecosystem Goods and Services Valuation	Willingness of participants to provide information	Making participation easy and convenient by reducing barriers such as time, cost, and effort to get more people involved, especially women Leverage on social media and traditional leaders to promote participation Provide clear information and communication about benefits of participation	Number of studies conducted to fill knowledge gaps for the preparation of the KRB: EbA-DRRP. Number of participants consulted (disaggregated by sex, age and ethnicity including IPs)	PMU	All 15 principles	Registers Meeting reports Progress reports
1.1.2 A Basin-wide Gender inclusive DRR Plan focused on Ecosystem-based Adaptation is developed.	Women and other marginalised groups may have limited participation in the planning and implementation processes due to social norms, lack of empowerment, or restricted access to resources and decision-making forums.	Seek representation from different gender and gender subgroups Hold separate men and women meetings and other gender subgroups including indigenous people Select venues accessible to all participants Use local language for consultations Observe ethical guidelines, including obtaining informed consent, ensuring confidentiality, and addressing any potential conflicts of interest	Basin-wide Gender inclusive DRR Plan focussed on Ecosystem-based Adaptation. Number of participants consulted (disaggregated by sex, age and ethnicity including IPs)	PMU	All 15 principles	DRR plan Progress reports

Output	Environmental / Social Risk	Risk mitigation measures	Indicators	Responsibility for implementing risk mitigation measures	AF principles	Means of Verification
1.2.1 Report on full stakeholder engagement with the beneficiary communities, including all gender and ethnic subgroups and other stakeholders of the KRB.	Marginalised and vulnerable groups including indigenous people, men, women, and gender subgroups might not be represented in the consultations Willingness of stakeholders to work together availability of stakeholders to attend meetings Female government officials are poorly represented in trainings	Ensure representation of vulnerable people and the differentiated gender subgroups, during meetings including at least 50% representation for women. Provide information and clear communication on benefits of participation Ensure that at least 50% of government officials and field staff attending in trainings to be women	Percentage of female participants consulted Number of stakeholders participating in joint planning and stakeholder engagements/dialogues (disaggregated by gender and sector) Number of stakeholder engagements/dialogues held by the project Percentage of female participants in training	PIU, Gender Specialist and gender focal points of the executing entities	2 (access and equity) 3 (vulnerable groups) 5 (gender equality) 5 (gender equality)	Annual progress report Gender action plan report
Component 2: Implementation of a satellite-based Multi-Hazard Early Warning System for the Kunene River Basin (KRB: MH-EWS)						
2.1.1 Weather stations for micro-climates in the basin installed, in collaboration with national meteorological agencies	The location of the weather stations might not be accessible	Ensure that the weather stations are in accessible areas through consultations with stakeholders and gender subgroups	Number of hydrometric stations installed (disaggregated by country)	PMU and Meteorological Agencies	9 (protection of natural heritage} 7 (indigenous people)	Annual progress report
	Lack of involvement of women during the design and implementation of weather stations	Ensure the participation of women in the design and implementation of weather stations	Percentage of female participants in the design and implementation of weather stations.	PIU Gender Specialist and gender focal points of the executing entities	2 (access and equity) 3 (vulnerable groups) 5 (gender equality)	Annual progress report
	Weather information stations are not user friendly to women and gender subgroups	Simplify the information from weather stations by using the local language	Number of weather information reports in local language	PIU Gender Specialist and gender focal points of the executing entities	2(access and equity) 3 (vulnerable groups) 5 (gender equality) 11 (climate Change	Annual progress report
2.1.2. Hydrometric stations installed along the Kunene River in collaboration with the national hydrological agencies	The location of the weather stations might not be accessible	Ensure that the hydrometric stations are in accessible areas through consultations with stakeholders and gender subgroups	Number of weather stations installed (disaggregated by country)	PMU and Meteorological Agencies	9 (protection of natural heritage} 7 (indigenous people)	Annual progress report

Output	Environmental / Social Risk	Risk mitigation measures	Indicators	Responsibility for implementing risk mitigation measures	AF principles	Means of Verification
	Information on floods might not reach women on time. Early warning systems not accessible to women enhance preparedness and response capabilities during disasters	Provide downscaled flood advice to farmers, identifying high ground/ appropriate siting for investments especially in infrastructure Proposing standards to enable flood proof infrastructure development	Percentage women receiving flood forecasts Guidelines for flood proof infrastructure developed	PIU Gender Specialist, PIU DRR+EWS Specialist, Meteorological Agencies, Hydrological Agencies	2(access and equity) 3 (vulnerable groups) 5 (gender equality) 11 (climate change)	Annual progress report
	Women excluded or underrepresented in disaster risk planning / training	Ensure that 50% of trainees are women involving women in disaster risk reduction planning and implementation of strategies that enhance community resilience. Ensure that the timing and location of training is convenient for and is clearly communicated to vulnerable users including women. Provide translation in local language Provide transport for those coming from remote areas	Percentage of female trainers.	Gender focal points of executing entities, PIU DRR+EWS Specialist, PIU Gender Specialist		Annual progress reports feature participation figures on vulnerable (including women) users Reporting on gender action plan
2.2.1 Multi-level KRB: MH-EWS designed and validated by governments in collaboration with local communities, integrating indigenous knowledge.	Vulnerable users are not consulted adequately. Their interests are not reflected in the Multi-level KRB: MH-EWS.	Ensure the representation of vulnerable users in stakeholder consultations on the formulation of the Multi-level KRB: MH-EWS.	Number and percentage of female participants in stakeholder workshops.	National Project Managers	2 (access and equity) 3 (vulnerable groups) 5 (gender equality)	Annual progress report
2.2.2 Big Data Analytics tool for EWS data capturing and monitoring, including a user-friendly system for data access and usage developed.	Vulnerable people might find the data system less user-friendly and data access and usage difficult to understand	Ensure that the users are trained on EWS data capturing and monitoring, including a user-friendly system for data access and usage prepared.	Number and percentage of female trained	National Project Managers	2 (access and equity) 3 (vulnerable groups) 5 (gender equality) 11 (climate change)	Annual progress report
Component 3. Inclusive community-based adaptation actions are co-designed and implemented						

Output	Environmental / Social Risk	Risk mitigation measures	Indicators	Responsibility for implementing risk mitigation measures	AF principles	Means of Verification
3.1.1 Rainwater retention infrastructure constructed or rehabilitated (20 existing earth/sand dams rehabilitated, 20 rainwater retention ponds established, rooftop rainwater harvesting systems installed on public buildings) to increase access to water for domestic and agricultural use.	There is risk of contamination of water/ outbreak of water-borne and/or water related diseases Women and gender subgroups are not represented in water management committees Loss of natural and cultural heritage. Loss of vegetation Loss of soil	Ensure 50% representation of women in management committees. Maintain safe distance (30 feet) between latrine and water sources Provision of potable water supplies and sanitation facilities, capacity building in sanitation and health issues, awareness campaigns Conduct feasibility studies, fencing, introduce proper antiquity education programmes Selective clearing of project sites, reforestation, preservation of protected plant species, use of alternative sources of energy, use of environmentally friendly technologies, awareness campaigns. Stabilisation of loose soil, controlled excavation, preservation of vegetation cover, controlled transportation of raw materials, appropriate landscaping Promote hygienic practices, including hand washing Take corrective action when water contamination is detected	Number of women benefiting from water infrastructure constructed Number of people (disaggregated by gender subgroup) reporting cases on water borne diseases Number of women in water management committees Number of existing earth dams rehabilitated. Number of rainwater retention ponds established Number of rainwaters harvesting systems installed	PIU	2 (access and equity) 3 (vulnerable groups) 5 (gender equality) 9(natural habitats) 11 (climate change) 15 (public health)	Annual progress report
3.1.2 Improved access to groundwater for gardening and domestic use, to build adaptive capacity by improving health, hygiene, and nutrition	Boreholes are poorly managed and not fully functional which could result in conflicts due to shortages of water Damage of critical habitats Dust, Emissions, Strong Light, Noise and Vibration Loss of vegetation Loss of Soil Disputes over water resources	Involve women and gender subgroups in water management committees Conduct feasibility studies, fencing, introduce proper antiquity education programmes Controlled operation times, use of appropriate equipment, proper orientation of lights, use of alternative materials, use water sprinklers to control dust, use of scrubbers	Reduction in time use (time saved) by different gender groups in collecting and carrying water for household use in project community's due borehole rehabilitation Number existing boreholes rehabilitated	PIU	2 (access and equity) 3 (vulnerable groups) 5 (gender equality) 9(natural habitats) 11 (climate change) 15 (public health)	Annual progress report

Output	Environmental / Social Risk	Risk mitigation measures	Indicators	Responsibility for implementing risk mitigation measures	AF principles	Means of Verification
		Selective clearing of project sites, reforestation, preservation of protected plant species, use of alternative sources of energy, use of environmentally friendly technologies, awareness campaigns. Stabilisation of loose soil, controlled excavation, preservation of vegetation cover, controlled transportation of raw materials, appropriate landscaping Provide water management training to farmers and introduce alternative sources of water such as boreholes. Establish mechanisms for complaints and conflicts resolution				
3.1.3 Value addition initiatives identified and supported, to increase adaptive capacity by securing livelihoods	Vulnerable groups are unaware of how to access the value addition support Increased gender-based violence	Involve women and gender subgroups to develop guidelines and criteria to access value addition subprojects Implement GALS approach	Number and percentage of different sub-groups of women and men with increased employment and income due to climate change adaptation activities	National Project Managers	2 (access and equity) 3 (vulnerable groups) 5 (gender equality) 6 (labour rights)	Annual progress report

Output	Environmental / Social Risk	Risk mitigation measures	Indicators	Responsibility for implementing risk mitigation measures	AF principles	Means of Verification
3.1.4 Drought-tolerant crop varieties promoted for sustenance during drought periods	Declining soil health Use of species that are not adapted or suitable to a site Soil and water pollution from chemicals & fertilisers	Re-introduce indigenous varieties to benefit vulnerable gender subgroups Encourage crop diversification Train all stakeholder in CSA Controlled disposal of waste and effluent by use of appropriate disposal facilities, use of appropriate drainage structures, use of cleaner technologies, proper storage of materials, awareness campaigns Use of organic fertilisers and biocides	Number and percentage of women (differentiated by sub-groups taking age economic class or ethnicity into account) involved in drought-tolerant crop production Number of reported pollution events Percentage of target community members farming with drought-tolerant crop varieties Crop productivity	PIU Conservation Agriculture Specialist	2 (access and equity) 3 (vulnerable groups) 5 (gender equality) 9(natural habitants) 11 (climate change) 15 (public health)	Annual progress report Community surveys
3.1.5 Rangeland restoration introduced to ensure increased production of drought-resistant fodder, higher species diversity and abundant soil surface cover.	Damage of critical habitats Use of species that are not adapted or suitable to a site Reduces access to natural resources Vulnerable households do not benefit from this Loss of natural and cultural heritage.	Ensure proper planning of soil and water conservation works Participatory processes for planning interventions Promote women in rangeland management Conduct feasibility studies, fencing, introduce proper antiquity education programmes	The number of women in leadership and decision-making roles or positions in the community where rangelands are under community-based protection (differentiated to account for ethnicity, economic class, age, and indigeneity) Number or size of property lost	National Project Managers	2 (access and equity) 3 (vulnerable groups) 5 (gender equality) 9(natural habitats) 11 (climate change) 15 (public health)	Annual progress report
3.2.1 An inclusive forum for development partners in the project area of the Kunene River developed.	Lack of consistency in attending the meetings	Rotate the chairing of the forum to encourage participation Invitations, minutes, and meeting agendas should circulate in advance to allow for planning	Number of meetings held	National Project Managers	(Access and equity) 3 (vulnerable groups) 5 (gender equality) 9(natural habitats) 11 (climate change) 15 (public health)	Annual progress report
Component 4: Raise awareness and improve knowledge on climate change adaptation in the Kunene River ecosystem						

Output	Environmental / Social Risk	Risk mitigation measures	Indicators	Responsibility for implementing risk mitigation measures	AF principles	Means of Verification
4.1.1 Awareness raised and knowledge shared on locally approved gender-responsive climate change adaptation measures.	Marginalised vulnerable users are not consulted adequately. Their interests are not reflected in climate change adaptation measures.	Ensure the representation of vulnerable users in stakeholder consultations on the formulation of gender responsive climate change measures. Hold at least one workshop in each commune/ constituency to invite views on the formulation of the gender responsive climate change measures	Number and percentage of female participants in stakeholder workshops Number of knowledge products developed on locally led gender responsive adaptation Number of awareness creation campaigns held on climate change adaptation Number and percentage of female participants in stakeholder workshops	PIU Gender Specialist	2 (access and equity) 5(gender) 14(climate change)	Annual progress report
4.1.2 Kunene River Awareness Kit online portal updated and reactivated, using the data and knowledge generated by the project.	Users do not receive the information they need or are not informed about the project and are unwilling to cooperate as a result.	Identify information needs and design information services accordingly. Ensure timely information for planning use	Number of men and women reporting that they have used the portal and found it to be effective	PIU DRR+EWS Specialist	2 (access and equity)	Annual progress report
4.1.3 Case studies from the project developed and submitted to IFAD and FAO knowledge management systems, SADC-GMI and WaterNet, for further dissemination	Researchers may have preconceived notions that influence the study. Findings from a single case may not apply to other contexts. Gathering accurate and comprehensive data can be difficult. Ensuring confidentiality and informed consent is crucial. Case studies often require significant time and resources	Use multiple researchers and triangulate data sources to reduce bias. Select cases that are representative of a broader population and clearly state the limitations. Use a variety of data collection methods (interviews, observations, documents) to ensure comprehensive data. Obtain informed consent, ensure confidentiality, and follow ethical guidelines. Plan and allocate resources effectively, and consider using technology to streamline resource use	Number of case studies on the learnings from the Kunene Basin project, on EbA in DRR, MH-EWS and integration of scientific and traditional knowledge	PMU	All	Case studio documents, audio recordings or videos

Output	Environmental / Social Risk	Risk mitigation measures	Indicators	Responsibility for implementing risk mitigation measures	AF principles	Means of Verification
4.2.1 Strengthened capacity of partner institutions in the Kunene River Basin, through skills and organisational development, to address challenges such as water scarcity, climate change impacts and competing interests among stakeholders	If the capacity-building efforts are not well-integrated into the institution's long-term plans, the improvements may not be sustainable There's a risk that partner institutions might become overly dependent on external support, which can undermine their autonomy and resilience. Institutional culture and resistance to new processes or technologies can hinder the effectiveness of capacity-building initiatives. The benefits of capacity strengthening might not be evenly distributed within the institution, leading to internal conflicts or dissatisfaction Willingness of the participants to be trained	Integrate capacity-building efforts into the institution's long-term strategic plans to ensure sustainability: *Encourage partner institutions to develop their own resources and capabilities to reduce dependency on external support *Foster a culture that is open to change by involving all stakeholders in the process and providing adequate training and support *Ensure that the benefits of capacity strengthening are distributed fairly within the institution to avoid internal conflicts. *Regularly monitor and evaluate the progress of capacity-building initiatives to make necessary adjustments and improvements	Number of institutions with capacity building plans integrated into long term strategic plans Stakeholders involved in training and support at different levels and disaggregated by gender and gender subgroups and ethnic groups Number of participants in a training session disaggregated by age, sex, and sub gender groups Number of training courses developed to build local and institutional capacity of governing bodies, water authorities, and local communities.	National Project Managers	All	Progress reports Training registers Strategic Plans and budgets Training reports

Annex H. Climate Risk Analysis

1. Overview

The Kunene River Basin, a vital transboundary water resource straddling the border between Angola and Namibia, stands at the forefront of climate change vulnerability in southwestern Africa. This expansive watershed, covering approximately 106,500 km², plays a crucial role in the socio-economic fabric of both nations, supporting diverse ecosystems, agricultural practices, and energy production. The basin spans multiple climatic zones, from the humid highlands of Angola to the arid regions of northern Namibia, creating complex interdependencies more frequently affected by adverse impacts of climate change, particularly the devastating droughts that are lasting for longer periods.

The transboundary nature of the Kunene Basin adds an additional layer of complexity to the climate change equation with the potential for both conflict and cooperation between Angola and Namibia in the face of shared climate risks.

The Kunene River Basin covers approximately 106,500 km², characterised by distinct geographical zones, each with its own climatic regime, ecological characteristics, and socio-economic dynamics in a unique geographical configuration that both determines its hydrological profile and influences the lives and livelihoods of the communities that depend on its waters and forms a natural border between Angola and Namibia, draining into the Atlantic Ocean.

The upper reaches of the Kunene Basin are located in the Angolan highlands, characterised by a humid subtropical climate with elevations ranging from 1,700 to 2,300 metres above sea level, are markedly different from the rest of the basin, receiving the highest rainfall in the entire with annual precipitation that averages between 1,000 to 1,500 mm, with some areas receiving up to 1,800 mm in particularly wet years (Mendelsohn et al., 2013) thus forms a natural water tower for the entire watershed. This abundant rainfall is largely attributed to the orographic effect of the highlands, which force moisture-laden air from the Atlantic to rise, cool, and precipitate.

The upper basin's generous rainfall regime supports a diverse array of ecosystems, including montane forests, grasslands, and wetlands that harbour rich biodiversity while regulating the basin's hydrology. The dense vegetation and soil structures in this region act as natural sponges, absorbing rainfall and releasing it gradually, thereby moderating flow regimes downstream.

Agriculturally, the upper basin has a combination of fertile soils, abundant rainfall, and moderate temperatures, creating ideal conditions for a variety of crops, including maize, beans, and vegetables. Smallholder farming dominates the agricultural landscape, with many communities relying on rain-fed agriculture for their livelihoods.

Challenges in the upper basin include deforestation, driven by agricultural expansion and demand for fuel wood, which threatens the region's ecological balance that when coupled with climate change projections indicating potential shifts in rainfall patterns, poses significant risks to the long-term hydrological stability of the entire Kunene system.

As the Kunene River descends from the Angolan highlands, it enters a transitional zone that marks the middle basin straddling the border between Angola and Namibia, characterised by a semi-arid climate, dominated by savanna ecosystems, interspersed with patches of dry forests and shrublands. Annual rainfall in this zone ranges from 600 to 800 mm, showcasing a clear precipitation gradient as one moves southward (CRIDF, 2020). This transitional climate supports a unique blend of flora and fauna adapted to semi-arid conditions.

One of the most notable features of the middle basin is the Ruacana Falls, with a drop of 120 metres, providing the basis for the Ruacana Hydroelectric Power Station with an installed capacity of 347 MW as the key pillar of Namibia's energy infrastructure, (NamPower, 2022).

The middle basin also marks the beginning of more intensive water management and utilisation. Several small to medium-sized dams and irrigation schemes are in this zone, supporting agricultural activities on both sides of the border. These infrastructures, while crucial for local economies, also introduce complexities in terms of water allocation and management between Angola and Namibia.

From an ecological perspective, the middle basin serves as a vital corridor for various species, facilitating movement between the more humid upper basin and the arid lower reaches. This ecological connectivity is increasingly threatened by habitat fragmentation due to human activities and climate change-induced shifts in vegetation patterns.

The semi-arid conditions of the middle basin make it particularly sensitive to climate variability. Even small changes in temperature and precipitation can have significant impacts on water availability, ecosystem health, and human activities. As such, this transitional zone may serve as an early indicator of broader climate change impacts in the Kunene Basin.

The lower reaches flow through Namibia's Kunene region, an arid landscape extending from the Namibian border to the river's mouth at the Atlantic Ocean. Annual rainfall in this region is both low and erratic, averaging less than 300 mm per year, with some areas receiving as little as 50 mm in dry years. This scarcity of rainfall is compounded by high evaporation rates, often exceeding 2,000 mm annually, creating a significant water deficit. (Namibia Statistics Agency, 2021).

The landscape of the lower basin is dominated by arid savanna and desert ecosystems. Vegetation is sparse and adapted to water scarcity, with species such as Mopane trees (Colophospermum mopane) and various drought-resistant grasses and shrubs dominating the flora. Despite its aridity, this region supports a unique array of desert-adapted wildlife, including species like the desert elephant and black rhino, making it an area of high conservation value.

Human settlements in the lower basin are sparse and primarily concentrated along the river course. The indigenous Himba people, known for their resilience and traditional pastoralist lifestyle, have inhabited this harsh environment with their livelihoods, centred around livestock herding, intrinsically tied to the river and highly vulnerable to climate fluctuations.

The Kunene River in this lower zone, provides the only permanent source of surface water for both human needs and wildlife in an otherwise parched region. The river's flow in this lower section is highly dependent on upstream dynamics and management decisions, making it particularly susceptible to both climate change impacts and human interventions in the upper and middle basin.

Water management in the lower basin focuses primarily on small-scale irrigation schemes and water supply for domestic and livestock use. The harsh conditions limit large-scale agricultural activities, but small areas of cultivation exist along the riverbanks. Additionally, the potential for further hydropower development in this section of the river has been explored, though environmental concerns and the need to maintain adequate flow for downstream ecosystems have tempered these ambitions.

The lower basin also encompasses the Kunene River mouth to the Atlantic Ocean, an estuarine environment which while small in extent, plays a crucial ecological role, supporting unique brackish water ecosystems and serving as an important habitat for migratory birds. The health of this estuarine system is directly linked to upstream water quantity and quality, making it a sensitive indicator of overall basin health.

The aridity of the lower basin magnifies its vulnerability to climate change. Even small reductions in river flow or increases in temperature could have profound impacts on both ecosystems and human communities

in this zone. As such, understanding and addressing the specific vulnerabilities of the lower basin is crucial for any comprehensive climate change adaptation strategy for the Kunene system.

Each of these geographical zones – upper, middle, and lower basin – has its distinct characteristics, that function as part of an interconnected system with complex interactions that determine the health and resilience of the entire Kunene Basin:

Hydrological Connectivity: The abundant rainfall in the upper basin is the primary source of water for the entire system. Changes in precipitation patterns or land use in the Angolan highlands can have far-reaching consequences downstream.

Sediment Transport: The river's flow carries sediments from the upper basin, which play a crucial role in nutrient cycling and maintaining the geomorphology of the middle and lower basin.

Ecological Gradients: The basin's diverse ecosystems, from montane forests to desert landscapes, form a continuous ecological gradient that supports unique biodiversity and enables species migration in response to climatic shifts.

Socio-economic Links: Human activities, including agriculture, energy production, and water consumption, create a web of socio-economic interdependencies across the basin. Management decisions in one zone can significantly impact livelihoods and development opportunities in others.

Climate Change Cascade: Climate impacts in one zone can trigger a cascade of effects throughout the basin. For instance, reduced rainfall in the upper basin could exacerbate water scarcity issues in the already arid lower basin.

Understanding these interdependencies is crucial for effective basin management and climate change adaptation which underscores the need for a basin-wide approach to addressing the challenges posed by climate change, rather than focusing on individual zones in isolation.

2. Climate Change Projections for the Kunene Basin

2.1 Temperature Changes

The Kunene Basin, like much of Southern Africa, is projected to experience significant warming over the coming decades. The magnitude of this warming, however, is not uniform across the basin and varies depending on the climate scenario considered.

According to the IPCC Sixth Assessment Report (2021), under a medium emissions scenario (SSP2-4.5), the mean annual temperature in the Kunene Basin region is projected to increase by 1.5°C to 3°C. This range accounts for variations across different parts of the basin, with higher increases expected in the interior (middle and lower basin) compared to coastal areas near the river mouth.

More specifically:

Upper Basin (Angola): Projections indicate a temperature increase of 1.5°C to 2.5°C. The slightly lower increase compared to other parts of the basin is attributed to the moderating effect of higher elevations and greater cloud cover in this region.

Middle Basin (Angola-Namibia border): This transitional zone is expected to see temperature rises of 2°C to 2.8°C. The semi-arid nature of this region makes it particularly susceptible to temperature increases.

Lower Basin (Namibia): The most significant warming is projected for the arid lower basin, with temperature increases of 2.5°C to 3°C. This substantial warming in an already hot and dry region could have severe implications for ecosystems and human activities.

These projections represent mean annual temperatures. Seasonal variations are expected to be more pronounced, with summer temperatures likely to increase more than winter temperatures. The number of hot days (days with maximum temperature above 35°C) in the lower basin is projected to increase by 20-30 days per year (World Bank Climate Change Knowledge Portal, 2021).

Furthermore, temperature extremes are expected to become more frequent and intense. Heat waves, defined as periods of abnormally high temperatures lasting several days, are projected to occur 2-3 times more frequently compared to the historical average (1981-2010) across the entire basin (CORDEX Africa Simulations, 2022).

The rate of warming is not linear, and there is potential for accelerated warming beyond 2063 if global emissions are not significantly reduced. Some models project that under a high emissions scenario (SSP5-8.5), temperatures in the Kunene Basin could increase by up to 4°C to 5°C by the end of the century (2100), highlighting the long-term risks if mitigation efforts are insufficient (IPCC, 2021).

These temperature increases have far-reaching implications for the Kunene Basin:

Increased Evapotranspiration: Higher temperatures will lead to increased evaporation from water bodies and greater transpiration from plants. This could exacerbate water scarcity, particularly in the middle and lower basin.

Shifts in Vegetation Patterns: Warmer temperatures may cause shifts in plant species distribution, potentially altering ecosystem compositions and agricultural suitability across the basin.

Heat Stress on Agriculture: Crop yields, particularly for staples like maize, may decrease due to heat stress. Livestock in the middle and lower basin will face increased heat-related challenges.

Human Health Impacts: More frequent and intense heat waves pose significant health risks, especially for vulnerable populations in urban areas and those engaged in outdoor labour.

Energy Demand: Rising temperatures are likely to increase energy demand for cooling, particularly in urban areas, straining existing power infrastructure.

2.2 Precipitation Changes

Projections for precipitation changes in the Kunene Basin are characterized by greater uncertainty compared to temperature projections. This uncertainty stems from the complex interactions between large-scale climate systems, local topography, and land-use changes. Nevertheless, most climate models indicate a general trend towards drier conditions across the basin, with significant spatial and temporal variability.

According to the IPCC Sixth Assessment Report (2021) and regional climate studies, the Kunene Basin is projected to experience the following precipitation changes:

Overall Trend: Models project a decrease in annual precipitation by 5-10% across the basin, compared to the 1981-2010 baseline period. However, this average mask significant variability across different parts of the basin and between seasons.

Upper Basin (Angola): Projections for the upper basin show the highest variability, with some models suggesting a slight increase in precipitation (up to 5%) while others project decreases of up to 10%. This

uncertainty is partly due to the complex topography of the Angolan highlands and their interaction with large-scale climate systems like the Intertropical Convergence Zone (ITCZ).

Middle Basin (Angola-Namibia border): This transitional zone is likely to see a more consistent decrease in annual precipitation, with projections ranging from 5% to 15% reduction. The semi-arid nature of this region makes it particularly vulnerable to rainfall reductions.

Lower Basin (Namibia): The most pronounced decreases are projected for the already arid lower basin, with models suggesting 10% to 20% reduction in the meagre annual rainfall with severe implications for an area already characterised by water scarcity.

Seasonal Changes: The distribution of rainfall throughout the year is also expected to change, potentially more dramatically than annual totals:

Wet Season (October to April): Models project a delayed onset and earlier cessation of the wet season, effectively shortening its duration. The core of the wet season (December to February) may see more intense but less frequent rainfall events.

Dry Season (May to September): The dry season is expected to become more prolonged and intense, with some models projecting up to a 30% decrease in the already limited dry season precipitation in the middle and lower basin (CORDEX Africa Simulations, 2022).

Extreme Precipitation Events: Despite the overall drying trend, the intensity of extreme precipitation events is projected to increase:

Heavy Rainfall: The frequency of heavy rainfall events (defined as daily precipitation exceeding the 95th percentile of the historical distribution) is projected to increase by 10-20% across the basin, with the upper basin seeing the largest increase (World Bank Climate Change Knowledge Portal, 2021).

Dry Spells: The duration of dry spells, particularly in the middle and lower basin, is projected to increase., the average maximum length of dry spells could increase by 5-10 days annually (Angola Third National Communication to the UNFCCC, 2023).

Interannual Variability: Climate change is expected to amplify the interannual variability of precipitation in the Kunene Basin. This means that the difference between wet years and dry years is likely to become more pronounced, challenging water resource management and agricultural planning.

El Niño Southern Oscillation (ENSO) Impact: The influence of ENSO events on regional precipitation patterns is expected to intensify. Strong El Niño events, which typically bring drier conditions to Southern Africa, may lead to more severe and prolonged droughts in the Kunene Basin (SADC Climate Services Centre, 2022).

The projected changes in precipitation patterns have far-reaching implications for the Kunene Basin:

Water Resource Management: Reduced and more variable precipitation will challenge existing water management strategies, potentially leading to conflicts over water allocation between different sectors and between upstream and downstream users.

Agricultural Productivity: Changes in rainfall patterns, particularly the shortening of the growing season and increased frequency of dry spells, will significantly impact rain-fed agriculture, which is prevalent in the upper and middle basin.

Ecosystem Health: Altered precipitation regimes may lead to shifts in vegetation types and biodiversity patterns across the basin, potentially threatening endemic species and ecosystem services.

Flood and Drought Risk: While overall precipitation is projected to decrease, the increased intensity of extreme rainfall events coupled with prolonged dry periods may exacerbate both flood and drought risks.

Hydropower Generation: Changes in precipitation patterns, particularly in the upper basin, will directly impact river flow regimes, potentially affecting hydropower generation at facilities like the Ruacana Power Station.

Groundwater Recharge: Reduced precipitation, coupled with increased evaporation rates, may negatively impact groundwater recharge, particularly in the middle and lower basin where groundwater is a critical resource for many communities.

Soil Erosion: More intense rainfall events, especially following prolonged dry periods, may increase soil erosion rates, affecting agricultural productivity and sedimentation in water bodies.

2.3 Extreme Events

Climate change is expected to not only shift average conditions but also significantly alter the frequency, intensity, and duration of extreme weather events in the Kunene Basin. These changes in extremes often have more immediate and severe impacts on ecosystems and human societies than gradual shifts in average conditions.

Droughts: The Kunene Basin, particularly its middle and lower reaches, is projected to face an increased risk of severe and prolonged droughts:

Frequency: the frequency of meteorological droughts (periods of abnormally low rainfall) is projected to increase by 20-30% compared to the historical average (1981-2010) (World Bank Climate Change Knowledge Portal, 2021).

Duration: The average duration of drought events is expected to increase. Models suggest that drought periods could last 10-20% longer than historical averages (SADC Climate Services Centre, 2022).

Severity: The combination of higher temperatures, increased evapotranspiration, and more variable rainfall is likely to result in more severe agricultural and hydrological droughts. The Palmer Drought Severity Index (PDSI) for the lower basin is projected to decrease by 1-2 points on average, indicating substantially drier conditions (CRIDF, 2020).

Spatial Extent: While the entire basin will be affected, the middle and lower basin are projected to experience the most severe increases in drought risk., areas of the lower basin that historically experienced severe drought conditions once every 10 years may face such conditions once every 5-7 years (Namibia Second National Communication to the UNFCCC, 2022).

Floods: Despite the overall drying trend, the risk of flooding is also projected to increase due to more intense extreme rainfall events:

Flash Floods: The frequency of flash floods, particularly in the upper and middle basin, is projected to increase by 15-25% due to more intense rainfall events (Angola Third National Communication to the UNFCCC, 2023).

River Flooding: While average river flows are expected to decrease, the risk of extreme flooding events may paradoxically increase. This is due to the projected increase in very heavy rainfall events, coupled with potential land use changes (e.g., deforestation) that could reduce the landscape's capacity to absorb excess water.

Coastal Flooding: At the Kunene River mouth, the risk of coastal flooding is expected to increase due to the combination of more intense storm surges and sea-level rise 1-in-100-year coastal flood level is projected to increase by 0.3-0.5 meters (IPCC, 2021).

Heat Waves: As mentioned in the temperature section, heat waves are projected to become more frequent, intense, and longer-lasting:

Frequency: the number of heat wave days (defined as days where maximum temperature exceeds the 90th percentile of the historical distribution for at least 3 consecutive days) is projected to increase by 30-50 days per year across the basin (CORDEX Africa Simulations, 2022).

Intensity: The maximum temperature during heat waves is projected to increase by 2-3°C above historical levels, with the most severe increases in the lower basin.

Duration: The average duration of heat wave events is expected to increase by 2-4 days compared to historical averages (World Bank Climate Change Knowledge Portal, 2021).

Dust Storms: In the arid lower basin, the combination of prolonged dry spells and land degradation is projected to increase the frequency and intensity of dust storms:

, the number of days with conditions favourable for dust storm formation is projected to increase by 15-25% compared to historical averages (Namibia National Climate Change Strategy and Action Plan, 2020).

Implications of Changes in Extreme Events: The projected changes in extreme events have significant implications for the Kunene Basin:

Disaster Risk Management: Increased frequency and intensity of extreme events will strain existing disaster response and management systems, necessitating enhanced early warning systems and preparedness measures.

Infrastructure Resilience: Both flood and drought extremes will challenge the resilience of water management infrastructure, including dams, irrigation systems, and urban water supply networks.

Agricultural Volatility: More frequent and severe droughts, interspersed with flooding events, will increase the volatility of agricultural production, threatening food security and rural livelihoods.

Ecosystem Stress: Extreme events can cause rapid and sometimes irreversible changes to ecosystems, potentially leading to biodiversity loss and altered ecosystem services.

Human Health: Heat waves and flood events pose direct health risks, while droughts can indirectly affect health through impacts on food security and water quality.

Economic Impacts: The increased frequency of extreme events is likely to result in higher economic losses, both from direct damages and from the need for increased investment in resilience and adaptation measures.

Migration Pressures: Severe and recurring extreme events, particularly in the more vulnerable middle and lower basin, may contribute to increased rural-to-urban migration or cross-border movements.

Transboundary Cooperation: Managing the impacts of extreme events, particularly floods and droughts, will require enhanced cooperation between Angola and Namibia in areas such as early warning systems, disaster response, and water allocation during crisis periods.

These projections underscore the urgent need for robust climate change adaptation strategies in the Kunene Basin. While the exact magnitude and timing of these changes remain subject to some uncertainty, the overall trends point clearly towards a future characterized by greater climatic stress and variability

Sector-Specific Vulnerabilities

The projected climate changes in the Kunene River Basin will have far-reaching impacts across various sectors. This section provides an in-depth analysis of how climate change is expected to affect key sectors within the basin, considering the unique characteristics of each geographical zone and the interdependencies between sectors.

2.4 Water Resources

The water resources of the Kunene River Basin are central to its ecological health, economic productivity, and social well-being. Climate change poses significant threats to this vital resource, with cascading effects across all sectors.

a) Reduced River Flow:

The combination of increased temperatures and altered precipitation patterns is projected to significantly impact river flow regimes:

Projections indicate a potential decrease in annual river flow by 20-30% by 2050, with this trend likely to continue or worsen (CRIDF, 2020). This reduction will be most pronounced in the middle and lower basin, exacerbating existing water scarcity issues in northern Namibia.

Seasonal flow patterns are expected to change dramatically. The WEAP (Water Evaluation and Planning) model simulations for the Kunene Basin suggest that:

Wet season (October to April) flows may decrease by 15-25%

Dry season (May to September) flows could see reductions of up to 40-50% in extreme years (Angola National Adaptation Programme of Action, 2021)

Low flow periods are projected to become more prolonged and severe. The number of days per year when river flow falls below critical ecological thresholds could increase by 30-45%, particularly affecting the middle and lower reaches of the river (World Bank Climate Change Knowledge Portal, 2021).

These changes in flow regimes will have significant implications for water availability, ecosystem health, and economic activities dependent on the river, such as agriculture and hydropower generation.

b) Increased Variability:

Climate change is expected to amplify the natural variability of the Kunene River's flow:

Interannual variability in river flow is projected to increase by 25-35% compared to historical averages (1981-2010) (Angola Third National Communication to the UNFCCC, 2023). This increased variability will complicate water resource planning and management.

The frequency of extreme high flow events may increase despite the overall drying trend. Hydrological modelling suggests that the magnitude of the 1-in-50-year flood event could increase by 10-15% compared to historical levels (SADC Climate Services Centre, 2022).

This heightened variability poses challenges for water infrastructure design and operation. Existing dams and flood control structures may not be adequately sized to handle the projected range of flow conditions.

c) Groundwater Recharge:

Changes in precipitation patterns and increased evaporation rates are expected to impact groundwater resources:

In the upper basin, where rainfall is projected to decrease less dramatically, groundwater recharge rates may decrease by 10-20% (Angola National Adaptation Programme of Action, 2021).

The middle and lower basin face more severe threats to groundwater resources. Models project potential reductions in recharge rates of 25-40% in these arid and semi-arid regions (Namibia National Climate Change Strategy and Action Plan, 2020).

Decreased groundwater recharge, combined with potentially increased extraction to compensate for surface water shortages, could lead to significant declines in water table levels. In some areas of the lower basin, water table declines of 0.5-1 meter per year are possible under severe climate scenarios (CRIDF, 2020).

The quality of groundwater may also be affected, with increased concentrations of dissolved solids due to reduced dilution and potentially increased seawater intrusion near the coast.

d) Water Quality:

Climate change is expected to have complex effects on water quality in the Kunene Basin:

Reduced river flows, particularly during dry seasons, will lead to higher concentrations of pollutants and nutrients, potentially increasing the risk of eutrophication in slower-moving sections of the river and in reservoirs.

More intense rainfall events could increase erosion and sediment loads in the river, affecting water treatment processes and the lifespan of reservoirs. Sedimentation rates in major reservoirs could increase by 15-25% (Angola Third National Communication to the UNFCCC, 2023).

Higher water temperatures will likely reduce dissolved oxygen levels and alter aquatic ecosystems. Models suggest that average water temperatures in the Kunene River could increase by 1.5-2.5°C, potentially exceeding thermal tolerances for some native fish species (SADC Climate Services Centre, 2022).

In the lower basin, increased evaporation and reduced flows may lead to higher salinity levels, particularly in the estuarine areas near the river mouth.

e) Transboundary Water Management:

The transboundary nature of the Kunene River adds an additional layer of complexity to water resource management under climate change:

Reduced water availability may strain existing water-sharing agreements between Angola and Namibia. The 1969 agreement on water use in the Kunene River, which forms the basis for current transboundary water management, may need to be revised to account for climate change impacts (UNECE, 2021).

Changes in flow regimes will affect the operation of shared infrastructure, particularly the Ruhakana hydroelectric scheme., the scheme's firm energy output could decrease by 15-25% due to reduced and more variable river flows (NamPower, 2022).

Increased variability in water availability may necessitate more frequent and complex negotiations between the two countries regarding water allocation, especially during drought periods.

There may be increased pressure for new water storage infrastructure to buffer against increased variability, which would require careful bilateral planning and agreement.

f) Ecosystem Impacts:

Changes in water resources will have profound effects on aquatic and riparian ecosystems:

Reduced dry season flows may lead to the fragmentation of river habitats, threatening fish populations and other aquatic species. Some models project that, up to 30-40% of the river's length could experience critically low flows during peak dry seasons, potentially leading to localized extinctions of less mobile aquatic species (CRIDF, 2020).

Changes in flow regimes and water quality will likely alter the composition of aquatic communities. Cold-water species may be particularly vulnerable to warming river temperatures.

Wetland ecosystems, particularly in the lower basin and at the river mouth, face threats from reduced water availability and potential saline intrusion. The area of functional wetlands in the lower Kunene could decrease by 20-30% under severe climate scenarios (Ramsar Convention Secretariat, 2021).

g) Adaptation Challenges and Opportunities:

Adapting water resource management to these projected changes will require a multi-faceted approach:

Enhanced monitoring systems: Improving hydrological and meteorological monitoring networks throughout the basin will be crucial for adaptive management. Investments in real-time monitoring and forecasting systems could improve water management efficiency by 10-15% (World Bank, 2021).

Infrastructure upgrades: Existing water infrastructure may need to be retrofitted or redesigned to handle increased variability. New infrastructure, such as additional storage capacity or water transfer schemes, may be necessary but will require careful environmental and social impact assessments.

Demand management: Implementing water conservation measures and improving water use efficiency across all sectors will be essential. Studies suggest that aggressive demand management could reduce water consumption by 20-30% in urban areas and 15-25% in the agricultural sector (CRIDF, 2020).

Ecosystem-based adaptation: Protecting and restoring natural ecosystems, particularly in the upper basin, can help regulate water flows and improve water quality. Reforestation and wetland restoration projects could enhance water retention and reduce erosion.

Transboundary cooperation: Strengthening mechanisms for joint water management between Angola and Namibia will be crucial. This may include developing shared early warning systems for floods and droughts, and establishing flexible water allocation mechanisms that can adapt to changing conditions.

Alternative water sources: Exploring and developing alternative water sources, such as water reuse systems and, where feasible, desalination technologies, could help buffer against increased water scarcity, particularly in the lower basin.

Addressing these challenges will require integrated approaches that consider the interconnections between water resources and other sectors, as well as the transboundary nature of the basin.

2.5 Agriculture and Food Security

Agriculture is a cornerstone of livelihoods and food security in the Kunene River Basin, with its importance varying across the basin's diverse geographical zones. Climate change poses significant threats to agricultural productivity and food security, with cascading effects on local economies and social structures.

a) Crop Yields:

Climate change is projected to have substantial impacts on crop yields throughout the Kunene Basin:

Overall Trend: Models project potential yield reductions of 5-15% for major crops like maize and sorghum by 2050, with this trend likely to continue or worsen. The severity of impacts varies across the basin and between crop types (FAO, 2021).

Upper Basin: In the more humid upper basin of Angola, some crops may initially benefit from warmer temperatures and potential increases in rainfall. However,

Maize yields could decrease by 5-10% due to heat stress during critical growth stages.

Cassava, a staple crop in the region, may see yield reductions of 3-7% due to changes in rainfall patterns and increased pest pressure (Angola Third National Communication to the UNFCCC, 2023).

Middle Basin: The transitional zone faces more significant challenges:

Sorghum and millet, important drought-resistant crops, may experience yield reductions of 10-20% due to increased heat stress and more erratic rainfall.

Legume crops like beans could see yield decreases of 15-25% due to heat stress during flowering stages (SADC Climate Services Centre, 2022).

Lower Basin: The already marginal agricultural conditions in the lower basin are expected to deteriorate further:

Yields of drought-resistant crops like pearl millet could decrease by 20-30% under severe climate scenarios.

The viability of rain-fed agriculture may be threatened in many areas, potentially necessitating a shift towards more resilient pastoral systems or irrigated agriculture where feasible (Government of Namibia, 2022).

Crop Quality: Beyond yield reductions, climate change may also affect crop quality. Higher CO2 levels could reduce the protein content of some cereal crops by 5-10%, potentially exacerbating nutritional challenges in the region (IPCC, 2021).

b) Livestock:

Livestock production, particularly important in the middle and lower basin, faces multiple climate-related challenges:

Heat Stress: Increased temperatures and more frequent heat waves will impact animal health and productivity:

Milk production in dairy cattle could decrease by 10-20% during severe heat waves.

Growth rates in beef cattle may reduce by 5-15% due to increased metabolic stress from higher temperatures (Namibia National Climate Change Strategy and Action Plan, 2020).

Forage Availability: Changes in precipitation patterns and increased aridity will affect pasture and forage availability:

In the middle basin, pasture productivity could decrease by 10-25% due to reduced rainfall and increased evapotranspiration.

The lower basin may see reductions in rangeland carrying capacity of 20-40% under severe climate scenarios, potentially forcing significant changes in pastoral practices (CRIDF, 2020).

Water Scarcity: Reduced water availability will impact livestock production, particularly in the drier parts of the basin. The distance that pastoral communities need to travel to water sources during dry seasons could increase by 30-50% in some areas of the lower basin.

Increased competition for water resources between livestock, crops, and other uses may lead to conflicts and forced migration of pastoral communities (IOM, 2023).

Disease and Pest Outbreaks: Changing climate conditions may alter the distribution and intensity of livestock diseases and pests:
The range of vector-borne diseases like Rift Valley Fever could expand northward into previously unaffected parts of the basin.

Tick-borne diseases may become more prevalent in the upper basin as temperatures increase, potentially affecting up to 30% more livestock (FAO, 2021).

c) Pest and Disease Outbreaks:

Changing climate conditions are expected to alter the dynamics of agricultural pests and diseases:

Pest Range Expansion: Warmer temperatures may allow certain pests to expand their ranges:

The Fall Armyworm, a significant threat to maize production, could expand its range into higher elevation areas of the upper basin, potentially affecting 20-30% more cropland (CABI, 2022).

Desert Locust outbreaks, historically rare in the Kunene Basin, may become more frequent in the lower basin due to changes in wind patterns and breeding conditions.

Disease Pressure: Changes in temperature and humidity will affect the prevalence and severity of crop diseases:

Fungal diseases like maize rust could become more severe in the upper basin, potentially reducing yields by an additional 5-10%.

In contrast, some bacterial diseases may become less prevalent in the drier conditions projected for the middle and lower basin (Angola Third National Communication to the UNFCCC, 2023).

Pest-Predator Dynamics: Climate change may disrupt natural pest control by affecting the lifecycles and distributions of beneficial insects and other predators:

Models suggest that the synchronisation between certain crop pests and their natural predators could be disrupted in up to 40% of the basin's agricultural areas, potentially leading to more severe pest outbreaks (SADC Climate Services Centre, 2022).

d) Agricultural Water Demand:

Climate change will significantly impact agricultural water demand and irrigation requirements:

Increased Evapotranspiration: Higher temperatures will increase crop water requirements:

, crop water demand could increase by 15-25% in the upper basin and 25-40% in the middle and lower basin, assuming no change in cropping patterns (CRIDF, 2020).

Irrigation Expansion: To maintain agricultural productivity, there may be pressure to expand irrigation:

Models suggest that to maintain current production levels, irrigated area in the basin may need to increase by 30-50%, placing significant strain on water resources (FAO, 2021).

Irrigation Efficiency: Improving irrigation efficiency will be crucial:

Implementing advanced irrigation technologies and practices could reduce agricultural water consumption by 20-30% while maintaining or even increasing yields (World Bank, 2021).

e) Soil Degradation:

Climate change is likely to exacerbate soil degradation processes in the Kunene Basin:

Erosion: More intense rainfall events, coupled with longer dry periods, will increase soil erosion risks:

, soil erosion rates could increase by 25-40% in steep agricultural areas of the upper basin.

In the middle and lower basin, wind erosion during prolonged dry periods could lead to topsoil losses of 5-10 mm per year in exposed areas (UNCCD, 2022).

Soil Organic Matter: Higher temperatures will accelerate the decomposition of soil organic matter:

Models project that soil organic carbon content could decrease by 10-20% across much of the basin, reducing soil fertility and water-holding capacity (IPCC, 2021).

Salinization: In irrigated areas, particularly in the lower basin, increased evaporation and reduced water quality may lead to soil salinization:

, up to 15-25% of currently irrigated land in the lower basin could be at high risk of salinization, potentially rendering it unsuitable for agriculture (Namibia Second National Communication to the UNFCCC, 2022).

f) Socio-economic Impacts:

The projected changes in agricultural productivity will have far-reaching socio-economic implications:

Food Security: Reduced and more variable agricultural production will threaten food security, as the number of people in the basin facing moderate to severe food insecurity could increase by 20-40% compared to current levels, with the most severe impacts in the lower basin (WFP, 2023).

Rural Livelihoods: Agricultural challenges will impact rural livelihoods and potentially drive migration. Models suggest that climate change could reduce agricultural incomes by 15-30% in the most affected parts of the basin, potentially forcing diversification into non-agricultural activities or migration to urban areas (IOM, 2023).

Gender Impacts: Climate change impacts on agriculture may disproportionately affect women, who often play a crucial role in smallholder farming. Increased water scarcity may force women and girls to spend 25-50% more time on water collection, reducing time available for education and other economic activities (UN Women, 2022).

Market Volatility: More variable agricultural production is likely to increase food price volatility. Year-to-year variations in staple food prices could increase by 30-50% compared to historical levels, challenging food access for vulnerable populations (FAO, 2021).

g) Adaptation Strategies:

Adapting agriculture in the Kunene Basin to climate change will require a multi-faceted approach:

Crop Diversification: Promoting drought-resistant and heat-tolerant crop varieties:

Widespread adoption of improved varieties could offset 40-60% of projected yield losses (CGIAR, 2022).

Conservation Agriculture: Implementing practices like minimal tillage, crop rotation, and mulching:

These practices could increase soil water retention by 20-30% and improve yields by 10-20% under drought conditions (FAO, 2021).

Water Management: Improving irrigation efficiency and implementing water harvesting techniques:

Precision irrigation technologies could reduce agricultural water use by 30-40% while maintaining or improving yields (World Bank, 2021).

Climate-Smart Livestock Systems: Promoting heat-tolerant breeds and improving rangeland management:

Implementing improved grazing systems could increase rangeland productivity by 15-25% even under climate stress (ILRI, 2022).

Early Warning Systems: Developing and improving climate information services for farmers:

Effective early warning systems for extreme events and seasonal forecasts could reduce climate-related agricultural losses by 20-30% (WMO, 2023).

Insurance and Financial Tools: Expanding access to weather index insurance and other risk management tools:

up to 50-60% of farmers in the basin could be covered by some form of agricultural insurance, significantly improving resilience to climate shocks (World Bank, 2021).

Research and Extension: Strengthening agricultural research and extension services to support adaptation:

Investing in climate-resilient agricultural research and effective extension services could improve overall agricultural productivity by 15-25% (CGIAR, 2022).

The agricultural sector in the Kunene Basin faces significant challenges due to climate change, with impacts varying across the basin's diverse geographical zones. Addressing these challenges will require integrated approaches that consider the interconnections between agriculture, water resources, and other sectors. In the next section, we will explore the implications of climate change for the energy sector in the Kunene Basin.

2.6 Energy

The energy sector in the Kunene River Basin, particularly hydropower generation, plays a crucial role in the region's economic development and is highly vulnerable to climate change impacts. The basin's energy landscape is characterized by the significant Ruacana Hydroelectric Scheme on the Angola-Namibia border, as well as smaller-scale energy production and distribution systems throughout the basin.

a) Hydropower Generation:

The Ruacana Hydroelectric Power Station, with its installed capacity of 347 MW, is the cornerstone of energy production in the basin and a critical component of Namibia's electricity supply. Climate change is projected to significantly impact its operations:

Reduced River Flow: As discussed in the water resources section, climate projections indicate a potential decrease in annual river flow by 20-30% by 2050, with this trend likely to continue or worsen. This reduction will directly impact hydropower generation. The average annual electricity generation at Ruacana could decrease by 15-25% compared to historical averages (NamPower, 2022).

The firm energy output (the minimum power that can be guaranteed year-round) could decrease by 30-40% under severe climate scenarios, significantly impacting the reliability of power supply (IRENA, 2022).

Increased Flow Variability: Greater inter-annual and seasonal variability in river flow will challenge hydropower operations.

The coefficient of variation for annual hydropower production could increase by 40-60%, making energy planning and grid management more complex (SADC Climate Services Centre, 2022).

Extreme low flow periods could become more frequent and prolonged, potentially leading to complete shutdowns of the power plant for several weeks during severe droughts.

Sedimentation: Increased erosion in the upper basin due to more intense rainfall events could accelerate reservoir sedimentation. The active storage capacity of the Ruacana reservoir could decrease by 10-15% due to sedimentation, further impacting power generation capacity (Angola Third National Communication to the UNFCCC, 2023).

Infrastructure Stress: More frequent and intense extreme weather events may stress hydropower infrastructure:

The frequency of spilling events (when water must be released without generating power) could increase by 20-30%, potentially causing increased wear on dam structures (NamPower, 2022).

Higher temperatures may affect the efficiency of power generation and transmission equipment, potentially reducing overall system efficiency by 2-4% during extreme heat events (IRENA, 2022).

b) Other Renewable Energy Sources:

While hydropower dominates the current energy mix, climate change may create both challenges and opportunities for other renewable energy sources in the basin:

Solar Energy: The basin, particularly its middle and lower reaches, has significant solar potential: average solar irradiation in the lower basin could increase by 3-5% due to reduced cloud cover, potentially enhancing solar power generation potential (IRENA, 2022).

However, higher temperatures may reduce the efficiency of photovoltaic panels by 5-8% during extreme heat events (World Bank Climate Change Knowledge Portal, 2021).

Wind Energy: Climate change may alter wind patterns in the basin. Models suggest that average wind speeds in the coastal areas of the lower basin could increase by 5-10%, potentially improving wind power generation potential (SADC Climate Services Centre, 2022).

However, more frequent, and intense dust storms in the arid regions could increase maintenance requirements for wind turbines.

Biomass Energy: Changes in vegetation patterns and agricultural productivity will affect biomass energy potential:

In the upper basin, faster vegetation growth due to higher temperatures and potential increases in rainfall could increase biomass energy potential by 10-15%.

However, in the more arid middle and lower basin, reduced vegetation productivity could decrease biomass energy potential by 20-30% (UNEP, 2020).

c) Energy Demand:

Climate change is expected to significantly alter energy demand patterns across the basin:

Cooling Demand: Rising temperatures will increase demand for cooling:

cooling degree days (a measure of cooling demand) could increase by 30-50% across the basin, with the most significant increases in urban areas (World Bank, 2021).

Peak electricity demand during summer months could increase by 15-25%, straining grid capacity and potentially leading to more frequent blackouts.

Heating Demand: While less significant in this region, winter heating demand may decrease:

Heating degree days could decrease by 20-30%, potentially offsetting some of the increased cooling demand on an annual basis (IPCC, 2021).

Agricultural Energy Use: Changes in agricultural practices in response to climate change may affect energy demand:

Increased irrigation needs could raise energy demand for water pumping by 20-30% (FAO, 2021).

The potential shift towards more climate-controlled agriculture (e.g., greenhouses) in some areas could further increase agricultural energy demand.

d) Energy Infrastructure:

Climate change poses various risks to energy infrastructure across the basin:

Transmission and Distribution: Higher temperatures and more frequent extreme weather events will stress electricity grids:

Thermal expansion of power lines during heat waves could reduce transmission capacity by 5-10% during peak demand periods (IRENA, 2022).

More frequent and intense storms could increase the frequency of power outages by 15-25% in vulnerable areas (World Bank, 2021).

Fuel Transport: For areas relying on imported fossil fuels, climate change may disrupt supply chains:

Sea-level rise and increased storm intensity could affect coastal fuel import facilities, potentially disrupting supply for 5-10 days per year (IPCC, 2021).

Energy Storage: The need for energy storage is likely to increase to manage greater variability in both supply and demand:

, the required energy storage capacity to maintain grid stability could increase by 40-60% compared to current levels (IRENA, 2022).

e) Socio-economic Implications:

The impacts of climate change on the energy sector will have far-reaching socio-economic implications:

Energy Security: Reduced hydropower reliability and increased demand could threaten energy security:

, the number of days with potential power shortages could increase by 30-50% without significant adaptations to the energy system (NamPower, 2022).

Economic Impacts: Energy sector challenges could affect economic productivity:

Climate-related disruptions to power supply could reduce GDP growth by 0.5-1% annually in the most affected regions (World Bank, 2021).

Energy Poverty: Climate impacts may exacerbate energy poverty, particularly in rural areas:

The proportion of household income spent on energy could increase by 15-25% for vulnerable populations due to increased cooling needs and potential energy price increases (UN Energy, 2023).

Gender Impacts: Energy sector challenges may disproportionately affect women and girls:

Increased unreliability of modern energy services could force women and girls to spend 10-20% more time on traditional biomass collection, impacting time available for education and economic activities (UN Women, 2022).

f) Adaptation Strategies:

Adapting the energy sector to climate change will require a multi-faceted approach:

Diversification: Reducing dependence on hydropower by developing a more diverse energy mix: the share of solar and wind power in the basin's energy mix could increase to 30-40%, improving resilience to hydrological variability (IRENA, 2022).

Improved Hydropower Management: Implementing advanced forecasting and management systems:

Use of seasonal climate forecasts and real-time monitoring could improve hydropower generation efficiency by 10-15% under variable flow conditions (WMO, 2023).

Grid Modernization: Upgrading transmission and distribution infrastructure:

Implementing smart grid technologies could reduce climate-related power outages by 30-40% and improve overall grid efficiency by 10-15% (World Bank, 2021).

Demand Management: Implementing energy efficiency measures and demand response programs:
Large-scale implementation of energy-efficient technologies and building designs could reduce overall energy demand by 20-30% compared to business-as-usual scenarios (UNEP, 2020).

Regional Integration: Strengthening regional power pools to enhance energy security:

Improved interconnections with the Southern African Power Pool could reduce the basin's vulnerability to local climate impacts by allowing a 30-40% increase in power trading capacity (SADC, 2022).

Decentralized Solutions: Promoting mini-grids and off-grid solutions for remote areas - up to 25-35% of rural households in the basin could be served by climate-resilient decentralized energy systems (IRENA, 2022).

Research and Innovation: Investing in climate-resilient energy technologies:
Developments in areas such as high-temperature resistant solar panels, advanced energy storage systems, and climate-proof transmission technologies could significantly enhance the resilience of the energy sector (World Bank, 2021).

2.7 Biodiversity and Ecosystems

The Kunene River Basin hosts a diverse array of ecosystems, ranging from subtropical forests in the upper basin to arid savannas in the lower reaches. This ecological diversity supports a rich tapestry of plant and animal life, many of which are endemic to the region. Climate change poses significant threats to these ecosystems and the biodiversity they harbour.

a) Habitat Shifts:

Climate change is expected to drive significant shifts in habitat distributions across the basin:

Vegetation Zones: Projections suggest potential northward, and upslope shifts of vegetation zones:

The boundary between subtropical dry forest and savanna ecosystems could shift northward by 50-100 km in the middle basin (UNEP, 2020).

Montane forests in the upper basin may shift upslope by 150-300 meters in elevation, potentially reducing their total area by 20-30% (Angola Third National Communication to the UNFCCC, 2023).

Species Range Shifts: Many plant and animal species will need to migrate to track suitable climatic conditions:

, up to 30-40% of plant species in the basin may need to shift their ranges by more than 100 km to remain in suitable climatic conditions (IPCC, 2021).

Some animal species, particularly those with limited mobility or specific habitat requirements, may struggle to keep pace with these rapid changes. Models suggest that 15-25% of endemic reptile and amphibian species in the basin could lose more than half of their current suitable habitat (IUCN, 2022).

Ecosystem Fragmentation: Climate-driven habitat shifts, combined with human land-use changes, may lead to increased ecosystem fragmentation:

The average size of contiguous habitat patches for key ecosystems could decrease by 20-35%, challenging species that require large, uninterrupted habitats (CBD, 2021).

b) Desertification:

Increased aridity in the lower basin may accelerate desertification processes:

Expanding Arid Zones: Climate projections suggest that arid and semi-arid zones could expand significantly:

the area classified as arid or hyper-arid in the lower basin could increase by 15-25%, encroaching on current semi-arid savanna ecosystems (UNCCD, 2022).

This expansion could lead to the loss of 20-30% of perennial grass cover in affected areas, impacting both wildlife and livestock.

Soil Degradation: Increased aridity, combined with potential overgrazing and unsustainable land use, could accelerate soil degradation:

Soil organic carbon content in affected areas could decrease by 25-40%, reducing soil fertility and water-holding capacity (FAO, 2021).

Wind erosion rates in newly desertified areas could increase by 30-50%, potentially creating feedback loops that further accelerate desertification (UNEP, 2020).

c) Wetland Degradation:

Wetland ecosystems, particularly in the lower basin and at the Kunene River mouth, face significant threats:

Reduced Inundation: Decreased River flow and increased evaporation may reduce wetland extent and inundation periods:

The area of seasonally inundated wetlands in the lower basin could decrease by 30-50% under severe climate scenarios (Ramsar Convention Secretariat, 2021).

The hydroperiod (duration of inundation) for remaining wetlands could shorten by 20-40%, impacting species adapted to specific inundation regimes.

Salinity Changes: In coastal wetlands near the Kunene River mouth, sea-level rise and reduced freshwater inflow may alter salinity regimes:

Saltwater intrusion could extend 5-10 km further upstream, potentially converting some freshwater wetlands to brackish systems (IPCC, 2021).

These changes could lead to shifts in vegetation communities, with salt-tolerant species replacing current freshwater-adapted plants in affected areas.

Biodiversity Impacts: Wetland degradation will have significant impacts on biodiversity:

Population sizes of wetland-dependent bird species could decline by 25-40% due to habitat loss and altered migration patterns (Bird Life International, 2022).

Fish species diversity in affected wetlands could decrease by 20-30%, with impacts on species with specific breeding habitat requirements (IUCN, 2022).

d) Freshwater Ecosystems:

River and stream ecosystems throughout the basin face multiple climate-related threats:

Flow Regime Changes: Altered precipitation patterns and increased evaporation will impact river flow regimes. The number of zero-flow days in ephemeral streams of the middle and lower basin could increase by 30-50%, threatening aquatic species that rely on persistent pools during dry seasons (CRIDF, 2020).

Peak flow magnitudes could increase by 10-20% in some areas due to more intense rainfall events, potentially altering channel morphology and riparian habitats.

Water Temperature: Increasing air temperatures will lead to warmer water temperatures:

Average water temperatures in the Kunene River could increase by 1.5-2.5°C, potentially exceeding thermal tolerances for some native fish species (SADC Climate Services Centre, 2022).

Warmer waters may also reduce dissolved oxygen levels, particularly during low-flow periods, potentially creating "dead zones" in slower-moving river sections and reservoirs.

Invasive Species: Changed environmental conditions may favour the spread of invasive aquatic species:

The suitable habitat range for aggressive invasive plants like water hyacinth (Eichhornia crassipes) could expand by 20-30%, particularly in warmer, slow-moving water bodies (CABI, 2022).

Some invasive fish species, often more tolerant of warmer and more variable conditions, could outcompete native species in up to 30-40% of the basin's aquatic habitats.

e) Terrestrial Wildlife:

Climate change will have diverse impacts on terrestrial wildlife across the basin:

Large Mammals: Changes in vegetation and water availability will affect large mammal populations:

The carrying capacity for large herbivores like elephants in the middle basin could decrease by 20-35% due to reduced vegetation productivity and water scarcity (IUCN, 2022).

Migration patterns of species like zebra and wildebeest may shift, with dry-season movements potentially covering 30-50% greater distances to reach water and suitable grazing areas.

Small Mammals and Reptiles: These groups may face challenges in adapting to rapidly changing conditions:

Up to 25-35% of small mammal and reptile species in the basin could face high extinction risk due to habitat loss and inability to migrate quickly enough to track suitable climate conditions (IPCC, 2021).

However, some adaptable species may benefit. For example, the range of certain arid-adapted rodent species could expand by 15-25% in the lower basin.

Birds: Changing climatic conditions will affect both resident and migratory bird populations:

Timing of migration for long-distance migrants that use the basin as a stopover or wintering ground could shift by 1-3 weeks, potentially creating mismatches with food availability (birdlife International, 2022).

Some arid-adapted bird species may expand their ranges northward, while forest-dependent species in the upper basin could see range contractions of 20-30%.

f) Plant Communities:

Plant communities across the basin will respond to changing climatic conditions in complex ways:

Species Composition: Changing temperature and precipitation patterns will alter plant community compositions:

In the upper basin, the proportion of drought-tolerant plant species in forest understories could increase by 20-30% (Angola Third National Communication to the UNFCCC, 2023).

In the middle and lower basin, the cover of C4 grasses (adapted to hot, dry conditions) could increase by 15-25% relative to C3 grasses.

Phenology: Plant life cycle events may shift in response to changing climatic cues:

The onset of spring leaf-out in deciduous species could advance by 1-3 weeks, potentially creating mismatches with pollinator activity (IPCC, 2021).

Flowering times for many plant species could shift by 5-15 days, which may impact seed production and ecosystem interactions.

Productivity: Changes in temperature, precipitation, and CO2 levels will affect plant productivity:

Net primary productivity in the upper basin could initially increase by 5-10% due to CO2 fertilization and longer growing seasons but may decline later as temperature and water stress increase.

In the more arid lower basin, vegetation productivity could decrease by 15-25% due to increased water stress, despite potential CO_2 fertilisation effects (UNCCD, 2022).

g) Ecosystem Services:

The changes in biodiversity and ecosystem function will have significant impacts on the ecosystem services provided by the Kunene Basin:

Water Regulation: Changes in vegetation cover and soil properties will affect water regulation services:

The water retention capacity of upper basin forests could decrease by 10-20% due to changes in vegetation structure and increased soil erosion, potentially exacerbating downstream flood risks (UNEP, 2020).

Carbon Sequestration: Changes in vegetation productivity and soil processes will affect carbon storage. The carbon sequestration potential of the basin could decrease by 15-25%, with the greatest reductions in the more arid regions (IPCC, 2021).

Pollination Services: Shifts in plant and pollinator phenology may disrupt pollination services: Crop pollination services provided by wild pollinators could decrease by 10-20% due to mismatches between crop flowering times and pollinator activity periods (FAO, 2021).

Cultural Services: Ecosystem changes will affect cultural and recreational services: The attractiveness of the region for nature-based tourism could decrease in some areas due to reduced wildlife populations and changes in landscape aesthetics, potentially reducing tourism revenues by 15-25% (World Bank, 2021).

h) Adaptation Strategies:

Adapting to these biodiversity and ecosystem changes will require a multi-faceted approach:

Protected Area Network: Expanding and connecting protected areas to facilitate species migrations: Increasing the protected area coverage by 20-30% and establishing ecological corridors could help maintain 60-70% of current biodiversity levels (IUCN, 2022).

Ecosystem-based Adaptation: Implementing nature-based solutions to enhance resilience: Large-scale reforestation and wetland restoration projects could improve water regulation, reduce erosion, and enhance biodiversity in 15-25% of the basin area (UNEP, 2020).

Species Conservation: Developing species-specific conservation strategies for the most vulnerable taxa: Implementing targeted conservation measures for 50-60 key vulnerable species could reduce their extinction risk by 30-40% (IUCN, 2022).

Invasive Species Management: Strengthening measures to prevent and control invasive species: Implementing comprehensive invasive species management plans could reduce the impact of invasives on native biodiversity by 40-50% (CABI, 2022).

Community-Based Conservation: Engaging local communities in conservation efforts: Expanding community-managed conservation areas to cover 15-20% of the basin could improve biodiversity outcomes while supporting local livelihoods (CBD, 2021).

Research and Monitoring: Enhancing biodiversity monitoring and research to inform adaptive management: Establishing a basin-wide biodiversity monitoring network could improve early detection of climate change impacts and enhance the effectiveness of conservation interventions by 30-40% (IPBES, 2023).

2.8 Human Health

Climate change poses various direct and indirect risks to human health in the Kunene River Basin. The impacts will be felt across different geographical zones and socio-economic groups, with vulnerable populations likely to be disproportionately affected.

a) Water-borne Diseases:

Increased water scarcity and flooding events may elevate the risk of water-borne diseases:

Diarrheal Diseases: Changes in precipitation patterns and temperature may increase the incidence of diarrheal diseases: the incidence of diarrheal diseases could increase by 15-25% in the basin, particularly in areas with poor sanitation infrastructure (WHO, 2021). During flood events, the risk of diarrheal disease outbreaks could increase by 30-50% due to contamination of water sources and overwhelmed sanitation systems.

Cholera: Warmer temperatures and altered water conditions may Favor the spread of cholera: The geographic range suitable for Vibrio cholerae, the bacterium causing cholera, could expand by 10-20% in the basin, particularly in warmer water bodies with reduced flow (Lancet Countdown, 2022). The annual risk of cholera outbreaks in vulnerable communities could increase by 20-30%.

Schistosomiasis: Changes in water availability and temperature may affect the distribution of schistosomiasis. The area at high risk for schistosomiasis transmission could increase by 15-25%, particularly in the middle basin where new irrigation schemes may create suitable habitats for snail intermediate hosts (WHO, 2021).

b) Vector-borne Diseases:

Changing climate conditions will affect the distribution and transmission dynamics of vector-borne diseases:

Malaria: Changes in temperature and precipitation will impact malaria transmission: the malaria transmission season could extend by 2-4 weeks in the upper and middle basin due to warmer temperatures (WHO, 2021). However, some currently endemic areas in the lower basin may become too hot and dry for malaria transmission, potentially reducing transmission risk by 10-20% in these areas.

Dengue and Chikungunya: Warming temperatures may increase the risk of arboviral diseases: The climatic suitability for Aedes aegypti mosquitoes, vectors of dengue and chikungunya, could increase by 20-30% in urban areas of the basin (Lancet Countdown, 2022). The annual risk of dengue outbreaks in major urban centres of the basin could increase by 25-40%.

Rift Valley Fever: Changing rainfall patterns may affect the dynamics of Rift Valley Fever outbreaks: The frequency of climatic conditions suitable for Rift Valley Fever outbreaks could increase by 15-25%, particularly in the middle basin (FAO, 2021).

c) Heat-related Illnesses:

Rising temperatures, particularly in urban areas, may increase heat-related morbidity and mortality:

Heat Stress: Increased frequency and intensity of heat waves will elevate the risk of heat-related illnesses: the number of days per year with high heat stress risk (wet-bulb temperature >28°C) could increase by 30-50 days in urban areas of the lower basin (IPCC, 2021). Annual heat-related mortality could increase by 20-35%, with the elderly and those with pre-existing health conditions at highest risk (Lancet Countdown, 2022).

Urban Heat Island Effect: Urban areas will face amplified heat risks due to the urban heat island effect, average summer temperatures in major urban centres of the basin could be 2-3°C higher than surrounding rural areas, exacerbating heat-related health risks (World Bank, 2021).

Occupational Health: Outdoor workers will face increased heat-related occupational health risks. The number of working hours lost due to extreme heat could increase by 25-40% in sectors like agriculture and construction (ILO, 2023).

d) Food Insecurity and Malnutrition:

Climate impacts on agriculture may exacerbate food insecurity and malnutrition:

Crop Yield Reductions: As discussed in the agriculture section, climate change is projected to reduce yields of staple crops: climate-induced crop yield reductions could increase the number of people at risk of undernourishment in the basin by 15-25%, with children under five at particular risk (WFP, 2023).

Nutritional Quality: Climate change may affect the nutritional content of crops: Elevated CO2 levels could reduce the protein content of staple grains by 5-10%, potentially increasing the risk of protein deficiency in vulnerable populations (IPCC, 2021).

Food Price Volatility: More variable agricultural production is likely to increase food price volatility: climate-induced food price spikes could temporarily increase the number of people unable to afford a healthy diet by 20-30% during bad years (FAO, 2021).

e) Mental Health:

The psychological impacts of climate change, while often overlooked, can be significant:

Eco-anxiety: Increasing awareness of climate change impacts may lead to increased eco-anxiety: the prevalence of climate change-related anxiety disorders could increase by 15-25%, particularly among younger generations (Lancet Countdown, 2022).

Disaster-related Mental Health Issues: More frequent extreme weather events may increase the incidence of post-traumatic stress disorder (PTSD) and depression: The risk of developing PTSD following a major climate-related disaster could be 20-30% higher due to the increased frequency and intensity of such events (WHO, 2021).

f) Air Quality-related Health Issues:

Changes in climate may affect air quality, with implications for respiratory and cardiovascular health:

Dust Storms: Increased aridity in the lower basin may lead to more frequent dust storms: the number of days with dangerous levels of particulate matter (PM10) due to dust storms could increase by 20-30% in the lower basin (UNEP, 2021). This could lead to a 10-15% increase in hospital admissions for respiratory issues during dust storm events.

Ground-level Ozone: Warmer temperatures may increase the formation of ground-level ozone: the number of days exceeding safe ozone levels could increase by 15-25% in urban areas, potentially leading to a 5-10% increase in asthma exacerbations (WHO, 2021).

g) Health System Impacts:

Climate change will place additional stress on health systems in the basin:

Infrastructure Damage: More frequent extreme weather events may damage health infrastructure: up to 10-15% of health facilities in flood-prone areas of the basin could be at high risk of periodic service disruptions due to flooding (World Bank, 2021).

Supply Chain Disruptions: Climate-related disruptions to transportation infrastructure may affect medical supply chains: The risk of climate-induced disruptions to essential medicine supply chains could increase by 20-30%, potentially affecting treatment for chronic diseases (WHO, 2021).

Health Workforce: Climate change may affect the health workforce through direct and indirect impacts: climate-related migration could reduce the number of healthcare workers in the most affected rural areas by 10-15% (IOM, 2023).

h) Vulnerable Populations:

Certain populations will be particularly vulnerable to the health impacts of climate change:

Children: Children are especially susceptible to climate-related health risks: climate change could be responsible for a 15-25% increase in childhood malnutrition and a 10-20% increase in paediatric infectious disease burden in the basin (UNICEF, 2022).

Elderly: Older adults are more vulnerable to heat stress and climate-sensitive diseases: The mortality risk for people over 65 during heat waves could be 30-50% higher compared to younger adults (Lancet Countdown, 2022).

Pregnant Women: Climate change poses specific risks to maternal health: climate-related factors could contribute to a 10-15% increase in adverse pregnancy outcomes, including preterm births and low birth weight (WHO, 2021).

People with Pre-existing Conditions: Those with chronic diseases may face exacerbated health risks: Climate change could be responsible for a 15-25% increase in hospitalizations for people with cardiovascular and respiratory diseases (Lancet Countdown, 2022).

i) Adaptation Strategies:

Adapting to these health challenges will require a multi-sectoral approach:

Health System Strengthening: Enhancing the resilience and capacity of health systems by investing in climate-resilient health infrastructure and early warning systems could reduce climate-related mortality by 30-40% (WHO, 2021).

Vector Control Programs: Implementing comprehensive vector control strategies, scaling up integrated vector management programs could reduce the risk of vector-borne disease outbreaks by 40-50% (Lancet Countdown, 2022).

Water and Sanitation Improvements: Enhancing access to safe water and improved sanitation, achieving universal access to safe water and sanitation in the basin could reduce the incidence of water-borne diseases by 50-60%, even under climate change scenarios (UNICEF, 2022).

Heat Action Plans: Developing and implementing heat action plans in urban areas, Comprehensive heat action plans, including early warning systems and cooling centres, could reduce heat-related mortality by 30-40% during extreme heat events (World Bank, 2021).

Food Security Measures: Implementing programs to enhance food security and nutrition, scaling up climate-smart agriculture and nutrition programs could reduce climate-induced malnutrition by 30-40% (FAO, 2021).

Mental Health Support: Increasing access to mental health services and support, by integrating climate change considerations into mental health services and expanding community support programs could reduce the burden of climate-related mental health issues by 20-30% (WHO, 2021).

Research and Surveillance: Enhancing health research and disease surveillance capabilities through establishing a comprehensive climate-health surveillance system could improve early detection and response to climate-sensitive health risks by 40-50% (Lancet Countdown, 2022).

3. Transboundary Implications and Interdependencies

The transboundary nature of the Kunene River Basin creates complex interdependencies between Angola and Namibia with potential for both conflict and cooperation.

a) Water Allocation:

Reduced river flow may strain existing water-sharing agreements between Angola and Namibia:

Current Agreements: The 1969 agreement on water use in the Kunene River forms the basis for current transboundary water management. However, this agreement did not explicitly consider climate change impacts. The assumptions underlying this agreement could be invalidated by climate change, with annual river flow potentially 20-30% lower than historical averages (UNECE, 2021).

Allocation Pressures: Reduced water availability will likely increase competition for water resources. During severe drought years, which could occur 2-3 times more frequently, the volume of water available for allocation could be 40-50% below the long-term average (CRIDF, 2020). This could lead to tensions, particularly if one country perceives that it is bearing a disproportionate burden of water shortages.

Seasonal Variability: Increased seasonal variability in river flow will complicate water allocation. Dry season flows could be 30-40% lower than historical averages, potentially necessitating more dynamic and flexible allocation mechanisms (Angola Third National Communication to the UNFCCC, 2023).

Groundwater Management: As surface water becomes scarcer, pressure on transboundary aquifers may increase reliance on groundwater resources in the lower basin could increase by 30-50%, potentially leading to unsustainable extraction rates and cross-border impacts (SADC Groundwater Management Institute, 2022).

b) Hydropower Generation:

Changes in upstream water management in Angola could significantly impact Namibia's hydropower generation at Ruacana Falls:

Flow Regulation: Upstream dam operations in Angola will have direct impacts on power generation in Namibia: changes in upstream reservoir management could affect up to 40-50% of the annual power generation potential at Ruacana, depending on how climate change impacts are managed (NamPower, 2022).

Sediment Management: Increased erosion in the upper basin could accelerate sedimentation in reservoirs. Sedimentation rates in major reservoirs could increase by 20-30%, potentially reducing their storage capacity and lifespan (SADC, 2022). This could necessitate coordinated sediment management strategies between the two countries.

New Infrastructure: Potential development of new hydropower projects in Angola could further alter flow regimes. If Angola develops its full hydropower potential in the basin, it could affect up to 60-70% of the natural flow regime reaching Namibia (IRENA, 2022).

c) Environmental Flows:

Maintaining adequate environmental flows for ecosystem health may become challenging under climate change scenarios:

Ecosystem Requirements: Climate change will alter the flow requirements for maintaining ecosystem health: the minimum environmental flow requirements to sustain key ecosystems could increase by 10-20% due to higher temperatures and increased evaporation, even as overall water availability decreases (CBD, 2021).

Competing Demands: Balancing environmental flows with human water needs will become more challenging. During severe drought years, which could occur 2-3 times more frequently, meeting both human water demands, and environmental flow requirements could be impossible without significant demand management (UNEP, 2020).

Transboundary Cooperation: Ensuring environmental flows will require close cooperation between Angola and Namibia. Up to 70-80% of the river's environmental flow requirements may depend on coordinated management actions between the two countries (Ramsar Convention Secretariat, 2021).

d) Migration:

Climate-induced changes in resource availability may influence human migration patterns within and between the two countries:

Rural-to-Urban Migration: Climate stresses on rural livelihoods may accelerate urbanization. Climate factors could contribute to a 20-30% increase in rural-to-urban migration rates in the basin, potentially straining urban infrastructure in both countries (IOM, 2023).

Cross-Border Movements: Severe climate impacts may drive cross-border migration. In extreme scenarios up to 5-10% of the population in the most climate-vulnerable areas of the basin may consider cross-border migration as an adaptation strategy (World Bank, 2021).

Pastoral Movements: Changing patterns of water and pasture availability may alter traditional pastoral migration routes. The timing and extent of seasonal pastoral movements could shift by 2-4 weeks and extend 50-100 km further, potentially increasing the frequency of cross-border movements (FAO, 2021).

e) Agricultural Interdependencies:

Climate impacts on agriculture will have cross-border implications:

Trade Patterns: Changes in agricultural productivity may alter food trade patterns between the countries. Climate-induced shifts in crop suitability could change the agricultural comparative advantage between different parts of the basin, potentially altering cross-border trade volumes by 20-30% (SADC, 2022).

Pest and Disease Management: The spread of agricultural pests and diseases will require coordinated responses. The risk of transboundary pest and disease outbreaks could increase by 30-40%, necessitating joint surveillance and control efforts (CABI, 2022).

f) Disaster Risk Management:

Climate change will increase the need for coordinated disaster response:

Flood Management: More intense rainfall events will require coordinated flood management. The frequency of flood events requiring coordinated binational response could increase by 40-60% (UNDRR, 2023). This will necessitate joint early warning systems and coordinated reservoir operations during extreme events.

Drought Response: Severe droughts will require coordinated management across the basin. The frequency of multi-year droughts affecting both countries simultaneously could increase by 30-50%, necessitating joint drought management plans (WMO, 2023).

g) Ecosystem and Biodiversity Conservation:

Protecting ecosystems and biodiversity in the face of climate change will require transboundary cooperation:

Migratory Species: Changes in climate will affect migratory species that cross national borders. The timing of key wildlife migrations in the basin could shift by 2-4 weeks, requiring coordinated management of protected areas and corridors across borders (IUCN, 2022).

Invasive Species: Climate change may facilitate the spread of invasive species across borders. The rate of spread of key invasive species across the basin could increase by 20-30%, necessitating joint monitoring and control efforts (CABI, 2022).

h) Health Systems and Disease Control:

Climate-sensitive health risks will require coordinated responses:

Disease Surveillance: Changing patterns of disease transmission will necessitate joint surveillance efforts. Up to 40-50% of emerging disease risks in the basin may have cross-border implications, requiring integrated surveillance systems (WHO, 2021).

Health System Capacity: Climate pressures on health systems may require resource sharing. During extreme climate events, which could be 2-3 times more frequent, up to 20-30% of health system capacity may need to be shared or coordinated between the two countries to manage peak demands (Lancet Countdown, 2022).

i) Economic Interdependencies:

Climate change will affect economic relationships between the two countries:

Energy Trade: Changes in hydropower generation potential may alter energy trade dynamics. Climate-induced changes in energy production patterns could alter cross-border electricity trade volumes by 30-40% (SADC, 2022).

Tourism: Climate impacts on ecosystems and wildlife may affect transboundary tourism. Changes in wildlife distributions and landscape aesthetics could shift up to 20-30% of tourism value between different parts of the basin, affecting both countries' tourism economies (World Bank, 2021).

j) Adaptation Strategies:

Addressing these transboundary challenges will require enhanced cooperation between Angola and Namibia:

Joint Climate Change Adaptation Strategy: Developing a basin-wide adaptation strategy. A comprehensive joint adaptation strategy could improve the effectiveness of climate resilience measures by 30-40% compared to uncoordinated national approaches (UNEP, 2020).

Strengthened Institutional Mechanisms: Enhancing the capacity of transboundary institutions. Strengthening the Permanent Joint Technical Commission (PJTC) for the Kunene River Basin could improve the speed and effectiveness of joint decision-making by 40-50% (SADC, 2022).

Integrated Monitoring Systems: Developing shared monitoring and early warning systems. A fully integrated transboundary monitoring system could improve the lead time for flood warnings by 50-70% and drought forecasts by 3-6 months (WMO, 2023).

Flexible Water Sharing Agreements: Developing more adaptive water allocation mechanisms. Implementing flexible, scenario-based water sharing agreements could reduce the risk of water-related conflicts by 60-70% under variable climate conditions (UNECE, 2021).

Joint Infrastructure Planning: Coordinating the development of climate-resilient infrastructure. Collaborative planning of water and energy infrastructure could improve overall system efficiency by 20-30% and reduce climate-related risks by 40-50% (World Bank, 2021).

Ecosystem-based Adaptation: Implementing transboundary ecosystem-based adaptation projects. Large-scale, coordinated ecosystem restoration efforts could enhance water regulation, reduce erosion, and improve biodiversity outcomes across 20-30% of the basin area (UNEP, 2021).

Capacity Building and Knowledge Sharing: Enhancing shared capacity for climate resilience. Establishing a joint climate change research and training centre could improve the technical capacity for climate adaptation in both countries by 50-60% (UNDP, 2023).

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Annex I: Indigenous Peoples in the Project Area

The Himba people, a semi-nomadic pastoralist ethnic group, have long inhabited the semi-arid Kunene region of Namibia and Angola, where their pastoral lifestyle and strong cultural identity have thrived until

recent years. Despite enduring various external influences over time, their core cultural values have remained resilient. According to Bollig (2020), the Himba people's social-ecological system has undergone significant transformations approximately every thirty to forty years since the early 1900s, profoundly altering their environmental framework. These changes—material, social, political, and cultural in nature—were influenced by historical events such as colonialism and government initiatives such as fixed boundaries in the 1920s, vaccination programmes in the 1930s, borehole drilling in the 1960s and 1970s, and community-based natural resource management programmes in the 1990s and early 2000s. The region also faced challenges such as disease outbreaks and severe droughts affecting both humans and livestock.

Despite these pressures, the Himba demonstrated remarkable adaptive capabilities. Nevertheless, the significant alterations to their current environmental setup are undeniable. Bollig (2020) cautions against overlooking the profound human impact on shaping the Kunene region and the landscape of Himba communities. This influence, however, was not one-sided, as both nature and human actions have contributed to the aridity of the landscape where the Himba pastoralists now reside. Bollig (2020) underscores that the resilience of the environment, though significantly diminished, remains crucial to the survival of the Himba people as a distinct ethnic group. He suggests that revolutionary changes have occurred in Kunene over the past 25 years, opening the once-isolated region to global and national exchanges of ideas, resources, and infrastructure, thereby introducing new opportunities for land use and economic activities such as tourism and mining.

The Himba people's culture revolves around their livestock, which not only sustains their livelihood but also connects them to their ancestors through rituals of sacrifice. However, the current state of the natural environment cannot support their traditional pastoral lifestyle. They face challenges in adapting their pastoral way of life amidst various external pressures such as environmental degradation (Inman, 2024) Climate change is a significant environmental factor affecting the Himba, leading to prolonged droughts and scarcity of resources. Inman et al. (2020) examined how Himba pastoralists were coping with these challenges and found that severe droughts had devastated their livelihoods, plunging many into poverty without adequate safety nets during environmental crises. The Himba increasingly turned to cultivating food rather than raising livestock due to drought, marking a shift in land use.

Despite its integral role in their cultural identity, pastoralism has become increasingly unsustainable. Respondents in the study identified drought as a primary threat endangering their cultural practices. Many cultural elements, including attire, ancestral rites, cosmetics, food traditions, and rituals, rely heavily on livestock, particularly cattle. However, drought-induced livestock losses have severely impacted their ability to produce traditional clothing from animal skins, perform rituals involving livestock sacrifice, create cosmetics from animal fat, and obtain meat and milk. Consequently, they are compelled to explore alternative livelihoods such as urban migration in search of employment, resorting to begging, and relying extensively on government drought relief and pensions. Drought thus poses a formidable challenge to their cultural practices and land use patterns.

The chart below is a compilation of Himba people’s perception of their natural environment, from a study conducted by Inman (2024).

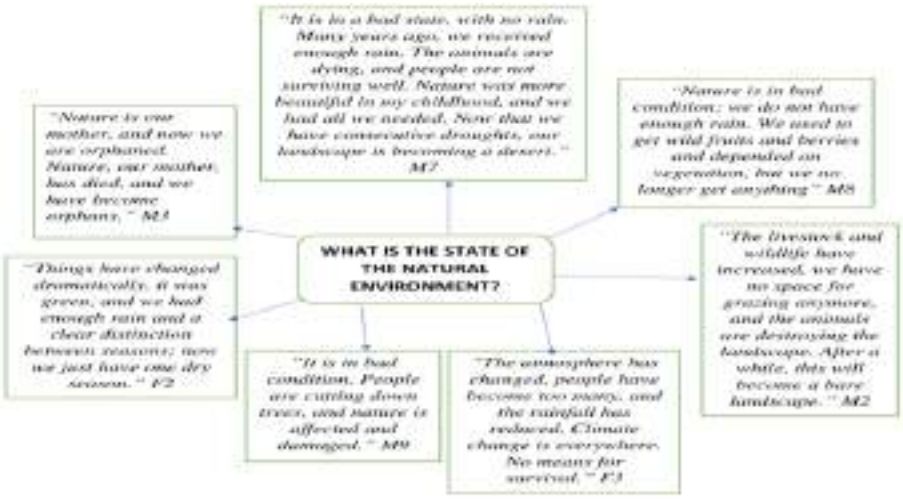

Figure 6. Himba people's opinions on the state of their natural environment (Inman, 2024).

According to Torrence and Grattan (2003), catastrophes can precipitate cultural change, with more vulnerable groups experiencing greater disasters and thus facing increased potential for cultural transformation. As the Himba confront these challenges, they must adapt their traditional practices while preserving their cultural identity and livelihoods. Activities rooted in cultural norms may not always confer adaptive advantages and can evolve in response to new ecological pressures. This is evident here, as drought has compelled the Himba to seek alternative livelihoods that may diverge from their customary practices.

Bollig (2020) observed significant shifts in agricultural practices among the Himba, such as the introduction of gardens to supplement their diet in response to recurring droughts. This represents a notable change in land use. Similar adjustments have been observed among the Maasai pastoralists, who, in the late nineteenth century, faced severe droughts, famines, and diseases leading many to adopt alternative survival strategies like agriculture or hunting and gathering, thereby altering their land use patterns.

These shifts indicate that traditional Himba land use practices are being challenged and sometimes supplanted by more convenient modern alternatives. Previously, livestock grazed freely, but now government regulations restrict grazing in certain areas to preserve the land, prompting some communities to implement grazing rotations. However, implementing these rotations is challenging due to the considerable numbers of livestock owned by families, as noted by respondents (Inman, 2024). Drought has significantly altered their land use practices, necessitating Himba pastoralists to reconsider and adjust their traditional lifestyles. In the past, plentiful cattle provided meat and milk, but their loss due to drought has forced people to turn to crop farming. The establishment of allocated and protected lands aims to promote sustainable land management, compelling the Himba to adapt to these new realities.

As the Himba people navigate the cultural shifts brought about by numerous external pressures, they face the challenge of preserving their traditional practices while adapting to new realities. This requires careful consideration of integrating modern technologies and innovations without compromising their cultural essence. They must also prepare for potential erosion of their cultural identity as they encounter modern lifestyles and evolving economic conditions (Inman, 2024). Adapting to pressing realities such as climate change is crucial for their survival, further complicating this delicate balance. In cases where their adaptive capacity is insufficient, external assistance may be necessary, employing participatory bottom-up approaches to tackle these challenges. Empowering the Himba community to navigate and thrive amidst environmental challenges promotes sustainable development that benefits both their communities and ecological systems.

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Annex K. Supplementary Stakeholder Engagement Reports

As indicated above, stakeholders’ consultations conducted in 2019, supplemented with those conducted in 2024, informed the design of the project

The tables below summarise the stakeholder meetings held in the capital cities and project areas. Full lists of attendees of these meetings are provided in Annex K.

Namibia Stakeholder Consultation Report

Mission dates: 27 May to 3 June 2024

Date and Location	**Name,** position, **and organisation**	**Meeting Summary**
27 May 2024, Windhoek	Mr. Petrus Muteyauli (Head of Multilateral Agreements, MEFT 2. Timoteus Mufeti, Environmental Commissioner, MEFT 2.Sion Shifa, Senior Conservation Scientist, MEFT	**Meeting with Ministry of Environment** The first meeting was with the Ministry of Environment, where we met the Environmental Commissioner and the Head of Multilateral Agreements. The Commissioner stressed that Kunene, Omusati, and Ondjozondjupa regions have seen a significant reduction in rainfall. In fact, the reduction in rainfall is affecting the whole country, especially Kunene region, where land use is of pastoral nature and the community there is unique and very badly affected by drought. He stressed that we need to understand how people live, and there is a need for capacity building that should include the government as well as many partners. There is also a need to strengthen early warning and disaster risk management at national and regional levels. He also stressed that he wants to see something that works well, so relevant institutions must be involved. Mr. Muteyauli also expressed that a project like this needs to consider tangible benefits to communities. He also pointed out that a similar project funded by the Green Climate Fund through UNDP is looking at early warning systems, and they have already done regional consultation. UNDP is earmarked for Kunene, so we should conduct them for overlap. They have also included Hardap and Karas regions. Therefore, exploring the gaps between the two projects and looking for synergies is necessary. Another project by WFP, which is looking at the water and energy nexus is also applying for funding from the Adaptation Fund. So, there is a need to look at the gaps and synergies for those projects. According to the Commissioner, disaster risk management is still a challenge in the country and does not seem to work. So, there is a need for proper early warning systems in the country. Both the commissioner and Mr. Petrus also mentioned that they have available literature and data that can be used to provide information to support the project proposal. The information will be made available through Mr. Shifa. The disaster risk management committee also has some information and reports that they can share, and most of this information is in digital formats, which Mr. Shifa can provide.
28 May 2024, Windhoek	1.Mesag Mulunga, Director of Planning, MAWLR 2.Mathews Ndjodhi, Chief Agro-Business Ambassador, MAWLR 3.Ismael Ehamba, Acting Director, MAWLR 4.Alfeus Moses, Chief Hydrologist, MAWLR 5.Olga K. Tjiueza, Chief Meteorological Technician, MWT	**Meeting with Ministry of Agriculture, Water and Land Reform (MAWLR)** The second meeting was at the Ministry of Agriculture, where we had a joint meeting with different institutions such as the meteorology services, the directorate of resource management, the directorate of rural water supply, the directorate of agricultural planning, the directorate of agricultural production extension and engineering services and they all gave their inputs. The acting director commented that it is a good project: Building the resilience of the communities in the Kunene Basin. He wanted to know if the Angolan side was also consulted, etc. Furthermore, they emphasized that important stakeholders such as MET must also be consulted. The hydrologist wanted to know if the early warning system would also include warnings such as water levels. They shared that a similar project would shortly commence in Kunene, entitled 'Enhanced Water Security and Community Resilience in the Adjacent Cuvelai and Kunene Transboundary Basins'. There could be an overlap in some outputs. They should see where they can collaborate. It is a UNDP-GEF project. The Cuvelai Water Course Commission could also be contacted for more information. Another project implemented in the same area includes SCORE by UNDP, which focuses on climate change resilience. Perhaps it is better to build on what was there before and learn from their ups and downs. Yet, another project by Millennium Account that had to do with rangeland management had a component of sustainability, so perhaps it is also worth reviewing. Repeating the same initiatives is not a good idea unless it is meant to strengthen and address the gaps.

	6.Simon Dirkse, Chief Meteorological Technician, MWT 7.Anna Haufiku, Senior Hydrologist, MAWLR	They assured us they would provide the relevant information and documentation to help us craft the proposal. They stressed that Kunene is the most drought-affected region in the country, so the project is significant. We also need to look at their nomadism, utilization of grazing, etc. Are they still nomadic? Capacity building is key in terms of knowledge and relevant technology. Regarding the drought issue, we are trying to review the drought policies, so we have policies before and after the drought to see which component would be important to address and activities for before and after. The key issue is early warning systems; the current one is not specific but is more of a broader focus. It would be useful to have a specific focus for each area. Then, we can make a significant impact. The broad one is not always location-specific and may be inaccurate. For documents, we can look at the current trends, such as marketing incentives for animals sold, and in terms of grazing, that information can be provided. We have reports on early warning, and reports and assessments of food security, and all sorts of disasters such as fires. We do this before, during, and after disaster. Pre-harvest, during harvest, and post-harvest.
29 May 2024, Opuwo	1.Uendjipa Thom, Senior Councillor, Wita Traditional Authority 2.Kapangare Tjambiru, Senior Councillor, Kakurukouse Traditional Authority 3. Verikouje Ndundu, Regional Officer, Red Cross 4. Kazorondu Heuita, Game Guard, Karuru Kopuse Traditional Authority 5. Tjikunda Katjina Kulunga, Administrative Control Officer, Epupa Constituency 6.Asnath Katjimbari, Chairperson, Kunene Rural Women Association 7. Ben U. Kapi Ngatuuone, Chairperson RFU 8.Ian Van der Merwe, Representative, Ngatuuane RFU	**Meeting with traditional leaders, local authorities, regional bodies, and farmers' association** In Opuwo, we met the traditional leaders, Regional Management for Meteorological Services and the Ministry of Agriculture, the Regional Council, representatives of Women's and Youth Groups, and the Farmers Union. They stressed that the information for early warning does not reach the target people. The people who need the information do not get it. They need boosters for network or cellphone reception so they can easily spread the information to the people. Network coverage is, therefore, key. Perhaps team up with telecommunication companies such as MTC to improve cell phone coverage to enhance information sharing on early warning systems. It was also stressed that it is best to involve the communities from the beginning of the project. There are various challenges that need to be addressed, such as road conditions, so sometimes it's not at all possible to access some communities because there are no roads there. This can be resolved by having focal points for each community where the information is shared, and then the focal point shares this information with the community. **Key question: What are the main challenges of climate change, and how have these affected the communities?** Agriculture is the main livelihood in this area, and it is rain-fed. Without rain, there are no sources of livelihood, and therefore even the people's health is also affected. That means no income to meet the needs, such as school fees. Because of drought, there is no food, and people are forced to move close to the river. The old people who cannot migrate are affected, but the young ones usually migrate to greener pastures. There are also no boreholes, just human-made wells, and no water left. This is obviously because of climate change, so the main problem is drought. Climate change affects us all. For example, animal prices are dropping as animals are losing value due to drought. For people living near rivers, the method we use to irrigate our crops is drawing water with buckets, and we don't have any protection from crocodiles. We must risk our lives to fetch water from the river where there are crocodiles.

	9.Chris van der Merwe, Chairperson, Ohaukororo RFU 10.Sennobia Charon Katjiuongua, Vice-Chairperson, Kunene Community Radio NCC 11.Ambata Eliaser, Chief Technician, MAWLR-DAPEES 12.Tutupenini T. Tjazapi, Chairman, Okozorgominya	Poverty, food insecurity, and lack of water are the main climate change challenges in this community. We are faced with extreme hunger, and this causes people to migrate to greener pastures such as towns. Ecosystems are very much affected by the lack of water. The impacts of climate change are different across genders. The most affected are women and children, as well as the elderly. They are suffering the most. The project must ensure that there are alternative water sources, such as water harvesting, to mitigate the impacts of climate change. New methods of agriculture are needed for people to produce food as a tangible outcome of the project. There need to be measures to reduce migration, and reforestation activities should be implemented. Perhaps it's also good to introduce seeds that are robust to drought, such as genetically modified ones. Climate change also affects wildlife, and the entire ecosystem is affected. We have lost out on important tree species, such as medicinal plants. There is local extinction of some of the important species that we depend on. The project must create awareness of the need to preserve plants and biodiversity. Deforestation is, for example, a problem, so we need reforestation and restoration activities implemented. The social structures are disrupted because of climate change, and this is due to factors such as migration, which has affected the Himba culture. Many are no longer able to sustain their traditional livelihood strategies. Literally, every year is a drought year. So, climate change has affected our culture and traditional practices. For example, one can lose their identity when migrating to cities and towns. **Aspirations and expectations:** There are many ways to help people create or generate income, so there are various income-generating activities such as break-making for young people. Another way to overcome remoteness is to go through traditional authorities so they can be empowered to mobilize their community to help them. We need to look at what people have and what is on the ground that can be used to empower the communities.

30 May 2024, Okanguati	Vemukondjisa Thom, Vetumbua Muhenje, Ester Koikoi, Munenje Tjanakambembe, Tjambura Karikamba, Wararimue Muhenje, Rahangauka Ngombe, Qena Muhenje Mayaa, Kandimuine Mukambengera, Kauya Ngwa-Muhonje, Meramia Mbuare, Kauijazemua Ijambiru, Maria Kandimune Kuaundja Ombura, Muhenge Wetupotjinyoa, Mamuini Tjavara et al.	**Community consultations** **Meetings with the female community members in Okanguati and Epupa** There is a drought, and our animals are dying. All the livestock have been killed, and now there is not even milk or food for children. We thought the government had thought about us by giving us social grants, but we give them back to the government through school fees. The other main issue is diseases for livestock, killing our goats and cattle, and the medicine does not work. We are truly pleading for help. Drought is the main impact of climate change in this community, and it is killing all our livestock, and we rely on this for our livelihood. Rain is important to sustain our livelihood and food security, so we try planting many things to survive, but the harvest is poor because of the lack of rain. So, now, our main livelihood is social grants, but we can only support our children with them. It is not enough to support everyone in the family. So, we only send some children to school, and some are left at home, leaving us with some money to sustain ourselves. Another issue is a shortage of drinking water. We have a shortage of drinking water, so we travel long distances to fetch water. The water points for animals are also very far. So, most of our water sources are wells that we have dug by ourselves with our hands, but there is no safety around the wells. We have cases of children falling into these wells and dying, so we need proper infrastructure. So really water supply is our only and main solution. Drought is affecting mostly the women. For example, sometimes, men can divorce women, leaving them as single mothers with children and with no support. So, all women are affected whether they are married or not. For example, women do not have the right to hunt or look for food, and women do not inherit cattle, and they have no right to the animals. **Gender issues** In our culture, women are not considered at all as important. You may be advantaged if you are married to a rich man, depending on whether the marriage is stable. This is because men do not share their property with their women. And so, when the man or the husband dies, the women don't inherit anything, and they are left vulnerable with their children. Widowed women are not allowed to find work. Regarding inheriting from men, when we get married sometimes, we build together with our husbands including obtaining livestock and even clothes and accessories for decoration to make ourselves beautiful. But when our husbands die their families take everything including the accessories leaving us naked. The children and their mothers are left without anything at all.

		Polygamy is also another issue that makes life very difficult. Sometimes the men may choose their favourite wife. For example, a man married to five wives, and he may only have a favourite wife and so the other wives and their children are left to beg. The other thing is men do not really want women to succeed so we are really in a very critical condition and our men are not treating us well. **Infrastructure and water** We do not even get drought relief because we do not have infrastructure and it takes two weeks to travel to the hospital or to the clinic where I live. We don't have access to a Mortuary too. When our loved one dies, we bury them the same day because we don't have access to the right facilities. Those living by the river do not even have the means to pump water to make gardens, so we use the bucket instead and this is very dangerous Drought relief helps us a little bit and social grants also help a lot. **Discrimination** Another social problem is tribalism and discrimination. Originally, I am a Tjimba, and my livelihood is mainly collecting wild fruits and wild honey. So, vulnerability is more pronounced among the Tjimba people than the Himba people. This is because the Tjimba people are stigmatized by the Himba, and they're regarded as inferior. This stigma is because of poverty. So, I just want to repeat that we need gardens, we need schools and roads and hospitals and infrastructure. **Traditional forecasting methods** We have many trees that we look at that tells us that there is drought or that drought is coming. A particular one is called Ohwangwe. So, we usually look at the flowering season. If we notice that there are no flowers, then we know that there is going to be drought. So many times, we can tell when drought is coming however, we do not have the means to prepare so we don't prepare for anything though we know that danger is coming we don't have the capacity to do anything. **Impacts on women** As a mother and my children, we have lost our livestock because of drought we no longer have anything, and so we resort to begging. We sometimes make bracelets and jewellery to sell to tourists. However, this is a seasonal thing, and it does not always give us enough. We need more income generating activities for women. We have realised the importance of education and we all want to send our children to school. However, it is very challenging because we do not have enough money to pay for their school fees so sometimes what we do is we send some to school and some they stay at home. **Women's expectations and aspirations from the project** Our expectation is for women's associations to be established to empower women to grow food and for them to sell to improve their livelihoods. We need community gardens under the women associations. Furthermore, we also want to be trained as women so that we can be empowered, and we can develop our skills so we can improve our livelihoods. We are also advocating for water harvesting to make gardens for our own food.
31 May 2024,	Mavetwapi Tjiumba, Maepingiko Ijindumba, Riamana Oruhama,	**Meetings with the male community members in Okanguati and Epupa** All the young people here have parents and the drought have affected their parents which also directly affect them.

	Maaruka Mupurua, Peihama Tjindunda, Kanungojo Muhenje, Kapangere Tjambiru, Kauta Koruhama, Vaatako Hembinda, Kuapunawa Tjirambi, Chief Vemui Tjambiru, Ijisuta Kaitema, Kanaumba Mohenje, Repute Japeule, Steven M. Jambiru, Kanambiya Shinga, Simon Effraem, Njumbi Ujamba, Mutambo Mautjindika, Charles Uanje, Maaruka Muparua, Hevita Mgumebiti, Ngumbi Mbomi, IJambiru Uvawura, Alungongo Wilbard, Rutemba Ngumbi, Muhenje Katazuu, Hepate Kautaarua, Muhenje Katoho, Japyanguka Tjhanje, Hambinda Kaninounusa, Tjindandi Kaukareerua, Tjinana Kaunrina et al.	As you can see that these young people are grown up, they're hungry. That is the main thing here, our young people are hungry. They don't have jobs and so they turn to stealing. All these young people here are from different tribes, but they all need help; they're all suffering in the same way. I'm a young farmer and I depend on livestock. I keep some goats and sheep and cattle and to some extent also grow some crops. Many times, we must migrate to greener pastures when there is drought. But where we migrate to there is no water. We only use traditional boreholes, and they are all dry now. The help we need is proper boreholes for us to give water to our animals and to grow food. During the rainy season when there is a bit of grass near the river our livestock stay near the river but when grazing is no longer there, we move far away even 80 kilometres from the river into the mountain and there is no water there. When there is drought there are also many diseases for livestock and sometimes, we try our best to treat our animals using traditional knowledge such as using aloe vera. However, they don't always work and many times we must buy medicine from the pharmacies. As a young person, I kept cattle for my livelihood but as you can see, the drought has killed all our animals, so we need jobs or maybe even irrigation opportunities to grow food. We need opportunities such as income generating activities such as making bricks, painting houses, building houses etc, because some of us have these skills but we don't have any jobs, and many would want to be trained in these trades too. Many of us here do not have education so we need training. So, what this project can do is build a business hub to train our young people in different skills so they can secure jobs. Some of us would have loved to finish school, however finishing school is a problem in this area because our parents do not have the money to help us finish. Many times, for us to pay for school uniforms, we need to sell livestock and our livestock are gone because of drought. So, we are forced to drop out of school. Many of us here have dropped out of school we have not been able to finish. So, we need help to pay school fees so that we can finish our education. We grew up in the good hands of our parents, but the drought killed all their animals. And that is why we are in the streets without jobs now. I think the only help and the only hope really is for us to grow food and for this to happen we need water supply. We are ready to start. **Men's expectations and aspirations from the project** The main concern is our young people. We need our young people to get jobs. There should be avenues for job creation for the young people. So instead of handouts young people can work. If they are not helped, they usually end up becoming thugs and the hazard to the communities. Young people need to be considered and maybe create awareness or association for young people that represent them in a community to express their voices and to empower them as well.

3 June 2024, Windhoek	1.Ndina Nashipili, MAWLR –DWA 2.Fulgentia Magira, CPM 3.Helvi Akwenye, MAWLR-DWA 4.Enich Petrus, MAWLR-DEPEES 5.Silvanus Uunona, CUVECOM 6.Nicholas Tembwe, MSYNS 7.Timoteus Mufeti, MEFT 8.Teofilus Nghitila, MEFT 9.Qingyun Diao, FAO 10.Eugene Kanguatjivi, FAO 12.Ilvorurue Kheijavi, MAWLR 13.Eugene Simwanza, MAWLR 14.Gottlieb S. Kahana, MAWLR 15.Anastasia Shiviya, MAEPESIL 16.Scholastica Chatu, NPC 17.Anna Dumeni, OPM	**Validation meeting with national and regional stakeholders** The Namibia Mission culminated in a wrap-up meeting with government and key stakeholders including the Kunene Permanent Joint Technical Commission, to validate the project design and outline next steps. The key agreements from this meeting were to: • Establish a dedicated interdepartmental Project Management Unit (PMU) to coordinate and oversee the project's implementation, ensuring effective collaboration among relevant government agencies and stakeholders. (GRN) • Develop a comprehensive project implementation plan, outlining clear roles, responsibilities, and timelines for each component, to be endorsed by the Project Steering Committee (PSC) and all implementing partners. (IFAD, FAO, GRN) • Conduct targeted capacity building and training programs for project staff, government officials, NGOs, and communities to enhance their skills in climate change adaptation, ecosystem-based disaster risk reduction, and sustainable livelihood development. (IFAD, FAO) • Create a robust monitoring, evaluation, and learning (MEL) framework, incorporating gender-responsive indicators and participatory approaches, to track progress, assess impact, and facilitate adaptive management throughout the project lifecycle. (IFAD, FAO) • Foster strong partnerships and coordination mechanisms among government agencies, development partners, civil society organizations, and private sector actors to leverage expertise, resources, and knowledge for effective project implementation and sustainability. (IFAD, FAO)

Angola Stakeholder Consultation Report

Angola Mission Part 1, 20-24 May 2024

Date and Location	**Name,** position, **and organisation**	**Meeting Summary**
20 May 2024, Luanda	1. Ivone Pascoal, Head of Department, DNACDS 2.Teotania Domingos, Technical Specialist, DNACDS 3.Anselmo Paulo, Technical Specialist, DNACDS 4.Benjamim Tchiyevo, Country Programme Coordinator, IFAD 5.Liudmila Saiovo, Climate Change Project Assistant, FAO	**Meeting with the Directorate for Sustainable Development and Climate Action, Ministry of Environment** The Director of the Environment Department emphasised the importance of concentrating efforts on areas that have not yet been addressed by existing adaptation projects. The target areas outlined in the concept note were suggested by local authorities. It will be necessary to build upon existing initiatives to enhance disaster risk planning, which currently tends to be reactive. Government constructed the Cafu Canal in Kunene Province to mitigate the effects of drought and provide water for crops and livestock. The Climate Change Directorate has ongoing projects in Cunene Province, focusing on addressing gaps in climate projects. One of these projects is a two-year initiative funded by the Global Environment Facility (GEF), aimed at enhancing resilience in the region. Additionally, the River Basin project, extended to four years, includes components such as community adaptation, with UNDP serving as the primary implementing partner. National partners involved in this effort include ADPP, NGOs, Water Agriculture, EDF, and ADRA. The project supported the capacity building of INAMET (National Institute of Meteorology) on civil society engagement and early warning systems. The Cafu project, focused on drought resilience, included capacity building and equipment programs, as well as a radio program implemented through ADPP, which proved instrumental during the COVID-19 pandemic. The management of weather monitoring stations by INAMET enabled the collection of vital information crucial for drought and flood forecasting and response. These monitoring stations have been upgraded to automatic systems, improving efficiency compared to previous manual methods. The Cafu canal is a government investment overseen by the National Irrigation Water Resources Management. Kunene faces challenges with both droughts and floods. The FAO is currently developing a project in Kunene. To avoid duplication and to capitalize on existing efforts, it is crucial to identify synergies with ongoing projects. This underscores the importance of assessing existing initiatives before embarking on new investments. The gaps identified include: the sharing information from monitoring and evaluation. This can be achieved by engaging with other stakeholders, consulting community leaders, and validating proposals through a working group. The gathered information will be shared with the Ministry of Environment to enhance the Early Warning Service database. The national observatory, established by law, faces the challenge of operationalizing through the integration of all data into a web-based database. Each project includes a sensitisation component, highlighting the importance of a communication strategy. The observatory, funded by partners in 2022, collaborates with the EU through the Institute of Farmers in Kunene, Namibia, and Huila provinces. Given its presence in each project, there is a critical need for synergy. Pilot projects also provide field equipment to support these efforts. Climate change disproportionately affects women and children, necessitating targeted actions. The UNFCCC action plan involves engaging National Gender Focal Points to adapt and develop national action plans. Climate change significantly impacts children, emphasizing the importance of sensitization and support when they are affected. For example, women often endure long journeys to fetch water and firewood, highlighting the need to educate them on climate change mitigation **and adaptation** strategies. Operational Focal Points: There is an established focal point for the Global Environment Facility (GEF), but none for the Adaptation Fund. The department proposes a focal point focusing on Disaster Risk Reduction (DRR), early warning systems (river systems), livestock adaptation, and knowledge management for replication. The implementation status and needs at INAMET regarding early warning systems need assessment and prioritization.

		Inclusion Strategy: The strategy includes Persons with Disabilities (PWD) within its communication strategy, emphasizing gender and climate change considerations. Indigenous people in agro-pastoralist areas are targeted for engagement, particularly through projects like FRESAN working with minority communities.
20 May 2024, Luanda	Manuel, Francisco, Henrique; Administrators, ADPP	**Meeting with ADPP (Ajuda de Desenvolivmento de Povo para Povo)** In Cunene Province, ADPP is actively supporting water and nutrition interventions through the FRESAN project. They have installed boreholes, solar panels, animal troughs, and facilitated domestic agriculture initiatives. Concurrently, CODSPA is engaged in agricultural projects. Vulnerable populations are receiving nutrition education focusing on drought-resistant crops, cooking demonstrations, agroforestry (including planting fruit trees), and resilient species. ADPP also operates a teacher training school in rural areas. Key needs and priorities include fostering strong relationships with local governments, especially since few organizations operate in Kunene. Challenges include the region's harsh climate and water accessibility issues, particularly reaching remote areas like Curoca, where families are dispersed up to 10 kilometres apart. The main minority groups, including the Kwanyama, Khoisan, and Himba, are focused on water access and nutrition, with initiatives such as honey production for dietary enrichment. The target communities are chosen based on their specific needs. Access to water enables sedentary lifestyles, enhances food security, and empowers local communities with knowledge and self-sufficiency. The Himba, traditionally nomadic pastoralists, benefit from settled lifestyles supported by these projects, which address vulnerability. The FRESAN project spans three years, emphasizing community stability when water sources are accessible for livestock. Women particularly benefit, gaining more opportunities to care for children and manage household duties. Having water closer to home reduces laborious tasks, providing women with increased participation in water management and community activities. Nutritional efforts focus on improving the health of mothers and children within these communities.
21 May 2024, Luanda	1.Mamisoa Rangers, Deputy Resident Representative UNDP 2.Pinto Vunge, Programme Manager, UNDP 3.Teotania Domingos, DNACDS 4.Anselmo Paulo, DNACDS	**Meeting with United Nations Development Programme (UNDP)** In 2021, UNDP conducted an assessment in Kunene in response to drought conditions and initiated voucher distribution. Additionally, in 2002, UNDP began addressing malnutrition through food distribution, concluding this effort in September 2022. In 2023, malnutrition treatment initiatives were launched in Kahama, Obanjie, and Nemakukura. Under CERF funding, UNDP and partners like UNICEF and WFP are responding to El Niño, focusing on acute and moderate malnutrition treatment in health institutions and communities across Ombadja and Kwanjambe. The project, implemented through partners such as World Vision and JAM, targets rural areas with high malnutrition rates, particularly in Kunene, Huila, and Namibie provinces. Ongoing assessments are evaluating El Niño's impact, with FAO conducting assessments in 11 municipalities and UNDP planning to expand coverage to 12-15 additional municipalities for IPC analysis. These efforts span Namibie, Huila, Cunene, Cuando Cubango, and Moxico provinces, with Kunene being most severely affected, leading to migration into Namibia in search of food and water. The main livelihoods in Kunene, Huila, and Namibe are centered around crop and livestock farming. Household responsibilities are typically shared equally between men and women, with men primarily managing pasture and women engaged in crop farming. Both genders are significantly affected by drought conditions. In 2021, areas such as Kahama, Kuroka, and Kwanjambe experienced IPC 4 (Integrated Food Security Phase Classification), indicating severe food insecurity. In 2022, Gambos in Huila was the most affected by drought, with no significant improvement noted since 2021. WFP projects typically span six months, with community members admitted and removed based on their recovery status.

21 May 2024, Luanda	Antonio Paolo, Vulnerability Analysis and Mapping Officer, WFP	**Meeting with World Food Programme (WFP)** There are insufficient resources allocated to build resilience among communities, exacerbated by severe locust infestations during drought periods. Lessons learned highlight that chronic food insecurity, as seen in Sango, differs from acute situations, both of which are prevalent. Past emergency and development programs have shown limited success. To address these challenges, there is a pressing need to enhance income generation and resilience-building efforts. Community kitchens have been established, strategically placed where water is accessible, supporting the cultivation of kitchen gardens. The school feeding program, managed through the Ministry of Education, has been a successful initiative. However, challenges persist among nomadic groups like the Himba, who follow water sources and practise migratory lifestyles. The project aims to establish ecosystem-based infrastructure to support their needs. Access to land remains culturally determined, posing challenges, especially along the 165 km long Cafu canal. Water availability is typically under a 99-year lease managed by local governments.
24 May 2024, Ondjiva	6.Neri Tuhafeni, Provincial Coordinator, FAO	**Meeting with the Food and Agricultural Organisation (FAO) field office** FAO is currently implementing the FRESAN project across six municipalities in Kunene Province, benefiting 2625 beneficiaries. They are establishing 75 Farmer Field Schools (FFS) across various localities: 13 in Cahama, 18 in Ombadja (including Kanyama), 6 in Nekunde, and 23 in Cuvelai. The project provides training on seed cultivation for maize, sorghum, and millet, along with extension services in horticulture production and food processing. Each community hosting an FFS has a designated facilitator to offer technical expertise. Technological advancements such as solar and diesel pumps, as well as drip irrigation systems, have been introduced to enhance agricultural productivity and nutrition outcomes. Commercialization efforts include initiatives like chicken farming and egg sales. In areas like Ombadja, Kwanyama, and Curoca, which are inhabited by nomadic pastoralists, some individuals own up to 1000 cattle, relying primarily on meat and milk for sustenance. However, gaps have been identified, including limited intervention coverage in the target areas, which is insufficient to meet community needs effectively. There is a clear need for additional partners to expand interventions and support more people. Moreover, farmers lack the financial capacity to invest in equipment necessary for effective irrigation, despite the construction of three irrigation canals. Efforts to address these gaps should prioritize increasing partner involvement and providing adequate resources and support to enhance agricultural productivity and sustainability in the region.
24 May 2024, Ondjiva	David da Costa, Data Manager, WHO	**Meeting with World Health Organisation (WHO) field office** WHO is currently active in Cuvelai and Kwanyama, focusing on raising awareness about guinea worm disease. This disease affects both humans and animals, remaining in the body for up to 12 months. WHO's efforts include community sensitisation on the risks associated with using unprotected water sources. The government's response involves promoting awareness and implementing measures to mitigate the disease's spread, including distributing water filters to improve water quality for human consumption. However, there is currently no solution available to protect animals from contracting guinea worm. The initiative to separate water sources for humans and animals is crucial in preventing the spread of the disease. This initiative is supported by the Carter Centre USA, given that Angola is one of the five African countries affected by guinea worm disease. The scarcity of water forces affected communities to drink from any available source, often resulting in consumption of salty water. Consequently, women often endure long journeys to locate suitable water sources.
24 May 2024, Ondjiva	Onias Mpofu, Project Coordinator, ADPP	**Meeting with ADPP field office** ADPP in Kunene is primarily focused on nutrition initiatives, while ADRA is promoting groundwater tanks designed to provide each family with one bucket of water per day. These tanks tap into water levels ranging from 12 to 18 meters

		underground. The Cafu canal represents a significant investment, but efforts are needed to distribute water to interior villages for improved access. Water scarcity often forces people to migrate to riverbanks, where land ownership issues arise, necessitating land demarcation along the canal. Kunene's population is predominantly nomadic, with approximately 500 wells but a lack of potable water. Desalination could potentially address this issue. The Himba, comprising various tribes such as the Kwanyama and Omaja, are concentrated between Curoca and Oncocua, facing accessibility challenges due to dispersed households. ADPP employs community facilitators (ADECOs) to mobilize local communities, translating information into local languages. FAO collaborates with Farmer Field Schools (FFS) and water point management committees, where women play key roles. Effective monitoring involves ensuring safety, language accessibility, and local administration involvement, necessitating the establishment of focal points in each area. Community mobilisation often requires approval from traditional leaders, facilitated by clearance letters from provincial governments. ADECOs require basic training on topics like climate change and gender equity, alongside incentives to effectively carry out their roles. Communities also face food security challenges amid low literacy levels. Men and youth often migrate in search of better opportunities, leaving women and children behind.

The mission team met with stakeholders including the Ministry of Environment at head office and provincial level, United Nations Development Programme, World Food Programme, ADPP, World Health Organisation, traditional leaders, local authorities, and communities comprising of men, women, and youth.

The following institutions were identified as potential collaborators at local level:
The local administration (Chitado Administration) could support with monitoring of field activities and report periodically, taking into consideration transport and communication challenges.
The National Police, who are responsible for environmental education as assigned to them by the provincial Government, would also monitor related activities. Weather stations would be placed close to the police posts or near traditional leaders to guarantee some level of security. Fire fighters support INAMET with collecting and reporting weather data to INAMET. Data processing and dissemination is done by INAMET. The firefighters, however, provide support with emergency response in the case of floods and weather-related hazards/incidences.
Community facilitators (ADECOs) – community members trained by the project to facilitate project implementation at community level. The project could make use of ADECOs but may not be available. During the follow up mission, the ADECOs based in Chitado were not available, but the secretary to the administration supported the mission with translation and contact with the community.

Angola Mission part 2, 11-16 June 2024

Summary of stakeholder consultations

Date and Location	Name(s)	Position and organisation	Meeting Summary
13/06/2024 – Ondjiva Municipality	1.Contreiras Tchingungo 2. Teotania Domingos 3.Sheila Neto, 6.Neri Tuhafeni	Head of Department in the Provincial Department of Environment Technical Specialist, DNACDS Consultant, SREP project Provincial Coordinator, FAO	We met the Provincial environment office, Provincial IDA Department, Representation of FAO; IFAD/FAO Mission team, and MINAMB. The Provincial Government represented by the Head of department for Environment in Kunene formally received the mission team. The mission team presented the mission objectives to the governments. The mission team undertook visits to Curoca Municipality, specifically Chitado Commune. Chitado population comprises 27,697 people, and its ethnic group is Mundimba, Muchimba Muhacaona. **Findings and challenges** It was described that with regards to climate change, the observed effects are intense draughts and floods which in turn result in rural exodus from the nomadic population. The impact of climate change has affected significantly in a negative manner local ecosystems and biodiversity resulting in livestock and land loss by many families. The Muchimba and Mundimba groups are the most vulnerable due to their nomadic characteristics. Other challenges presented by the local environmental representative is the absence of mechanisms to attenuate negative effects caused by climate change, such as control equipment, transport, environmental education with high deficit. Identified risks are cutting of trees, burning resulting in wildfires and consequently low levels of precipitation leading to drying of intermittent rivers, increased temperatures, emergence of ravines, occupation of areas with ecological potential, poaching (animals and plants) and many other negative aspects. Such risks pose a difficulty in the planning, definition, and distribution of land use. Furthermore, they lead to family leaving their lands due to degradation and loss of soil fertility, hunger, loss of livestock and even people perishing. There are few projects related to climate change supported by the Ministry of Environment, **Suggestions** The project being designed can align with existing political and environmental frameworks at national and regional levels, by observing and using lessons learnt from existing or previous projects and mechanisms. Useful adaptation strategies to deal with impacts of climate change can be centered around training the community in topics related to climate change, include the community in decision making and execution of certain activities and projects that will affect and benefit them. Adaptation measures used by the local environmental institution are the installation of pilot committee and installation of weather stations which are currently non-operational. The local environmental department can provide data related to climate, biodiversity, flora, fauna, hydrological resources, and minimum historical climate data. Vet services for animals.

Date and Location	Name(s)	Position and organisation	Meeting Summary
			Installation antenna for communication.
14/06/2024 – Curoca Municipality – Chitado Village			We met the Communal Administrator, traditional leaders, religious leaders, National Police, Firefighters, teachers *Chitado Population:* 27,697 *Ethnic groups:* Mundimba, Muchimba (Himba), Muhumbe, Mutyiavikwa, Mungambwe, Mútua and Muhacaona. Number of police in Chitado is 11, i.e., 8 for public order and 3 fire fighters. Traditional leaders highlighted that rains are not regular in the community. Community depends on purchased food using income from animal sales. High number of people from Curoca migrated to Namibia in 2021/2022 due to hunger and caused deaths of humans. Cunene Government repatriated them back to Angola, but they abandoned the concentration camp going back to Namibia in seek for better life conditions Main drivers of migration include hunger, due to lack of water, availability of casual work opportunities in Namibia, Language commonality with Namibians, and proximity to services in Namibia. The cost of accessing basic services and goods from the rest of Angola is higher than accessing them from Namibia. **<u>Key challenges</u>** *Transport and communication challenges*. The lack of road network to the rest of Angola (Ondjiva), and lack of mobile network services. Development projects in Chitado lagged due to lack of human resources willing to serve in these conditions, and the experience of SREP and FRESAN projects. *Recurrent Droughts.* Over 90% families practise crop cultivation and livestock rearing, all on rainfed for crop and forage for the animals. The droughts have resulted in death of cattle and a decrease in cattle population, and hunger exacerbated. *Land issues.* The community has little control over the land along the Cunene River to access water for gardening and for their cattle. The land is occupied by privately owned commercial farms. *Exclusion from employment opportunities* by interventions of the private sector and development interventions. The population believe they have something to contribute but are discriminated against based on their culture. **Main proposals by the community leaders** Vet services for animals including medicine. Irrigation support for gardening Installation of Antenna for mobile service - communication Road Access to rest of Angola School gardens for nutrition interventions Environmental education – also proposed by the Provincial Environment department. **Partners available in Chitado** **IDA** is present in Chitado through SREP but has made no progress yet. No extension staff stationed there, due to access problems.

Date and Location	Name(s)	Position and organisation	Meeting Summary
			FAO is present through the FRESAN project and has implemented 8 FFSs in Chitado. Challenge has been the lack of physical access and communication for effective monitoring of activities **ADPP** intervened in Chitado until 2022. **Government**: Health, Education, National Police, Firefighters, Communal Administration (Administrator, Vice administrator, Secretary) **The police** are providing environmental awareness to communities as recommended by the provincial government, but transport is a challenge. The church and Traditional Leaders (are equally influential in the community)
14/06/2024 - Chitado Village	*Comité Molumbua*	The Local Traditional Leader	During the public consultation, mentioned that during the colonial era, the rainfall was not as irregular as it is now. They did not experience long periods without rain or even floods. Currently, they can go up to a year without rain in some areas which in turn affects agricultural practices. The community only has 1 school, 1 health centre, that does not meet their needs in terms of capacity and other aspects. Communication networks are non-existent. They request that a water channel is built benefiting Chitado, Calueque and Chitapaúa
	Tchohucu Manuel Txali	Local Traditional Leader	The village has been experiencing lack of rainfall for the past 8 years and for that reason, most of the livestock perished. When it rains, they plant sorghum and other cereals, but very far from their houses because of the proximity to water sources. The community or individuals usually dig rudimental holes to harvest water for consumption and for the animals.
	Luis Katiaka	Community member – Herder	Kids cannot go to school due to hunger and long distances they need to walk to reach the institutions.
	Catamohambo Tchindumba	Community member - Farmer	There are no water infrastructures such as dams, dikes or other storage infrastructures like in other places. There are a lot of private farms near the river, making it difficult to access it.
	Camucaiona Tchinhunga	Community member - Herder	The community doesn´t work and is not used to irrigation, cultivating only when it rains. She wants the kids to have access to education, but because of the lack of transportation and road infrastructures, she does not see how that can be achieved.
	Augusta Baptista	Teacher	The project should implement vegetable gardens in the schools with the aid of Farmer field schools (FFS), to combat hunger and promote the importance of community vegetable gardens. The interventions and training should be taught in the local language for better engagements and dissemination of the information.

Date and Location	Name(s)	Position and organisation	Meeting Summary
		Religious leader	There needs to be capacity building for the youth in all thematic areas that will be useful for their future, such as languages, IT, woodworking, mechanics, agricultural practices, and many others. The youth should also be taught the pros and cons of early marriage versus education, and sexually transmitted diseases.
15/06/2024 – Chitado Village, Kutanga Community			33 participating community members, 14 males, 19 females. The community has about 50 households. Households are large, composed of more than one nuclear family. This is a cultural set-up for better control of family wealth (cattle).
		Traditional Community Leader	The village has limited access to the rest of the province, due to the poor road infrastructure and lack of transportation. The existing transports which are motorbikes tend to be extremely expensive/ costly. The community asks for intervention on that matter
15/06/2024 – Chitado Village, Ndaveva Community			32 participating community members, 13 males, 19 females. The community has about 50 households. Households are large, composed of more than one nuclear family. This is a cultural set-up for better control of family wealth (cattle).
	Veronica	Business owner	I own a small tuck shop and sometimes it is hard to get the merchandise due to poor road infrastructures and poor communication network in Chitado. Most times the network used is from Namibia with a very weak signal. Another important aspect to mention is that even if we must help solve the problem of climate change, we lack the knowledge and technology to do so.
28 June 2024, Luanda			Project validation meeting At the end of the mission, a validation meeting was held in Luanda, where several government and civil society stakeholders discussed the challenges and opportunities in the Cunene River Basin, and validated the interventions proposed by the mission team

Annex K: Lists of stakeholders consulted

IFAD
CONSULTATION FOR KUNENE RIVER BASIN PROJECT
Venue: MINAMB
Date: 20 May 2024

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7	Joylyn Ndoro	F	IFAD	Consultant, Social Inclusion, Nutrition and Gender Specialist	joylynndoro@gmail.com
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IFAD
Investing in rural people
UN-Agencies
Stakeholder consultation for the Kunene River Basin Project
Date: 20 May 2024

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IFAD
Investing in rural people
UN-Agencies and NGOs
Stakeholder consultation for the Kunene River Basin Project
Date: 21 May 2024

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9	Henrique Kanjengo		ADPP	Partnerships officer	
10	Mamisoa Rangers	F	UNDP	Deputy Resident Representative	mamisoa.rangers@undp.org
11	Pinto Vunge	M	UNDP	Environment Specialist	pinto. pedro. vunge@undp

IFAD
Investing in rural people
UN-Agencies and NGOs in Cunene
Stakeholder consultation for the Kunene River Basin Project
Date: 24 May 2024

No	Name	Gender	Organization	Title	Email & Contact No
1	David da Costa	M	WHO	Assistant Data Manager	
2	Onias Mpofu	M	ADPP	Supervisor	
3	Neri Tuhafeni	M	FAO	Coordinator - Cunene	neri.tuhafeni@fao.org
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IFAD
Investing in rural people
Provincial Government – Directorate of Environment - Cunene
Stakeholder consultation for the Kunene River Basin Project
Date: 15 June 2024

No	Name	Gender	Organization	Title	Email & Contact No
1	Contreiras Tchingungo	M	Env. Dept Cunene	Head of Department	
2	Sheila Neto	F	SREP	Environment Specialist	sheirussa@gmail.com
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IFAD
Investing in rural people
Government, UN Agencies, and NGOs - Luanda
Stakeholder consultation for the Kunene River Basin Project
Date: 28 June 2024

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IFAD
Investing in rural people
Communal Administration – Chitado – Curoca - Cunene
Stakeholder consultation for the Kunene River Basin Project
Date: 16 June 2024

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1.	Fiel Tomei Hiwapo	M	Administration – Chitado	Administrator	
2.	Amandio	M	Administration – Chitado	Secretary	927205125
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7.	Neri Tuhafeni	M	FAO	Coordinator - Cunene	neri.tuhafeni@fao.org
8.	Titus Zayone	M	IFAD	Consultant, PM - Monitoring and Evaluation	t.zayone@ifad.org
9.	Americo Paciencia	M	IDA	Head of Department - Cunene	927800924
10.	Agostinho	M	Religious group	religious Leader	935909056
11.	Joao Bastista	M			
12.	Manuel Malungu Mawonila	M	Health	Head of Health centre	922194554
13.	Carlos Jonacis	M	Residents Committee	President	
14.	Manuel Felisberto	M	Chitato Elementary School	Teacher	934224067
15.	Alvaro Chineva	M	Chitato Elementary School	teacher	934919251
16.	Ngola Nkhula	M		worker	
17.	Venancio H. Ngikavanga	M	Chitato Elementary School	Teacher	925703043
18.	Manuel Fenengo	M			
19.	Joao Mateus Kambuta	M	Traditional Leadership	Village Headman	
20.	Francisco Tholongo	M	national police	Commander	932095609
21.	Fernando Cabinda	M	SPCB	Commander	948829703

No	Name	Gender	Organization	Title	Email & Contact No
22.	Juliana Laussati	F	Community	member	
23.	Augusta Baptista	F	Chitato Elementary School	Teacher	927475805
24.	Hibalukassa V. P. Naikete	M	Chitato Elementary School	Teacher	937514501
25.	Teresa Zomba	F	Ex-combatant	ex-combatant	
26.	Avelina Jamba	F	Ex-combatant	ex-combatant	
27.	Waheya Chiramba	F	Community	farmer	
28.	Kamukayona Tchuna	F	Community	farmer	
29.	Muhasila Ndiambe	F	Community	farmer	
30.	Victorina Tchipuco	F	Community	farmer	
31.	Belita Katututu	F	Community	farmer	
32.	Juliana Sabino	F	Administration – Chitado	Social Action Department - Chitado Administration	933848695

IFAD
Investing in Rural People
Community Consultation for Kunene River Basin Project
Date: 16 June
Venue: Kutanga - Chitado

No	Name	Gender (M/F)	Indigenous people (Yes/No)	Email & Contact No
1	Joao Mateus	M	Yes	
2	Ananias Kapera	M	Yes	
3	Mundikovei Tfirambi	M	Yes	
4	Tyome Tunga	M	Yes	
5	Gulherme kapata	M	Yes	
6	Elau Tjinidanti	M	Yes	
7	maria Muculepi	F	Yes	
8	katjiphele Tyanli	M	Yes	
9	Tariana Bolede	F	Yes	
10	Bibiana Cuhuna	F	Yes	
11	Toutala Titusa	F	Yes	
12	Rusia kodino	F	Yes	
13	Clementina Francisco	F	Yes	
14	Dina Tjipotawo	F	Yes	
15	maite Mugondo	F	Yes	
16	Emilia Selino	F	Yes	
17	Kavetjihola kahongo	F	Yes	
18	kafina velenu	F	Yes	
19	baningilua Petra	F	Yes	
20	madalena katiti	F	Yes	
21	Tyahangwa Kabuta	F	Yes	
22	Kavelithi Mupungua	F	Yes	
23	Sudite kahongo	F	Yes	

No	Name	Gender (M/F)	Indigenous people (Yes/No)	Email & Contact No
24	Tosicava Inosu	F	Yes	

IFAD
Investing in Rural People
Community Consultation for Kunene River Basin Project
Date: 17 June 2024
Venue: Ndaveve - Chitado

No	Name	Gender (M/F)	Indigenous people (Yes/No)	Email & Contact No
1	Roinde batista	F	Yes	
2	Rlembeka Mbimbo	F	Yes	
3	Muasoquele Kuya	F	Yes	
4	laimi Tjoabeka	F	Yes	
5	kakuimuqua kawoko	F	Yes	
6	Kalali Rubuna	F	Yes	
7	Riemueta Kuva	F	Yes	
8	Senifa Mulenduli	F	Yes	
9	Veholeti Maulisu	F	Yes	
10	Neso Kuva	M	Yes	
11	Rimembo maulisu	F	Yes	
12	Rio Ndaviti Wana	M	Yes	
13	Gideon Sitanu	M	Yes	
14	Itauzi Mbedula	M	Yes	
15	Mbututu Kuva	M	Yes	
16	Tyohuku manuel	M	Yes	
17	Milanda maulisu	M	Yes	
18	Siena kalupela	M	Yes	
19	Utaya Tyuma	M	Yes	
20	Kazamuhambo Tyindya	M	Yes	
21	Ruis katyaka	M	Yes	
22	kamungewa Tyali	F	Yes	
23	Virilua Tinavilika	F	Yes	
24	Katutalwa Mbimbi	F	Yes	
25	vapaizako Tyiema	F	Yes	
26	Kasukona Tyawana	F	Yes	
27	Igoona beja	F	Yes	
28	kandungundungu Maulisu	M	Yes	
29	Mandalena Wambinda	F	Yes	
30	Ngolotia Ananis	F	Yes	
31	Mukamikunde Mundyua	F	Yes	

*4***Participants lists from stakeholder consultation meetings in Namibia.**

IFAD
Investing in rural people
CONSULTATION FOR KUNENE RIVER BASIN PROJECT
Venue: WWF
Date: 3 June 2024

No.	Name	Gender (m/f)	Organization	title	Email and contact no
1.	Shirley Magazi	F	IFAD	Consultant	smogara@gmail.com
2.	Emilia Inman	F	IFAD	Consultant	haimbiliemilia@gmail.com
3.	John K. Kasaona	M	IRDNC	Executive Director	johnkk@irdnc.org.na
4.	Maxi Haia	F	NACSO	Director	MaxienaH@nacso.org.na
5.	Juliane Zeidler	F	WWF	County Director	jzeidler@wwwf.na
6.	Qingyun Diao	F	FAO	Country Representative	Qingyun.Diao@fao.org
7.	Eugene Kanguatijivi	M	FAO	Project Officer	Eugene.Kanguatjivi@fao.org
8.	Simon Thuo	M	IFAD	Regional Consultant	

IFAD
Investing in rural people
Meeting with UN Agencies
Stakeholder consultation for the Kunene River Basin Project
Date: 27 May 2024

No.	**Name**	**Org.**	**Title**	**Email and contact no.**
1.	Hopolang Phororo	UN	Resident Coordinator	Hopolang.phororo@un.org
2.	Enoch Shebudd	UN-WFP	Deputy County Director	
3.	Nelson Zakarafi	UN-RCO	Development Coordinator	Nelson.zakarafi@un.org
4.	Ivonald da Cruz	UN -IFAD	Programme Management Specialist	i.dacruz@ifad.org
5.	Christian Shingiro	UNDP	Deputy Representative	Christian.Shingiro.undp.org
6.	Emilia Inman	IFAD	Consultant	haimbiliemilia@gmail.com
7.	Shirley Magazi	IFAD	Consultant	smagazi@gmail.com
8.	Eugine Kanguatjivi	FAO	Project Officer	Eugene.Kanguatjivi@fao.org
9.	Simon Thuo	IFAD	Regional Specialist	Simonthuo@gmail.com
10.	Francesco Rispoli	IFAD	Country Director	f.rispoli@ifad.org

IFAD
Investing in Rural People
27 May 2024, Ministry of Agriculture, Water and Land Reform.
Ministry of Works and Transport
Stakeholder Consultations for the Kunene River Basin Project
Date: 27 May - 03 June 2024

No.	Name	Organization	Title	Email and contact No.
1.	Mesag Mulunga	MAWLR	Director of Planning KBD	mesag.mulunga@mawlr.gov.na
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3.	Ismael Ehamba	MAWLR	Acting Director	iehamba@gmail.com
4.	Alfeus Moses	MAWLR-OWA	Chief Hydrologist	alfeus.moses@mawlr.gov.na
5.	Olga K. Tjiueza	MWT-MET	Chief Met Technician	olga.karunga@mawlr.gov.na
6.	Simon Dirkse	MWT-MET	CMT	simon.dirkse@mawlr.gov.na
7.	Anna Haufiku	MAWLR	Senior Hydrologist	anna.haufiku@mawlr.gov.na

8.	Emilia Inman	IFAD-UNAM	Consultant	haimbiliemila@gmail.com
9.	Shirley Magazi	IFAD	Consultant	smagazi@gmail.com
10.	Ivonald da Cruz	IFAD	Programme Mngt Specialist	i.dacruz@ifad.org
11.	Eugene Simwanza	MAWLR	Control AT	simwanzasimiwanza@gmail.com
12.	Francesco Rispoli	IFAD	Country Director	f.rispoli@ifad.org
13.	Simon Thuo	IFAD	Regional Specialist	s.thuo@ifad.org
14.	Eugene Kanguatjivi	FAO	Project Officer	Eugene.kanguatjivi@fao.org
15.	Qingyun Diao	FAO	Country Representative	Qingyun.Diao@fao.org
16.	Ben Haraseb	MAWLR	Director	ben.haraseb@mawlr.gov.na

IFAD
Investing in Rural People
21 May 2024, Kunene Region, Regional Leadership
Stakeholder Consultations for the Kunene River Basin Project
Date: 27 May – 03 June 2024

No.	Name	Organization	Title	Email and contact No.	Gender	Youth
1.	Sion Shifa	MEFT	SCD	sionshifa@yahoo.com 0812781707	M	
2.	Qingyun Diao	FAO	REP	Qingyun.Diao@fao.org	F	
3.	Eugene Kanguatjivi	FAO	Project Officer	Eugene.kanguatjivi@fao.org	M	
4.	Simon Thuo	IFAD	Regional Specialist	s.thuo@ifad.org	F	
5.	Shirley Magazi	IFAD	Consultant	smagazi@gmail.com	F	N
6.	Emilia Inman	IFAD-UNAM	Consultant	haimbiliemila@gmail.com	M	N
7.	Mr. Tjinezuma Kavari	HIPO	Board Chairperson	kavari@gmail.com	M	N
8.	Steven M. Jambiru	Kakurukouje T/A	Senior Council	stevenjambiru@gmail.com 0812839550	M	N
9.	Mr. A.M Kapi	Zahumuka P. Co-op NNFU	Board Chair – board Member	amakapi@gmail.com	M	N
10.	Unangatenua Kupi	IRDNC	Coordinator	unangatenuak@yahoo.com	M	N
11.	Tufupeni T. Tjazapi	Okozorgominya FA	Chairman	tupenitjazapi@gmail.com	M	N
12.	J. Muteze	Vita Royal	senior Council	0813812061	M	N
13.	Victorino Simon	MAWLR-DWOSSC KUNENE	Senior ***	victorino.simon@gmail.com 0814975911	M	N
14.	Rex T. Sheehana	Ngatunan RFU	Secretary	0811465031	M	N
15.	Tjipundi Kemumuine	Otuharu Tutatu Fwniesasion	Chairperson	kemumuinetjipundi@gmail.com 0812324820	M	N

IFAD
Investing in Rural People
Stakeholder Consultations for the Kunene River Basin Project
Date: 27 May – 03 June 2024

No.	Name	Organization	Title	Email and Contact No.	Gender	Youth
17.	Uendjipa Thom	Wita Traditional Authority	Senior Council	0818249147	M	NO
18.	Kapangare Tjambiru	Senior Councilor	Kakurukouse TR	071482554	M	NO
19.	Verikouje Ndundu	Red Cross	Regional Officer	0812086013	M	YES
20.	Kazorondu Heuita	Karuru Kopuse Traditional Authority	Game Guard	0814798606	M	NO
21.	Tjikunda Katjina Kulunga	EPUPA Control Admin	Admin Control Officer	0813714577 0811295741	M	

		Constituency Officer				
22.	Asnath Katjimbari	Kunene Rural Women Association	Chairperson	0812356748	F	NO
23.	Ben U. Kapi	Ngatuuone RFU	Chairperson	0812632528	M	
24.	Ian Van der Merwe	Ngatuuane RFU	Crops Representative	0812560965	M	NO
25.	Chris Van der Merwe	Ohaukororo	Chairperson	0813171340	M	YES
26.	Sennobia Charon Katjiuongua	Kunene Comm Radio NCCI	Board Member Vice-Chairperson	katjiuonguacharon@gmail.com 0816968168	F	NO
27.	Ambata Eliaser	MWLR-DAPEES	Chief *** Technician	chiaserambata70@gmail.com 0811248797	M	NO
28.	Tutupenini T. Tjazapi	Okozorgominya FA	Chairman	tutupenitjazapi@gmail.com	M	NO
29.	Amos Mchambo	Ufumano Church	Deacon	0812405511	M	NO
30.	Kavari Muharukua	Opuwo Churches	Chairman	0817988556	M	NO

IFAD
Investing in Rural People
Stakeholder Consultations for the Kunene River Basin Project
Date: 27 May - 03 June 2024
MEFT Management 27 May 2024

No.	Name	Organization	Title	Email And Contact No.	Signature And Date Consulted
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3.	Petrus Mutiyauli	MEFT	Deputy Director	petrus.mutiyauli@meft.gov.na	
4.	Shirley Magazi	IFAD	Consultant	smagazi@gmail.com	
5.	Emilia Inman	IFAD-UNAM	Consultant	haimbiliemila@gmail.com	
6.	Simon Thuo	IFAD	Regional Specialist	s.thuo@ifad.org	
7.	Eugene Kanguatjivi	FAO	Project Officer	Eugene.kanguatjivi@fao.org	
8.	Qingyun Diao	FAO	FAO	Qingyun.Diao@fao.org	

IFAD
Investing in Rural People
Community Consultation for Kunene River Basin Project
Date: 27 May -03 June 2024
Venue: Epupa

No.	Name of participant	Gender (M/F)	Youth under 35 years old (yes/no)	Indigenous people (yes/no)	People with disabilities (yes/no)
1.	Veitjuiua Thom	M	Yes	Yes	No
2.	Vazurarisa Tjamoiru	F	Yes	Yes	No
3.	Vakarereia Tjiposa	M	Yes	Yes	No
4.	Izilda Tjokoeoke	F	Yes	Yes	No
5.	Uasatarora Mutambo	M	Yes	Yes	No
6.	Vemukondjisa Thom	F	Yes	Yes	No
7.	Vetumbua Vi Muhenje	F	Yes	Yes	No
8.	Ester Koikoi	F	Yes	Yes	No
9.	Munenje Tjanakambembe	F	Yes	Yes	No
10.	Tjambura Karikamba	F	Yes	Yes	No
11.	Kovizia Maariseki	M	Yes	Yes	No
12.	Veripeuavi Muhenje	F	Yes	Yes	No
13.	Bertha Mbambi	F	Yes	Yes	No

14.	Mbimutyita Muhenje	M	Yes	Yes	No
15.	Tjeore Verikonga	M	Yes	Yes	No
16.	Tjikuendi Jakwatavi	M	Yes	Yes	No
17.	Utjuziua Kuvare	F	Yes	Yes	No
18.	Maria Kandiimuine	F	Yes	Yes	No
19.	Secilia T. Mualiputji	F	Yes	Yes	No
20.	Pena Sakeusa	M	Yes	Yes	No
21.	Hamandike Muhenje	F	Yes	Yes	No
22.	Kambopi Tjambiru	F	Yes	Yes	No
23.	Rusia Muanjangambo	F	Yes	Yes	No
24.	Katunovandu Thom	F	Yes	Yes	No
25.	Kasokona Thom	F	Yes	Yes	No
26.	Sarender Thom	F	Yes	Yes	No
27.	Ndian Thom	F	Yes	Yes	No
28.	Tjazapuije Tjambiru	F	Yes	Yes	No
29.	Kaunambonga Ephraem	M	Yes	Yes	No
30.	Kazezenia Tjambiru	F	Yes	Yes	No
31.	Ngunonie Thom	F	Yes	Yes	No
32.	Wapanderaine Thom	M	Yes	Yes	No
33.	Kamdjendje Hepute	F	Yes	Yes	No
34.	Kamugewa T. Ndunda	F		Yes	Yes
35.	Mikiina Muhenje	F		Yes	Yes
36.	Kavenaye Efraem	F		Yes	Yes
37.	John Muhenje	M		Yes	Yes
38.	Kama T. Tiquopuini	M		Yes	Yes
39.	Amosa Mbendura	M		Yes	Yes
40.	Yekutomba	M		Yes	Yes
41.	Viasaida Kandimune	F		Yes	No
42.	Nico Kaita	M	Yes	Yes	No
43.	Remeber Kaita	M	Yes	Yes	No
44.	Mariyes Kaita	M	Yes	Yes	No
45.	Martha Ijambiru	F	Yes	Yes	No
46.	Mathew Ijidunda	M	Yes	Yes	No
47.	Wakandjanao Mbenduya	F	Yes	Yes	No
48.	Jimbasi Mbendura	M	Yes	Yes	No
49.	Filipus Hoeb	M	Yes	Yes	No
50.	Kasops Kakoi	M	Yes	Yes	No
51.	Tieus Mbendura	M	Yes	Yes	No
52.	Racheal Kamoruao	M	Yes	Yes	No
53.	Moposipi Muhenje	M	Yes	Yes	No
54.	Rutjindo Katironaam	M	Yes	Yes	No
55.	Kahitire Muhenje	M	Yes	Yes	No
56.	Umuna Danuel	M	Yes	Yes	No
57.	Mbarirako Muhenja	M	Yes	Yes	No
58.	Kahurukirue Tjinange	F	Yes	Yes	No
59.	Ripueni Shituripo	M	Yes	Yes	No
60.	Uendjiundjai Ruiter	F	Yes	Yes	No
61.	Kakunaa Muhenje	F	Yes	Yes	No
62.	Marijua Mutambi	M	Yes	Yes	No
63.	Tjambiru Ngavetungue	M	Yes	Yes	No
64.	Munenje Watusurirep	M	Yes	Yes	No
65.	Ngumdara Muhenje	M	Yes	Yes	No
66.	Rapall Tjihita	M	Yes	Yes	No
67.	Murambi Huputt	M	Yes	Yes	No
68.	Verinyaerako Kayeya	M	Yes	Yes	No
69.	Hambepe Tjambiru	M	Yes	Yes	No
70.	Vyasapo Une-Kariro	M	Yes	Yes	No
71.	Ukongorera Mbinge	M	Yes	Yes	No
72.	Mamureve Hepute	M	Yes	Yes	No
73.	Kauijazemua Ijambiru	F	Yes	Yes	No
74.	Maria Kandimune	F	Yes	Yes	No
75.	Kuaundja Ombura Muhenge	F	Yes	Yes	No
76.	Wetupotjinyoa T.	F	Yes	Yes	No
77.	Mamuini Tjavara	F	Yes	Yes	No
78.	Eugene Kanguatjivi	M	Yes	Yes	No
79.	Analdus Ijiura	M	Yes	Yes	No

IFAD
Investing in rural people
COMMUNITY CONSULTATION FOR KUNENE RIVER BASIN PROJECT
DATE 31ST MAY 2024
VENUE: EPUPA

No.	Name of participant	Gender (M/F)	Youth-under 35 years old (yes/no)	Indigenous people (yes/no)	People with disabilities (yes/no)
1.	Raul Murotwa	M		YES	YES
2.	Ananias Kaluwapa	M		YES	YES
3.	Katuyi Muhenje	M		YES	YES
4.	Veiyiua Thomo	M		YES	YES
5.	Mbeumuna Rafael	F		YES	YES
6.	Loide Amukoshi	F		YES	NO
7.	Flora Francisico	M		YES	NO
8.	Mazumo Ngombe	M		YES	NO
9.	Emmanuel Daniel	M		YES	NO
10.	Gabriel Kaita	M		YES	NO
11.	Katoho Muhonje	M		YES	NO
12.	August Kapera	M		YES	NO
13.	Tjakuvaka Muhenje	M		YES	NO
14.	Kavari Kaihorerua	M		YES	NO
15.	Gabriel K. Tjambiru	M		YES	NO
16.	Karukurue Tjiuma	M		YES	NO
17.	Mbitito Kavari	M		YES	NO
18.	Kandjima Muhenje	M		YES	NO
19.	Maveya Kavari	M		YES	NO
20.	Mario Tavares	F		YES	NO
21.	Treza Kazera	M		YES	NO
22.	Kariyoro O. Ngombe	M		YES	NO
23.	Kambuaoko Muhenje	M		YES	NO
24.	Verinyaerako Kageya	M		YES	NO
25.	Kambondjo Tjiposa	M		YES	NO
26.	Marikondjo Tjambira	M		YES	NO
27.	Wararimue Muhenje	F	Yes	Yes	No
28.	Rahangauka Ngombe	F	Yes	Yes	No
29.	Qena Muhenje	F	Yes	Yes	No
30.	Mayaa Kandimuine	F	Yes	Yes	No
31.	Mukambengera M.	F	Yes	Yes	No
32.	Kauya Ngwa-Muhonje	F	Yes	Yes	No
33.	Meramia Mbuare	F	Yes	Yes	No
34.	Amuldus Tjivera	M	Yes	No	No

IFAD
Investing in rural people
COMMUNITY CONSULTATION FOR KUNENE RIVER BASIN PROJECT
Venue: Okanguati
Date: 30th May 2024

No.	Name of participant	Gender (M/F)	Youth-under 35 years old (yes/no)	Indigenous people (yes/no)	People with disabilities (yes/no)
1.	Mavetwapi Tjiumba	M	No	Yes	No
2.	Maepingiko Ijindumba	M	No	Yes	No
3.	Riamana Oruhama	M	No	Yes	No
4.	Maaruka Mupurua	M	No	Yes	No
5.	Peihama Tjindunda	M	No	Yes	No
6.	Kanungojo Muhenje	M	No	Yes	
7.	Kapangere Tjambiru	M	No	Yes	
8.	Kauta Koruhama	M	No	Yes	No
9.	Vaatako Hembinda	M	No	Yes	
10.	Kuapunawa Tjirambi	M	No	Yes	
11.	Chief Vemui Tjambiru	M	No	Yes	
12.	Eugene Kanguatjivi	M	No	Yes	

13.	Ijisuta Kaitema	M	Yes	Yes	No
14.	Kanaumba Mohenje	M	Yes	Yes	No
15.	Repute Japeule	M	Yes	Yes	No
16.	Steven M. Jambiru	M	Yes	Yes	No
17.	Kanambiya Shinga	M	Yes	Yes	No
18.	Simon Effraem	M	Yes	Yes	No
19.	Njumbi Ujamba	M	Yes	Yes	No
20.	Mutambo Mautjindika	M	Yes	Yes	No
21.	Charles Uanje	M	Yes	Yes	
22.	Maaruka Muparua	M	Yes		No
23.	Hevita Mgumebiti	M	Yes		No
24.	Ngumbi Mbomi	M	Yes		No
25.	IJambiru Uvawura	M	Yes		No
26.	Alungongo Wilbard	M	Yes		No
27.	Rutemba Ngumbi	M	Yes	Yes	No
28.	Muhenje Katazuu	M	Yes	Yes	No
29.	Hepate Kautaarua	M	Yes	Yes	No
30.	Muhenje Katoho	M	Yes	Yes	No
31.	Japyanguka Tjhanje	M	Yes	Yes	No
32.	Hambinda Kaninounusa	M	Yes	No	No
33.	Tjindandi Kaukareerua	M	Yes	No	No
34.	Tjinana Kaunrina	M	Yes	Yes	No
35.	Hunga Jipara	M	Yes	Yes	No
36.	Mutambo Kiapiti	M	Yes	No	No
37.	Ijiumbua Hijambifise	M	Yes	No	No
38.	Tjinana Kaharakana	M	Yes	Yes	No
39.	Tjindandi Muangemba	M	Yes	No	No
40.	Tjindandi Kapata	M	Yes	No	No
41.	Jiposa Ijarambua	M	Yes	No	No
42.	Hembinda Vapuzako	M	Yes	No	No
43.	Muhenye Njomuu	M	No	Yes	No
44.	Hembinda Tjiuone	M	Yes	No	No
45.	Ngombe Vakuvirapi	M	Yes	No	No
46.	Jambiru Kavepanga	M	Yes	No	No
47.	Tjiposa Kamupandera	M	Yes	No	No
48.	Ingi David	M	Yes	No	No
49.	Kampenderu Jiposa	M	No	No	No
50.	Kampepua Jiposa	M	Yes	No	No
51.	Kapika Undaka	M	Yes	No	No
52.	Ijiuma Uarimo	M	No	No	No
53.	Mgombe Tjilonga	M	Yes	No	No
54.	Mgumbi Uakuatwatyapa	M	Yes	Yes	No
55.	Tjingee Jarara	M	No	Yes	No
56.	Mbinge Hangekaava	M	No	Yes	No
57.	Kapika Vemupiana	M	No	Yes	No
58.	Hembinda Vezepaumue	M	No	Yes	No
59.	Tjirambi Uatakanisa	M	No	Yes	No
60.	Ngombe Kautouenua	M	No	Yes	No
61.	Harire Makuljavi	M	No	Yes	No
62.	Kambindja T.	M	No	Yes	No
63.	Efraem Angure	M	No	Yes	No
64.	Kurinaua Tjinana	M	Yes	Yes	No
65.	Muundjua Varrakana	M	No	Yes	No
66.	Manjombara Muncomuaba	M	No	Yes	No
67.	Thom Mdolazu	M	No	No	No
68.	Unda Tjimba	M	Yes	No	No
69.	Kavare Kuzeeko	M	Yes	No	No
70.	Ngombe Vemujera	M	No	No	No
71.	Hepute Tjikuva	M	Yes	No	No
72.	Mbendura Tjihekata	M	Yes	No	No
73.	Jambiru Riapaapo	M	Yes	No	No
74.	Tjindandi Rikondjerua	M	Yes	No	No
75.	Jambiru Jaunduka	M	No	Yes	No
76.	Hepute Nduzuzu	M	Yes	Yes	Yes
77.	Tjambiru Kanjonjua	M	Yes	Yes	Yes
78.	Nanaa Ushuna	M	No	Yes	No

79.	Hepute Makahapapi	M	Yes	Yes	No
80.	Mbinge Vakaakua	M	Yes	Yes	Yes
81.	Jambiru Kanjanda	M	Yes	Yes	No
82.	Muhenje Nguindara	M	No	Yes	No
83.	Muhenje Ndinaani	M	Yes	Yes	No
84.	Muharukau Mbopata	M	No	Yes	Yes
85.	Tjiumbua Mavatwaapi	M	Yes	Yes	Yes
86.	Rutjindo Vemujakara	M	Yes	Yes	No
87.	Yradans Tjiua	M	Yes	No	No

IFAD
Investing in rural people
COMMUNITY CONSULTATION FOR KUNENE RIVER BASIN PROJECT
Venue: Windhoek County Club
Date: 3 June 2024
Debrief Session

	Name	Gender (M/F)	Organization	Title	Email and contact No.
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2.	Fulgentia Magira	F	CPM	Ms.	Fulgentia.mayira@opm.gov.na
3.	Helvi Akwenye	F	MAWLR-DWA	Ms.	Helvi.akwenye@mawlr.gov.na
4.	Enich Petrus	M	MAWLR-DEPEES	Mr.	Erich.Petrus@mawlr.gov.na
5.	Silvanus Uunona	M	CUVECOM	Mr.	suunona@covecom.org
6.	Nicholas Tembwe	M	MSYNS	Mr.	Nicolars.tembwa@msynsigo.vana
7.	Timo Mufeti	M	MEFT	EC	timomufeti@meft.gov.na
8.	Teofilus Nghitila	M	MEFT	ED	ED@meft.gov.na
9.	Qingyun Diao	F	FAO	REP	Qingyun.Diao@fao.org
10.	Eugene Kanguatjivi	M	FAO	Project Officer	Eugene.kanjuatjiri@fao.org
11.	Ilvorurue Kheijavi	M	MAWLR	Agricultural Scientific Officer	concyngaruka@gmail.com
12.	Eugene Simwanza	M	MAWLR	Control Agri-Tech	Simwanza.simwanza@gmail.com
13.	Gottlieb S. Kahana	M	MAWLR	Agricultural Scientific Officer	Dudeskahana@gmail.com
14.	Anastasia Shiviya	M	MAEPESIL	DD	
15.	Scholastica Chatu	F	NPC	NDA	schatu@npc.gov.na
16.	Emilia Inman	F	IFAD	Consultant	haimbiliemilia@gmail.com
17.	Shirley Magazi	F	IFAD	Consultant	smagazi@gmail.com
18.	Anna Dumeni	F	OPM	Control Adm. Officer	Anna.dumeni@opm.gov.na

Annex L Pictures

Consultations in Okanguati, Namibia Community leader (Okanguati) narrating



Consultations in Matala, Huila, Angola
the historic memory of the past droughts