CONCEPT NOTE PROPOSAL FOR SINGLE COUNTRY

Chad Oasis Project

Reversing the degradation trend in the oases of Borkou, Ennedi West and Wadi Fira through strengthening adaptation measures and improving resilience to climate change of vulnerable communities

Title of Project	Reversing the degradation trend in the oases of Borkou, Ennedi West and Wadi Fira through strengthening adaptation measures and improving resilience to climate change of vulnerable communities
Country:	Chad
Thematic Focal Area:	Multisector project
Type of Implementing Entity:	Regional Implementing entity
Implementing Entity:	Sahara and Sahel Observatory (OSS)
Executing Entities:	Ministry of Environment, Fisheries and Sustainable Development through the General Directorate of Forest, Wildlife and Fisheries Resources; in collaboration with the Union of Women for the Fight against Desertification in the Sahel
Amount of Financing Requested:	10,000,000 in U.S Dollars Equivalent
Project Formulation Grant Request:	Yes ☒ No ☐
Amount of Requested financing for PFG:	50,000 in U.S Dollars Equivalent
Letter of Endorsement (LOE) signed:	Yes ☒ No ☐
Stage of Submission:	This is the first submission ever of the concept proposal

PART I PROJECT INFORMATION

1. Project Background and Context

1.1 Background information on Chad

1. Chad, is the 5th largest country in Africa and ranks second among Sahelian countries after Sudan, covers an area of 1.284 million km^2 of which 98.1% is land and 1.9% is water, consisting mainly of 5 lakes including Lake Chad.It is a landlocked country in Central Africa, bordered to the north by Libya, to the east by Sudan, to the south by the Central African Republic and to the west by the countries with which it shares Lake Chad, namely Cameroon, Niger and Nigeria (Figure 1). The country's landscape is made up of vast Saharan, Sahelian and Sudanian zones.

2. Chad's land surface presents a spectacular variety of geographic contrasts. The vast northern third is located in the Sahara Desert and is sparsely populated, home to just **1 percent** of Chad's population. Both N'Djamena, the capital, and Lake Chad are located on the country's southwestern. Lake Chad is fed by the country's two main rivers, the Chari and the Logone. It is the largest body of water in the Sahel and a major center of economic activity for the region. However, due to erratic variations in the region's climate and overexploitation of the rivers that feed it, this shallow lake (1.5 m deep on average) has shrunk to a small fraction of its 1960 size.

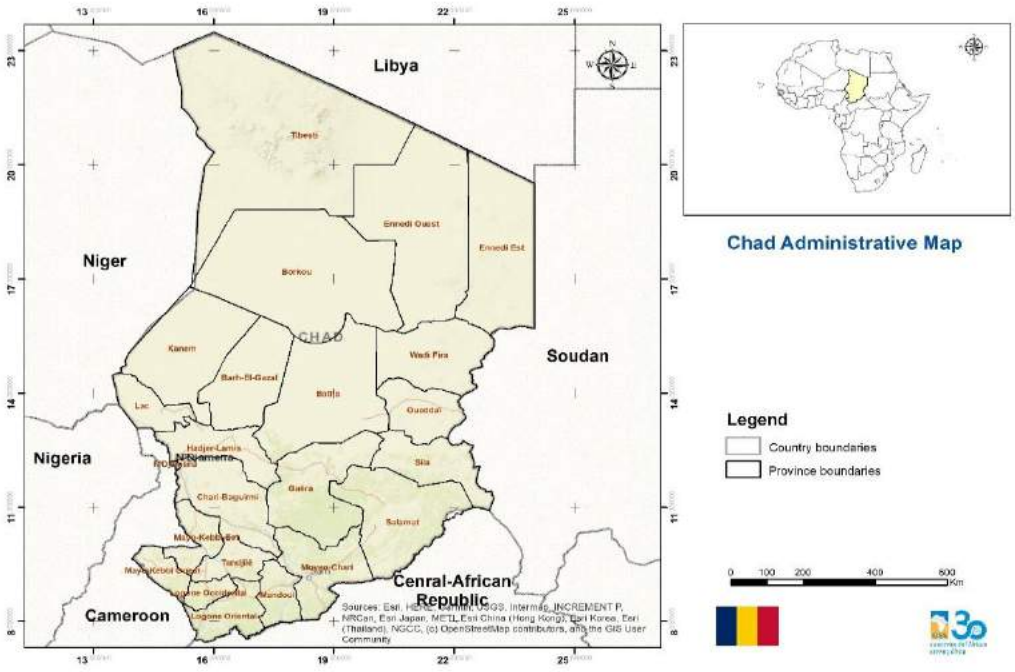

Figure 1 Administrative division of Chad (source: OSS,2022)

3. According to the latest World Bank report of Chad, the country has made significant progress in reducing poverty over the past 15 years. Nevertheless, it remains one of the poorest countries in the world, counting as a Least Developed Country (LDC)[1]. In the 2018 Human Development Index (HDI), Chad ranks 187th out of 189 countries and territories. According to the latest Chad Household Consumption and Informal Sector Survey (2018-2019), approximately 42% of Chadians, or 6.5 million people, including 3.4 million women and 3.1 million men, live below the national poverty line of 242,094 CFA francs per year or 663 CFA francs (Equivalent to $1.2) per day. Approximately, 15% of the population (2.4 million people) were in extreme poverty, i.e., unable to meet their basic nutritional needs of 2,300 kilocalories per day. Nearly 89% of poor households are in rural areas, while only 3% are in the capital, N'Djamena. Four main factors explain this poverty: (i) a lack of economic diversification; (ii) low productivity in the rural sector; (iii) exposure to shocks; and (iv) low levels of human capital. Of course, as elsewhere in the world, the repercussions of the COVID_19 pandemic made the situation worse and pushed the country back into a second recession in 2020-2021.

4. Chad's economy is dominated by the agricultural sector, contributing at 51.9 % to the country's GDP in 2020, followed by the services sector with 43.6 % and the industrial sector with 12.0 %[2]. Chad's main export is petroleum with 92 % of total exports, followed by gold, insect resins and oilseeds[3]. Overall, 80 % of the population is engaged in smallholder farming and heavily relies on agriculture for food security and livelihoods. Therefore, concerns are rising about the effects of climate change including rising temperatures, reduced water availability and the occurrence of floods and other extreme weather events. Agricultural production in Chad is primarily subsistence based and rainfed.

5. Since 2015, the country has been experiencing an unprecedented economic and financial crisis resulting in a continuous deterioration of the State's financial resources linked to the drastic fall in the price of oil, one of the country's main

[1] World Bank, "World Bank Open Data,". Online available: https://data.worldbank.org
[2] World Bank, "World Bank Open Data," . Online available: http://wdi.worldbank.org/table/4.2
[3] Observatory of Economic Complexity (OEC), "Chad," 2020. Online available: https://oec.world/en/profile/country/tcd/#Exports.

sources of revenue. This situation has a negative impact on the financing capacity of the administration's operations and investment for the sustainable development of the country. Also, the provision of public services in the various areas of rural development are underdeveloped due to lack of financial resources. Chad currently serves as a destination for migrants and refugees, 70 %[4] of whom are from Sudan. Other major countries of origin include the Central African Republic (19 %) and Cameroon (7 %).

1.2 Relief

6. According to the first NAP[5], Chad is located on a wide plain with flanks that rise gently eastward toward the Ennedi Range and north toward the Tibesti Mountains, which culminate in the Sahara's highest peak, Emi Koussi, at 3,415 m. The country's northern third consists of vast sandy and gravel plains, too dry for cultivation except for small- scale traditional irrigated farming in scattered oasis towns. The high plateaus of the Ennedi and Ouaddaï ecoregion gently slope toward the lower Sahelian plains of the Batha and Kanem ecoregions, stretching to Lake Chad far to the west. The Ennedi Plateau[6] is a mountainous region in the north-eastern corner of Chad, an impressive sandstone massif eroded by wind and temperature changes into series of terraces, gorges, cliffs and outliers. Although it is part of the Sahara, the climate of the Ennedi Plateau is much more suitable for human habitation than most of the desert, with regular rain during summer, wadis (seasonal rivers) flowing once or twice a year, and a relatively large range of flora and fauna – including some of the few remaining populations of Saharan crocodiles west of the Nile. In 2016 the Ennedi Massif was recognised as a protected UNESCO World Heritage Site.
7. The southern third of Chad is in the Sudanian climate region, with many ecoregions that are defined by plateaus and local highlands, expansive plains, and broad drainage channels that flood annually. To the west, these plains are more conducive to agriculture owing to their deep, rich alluvial soils. In contrast, the largest ecoregion in the southeast, Moyen-Chari and Salamat Plain (EMS – Eastern Middle-Chari and Salamat), contains large expanses of Sudanian zone woodlands and savannas where scattered communities are engaged in subsistence farming, fishing, and raising livestock.

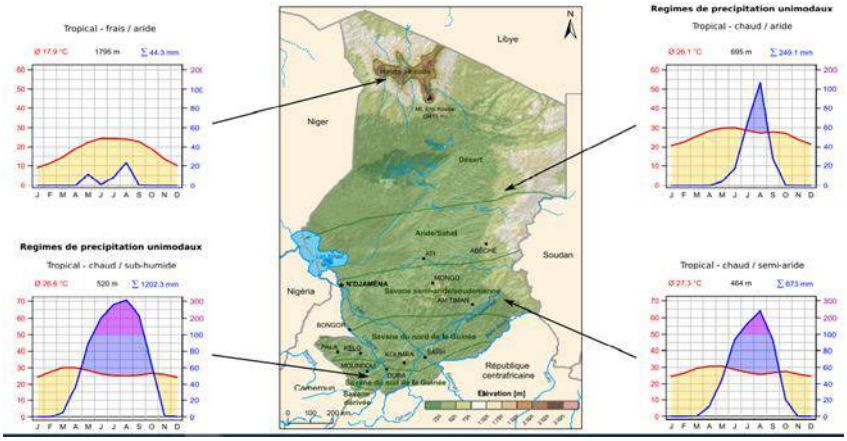

Figure 2: Topographic map of Chad with agro-ecological zones and existing rainfall patterns

1.3 Bioclimatic zones and their hydro-climatic characteristics

8. Chad has three major agro-ecological zones: (i) a Saharan or desert zone with rainfall of 100 mm/year or less, representing 47% of Chad's surface area, which is characterized by a complex oasis system combining date production, subsistence irrigated agriculture, small-scale sedentary livestock farming and transhumant camel farming, (ii) a Sahelian zone (43% of the territory) which receives rainfall that varies between 200 and 600 mm/year has an agro-pastoral vocation; It is a livestock zone par excellence, but agriculture is also widely practiced, and (iii) an essentially agricultural Sudanian zone, with rainfall varying between 600 and 1,200 mm/year, which covers about 10% of the territory and is characterized by diversified production systems, combining food crops and cotton cultivation with small ruminant, cattle, pig and poultry farming.
9. The main plant formations in Chad include, from north to south: (i) shrub steppes with thorny plants and annual herbaceous plants; (ii) tree and shrub steppes with thorny and non-spiny plants and annual herbaceous plants; (iii) tree and shrub savannahs with annual herbaceous plants and perennial herbaceous plants The fauna includes: the fauna of the oases, the fauna of the Saharan massifs, the crocodile and endemic species of fish in the Archéï guelta, avifauna and freshwater fish, the hippopotamus in Lake Chad, the manatee in Lake Léré (Mayo-Kebbi) and concentrations of

[4] UNDESA, "Trends in International Migrant Stock: Migrants by Destination and Origin," New York, 2019.
[5] FIRST NATIONAL CLIMATE CHANGE ADAPTATION PLAN OF CHAD, feburary 2022
[6] Africanrockart.britishmuseum.org. Retrieved 2019-11-01.

elephants in the dry season, giraffes and other large mammals in the Zakouma National Park; elephants are also found in the Fitri Lake because it is landlocked, Chad shares its biomes with its neighbors: (i) the Saharan desert biomes with Libya, Sudan and Niger; (ii) the Sahelian biomes with Sudan, Niger and Nigeria; (iii) the dry savannahs with Sudan, Central African Republic, Cameroon and Nigeria; (iv) the humid savannahs with Central African Republic and Cameroon.

1.3.1 *Temperature*

10. According to a recent GIZ report, and in response to increasing greenhouse gas (GHG) concentrations, air temperature over Chad is projected to rise by 2.1 to 4.3 °C[7] (very likely range) by 2080 relative to the year 1876, depending on the future GHG emissions scenario (Figure 2). Compared to pre-industrial levels, median climate model temperature increases over Chad amount to approximately 2.1 °C in 2030 and 2.5 °C in both 2050 and 2080 under the low emissions scenario RCP2.6. Under the medium / high emissions scenario RCP6.0, median climate model temperature increases amount to 2.1 °C in 2030, 2.6 °C in 2050 and 3.5 °C in 2080.
11. In line with rising mean annual temperatures, the annual number of very hot days (days with daily maximum temperature above 35 °C) is projected to rise with high certainty all over Chad (Figure 3). Under the medium / high emissions scenario RCP6.0, the multi-model median, averaged over the whole country, projects 17 more very hot days per year in 2030 than in 2000,31 more in 2050 and 49 more in 2080. In some parts, especially in central Chad, this amounts to more than 300 days per year by 2080.

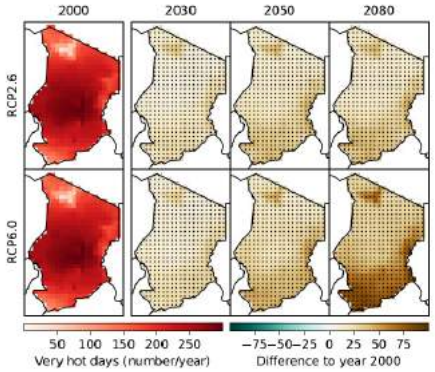

Figure 3: Projections of the annual number of very hot days (daily maximum temperature above 35 °C) for Chad for different GHG emissions scenarios

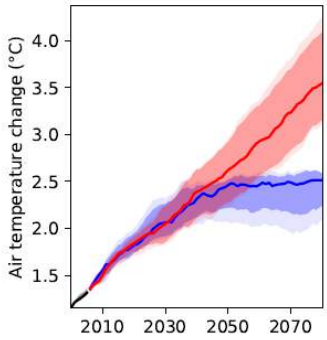

Figure 4: Air temperature projections for Chad

1.3.2 *Water resources*

12. Overall, Chad has considerable renewable water resources in relation to its needs. However, these resources are not distributed throughout the country and are highly variable and fragile.

Rainfall

13. Chad's rainfall varies according to the agro-ecological zones. Thus, it is less than or equal to 100 mm/year in the Saharan or desert zone, from 200 to 600 mm/year in the Sahelian zone, and from 600 to 1,200 mm/year in the Sudanian zone. Precipitation[8] is the source of running or stagnant surface water. The distribution of rainfall in time and space over the southern half of Chad is linked to the migrations of the Inter-Tropical Front (ITF) or Inter-Tropical Convergence Zone (ITCZ). The rains occur south of this front, which passes through N'Djamena around mid-May and descends towards the end of September. In the south of the country, the rainy season starts earlier and ends later, by about a month.

Surface water

14. In terms of surface water, Chad's major source is Lake Chad, which is located on the western border and which supports around 50 million people in the entire basin including neighbouring Cameroon, Niger and Nigeria. Lake Chad used to rank as one of the largest lakes in Africa, yet due to climate impacts and unsustainable water management, the lake surface has shrunk from approximately 25 000 km^2 in the 1960s to a minimum of 1 800 km^2 in 2010.
15. Chad water surface[9] include also the Chari (1200 km long) and the Logone (1000 km long) basins, the only perennial rivers, feeding Lake Chad, the Mayo-Kebbi (tributary of the Benue in Nigeria, itself a major tributary of the Niger), Salamat and Batha (a temporary river that empties into Lake Fitri) basins The Chari and Logone rivers originate in the Central African Republic (CAR). These hydrosystems temporarily feed floodplains, due to flooding and low relief in the southern part of the country, whose current area, once estimated at 95,000 km^2, is poorly known due to lack of recent

[7] Climate Risk Profile of Chad, the Inter-Sectoral Impact Model Intercomparison Project (ISIMIP), GIZ 2020
[8] Chad Water and Sanitation Master Plan 2003-2020.
[9] World Bank (2019), Chad Water and sanitation sector note

hydrological data. The surface waters also include 5 lakes, the most important of which, spatially and ecologically, is Lake Chad and Lake Fitri.

16. Similarly, Lakes of Ounianga, which constitutes a particular ecosystem, are a series of lakes in the Sahara Desert, in North-Eastern Chad, occupying a basin in the mountains of West Tibesti and Ennedi East. It was added as a UNESCO World Heritage site in 2012. According to the UNESCO description[10], the lakes are in a hot and hyperarid desert that features a rainfall of less than 2 millimetres (0.1 in) a year. The lakes exhibit a variety of sizes, depths, chemical compositions and colorations.There is a total of 18 lakes.
17. In addition to these large areas, there are temporary drainage basins and smaller bodies of water, some of which are quite numerous and locally important for the populations: The Wadis of Kanem and Ouaddaï, natural and artificial ponds, a few artificial reservoirs, the oases and lakes of Ennedi, Borkou and Tibesti. In addition, there are other basins that are rather dead, since their water courses only flow during exceptional rains, the most important being the Bahr el Ghezal.

Groundwater

18. Groundwater resources are abundant and present in almost all the territory, but their renewal and exploitability is very variable. Three quarters of the country's surface area is made up of sedimentary formations, which are the site of continuous aquifers in the form of open or deep aquifers, distributed in the three geo-climatic zones, but mainly found in the north, west and south of Chad. The rest of the country is constituted of crystalline basement formations, which can be the site of discontinuous aquifers in the alterations.
19. Although considerable water reserves exist in the continuous aquifers of the Saharan zone, these are fossilized and susceptible only to "mining" exploitation. Renewable resources are mostly found in the Sudanian zone. Groundwater is generally poorly mineralized, with a few exceptions: excessive levels of sulfates, chlorides and magnesium from evaporite layers in some aquifers in the Sahelian zone, and ferruginous water in some aquifers in the Sudanian zone.

1.4 Agriculture and Food Security

20. The agricultural sector plays a major role in the national economy and remains the driving force behind the country's development, despite Chad's accession to the ranks of oil producing and exporting countries in 2003. The primary contribution of Chadian agriculture to the economy is its large share in the formation of GDP, of which 20% comes from food production and 3% from cash crops. It is also a major provider of employment, employing 2/3 of the country's active population, more than half of whom are women. The second fundamental contribution of agriculture is the production of food, which constitutes an immediate response to the issues of food insecurity and poverty, which are particularly important due to the recurrent food shortages that Chad experiences. The third contribution of agriculture to overall growth is the supply of raw materials to the country's agri-food to the country's agribusiness industries. Most of the production comes from small family farms of 2 to 5 ha for rainfed crops, and 0.1 to 1 ha for market gardening. Significant efforts have been made in recent years, with the development of both public and private hydro-agricultural facilities and the use of improved seeds, fertilizers and the development of mechanization. The main food crops are millet, sorghum, béré-béré, maize, rice and market gardening. Cash crops are cotton, sugarcane, peanuts and sesame.
21. Women are the main labor force in the agricultural sector, in both the rainfed and irrigated sub-sectors although there are no official statistics. They are the main bread winners in the household. However, women have been caught in complex web of vulnerabilities associated with the impacts of conflict, violence, climate change and environmental degradation. As bread winners, women had been particularly impacted by Covid-19 through the closure of markets and the curtailing of economic opportunities related to that.
22. Chad has one of the highest levels of hunger in the world - 66.2 percent of its population of 15.5 million live in severe poverty. It is surrounded by countries at war, and conflict and the climate crisis exacerbate hunger and poverty. Around 40 percent of children aged under five suffer stunting, with low height for their age caused by chronic malnutrition. The presence of hundreds of thousands of refugees who have fled conflict in neighbouring countries has put additional pressure on Chad's already limited resources. Displaced people, and other poor communities, in the Lake Chad Basin, the east and south of the country are dependent on humanitarian assistance for survival. According to the 2019 Humanitarian Response Plan, 4.3 million people need humanitarian assistance, of whom only 2 million are targeted with adequate support[11].
23. Most livestock in the Sahel region is raised according to a transhumant production system, characterized by cyclical migrations that coincide with the wet and dry seasons. In chad, herds travel north during the rainy season to take advantage of temporary pasture that appears when rain falls on land that is arid for most of the year. At the end of the rainy season, herds return south, as temporary pasture is exhausted, to graze on lands that are also occupied by sedentary, crop-producing farmers. Historically, the relationship between transhumant; herders and sedentary farmers has been largely symbiotic. Since herds typically returned after farmers had taken in their harvests, farmers tended to welcome livestock into their fields to graze on the remaining vegetable matter and, in return, fertilize the land.

[10] UNESCO, Lakes of Ounianga, CHAD 2015, WHC-15/39.COM/7B

[11] WFP (2020) Chad Country Brief. https://www.wfp.org/countries/chad

Pastoralists often transported the harvests produced by farmers as they migrated with their cattle, in return for a portion of the harvest, a practice known as “chele”. Herders traded milk and meat products in return for cereals, fruit and vegetables from farmers. When conflict did break out between the two groups, it was normally managed by traditional, local conflict resolution mechanisms.

1.5 Population and indigenous people

1.5.1 ***Population***

24. According to the second General Census of Population and Housing (RGHP2, in 2009, 11.1 million inhabitants, density 8.6 inhabitants per km2), Chad's population will have reached 16,244,513 by 2020[12], including a significant proportion of refugees. Its average annual growth rate is 3.3%, average mortality is 1.4% and infant mortality is 8.7%. It is predominantly rural (76.7%), young (the average age is 17 years and life expectancy are 52.6 years for men and 55.4 years for women). Its average density was 8.6 inhabitants/Km^2 in 2009 and would be around 13.1 inhabitants/Km^2 in 2021.
25. Spatial distribution is very uneven: 0.1 inhabitants/km^2 in the north, 52.4 inhabitants/km^2 in the south, with the desert sporadically occupied by the nomads of the Tedas and Dazas who represent only 3.4 percent of the total population, the north sparsely occupied by the well-dispersed Arabs and Islamized (Kotokos, Ouaddaians, and Kanembous), and the fertile south almost overpopulated, occupied by the Sudanese (Saras, Massas, Mundangs, and Toupours). Chad has a gender[13] inequality index of 0.701, which ranks it 160th out of 162 countries in 2018.
26. Violence in the Central African Republic, Nigeria, South Sudan and Sudan continues to push people across the border into Chad, exacerbating already protracted refugee crises in the country’s east, south and lake regions. As of 31 December 2021, Chad had 555,787 refugees and asylum seekers in its territory, including 374,216 Sudanese from Darfur, 121,511 Central Africans primarily in the south, 35,878 Cameroonians and 19,321 Nigerians in the Lake Chad area, 254 Congolese, and over 4,607 refugees and asylum seekers whose origins are not specified. Between December 2019 and January 2020, approximately 16,000 new Sudanese refugees crossed the border into eastern Chad, fleeing interethnic violence.
27. The majority of refugees live in camps; however, approximately 30 percent of Nigerian and Central African refugees are settled in host villages. In some regions, particularly in the east, the majority of refugees leave the camps before the start of the rainy season for “opportunity villages”. In the Lake Chad area, the security situation limits refugees’ and host communities’ access to land and fishing areas. In the Lake Chad region, climate change and conflict dynamics create a loop in which the impacts of climate change create additional pressures, while conflict undermines the communities’ ability to cope. The people of Lake Chad are trapped in conflict. Violent conflicts, poor governance, endemic corruption, environmental mismanagement and poverty have ruined the lives of local people. Climate change exacerbates these difficulties.
28. More generally, the socio-economic crises that have occurred in Chad in recent years are putting pressure on protection efforts and the ability of authorities, communities and families to protect those most at risk. This concerns both Chadian populations and refugees and particularly affects children and people with special needs, particularly women and girls. In addition, refugees and other displaced persons often face increased risk due to their displacement status. Protection challenges and solutions in Chad can only be properly addressed through a combination of concerted and coordinated humanitarian, resilience and development actions. The security implications have also disrupted traditional cross-border transhumance and trade, with consequences for the national and local economy. Whether the people trapped in conflict can escape will depend on a nuanced understanding of the interaction between climate change and conflict in this specific context.

1.5.2 ***Indigenous people***

29. Two population groups are considered as Indigenous to Chad: the Mbororo sub-group of the Fulani people (called also the Peul M’Bororo) and the Toubou[14]. The Mbororo Fulani live primarily from pastoralism and subsistence farming. Clustered in the dry center and tropical south where there is pasture for their livestock, it is estimated that they make up some 10% of the Chadian population. Many of the Fulani have emigrated to neighbouring Cameroon, the Central African Republic or Niger. They can be recognised by their way of life, culture, language, and by the discrimination, they suffer from. The Fulani are often poor, the majority of them are illiterate and they have no political representation at the national level.
30. The Toubous are considered one of the oldest groups and are known for their capacity for adaptation and survival in the particularly arid environment of the Tibesti mountains. They rear camels and cattle and live largely in northern Chad, with the exception of small communities settled in Niger, Libya and Egypt.

12 INSEED-TCHAD - POPULATION, Total population projection by year of projection by gender (2009 -2050), Medium assumption.
13 FAO et CEEAC. 2021. National Gender Profile of Agriculture and Rural Development Sectors - Chad. N’Djamena. https://doi.org/10.4060/cb3046fr
14 https ://www.iwgia.org/en/chad/3498-iw2019-chad.html.

31. These indigenous peoples face difficulties in accessing land and natural resources such as water and grazing land. Climate change exacerbates this situation by accentuating these difficulties. This disrupts the transhumance corridors, increasing the vulnerability of these nomadic populations. Indigenous peoples contribute to the preservation of the Sahel's fragile ecosystems and their traditional knowledge deserves to be used, as it provides a valuable opportunity to complement the climate science base and identify other sustainable adaptation options. The Government has committed to involving these populations in national adaptation efforts and facilitating their own adaptation, including by appointing Hindou Oumarou, the President of the Association of Peul Women and Indigenous Peoples and a human rights and climate activist, as the Goodwill Ambassador to the Presidency of the Republic.

1.6 Biodiversity

32. Chad has 18 protected areas: three (3) National Parks, seven (7) wildlife reserves, one (1) biosphere reserve, eight (8) hunting domains, and one (1) pilot community hunting domain. Ramsar sites in Chad refer to the six sites designated as Ramsar Wetlands of International Importance in Chad. They cover an area of 124,050.68 square kilometres (47,896.24 sq mi). They include Lac Fitri, Chadian part of the Lake Chad, Massenya Plain, Floodplains of the Bahr Aouk & Salamat, and the Binder-Léré fauna reserve.
33. In terms of plant diversity, Chad is home to a rich and very diverse flora. According to the national strategy on biodiversity in Chad[15], it is estimated that there are about 4,318 species of higher plants (wild and domestic), including 71 endemic species (including *Ficus carica*, *Ficus salicifolia*, *Rauwolfia sp*, *Adina microendemic* (including *Ficus carica, Ficus salicifolia, Rauwolfia sp, Adina microcephala, Clematis tibestica novsp, Celsia tibestica novsp, Artemisia tilhona novps*, endemic to Tibesti, ...) and 11 endangered species (including *Anogeissus leiocarpus, Pteropcarpus enrinaceus, Vitex doniana ,Detarium microcarpum, Prosopis africana*....) This list is far from being exhaustive, because there was never been a complete inventory made on the whole territory. Nevertheless, the Laboratory of Veterinary and Zootechnical Research of Farcha (LVRZ) has a herbarium of 8,000 specimens and a reference herbarium with more than 2,500 specimens at the level of the "Projet suivi écologique et conservation du Parc National de Zakouma", which is recognized as a national site with a unique richness in francophone Africa. The park's flora includes more than 700 plant species. No reliable information is currently available for the lower plants, notably the group of fungi, algae and lichens.
34. Chad's wildlife diversity includes 722 species of animals (wild and domestic), not including the group of insects that are found in the country and which seems to be richer in specific diversity. The best-known fauna is composed of mammals, birds, reptiles and fish. We currently know 131 species of large mammals, 532 species of birds, of which 354 are resident 117 palearctic migrants and 260 Afro-tropical migrants, and 177 species of fish. Among these species, 15 mammal species, 4 bird species as well as crocodiles (*Crocodilus niloticus*) and (*Varanus niloticus*), the Sitatunga (*Limnotragus spekei*), the manatee (*Trichechys senegalensis*) and the white-cheeked otter (*Aonyx capensis*) are fully protected.

1.7 Environmental threats and challenges

35. The factors degrading Chad's environment include the regression of the vegetation cover, the progressive advance of the desert, the decrease in biodiversity, the degradation of arable agricultural land, hydro-morphological alterations, the silting up of hydro-systems, and the increased fragility of the populations. Degraded areas in Chad have been estimated at 428,000 km², or 33.43% of the total area[16]. The main explanatory factors are: overgrazing, wind erosion, fuelwood and timber and mining activities.
36. The exponential increase in livestock numbers in recent years and changes in transhumance routes are also contributing to the recomposition of the rural space. The pressure on natural resources has also contributed to the degradation of historical relations between pastoral and agricultural societies. The reduction of the surface area of Lake Chad from 25,000 km^2 to 2,500 km^2 between 1963 and 2008 has had negative effects on the quality of life of communities, biodiversity and the risks of migration and conflict.

1.8 Climate trends

1.8.1 ***Past climate***

37. The IPCC Sixth Assessment Report (2021) indicates that the increase in extreme weather and climate events has resulted in irreversible impacts, with natural and human systems being pushed beyond their capacity to adapt. The extent and magnitude of climate change impacts are greater than those estimated in previous assessments. Climate change has led to widespread deterioration in ecosystem structure and function, resilience and natural adaptive capacity, and altered seasonal patterns, with adverse socio-economic consequences. Climate change is therefore among the most worrying and urgent challenges facing humanity in the 21st century.
38. As a least developed country, Chad is not spared the consequences of climate change, which represents an additional constraint in its efforts to fight poverty and improve the living conditions of its population in general. Indeed, climate

[15] National Strategy on biodiversity in Chad, 2016
[16] PAN/LCD (2003)

change, particularly global warming and the increased frequency of extreme weather and climate events, pose risks to all of Chad's ecosystems and human systems. As a Sahelo-Saharan country (90%), Chad's vulnerability is accentuated by its heavy dependence on rain-fed agriculture and its limited and undiversified local resources and economies.

39. Chad's climate risk profile[17] indicates that the rainy season lasts two months in the north and more than six months in the extreme south of the country. Throughout the country, average minimum and maximum temperatures range from 19 to 21°C and 34 to +37°C respectively. Annual minimum temperatures in Chad have increased by 0.5 to 1.7°C depending on the station since 1950, while annual maximum temperatures have increased by 1.34°C over the same period. The Chad NDC[18] indicates that the inter-annual evolution of the temperature index from 1950 to 2019 shows a continuous increase in temperature since the early 1980s until today. Globally, the 1990s and 2000s were the warmest years since the beginning of weather records in Chad. Maximum temperatures have increased by an average of 1.1°C across the country. The Third National Communication (TNC) indicates an average annual temperature increase of 0.8ºC in the south, 1.2ºC in the center and 1.3ºC in the north.

40. Precipitation is highly variable from year to year and from decade to decade. Meteorological observations in the Sudanian part indicate a decrease in rainfall trends during the rainy season (May-October) over the period 1951-2000. In the Sahelian zone, there has been a recovery in rainfall since the 1990s, with above-average rainfall in several years. The evolution of the national rainfall index shows strong variability from 1965 onwards, with a downward trend, with repercussions on natural and human systems. The length of the agricultural season is also subject to significant inter-annual variability, with a marked trend towards shorter seasons. Another trend is the increased frequency of prolonged dry periods during the rainy season. According to the Chad TNC[19], when considering the average climate sensitivity, it is expected that in the south, central-west and central-east, rainfall will be close to that currently observed, given that the increase in rainfall indicated by most models is only around 11%. In the north and northeast, up to 100% excess rainfall, but unfortunately this will not bring a very significant change in these regions where sometimes no rainfall is recorded throughout the year. These conditions will further affect timber resources, water resources and rural development sectors.

41. Among the extreme weather phenomena, the National Strategy and Action Plan for Disaster Risk Management of Chad (SNPAGCC) adopted in 2020 highlights droughts and floods as the most important, and are often the cause of recurrent disasters with considerable impacts on the population and the environment. Borkou belongs to the hot and arid tropical climate of the Saharan type. It is crossed by the isohyet 100, on its southern limits. The average annual rainfall rarely reaches 100 mm. The rainy season is spread over three months, with August being the wettest month.

42. The figures below illustrate these variations in rainfall and temperature over Chad as presented in the risk profile document and in the Third National Communication (TNC).

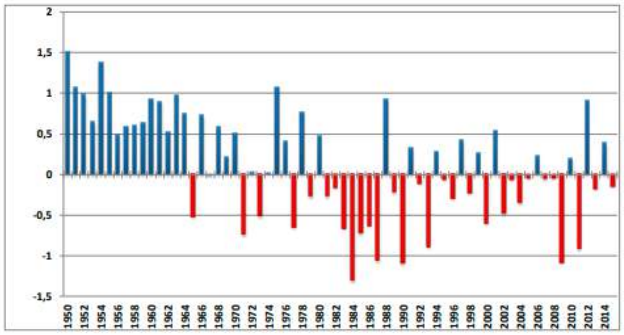

Figure 5: Interannual evolution from 1950 to 2014 of the national annual rainfall accumulation index.

1.9 Forecast

43. The climate risk profile[20] conducted in Chad projects that in response to rising greenhouse gas (GHG) concentrations, air temperature in Chad is projected to increase by 2.1°C to 4.3°C by 2080 relative to the year 1876 under different GHG emission scenarios. Relative to pre-industrial levels, the median temperature increase from climate models in Chad reaches about 2.1°C in 2030 and 2.5°C in 2050 and 2080 under the RCP2.6 emissions reduction scenario. For the medium-to-high emissions scenario (RCP6.0), the median of climate model temperature increases is 2.1°C in 2030, 2.6°C in 2050, and 3.5°C in 2080.

44. Along with the increase in average annual temperatures, the number of very hot days per year (maximum temperature exceeding 35°C) is projected to increase with a high degree of certainty across the country. Under the RCP6.0 medium-

[17] chad-country-programme.2019
[18] National Determined Contribution of Chad, 2021
[19] Third National Communication, 2020
[20] GIZ, 2021, Climate Risk Profile, Chad. https://agrica.de/wp-content/uploads/2021/01/GIZ_Climate-risk-profile-Chad_EN_final.pdf

to-high emissions scenario, the median of the multi-model ensemble projects 17 more very hot days per year in 2030 than in 2000, 31 in 2050, and 49 in 2080. In some parts of the country, particularly in the center, this equates to more than 300 very hot days per year by 2080.

45. Compared to the year 2000, the median of the projections shows an increase in average annual precipitation of 32 mm under RCP2.6 and 50 mm under RCP6.0 by 2080. The number of days with heavy rainfall is also projected to increase. In Chad, some climate models project an increase in the number of heavy rainfall days from 7 per year in 2000 to 9 (RCP2.6) and 10 (RCP6.0) by 2080. Chad's hydrological projections predict a larger increase in potential evapotranspiration under RCP6.0 than under RCP2.6. Under RCP6.0, potential evapotranspiration would increase by 2.1% in 2030, 3.3% in 2050, and 5.7% in 2080 compared to 2000 levels. The figures below illustrate these different projections.

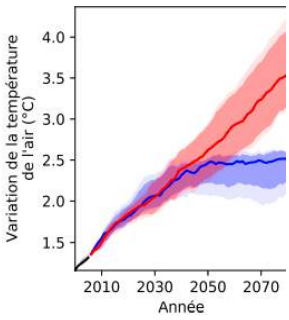

Figure 6: Air temperature projections in Chad for different GHG emission scenarios

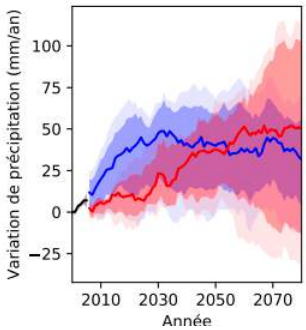

Figure 7: Average annual rainfall projections in Chad for different GHG emission scenarios, relative to the year 2000

1.10 Impacts of climate change

1.10.1 ***Impacts on water resources***

46. Climate changes are having an impact on surface water resources, particularly through the drastic reduction in the water level of Lake Chad between 1966 and 1975, by 95%. Still facing major threats, its variability under climate change remains very uncertain. The country's other lakes were also severely affected by the droughts of the 1970s and 1980s, with Lake Fitri drying up completely in 1973 and 1984 as a result of a significant reduction in inflows. The country's two major rivers, the Chari and the Logone, also experienced marked variability in their hydrological regimes (the lowest modulus of the Chari, at N'Djamena, was 235 m3/s, recorded in 1984 and a clear downward trend). Current projections of water availability in Chad are fraught with a high degree of uncertainty under either GHG emission scenario. Considering population growth per capita, water availabilitý in Chad is projected to decline by 75 percent by 2080 relative to the year 2000 under both scenarios.

1.10.2 ***Impacts on agriculture and livestock***

47. Agriculture contributes 51.9% of GDP, 20% of which comes from food production and 3% from cash crops. The impacts of climate change on agriculture include decreases in yields and production (-10 to -25%) of food crops (millet, sorghum, maize), a regression of vegetation cover, and an expansion of cultivated land at the expense of forest land that may lead to irreversible deforestation in the long term. It is also noted that the distribution area of crop pests (plagues, diseases, etc.) is extended, which can lead to a decrease in agricultural production. Impacts are observed on the modalities of livestock transhumance with possible reductions in forage biomass with prolonged stays in the south and an evolution towards agro-pastoral systems.

1.10.3 ***Impacts on fishing and aquaculture Sector***

48. The fisheries and aquaculture sector represent 3% of GDP. Fish farming is still underdeveloped with only 156 tons of production in 2016; this represents a very small percentage of the total national fish production. However, fisheries and aquaculture are impacted by climate change through the loss of about 210,000 ha of spawning areas in the floodplains and swamps of the Chadian part of Lake Chad. Most of the known fish species in Chad are now threatened with extinction. There is also a loss of oxygen saturation that eliminates many fish species, especially in swamp water, and poor reproduction of many migratory species, including an important commercial species, the Salanga (*Alestes baremoze*), which recovers during years of good river flooding.

1.10.4 ***Impacts on ecosystem services***

49. Recurrent droughts and extensive desertification have contributed to the loss of biodiversity in Chad. Other impacts of climate change observed are related to the limitation of vegetation to lowlands, outwash plains and groundwater outcropping areas in the north, increased dieback of woody plants and soil cracking in the Sahelian zone. The Sudanian zone is experiencing a relative reduction in large trees. The disappearance of certain animal and plant species

(especially aquatic species), the degradation of ecosystems and ecosystem services, especially wetlands and river systems, which are at risk of being transformed into other ecosystems, are also observed impacts. An increase in the risk of forest fires and bush fires has also been noted.

50. In a context of increasing desertification, insecurity and the loss of grazing land to expanding settlements, the southward migration of Chad's herders is causing tensions over land and water with local farmers. Chad is facing a resurgence of deadly communal conflicts between nomadic Arab herders and local farmers. Land use rights and access to water are the leading causes of these inter-communal clashes, especially during the arid and dry season, where water sources and pastures become very scarce. Farmers who do not allow cattle to graze in these areas are attacked by herders who destroy their fields and huts. Drought and desertification degrade pastures, drying up many natural water sources and forcing large numbers of herders to migrate southward in search of grassland and water for their herds. These conflicts quickly escalate and aggravate relations among communities and clans. To prevent the crisis from escalating, national authorities should strengthen security for herders and farmers, implement conflict resolution mechanisms, promote social cohesion and guarantee herders and breeders access to land as well as ensure food self-sufficiency. There is also concern regarding the non-respect of transhumance corridors, by both farmers and herders, and the non-application of texts governing transhumance corridors by local authorities.

1.10.5 ***Impacts on Human health and nutrition sector***

51. Climate change poses significant threats to the health and nutrition sector due to the increased frequency of heat waves, floods, droughts and storms. Increased morbidity and mortality resulting from vector-borne and non-vector-borne tropical diseases (malaria, cholera, bacillary dysentery, measles, etc.) and water-related diseases (diarrhea and cholera). There are already more than 2.5 million cases of malaria, including 8,693 deaths in 2018. A significant increase in the number of cases of meningitis that largely corresponds to the Sahel region and is the site of the majority of meningitis epidemics. The effects of climatic shocks associated with conflict and migration exacerbate malnutrition (which is already chronic in 14 regions of Chad with a prevalence ranging from 40.1 percent to 63.9 percent). Projections of the share of the population affected by at least one heat wave per year show a sharp increase for the RCP6.0 scenario, from 2.5% in 2000 to 14% in 2080. In addition, for the same scenario, and the same baseline, heat-related mortality is likely to increase threefold, to 12 deaths per year per 100,000 inhabitants.

1.10.6 ***Impacts on infrastructures***

52. Human settlements and economic production sites, particularly in densely populated urban areas (such as N'Djamena, Moundou, or Sarh) are impacted by climate change. Makeshift dwellings are often built in unstable geographical locations, such as riverbanks, where flooding can result in the destruction of homes, water contamination, injury or death. The heavy floods of 1996, 1999, 2004, 2005, 2006, 2007 and 2008, 2010, 2016 affected the precarious neighborhoods of urban centers, leaving thousands of people homeless and homes destroyed in N'Djaména.

1.10.7 ***Impacts on the oasis ecosystem***

53. Climate change is expected to have a significant influence on the ecology and distribution of tropical ecosystems, though the magnitude, rate and direction of these changes are uncertain[21]. With rising temperatures and increased frequency and intensity of droughts, wetlands and riverine systems are increasingly at risk of being converted to other ecosystems with plants being succeeded and animals losing habitats. Increased temperatures and droughts can also influence succession in forest systems while concurrently increasing the risk of invasive species, all of which affect ecosystems. With regards to tree cover. model projections vary depending on the scenario. Climat Model projection announce a variation for more or less of 2% in the tree cover in the south of the country by 2080. Although these results paint a rather positive picture for climate change impacts on tree cover, it is important to keep in mind that the model projections exclude any impacts on biodiversity loss from human activities such as land use, which have been responsible for significant losses of global biodiversity in the past, and are expected to remain its main driver in the future[22] .For example, population influxes in affected areas, need for pasture and agricultural land and logging have resulted in high rates of deforestation[23]: Chad has lost 1.54 million ha of forest cover in the period from 2001 to 2016, which is equivalent to a 25 % decrease[24].

1.11 Vulnerability assessment and adaptation measures

54. The vulnerability assessment conducted in 2020 through the process of developing Chad's Third Communication on Climate Change showed that agriculture, livestock, forestry, health and water resources sectors are all vulnerable to the adverse effects of climate change. Indeed, food security is far from assured in the future as there is a clear gap between the food needs of a rapidly growing population and likely agricultural production. By 2050, if nothing is done,

[21] T. M. Shanahan et al., "CO² and Fire Influence Tropical Ecosystem Stability in Response to Climate Change," Nat. Publ. Gr., no. July, pp. 1–8, 2016.

[22] IPBES, "Report of the Plenary of the Intergovernmental Science- Policy Platform on Biodiversity and Ecosystem Services on the Work of Its Seventh Session," n.p., 2019.

[23] FAO and UNHCR, "Rapid Woodfuel Assessment 2017 Baseline for the Area Around the City of Goré, Chad," Rome, Italy and Geneva, Switzerland, 2018.

[24] Global Forest Watch, "Chad." Online available: https://www.globalforestwatch.org

the number of malaria cases will increase by about 50% and that of meningitis and measles by 76.79% and 9.74% respectively.

55. For surface water resources, the impacts stem from projected changes in precipitation and land use. Changes in the volume, timing and quality of flow and recharge, and the characteristics of the aquifer system, are the determining factors in the impacts of climate change on groundwater resources. It is likely to observe on groundwater: a very significant decrease in the recharge of aquifers in large sedimentary basins and a decrease or increase in the contribution of groundwater to rivers depending on the increase or decrease in recharge.

56. Announced in its Third National Communication and confirmed in its first National Adaptation Plan and its updated Determined National Contribution, Chad has adopted a series of measures to address the immediate risks of climate change. Among these measures the national authorities intend to enhance the development of new techniques and less costly technologies for water and soil conservation, mobilization of runoff water and its use for irrigated and off-season crops, particularly market gardening, establish a balance between the availability of water resources and water needs for irrigation and consumption by the population and livestock; continuing to build hillside reservoirs and dams and promote and enhance mobilization of surface water for the increase of agricultural production and for the recharging of groundwater

57. On other hand and in relation with the agriculture and direct support to population, the government intends to further support for the development of small-scale livestock farming for women and young people, the promotion of the realization of large-scale hydro-agricultural facilities (dams, micro-dams, dykes, dikes, spreading sills). It will also strengthen the collection of agro-meteorological data throughout the country and to Intensify and diversify agricultural production systems while integrating agroforestry and to develop animal fattening and the promotion of the exploitation and development of non-timber forest products sectors.

58. To do this, it is necessary to provide decision-makers with the necessary tools and mechanisms to ensure the implementation and monitoring of the above-mentioned actions. For this purpose, Chad government will support for the implementation of local development plans, enhance the development and implementation of development and management plans for natural forests, community forests and will improve the effectiveness of mechanisms for anticipating and coordinating interventions in emergency situations.

59. This project, which focuses on building the resilience of oasis ecosystems to cope with drought, is part of the implementation of these priority adaptation measures as outlined in Chad's Third National Communication, NAP and updated NDC.

1.12 Specific information on the project area

1.12.1 ***Geographic, socio-economic and environmental characteristics of the oases of Borkou, Ennedi Ouest et Wadi-Fira***

60. The project will operate in three regions, namely: Borkou (Faya), West Ennedi and Wadi Fira as shown in the figure 8. The geographical, socio-economic and environmental characteristics of these three areas are as follows:

Borkou Province

61. The Borkou region is a basin that contains several oases in which the main agricultural activities (market gardening and livestock) are developed. Agriculture is the secondary activity practiced in the oases of the region through market gardening and arboriculture (especially dates) while livestock is the main activity. It is one of the 23 regions of Chad in accordance with Ordinance No. 0037/PR/2018 of August 07, 2018 on the creation of administrative units and autonomous communities. Borkou contains a population belonging to the Saharan ethnic-linguistic group. This ancient and well-hierarchical settlement is mainly made up of nomads who travel throughout the Sahara.

62. In the Borkou region, average annual temperatures in the area are around 29°C. Due to the short rainy season, annual fluctuations are not very pronounced. Low temperatures are observed in December, January and February; the average is 22°C but the minimum and maximum temperatures reach 9°C and 26°C respectively in January, with a fairly high thermal amplitude of around 17°C. The hottest periods are observed in May, June and July with an average of 35°C and minimum and maximum temperatures reaching 25°C and 43°C respectively, with fairly marked daily fluctuations: 18°C on average.

63. Daza is the main language of Borkou. The inhabitants are commonly called "Gorane" in Arabic. The region has 97,251 inhabitants with a density of 0.65 inhabitants/km² (RGPH2, 2009). This population is estimated at 138,103 in 2020[25]. The population is very young, with those under 15 years of age representing 46% of the total population. Adults or working people (15-59 years old), who are more numerous, represent 50% and older people (over 60 years old) 4%.

[25] Yearbook of Agricultural Statistics 2010-2020.

Life expectancy is the lowest in the country: 39.2 years on average, and the average age is 32 years. Population growth is also low: 2.10% per year, with a very high crude mortality rate: 22.80%.

64. The proportion of women of childbearing age is 46.09% and the fertility rate is 6.3 children per woman. 16% of the population attends school, below the percentage for the 6-14 age group (28%)[26]. The region has little or no sanitation facilities: 95% of the population disposes of waste in an uncontrolled manner (in the streets, around concessions, or elsewhere in the countryside). The only important market is that of Faya (capital of the region), with important trade flows that make the locality the hub of the Chadian Sahara. Dates and natron leave this market for other centers in the area, notably Bardaï and Fada, but also for the east (Abeche) and the south of the country via N'Djamena.

65. Borkou is almost devoid of vegetation. The few vegetation cover present in the region are summarized in: - the shrubby and herbaceous steppe with Acacia and Aristida which is located mainly in the south-eastern part over a fairly small area (537826 ha); -the very sparse vegetation characteristic of the Sahara is arranged in pockets, probably around the oases and on a very small area (723,051 ha). The Borkou region is the driest in the country. Apart from the Wadis and oases, the only wadis present have their source in the Tibesti watershed and in the Mourtcha watershed in the western Ennedi. All these wadis dry up very quickly.

66. More long-standing economic pursuits remain equally important, however, and supply regional and trans-border trade: camel husbandry, based on pastures to the south of Faya, date cultivation and salt mining. The date-palm grove in Faya in particular is continuously expanding, and new plantations indicate future directions of growth. Dates are produced for local consumption, but also for direct exchange against cereals imported, mostly on camelback, from central Chad. Some are exported to the Chadian capital by lorry and sold for cash. The majority of people in Faya speak Dazaga, one of the two mutually comprehensible dialects that outsiders refer to as ‘Tubu’. However, the town has also attracted an immigrant population, mostly from eastern Chad, who work as petty traders, salt miners, builders and agricultural labourers

Ennedi West Province

67. The region is part of the Mourdi depression and contains lakes (Ounianga), which are a significant tourist attraction in a Saharan context. West Ennedi belongs to the Saharan ethnic-linguistic group. It was part of the organized northern states with mostly nomadic populations. The inhabitants are mainly Daza and, to a lesser extent, Teda. The main languages spoken are Daza and Teda, known under the generic name of Goran but with many variations.

68. With a population of 59,744 inhabitants, West Ennedi is one of the least populated regions in northern Chad with a density of 0.48 inhabitants/km² (RGPH2, 2009). A large part of the population is young: 46% of the population is under 15 years old. Life expectancy is 55.4 years on average. The crude mortality rate is 12.40%. The proportion of women of childbearing age is the highest in the country: 90.4% and the fertility rate is 6.1 children per woman. In Ennedi West, the school enrolment rate is low (9%). This compares with the population aged 6-15 years (29%). The literacy rate is 8% and 69% of the population can neither read nor write. The region has an agropastoral vocation. 57% of the inhabitants work in agriculture. Agriculture is the main activity practiced in the oases through market gardening, which is the most developed, and to a lesser extent, arboriculture, especially the date palm.

69. Livestock breeding is a significant activity, in a transhumant mode in which pastoralists travel hundreds of kilometers in search of pastures in the southeast of the region. This nomadic livestock industry is mainly composed of camels and small ruminants. The region has several markets, the most important of which are Fada, where cereal products essential to the population's diet converge, and Ounianga, from where salt leaves for Libya and the south of the country. Despite its location in the Sahara, the region benefits from the rise of the isohyet 100, which allows to observe a vegetation of shrub and herbaceous steppe type quite important: - The shrub and herbaceous steppe with acacias and Aristida covers the entire southern part of the region on an area of 2321877 ha. The very sparse vegetation characteristic of the Sahara covers Fada and its surroundings, extending to the eastern side but also around the Ounianga lakes and oases over 1639169 ha. Unlike Borkou, the Western Ennedi contains oases and wadis that drain the south, mainly in the Mortcha watershed.

70. In the Ennedi West region, the average annual temperature in the region is around 29°C. Due to the short rainy season, annual fluctuations are not very marked. Low temperatures are observed from December to February. The average is 22°C, but the minimum and maximum temperatures reach 9°C and 26°C respectively in January, with a temperature range of about 17°C.High temperatures are observed in May, June and July, with an average of 35°C and minimum and maximum temperatures reaching 25°C and 43°C respectively, with fairly marked daily fluctuations: 18°C on average.

71. Given its great length from north to south (about 500 km), two variants can be distinguished in the West Ennedi region: in the north, the Saharan domain proper (above the 100 mm isohyet), and in the south, the Saharo-Sahelian zone (between the 100 and 200 mm isohyets). Average annual rainfall rarely reaches 100 mm in its northern part, unlike the south.

[26] Regional Water and Sanitation Investment Plan 2015 – 2030.

Wadi-Fira Province

72. The populations of Wadi-Fira have diverse origins but many specialists agree on an oriental origin. The people of the region are descendants of migrants from the east from Saudi Arabia. Five ethnic groups can be distinguished: the Mimi in the Biltine, the Tama of Guéréda in the Dar Tama department, the Zaghawa of Iriba in the Kobé department, groups of Arabs and Goranes in the western part (Arada) and the Maba on the borders of the Ouaddaï region. Compared to the northern regions, Wadi-Fira is fairly populated, ranking 13th in the country in 2009. The region has a population of 4,949,333 and a density of 33.60 inhabitants/km² (RGPH2, 2009).
73. In Wadi-Fira, the average temperature is around 26°C with extremes between 22 and 31°C. The hottest months are in April, May and June when temperatures reach 30°C, the coolest months are in December, January and February, when temperatures are around 22°C. Temperature fluctuations are less pronounced during the rainy season, especially in July and August, when temperatures drop to 11°C. On the other hand, during the cooler months, temperature ranges reach 19°C. Minimum temperatures are around 13°C in December and January and maximum temperatures reach 40°C in April and May.
74. Located on the margin of the Saharan zone, Wadi-Fira is crossed by the 300 and 200 mm isohyets. It belongs to the Sahelian climate with Saharan dominance. Rainfall is rare in the northern part, influenced by the Saharan domain, as evidenced by the Arada rainfall station where the annual cumulative rainfall does not reach 200 mm per year. On the other hand, in the eastern and south-eastern part, plateaus and wadis create a microclimate that causes rainfall that can exceed 400 mm per year, as evidenced by the stations of Guéréda and Biltine. The rainy season lasts 3 to 4 months depending on the environment. Inter-annual fluctuations are quite marked, with the maximum rainfall reaching 470 mm in 1994 and the minimum being 120 mm in 1996. August is the wettest month and concentrates most of the annual rainfall, 130 mm in 2008 for an annual total of 200 mm on the station of Arada. Wadi-Fira has a fairly mild microclimate, because of the many wadis, especially on the eastern side of the region.
75. This population is estimated at 754,740 inhabitants. It is very young (53% of the inhabitants are under 15 years old). Adults or working people (15-59 years old) represent 41% and the elderly (over 60 years old) 6%. The population growth is sustained (6.5% per year). The proportion of women of childbearing age is 42.86%; the fertility rate is 7.2 children per woman. 11% of the inhabitants attend school, well below the 6-14 age group (31%). 10% of the population can read and write. The region has significant potential for agriculture, which is the second main activity. Vast areas are developed around wadis and ponds as well as on the sides of the mountains
76. Cereal production is quite significant and is growing, consisting mainly of small millet (penicillium) but also red sorghum. However, the cultivation of oilseeds, although less important than that of cereals, shows a very high growth rate. The existence of wetlands also makes it possible to grow tomatoes, okra, peppers and watermelons, which are sold in the region's urban centers. Animal husbandry remains the main activity of the region. There are several types, ranging from sedentary to transhumant through an intermediate type: semi-sedentary (transhumance to neighbouring regions). The presence of wadis and ponds is quite conducive to the development of livestock in the region. The most present species are goats, sheep and cattle
77. Donkeys outnumber camels due to the sedentary and semi-sedentary type of breeding. The density of livestock in the region is 9.06 LU/km². The region is dainty by many wadis that originate on the highlands in the east. Most of them flow westward and seep into the flat, sandier areas. Some of them are oriented towards the south and feed the Batha river. Finally, in the extreme east, the wadis are oriented towards Sudan. The higher altitude and milder climate make sedentary or semi-sedentary livestock farming and market gardening favourable in these numerous wadis.

1.13 Project zone identification, description & target population

78. The project activities will be developed in priority in the areas selected by the executing entity in close consultation with the communities as the most vulnerable in the country, based on the following criteria: (i) high variability of rainfall, (ii) high frequency of drought episodes, (iii) significant environmental degradation, (iv) degree of threat of the oases by sand dunes movement (v) food insecurity, (vi) high dependence on agriculture and livestock, (vii) low level of income of the population, (vii) Chad's priorities in strategic development documents (NAPA, NAP, NDP...). The consultative selection process took place from September 3 to 17, 2022 where different oases were visited across 8 regions.
79. The process resulted on selecting Five (05) communes namely Biltine, Arada, Kalait, Fada and Faya Largeau as presented in the following table:

Province	Department	Communes
Borkou	Borkou	Faya
Ennedi West	Fada	Fada
		Largeau
	Mourtcha	Kalaït
Wadi-Fira	Biltine	Biltine
	Al Biher	Arada

80. Most of these communes are located in the northern region of Chad, as shown in the map (figure 9), where we find a number of oases around which socio-economic activities related to agriculture, livestock, pastoralism and market gardening are practiced. These oases suffer from the negative impacts of drought, causing water shortages, SDM and soil fertility problems. The most vulnerable among the communities living in these areas are women who practice market gardening as main activity, in addition to other income-generating activities. Direct project beneficiaries will be selected during the development of the full proposal among the vulnerable communities of the five (05) selected communes and whose activities are strongly exposed to the risk of drought.

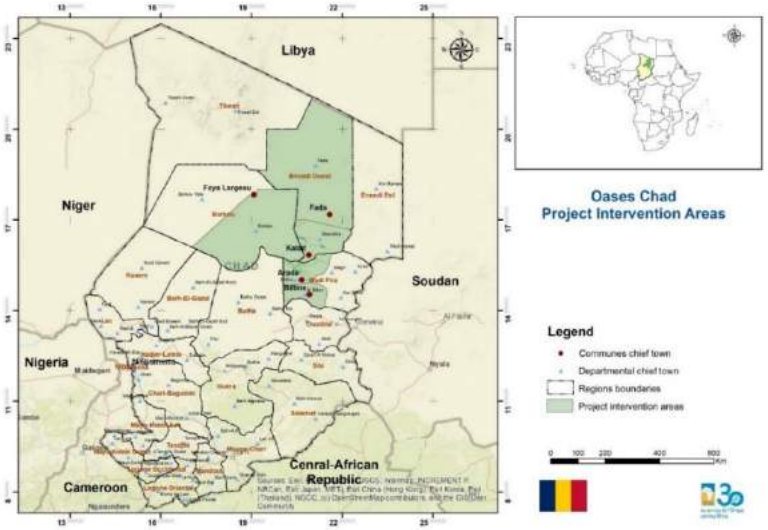

Figure 8 Oases Chad project intervention areas map

81. A field mission was organized as part of the development of this project and allowed to have information and data characteristic of the oases in the various municipalities identified as follows:

82. The first commune is **BIILTINE**. One of the 6 departments composing the region of Wadi Fira, the commune is populated mainly by the mimi community. Situated in the northeast of the province, there are about 320 oases called forest gallery of which 90 have the potentiality of river or pond. In consultation with the partner, only 15 oases and wadis have been selected as target areas for the project's intervention. these are the following oases and wadi: Dankou, Kondobor, Anaba, Yawada, Touna, Ourgis,Bobok,Kandrok,Kodrok,Bargad,Kimzim,AmGafal,Lobodo,Blou and Touna. The two Wadis visited in this commune are Wadis Taouss and Wadis Langar. The choice of these areas was made taking into consideration the ease of access to the sites as well as the similarities with the identified project areas.

83. The first site was Wadis Taouss. It has a length of 14 km and houses grouped in 3 or 4 houses next to each other. Each group is composed of 15 up to 25 members each respectively. Each group has 10 hectares but only exploits 5 hectares per year. This Wadis does not hold water for long (2 to 3 months) and is exploited by 9 villages that dig traditional wells by hand for crop use. The second site is Wadis Langar. It is 4 km long and about 1.5 km wide. It presents the same difficulties in terms of water retention, but it is exploited by 11 villages. The commune of Biltine has about 45 groups and associations, 60% of which are women and 25% are young people who work in the oases. The mission met with the union of market gardeners' groups called "Marjane", which includes 7 groups in which the representation of women is 28.3%. The difficulties identified concern mainly the ravages of crop pests, the conflict between farmers and breeders, lack of water, the problem of a health center, the problem of storing their products, the lack of fencing for the gardens, the high school dropout, etc. It is noted that there is an absence of trees that could serve as living hedges for protection against the sand.

84. The second commune is **ARADA**. This commune has about 35 identified Wadis of which 3 have been visited. The choice of these areas was made taking into consideration the ease of access to the sites as well as the similarities with the identified project areas. The first site is Rahad Alfé. It is 18 km long and 200 m wide Wadis. It is exploited by 12 groups. The second site is wadi Rahad Abhazer (Sahabit). It is about 3 km long and 400 m wide. It is exploited by 8 groups and associations of women widows and youth group. The third on is Wadis of the airport. It is 6 km long and about 1 km wide and it is exploited by 13 groups. In the commune of ARADA, 26 oases and wadis have been selected as target areas for the project's intervention. these are the following oases and wadi (Cheba bir, Kaira rahadel, Karay rahadel, Abouchabeuch Wadi, Oumchalouba, Aboudjibit bir, Zouma bir, Ataib mares, Ladoba, Koukou Wadi, Moufra Wadi, Amraduit, Marzoukhamer, Alrabsa,Arada , Ganatir hadjer, Remele Wadi, Rahatelou Wadi, Kabga, Ananimir bir, Maba Wadi, Sokara bir, Araouba Wadi).

85. The third commune is **KALAIT**. This commune has approximately 46 identified Wadis, which are home to 8 villages. There are 123 farmers organized into groups and associations, and each group has about 6 hectares. The latter have the capacity to exploit 54 hectares if water is available on a full-time basis. The mission visited two Wadis the first is 6

km long and 130 m wide. It has 14 women's and youth groups, each with an average of 15 people. The second Wadis is a market gardening site in the town of Kalait with a delimited area for market gardening. The fraction of women and youth in market gardening activities is about 90%. In the commune of KALAIT, 39 wadis have been selected as target areas for the project's intervention. These are the following oases and wadi : Merbe Wadi, Habachi Wadi, Abouadarchirak Wadi Arnap Wadi, Abouadarsafa Wadi, Bandar Wadi, Bartasigi Wadi, Ouhamide Wadi, Modounga Wadi, Haouach Wadi, Sabok Wadi, Ouloumanga Wadi, Baranga, Beherdiganga Wadi, Ahadianga Wadi, Chili Wadi, Djikdjik Wadi, Diona Wadi,Wadi Merbé, Wadi Am Hérizé, Wadi Habachi,Wadi Abou Adar Safa, Wadi Bobouch, Wadi Arnap, WadiKalait, Wadi Bandar, Wadi, Bartasigi, Wadi Dreidinga, Wadi Ou Hamidé, Wadi Abou Adar Chirak, Kohourkite , Arkoma , Bakaorsere ,Tiedogin ,Kahourkite ,Gara Wadi,Tohimbini , Direlibra , Direbate.

86. The fourth commune of **Fada.** with about 120 oases, this commune of which only 14 are operated by 6 villages. The mission visited 4 oases. The Micham oasis is enclosed between the chains of hills to the east of Archeï. It is 18 km long and 800 m high. The Wayi or Kachebi oasis which covers a belt around the village with an area of 7 200 000 m2 but only 1 800 000 are exploited. The water does not last very long in this oasis. Okou or Archeï oasis are is 3 km long and about 200 m wide while the Inou oasis has almost the same characteristic with an 8 km long and about 1 km wide between two hills. The fraction of women and young people involved in market gardening activities is about 70% in Fada. In the commune of FADA, 25 sites have been selected as target areas for the project's intervention. These are the following oases and wadi: Wadi Oforou, Wadi Morougeni, Wadi Orone, Oued Bechike, Oued Tarchia, Oued Bodeni, Oued Torbo, Oued Elibo, Oued Tourbatono, Koro, Chibere, Oued Archi, Kosomeba, Tourkou, Koro, Wadi Ezarti, Oued Beli Djoue, Oued Ohouka, Oued Bodeni, Oued Kontor, Korokou, Wadi Nohi, Hokoti, Ouedi ezakarti, Ouedi Nour, Gaora halagana.

87. The fifth commune is **FAYA**. It should be noted that the Borkou area has more than 1000 oases, but only 94 oases are identified as exploitable and exploited. In this region, hydro-agricultural facilities are lacking, with rudimentary water networks. The farmers use artesian wells for watering. The team visited four artesian well sites in the public garden of the Faya palm grove about 12 km away. There are more than 500 groups in the Borkou region, some of which have been set up as unions, with each union consisting of 10 to 15 groups and associations. In the commune of FAYA, only 3 sites have been selected as target areas for the project's intervention. The project will be implemented in Elleboye, Faya and Amoul.

2. Project Objectives

88. The overall objective of the project is to strengthen the resilience of vulnerable communities in Borkou, West Ennedi and Wadi-Fira by building adaptive capacity to recurrent drought risks and promoting the sustainable management of oases and associated ecosystems.

89. The specific objectives of the project are:

- Ensure the permanent monitoring of climate risks by producing data and environmental information on oasis ecosystems in the communes of Faya, Fada, Kalaït, Biltine and Arada;
- Contribute to the strengthening of the regulatory and institutional framework for the management of oasis ecosystems;
- Implement concrete adaptation actions to improve the resilience of the most vulnerable communities in the project area;
- Strengthen the institutional and technical capacities of the project stakeholders in terms of adaptation to climate change and sustainable management of oasis ecosystems.

3. Components and financing of the project

Project Components	Expected Outcomes	Expected Concrete Outputs	Amount (US$)	%
Component 1: Enhanced Sustainable water and land resources management in the oasis ecosystems.	Outcome 1.1: Water availability in the oasis is enhanced	Output 1.1.1: Water availability for the development of agro-pastoral activities in the intervention sites is promoted.	800,000	9
		Output 1.1.2: Access to potable water for target communities is enhanced.	800,000	9
	Outcome 1.2: Sustainable Land Management Practices are promoted	Output 1.2.1: A plan of action on the legal and institutional framework for the sustainable management of oasis ecosystems, is developed.	1,500,000	18
		Output 1.2.2 Climate resilient Agricultural practices are adopted.	1,750,000	21
Subtotal C1			4,850,000	57
Component 2: Implementation of concrete adaptation measures to improve the resilience of the local communities vulnerable.	Outcome 2.1: Climate resilient livelihood are strengthened.	Output 2.1.1: Livestock production practices are improved.	500,000	6
		Output 2.1.2: Oasis value chain is strengthened.	500,000	6
		Output 2.1.3: Community livelihoods resilience is enhanced through adoption of (IGAs).	1,500,000	18
Subtotal C2			2,400,000	30
Component 3: Capacity building of the different stakeholders, knowledge sharing and awareness raising of all stakeholders	Outcome 3.1: Capacity of stakeholders to adapt to CC risk in the oasis is enhanced.	Output 3.1.1: Reliable and updated data and information necessary for the efficient and sustainable management of oasis ecosystems in the project area, are available.	400,000	5
		Output 3.1.2: A plan of action on the legal and institutional framework for the sustainable management of oasis ecosystems, is developed	400,000	5
	Outcome 3.2 Enhanced awareness and ownership of adaptation and climate risk reduction processes of the targeted populations	Output 3.1.2: Knowledge and awareness on environmental issues in oasis are developed and disseminated.	300,000	4
Subtotal C3			1,100,000	14
Activities budget (A)			**8,450,000**	**100**
Project Execution cost (B) (9,4%)			794,000	
Total Project Cost (C) = A+B			9,244,000	
Project Cycle Management Fee charged by the Implementing Entity (8,2% C)			**756,000**	
Amount of Financing Requested			**10,000,000**	

4. Projected Calendar

Milestones	Expected Dates
Start of Project Implementation	January 2024
Mid-term Review (if planned)	February 2026
Project Closing	December 2027
Final Evaluation	June 2028

PART II PROJECT JUSTIFICATION

A. Description of the project components

90. Frequently ranked as one of the most vulnerable countries in the world to climate change, Chad has struggled for years with a range of environmental pressures that have threatened its population especially its nomadic populations and those who occupy the most vulnerable areas of the Chad such as the oases and more precisely in the north of the country where this project will be implemented.

91. Recurrent droughts and extensive desertification have contributed to the loss of biodiversity in Chad. 80 % of the population is engaged in smallholder farming and heavily relies on agriculture for food security and livelihoods. Therefore, concerns are rising about the effects of climate change including rising temperatures, reduced water availability and the occurrence of floods and other extreme weather events. Seasonal southerly migration by pastoralists and their cattle in the Sahel – traditionally in the dry season between October and May – has always caused friction with local sedentary populations reliant on the same pasture and wells used by herders to feed and water their livestock

92. However, in recent years the impact of climate change has changed patterns in place for many generations, causing new tensions. Over the course of just a decade, landlocked Chad's dry northern Saharan and central Sahelian zones have spread 150 kilometres south, shrinking fertile farming and grazing areas. Decreasing or more erratic rainfall has forced herders mostly Mbororo (Fulani, Peulh), Toubou to move south ever earlier in the year, with the result that at times their herds arrive before local farmers have had time to harvest their crops and spoil the yield. They also tend to stay for longer periods or even permanently, further upsetting the delicate balance between Chad's different ethnicities, lifestyles and livelihoods.

93. Thus, and to face all these serious dangers the project proposes an integrated approach that combines both the dimension of combating desertification, improving access to natural resources including water, ensuring food security for all while helping to mitigate inequalities and vulnerabilities for the poorest.

94. This project will build on the acknowledgements and advances made by national parties in terms of planning and strategy, such as the updated NDC or the national adaptation strategy, and will move to the concretization of these concrete adaptation actions with a focus on oases as an example of an endangered system. The project will also strengthen national planning capacities by providing access to quality information and support for broader, bottom-up consultation processes.

95. The main actions to be deployed in the sites will eventually lead to a significant reduction of the impacts related to major climate hazards in the chad (particularly the Water and food security), to the improvement of the livelihoods and living conditions of the communities as well as to revitalize the ecosystem. For a better efficiency/effectiveness, this project will be implemented following a participatory and inclusive community and inter-institutional **approach, which** will integrate the knowledge management and set forth the appropriate channels to enable an active participation of all key stakeholders, including the project's beneficiaries during the entire cycle of implementation. The project is thus organized around three components where the planned activities as well as the expected outputs and outcomes to achieve the project objectives are in line with the Adaptation Fund's strategic outcomes. Presented below are the details on the components, outcomes and activities.

Component 1: Enhance Sustainable water and land resources management in the oasis

96. Chad suffers from water scarcity as a result of the variability in the hydrological regimes of the rivers and rainfall in the region. The ecosystem of the target communities has not been spared from degradation, leading to an overall decline in local access to water, crop failures, livestock death, collapsed fisheries and wetlands services. The project in this component seeks to strengthen the sustainable management of the water and land resources to enhance the livelihoods and food security of the target areas, through outcome 1.1 on enhanced water availability and 1.2 on the promotion of Sustainable land management practices.

Outcome 1.1: Water availability in the oasis is enhanced.

97. Chad, is projected to have increased temperatures averaging 2–6°C or higher by the end of the century. This increases in temperatures will lead to an increase in water demand and consumption in the oasis from a growing population and for agricultural purposes. To guarantee the availability and access to water for both agropastoral activities and for domestic use the project will carry out activities listed under output 1.1.1 and .1.1.2 respectively.

Output 1.1.1: Water availability for the development of agropastoral activities in the intervention sites is promoted.

98. In the target areas Oasis agriculture, dominated by date-palms is not dependent on rainfall but rather on irrigation from groundwater where an aquifer fed from distant sources is exposed and with the challenge of climate change the farmers are not only not only facing the challenges of decreasing water availability but also increasing challenges of rapid population growth and decreasing availability of land. The project through this output will seek ways to improve the access to water for irrigation, improve livestock sector through sustainable provision of water for livestock herds, to sustain productivity and the livelihoods of the small-scale farmers in the target communities through better irrigation

water access, efficiency and conservation through the activities listed below. This output will also be an opportunity to introduce innovative solutions to mitigate this problem, the use of renewable energy and the development of innovative techniques in irrigation will both reduce the energy bill and make considerable savings compared to the amount of water needed for irrigation. This output will be will be implemented through:

- Activity 1.1.1.1: Assess the surface and ground water resources in the target area.
- Activity 1.1.1.2: Build/rehabilitate and equip solar powered water infrastructures for agricultural (irrigation and pastoral) and (water points / drinking troughs to transhumance).
- Activity 1.1.1.3: Promote and enhance the irrigation systems (drip irrigation system, etc.).
- Activity 1.1.1.4: Capacity build the farmers and pastoralists on the sustainable water resource use

Output 1.1.2: Access to potable water for target communities is enhanced.

99. According to recent figures, approximately 44[27] percent of the population in Chad lacks access to potable water, while in the targeted project areas the access rate to safe drinking water in Ennedi is projected to be at 57%, and in Wadi Fira at 46%[28]. The project will assess and share the most viable water solutions and develop model collection systems for water. This is expected to reduce the prevalence of water-borne diseases, reduce the burden of fetching water, which is the sole responsibility of women and young girls. Attention will be paid to sensitise the target communities around water demand, and water use through the activities listed below.

- Activity 1.1.2.1: Select the most viable water solution.
- Activity 1.1.2.2: Build/rehabilitate and equip water models for human consumption.
- Activity 1.1.2.3: Develop and implement a water resource management system in the target areas.

Outcome 1.2: Sustainable Land Management Practices are promoted

100. The target communities suffer from land degradation from overgrazing, deforestation, inappropriate farming practices, and the pressure of increased numbers of people and livestock. The project will enhance Sustainable land management practices, to help restore the ecosystem and ecosystem services such as regulating water cycles, sequestering carbon, and helping to preserve agrobiodiversity through the development of green belts for sand dune movement management and adaptation of climate resilient agricultural practices. In addition, local varieties of agricultural seeds are disappearing for this purpose the project plans to create a seed bank. Globally, it's estimated that 40% of plant species are vulnerable to extinction. A seed bank is a form of insurance, a way of maximising the number of plant species we can save from this fate. Furthermore, to increase agricultural productivity and improve livelihoods of small-scale farmers in the target communities. The project will liase with the relevant stakeholders to improve farmer extension services to provide technical information and training on the best management practices for planting, harvesting and crop storage, to facilitate the adoption of new management practices and to encourage farmer-to-farmer learning. The use of indigenous knowledge will be promoted through engagement with custodians' services.

Output 1.2.1: Sand Dune Movement is managed.

101. Sand dune movement is common around the target area, which experiences a lot of wind erosion causing dust storms, which not only reduce visibility, but also cause health problems. The encroachment of the moving dunes poses significant threats to agriculture in the area endangering the communities' food security by making the agricultural lands unproductive forcing large scale migration to urban centers. For this the objective mentioned below will be concretized through the following activities:

- Activity 1.2.1.1: Assess sand dune movement risk areas and establish mechanical and biological fixation.
- Activity 1.2.1.2: Improve the production of fodder for livestock to complement and strengthen the livestock activities.
- Activity 1.2.1.3: Create seed production units and seed banks for agricultural products.

Output 1.2.2: Climate resilient Agricultural practices are adopted.

102. Sustainable land management (SLM) comprises measures and practices adapted to the biophysical and socio-economic conditions of the target areas will be implemented in conjunction with the line ministry and community. These will be aimed at the protection, conservation and sustainable use of resources (soil, water and biodiversity). The project will promote improved practices for better soil management, leading to more fertile soils and better water retention capacity, contributing to increased resilience towards the effects of climate change on agricultural soils.

103. In addition, In Chad the use of soil and water becomes important to ensure peaceful coexistence between shepherds and farmers, and entire communities. The project also involves Identification and creation of transhumance routes and rest areas in target areas, which are paths used by transhumant and semi-nomadic shepherds for the movement of livestock. Thanks to these "routes or corridors", disputes between shepherds and farmers will be avoided because very often, on the journey from one grazing area to another, animals' cross areas used for agriculture, or vice versa, farmers

[27] USAID Study, 2020

[28] https://2012-2017.usaid.gov/results-data/success-stories/potable-wells-improve-water-access-chad.

cultivate areas dedicated to moving livestock, causing clashes between different groups. Thus, in connection with this ouput, the following activities will be implemented.

- Activity 1.2.2.1: Assessment and integration of indigenous and local agricultural practice and techniques in the target areas.
- Activity 1.2.2.2: Promote of the sustainable land management and adaptive agricultural techniques in target areas.
- Activity 1.2.2.3: Identification and creation of transhumance routes and rest areas in target areas.
- Activity 1.2.2.4: Provision of the farmers with agricultural equipment to enhance production.

Component 2: Implementation of concrete adaptation measures to improve the resilience of oasis ecosystems and local communities

104. This component aims at restoring and better managing the productive assets of the targeted oasis ecosystems and their resources through the establishment of a dynamic partnership between the various stakeholders. People will adopt new ways to process, refine products, while providing basic, and further training, and helping the local population to organize in associations, cooperatives, or private companies. Indeed, given the increasing pressure on oasis agro-systems, capacity-building programs should allow local populations to see their oases as opportunities that can be better explored, and that they should contribute in protecting them. This will also allow them to better comply with Connections with traders, strong farmer associations and a keen market understanding are all critical to helping rural communities to maximize the value of their farm products from seed to market norms, to protect biodiversity and promote activities aimed at reducing pressure on the environment. Lessons drawn from these oases will eventually be applied to other oases on a larger scale.

Outcome 2.1 Climate resilient livelihood are strengthened.

Output 2.1.1: Livestock production practices are improved.

105. The project will promote the production of small short-cycle animals. It will focus on the scaling up of small animal husbandry, namely poultry, goats, etc. Support introduction of drought-tolerant livestock breeds. The project will collaborate with animal research/breeding centers in the targeted countries to identify livestock breeds that are able to feed on poor quality forages (a characteristic of drylands) and crop residues. Often these are the breeds that have low feed requirements and yet produce better quality livestock products in the breading techniques and fodder production

106. The project will also seek to enable access to veterinary services for cattle farmers in the region, as most cattle farmers currently lack access to vet services. In fact, climate change projections of frequent droughts could increase the frequency and magnitude of cattle diseases.

107. In the frame of this ouput, a KAP survey will be conduct. KAP Surveys have become a best practice in communication procedures, as they provide critical baseline material that help inform the preparation of communication strategies and shape activities in awareness campaigns. The baseline KAP study sought to • Support project monitoring and evaluation on the target audience's awareness levels • Enhance the project's public information strategy and communication messaging • Identify gaps in knowledge. The KAP survey tools will allow for the capture of essential data and information that will provide benchmarks for monitoring and evaluation of the project activities

- Activity 2.1.1.1 Conduct KAP survey.
- Activity 2.1.1.2: Promotion of short life cycle livestock (women)
- Activity 2.1.1.3: Facilitate veterinary services access in the target areas.
- Activity 3.1.3.4 Sensitize and provide conflict management trainings for cattle herders, farmers and local authorities near transhumance corridors.

Output 2.1.2: Oasis value chain is strengthened.

108. Transformation units of agricultural products will also be installed in order to allow a better valorization of the agricultural products and to produce by-products. The project will support the development of oasis landscape products (dates, fruit trees, aromatic plants and medicinal plants, therapeutic and culinary plants, olive oil, cereal and fodder crops, henna, tobacco, meat, milk etc.) and by-products (such as organic waste), as well as the craft products (weaving and basketry) under productive alliance (PA) and / or value chain (VC) approaches

- Activity 2.1.2.1: Create agricultural product processing units (dates, olives etc.).
- Activity 2.1.2.2 Establish/enhance a market linkage for climate resilient value chains.

Output 2.1.3: Community livelihoods resilience is enhanced through adoption of (IGAs).

109. To strengthen the resilience of the local community the project will promote the diversification of local livelihoods through community micro-projects aimed at promoting alternative farming and non-farming activities, which not only generate income and improve living conditions, but also reduce pressure on natural resources and help improve the quality and the sustainability of these resources.

110. Women's Socio-Professional Associations and Groups (W-SPAG) taken from all ethnic groups will be involved in the development of the IGAs and prioritization will be made according to the activity nature. In other words, priority in

activities access will be given to women's socio-professional groups practicing the target activity. In this framework an information campaign will be organized to sensitize (W-SPAG) to the project objectives and benefits Through the community-led programmes, the groups build their skills on income-generating activities, entrepreneurial skills, and in some cases a vocational skill training Strengthen the capacity of these women's groups to implement income generating activities, collectively managed for the benefit of their members.

- Activity 2.2.1.1: Create/strengthen women's associations for IGA activities (Cook stove production).
- Activity 2.2.1.2: Develop/implement entrepreneurial training for income generating activities beneficiaries.
- Activity 2.2.1.3: Establish revolving fund schemes with a gender focus.
- Activity 2.2.1.4: Establish and support savings and credit co-operative society

Component 3: Capacity building of the different stakeholders, knowledge sharing and awareness raising of all stakeholders

111. Component 3 will focus on strengthening the environmental and economic governance of the oasis in the Borkou, Ennedi Ouest and Wadi Fira regions, which are the main backbones of the development of these areas. The initial focus will be on the establishment and strengthening of the institutional and technical capacity for well-informed, participative and community-owned adaptation planning. The project will strengthen and institutionalize awareness of the oasis resources management plan and build the capacity of sub-national and national structures to support in its implementation. All activities will be implemented in cooperation with national structures such as the Ministries of Agriculture and Environment, etc. These specific aspects will be achieved through outcomes 3.1 and 3.2 listed below

Outcome 3.1: Capacity of stakeholders to adapt to CC risk in the oasis is enhanced.

Output 3.1.1: Reliable and updated data and information necessary for the efficient and sustainable management of oasis ecosystems in the project area, are available.

112. Through this output, the project will assess/audit of the available monitoring and surveillance equipment being used by relevant institutional stakeholders in the collection of climate data in the project area. Based on the results and where applicable the project will upgrade the existent stations or establish new ones for more efficient analysis of oasis climate.

- Activity 3.1.1.1: Conduct baseline study.
- Activity 3.1.1.2: Set up/Reinforce community weather stations.
- Activity 3.1.1.3: Integration of Climate Change adaptation into national, sector and local level development planning.

Output 3.1.2: A plan of action on the legal and institutional framework for the sustainable management of oasis ecosystems is developed.

113. The project will support the establishment an integrated oasis landscape management plan aimed at promoting sustainable land and water practices, and diversified activities leading to diversified local livelihoods mainly under component 2. The plan will feed into or support the development of a coherent and comprehensive national strategy for the sustainable management of Oasis ecosystems in Chad. This will be done in full consultation with all relevant stakeholder ensuring their capacity to plan, develop and integrate actions and activities that will enhance the oasis ecosystem management.

- Activity 3.1.2.1: Develop an oasis resources management plan.
- Activity 3.1.2.2: Develop capacity-building materials for all project activities.
- Activity 3.1.2.3: Develop a Climate Change Adaptation Action Plan (CCAAP)
- Activity 3.1.2.5: Support/develop a dialogue and consultation framework on the natural resources and oasis ecosystems management.

Outcome 3.2 Awareness and ownership of adaptation and climate risk reduction processes of the targeted populations strengthened.

114. The objective of this outcome is to address and create an enabling environment to ensure all stakeholders are empowered to take the appropriate decisions and actions to address climate change impacts in the target communities. This component aims to consolidate the awareness raising and mobilization of the different stakeholders and target populations through appropriate communication and capacity development of the relevant stakeholders to facilitate the implementation of adaptation to climate change activities.

115. With regard to capacity building for local actors, planning documents at the local level do not sufficiently integrate crosscutting themes, such as climate change, biodiversity and natural and cross-border resource management.

Output 2.1.3: Community livelihoods resilience is enhanced through adoption of (IGAs).

- Activity 2.2.1.1: Create/strengthen women's associations for IGA activities (Cook stove production).
- Activity 2.2.1.2: Develop/implement entrepreneurial training for income generating activities beneficiaries.

- Activity 2.2.1.3: Establish revolving fund schemes with a gender focus.
- Activity 2.2.1.4: Establish and support savings and credit co-operative society.

Output 3.2.1: Knowledge and awareness on environmental issues in oasis are developed and disseminated.

- Activity 3.2.1.1: Capacity building of the national institutions on the production of updated data on the condition of ecosystems and climate risks in the project area.
- Activity 3.2.1.2: Develop the project communication strategy and knowledge dissemination plan.
- Activity 3.2.1.3: Develop a sensitization and awareness plan for communities on climate change impacts and adaptation with particular emphasis on indigenous knowledge.

B. Economic, social and environmental benefits

116. The intervention of this project will have environmental, social and economic benefits at the level of the individual plot or family, the community or the oasis landscape. The various activities planned will justify that oases can be made more sustainable and resilient to climate change and can provide clean air and water, halt the spread of desertification, sequester carbon, provide residents with shade and refreshment, and soak up excess rainwater during floods. Participatory integrated oasis landscape management and community development will reduce disaster risk, accelerate post-disaster recovery, and build overall climate resilience. Finally, the income-generating activities will offer households a source of income that is less exposed to climate change.

Economic co-benefits

117. The component 2 of the project will help implement activities leading to the diversification of income for oasian populations through the development of income-generating activities and the promotion of alternative production (market gardening, poultry farming, renewable energy for the micro-economy, etc.) and the improvement of other traditional crops and the enhancement and development of local products (e.g.: medicinal and aromatic plants, market garden produce, handcrafts-wickerwork, etc.). There will also be a work of labelling oasis products and a strengthening of the local market.

Social co-benefits

118. The number of persons benefiting from this project in the targeted regions is estimated at 35,000. Capacity building activities will improve the skills and knowledge of about 7,000 participants. Awareness-raising, training and education will help change the perceptions of local communities and other actors on how their actions can improve livelihoods, while also making oases activities economically attractive. A major benefit of this project will be the added social stability that it will bring to these regions. The restoration of the oases' landscapes will be vital for supplementing governments' health budgets and contributing to food security, hence reducing the burden on women as well.

Gender-sensitive development impact

119. The gender dimension will be considered in the project through the involvement of women and youth in all activities. The project will support women groups to proliferate gender-sensitive adaptation best practices. It will also target opportunities for women by generating income within the framework of adaptation including by exploiting the longer-term value chain of pastoral and oasian products (e.g., milk, cheese). The project will support women-based groups to diversify their livelihoods and income services by creating businesses to promote adaptation technologies. The resilience dimension will be considered during the implementation of production activities on farms through the use of climate-smart technology packages and awareness raising for resilient practices.

Environmental co-benefits

120. Sustainable management of water resources: This project will entail the implementation of adaptation measures such as; mobilization of the surface runoff and subsurface water, rehabilitation and proposal for improvements to traditional irrigation systems at national and local level, highlighting relevant traditional practices in terms of water management and saving.

121. Improvement or conservation of soil quality: Within the project activities, soil conservation and restoration are major actions to be undertaken for the enhancement of the oasis ecosystem. Measures will be taken to reduce SDM and erosion as well as community-based dunes stabilization.

122. In addition, actions aiming at regenerating the oases cover by means of the reintroduction of local, indigenous plants, and afforestation with local species, which are more resilient to climate change, are planned in the framework of component 2.

C. Cost-effectiveness of the proposed project

123. During the entire proposal phase, specific costs for each project activity, including cost effectiveness, will be supplied in detail (cost per person). Only once all project interventions have been completely identified is this possible. Environmental fragility and degradation are important elements of vulnerability. Population fragility is accentuated by

the decline in plant cover, the gradual expansion of the desert (3 km/year), a decline in biodiversity, the deterioration of fertile agricultural land, hydro morphological changes, and the silting of hydro systems.

124. According to the National Programme of Action to Combat Desertification, degraded regions in Chad are predicted to cover 428,000 km2, or 33.43 percent of the country's total area (2003). The primary causes are overgrazing, which is to blame for 62% of the damage, wind erosion, the need for wood fuel and timber, which has caused damage to vegetation across the nation, and mining. These elements are a result of increased competition for land and other natural resources brought on by population growth and a rise in agricultural land development, which has been sped up by the use of plowing and the recent development of mechanization. West African nations' total cultivated land area is thought to have increased from 553,696 km2 to 1,165,720 km2 between 1975 and 2013. Chad's average yearly expansion rate is expected to be 4-5 percent, compared to the subregion's overall average of 2-3 percent. Rural areas have changed as a result of the exponential rise in livestock populations in recent years and modifications to transhumance routes. (*)

125. A successful climate response must include comprehensive land-use planning because it may reduce greenhouse gas emissions and serve as a cost-effective adaptation strategy at the national, regional, and local levels. The location, mix, and design of development have a substantial impact on the long-term implications of climate change and can boost resilience to its effects. The project will therefore use a portion of Project funds to address this under Components 1 and 2, which together are allocated about US$8 million. The first component seeks to strengthen the legal framework and close gaps in the sustained management of oasis ecosystems at various scales throughout the project region. To broaden the oasis National policy axis, an action plan for managing oasis resources will be created. In response, the proposed project will strengthen the capacity of local, state, and federal entities while institutionalizing and raising awareness of the institutional and regulatory framework.

126. As for component 2, it concentrates on enhancing communities' capacities for adaptation and resistance to the effects of CC. This will be accomplished through implementing adequate and practical solutions in the water and agriculture sectors, both of which are essential for the target regions' livelihoods and food security. A portion of the funds allotted will go toward equipping vulnerable areas and improving their capacity to reduce the population-wide effects of climate threats. In the most vulnerable locations, initiatives aiming at establishing institutions for resource mobilization and preservation as well as diversifying livelihoods will also be implemented. The development of income-generating activities, the promotion of alternative production (market gardening, poultry farming, renewable energy for the microeconomy, etc.), the improvement of other traditional crops, and the enhancement and development of local products are all part of the project's component 2. These activities will help the oasian populations diversify their sources of income (e.g.: medicinal and aromatic plants, market garden produce, handcrafts-wickerwork, etc.). Additionally, there will be work done on the local market and the labelling of oasis products. The third component aims to close the capacity gaps for CC adaptation at various levels in the project's target zone. Communities are thought to know little or nothing about climate change, and thus have little ability to adapt to its effects. In response, the proposed project will increase and institutionalize community-level awareness while strengthening national and sub-national structural capacity.

D. Consistency with development strategies

127. The project will contribute directly to the achievement of the objectives and supports the implementation of the Government's key policies and programmes aimed at achieving sustainable growth and adapting to the effects of climate change.

Table 1: Project alignment with national policies and strategies

Strategy / Plans	Project Alignment
Vision 2030: The Chad we want	Vision 2030 aims to ensure that Climate Change Adaptation (CCA) and mitigation actions and climate-related disaster risk reduction (DRR) are developed in a coordinated and efficient manner to develop resilience in the face of climate variability and adverse climate-related impact on agro -pastoral production systems in Chad and their contribution to food security and the wellbeing of populations. The project will be aligned with Vision 2030 through the promotion of climate resilient agricultural production. The main focus will be around monitoring available water sources and increasing water availability. This will in turn enhance water availability to ensure increased agricultural sustainability and productivity. Through component 2 the project will train beneficiaries on the need for climate resilient agricultural techniques and approaches such as climate-resilient crops and techniques aimed at increasing soil nutrient and moisture levels and reducing soil erosion.
National Strategy to Combat Climate Change in Chad – NSCCCC, (2017)	This NSCCCC aims for the sustainable and coherent integration of the challenges in CCA and mitigation into national development policies as well as improving effective coordination of initiatives aimed at the fight against climate change. The

	project will be aligned with the objectives to strengthen the resilience of oases systems; promote actions to adapt to climate change; prevent risks and manage extreme climatic phenomena; strengthen the capacity of institutions and actors in the fight against climatic change.
• National communications to the UNFCCC (2001 and 2012) • National Adaptation Programme of Action – NAPA, (2009) • Nationally Determined Contributions – NDC (2021) • National Adaptation Plan (NAP)	The project will be aligned with the national priorities to adapt to climate change as detailed in the national communications to the UNFCCC, the NAPA and the NDC. This will be done through the focus on: i) managing water through the rehabilitation and /or creation and development of water harvesting and agricultural irrigation structures and the application of Integrated Water Resources Management (IWRM); and ii) using improved inputs, (organic fertilisers including composts, adapted plant varieties), land and water conservation.
National Development Plan – NDP (2017-2021)	The main objectives of the NDP is that of achieving food security through rural agricultural investments. The main sectors relevant to this project are those of agriculture, water and the environment. The NDP aims to ensure the sustainable management of natural resources and implement policies to adapt to climate change; to combat climate change and preserving biodiversity; and implement climate-resilient agricultural practices.
National Poverty Reduction Strategy Paper (2008 – 2011)	The NPRSP aims to: (i) promote good governance; (ii) reduce poverty through growth based on the development of rural areas and basic infrastructure; (iii) ensuring the development of human resources, particularly through education and health; (iv)improving the protection of vulnerable segments of the population; and (v) protecting ecosystems. The project will have a strong focus on rural climate-vulnerable smallholders. It will do this through addressing the lack of knowledge on climate-resilient agricultural practices, and increasing the capacity to climate adaptation.
National Strategy and Action Plan on Biological Diversity.	The overall objective targeted through the Action Plan is to slow down in the short term the trend of loss of biological diversity and the degradation of its biotopes through sustainable participatory management strengthening current achievements. The project will be aligned with the Strategy and Action Plan through the promotion of agricultural techniques and approaches that will help reduce soil degradation and improve soil fertility.
National Environmental Policy	The objective of the National Environmental Policy is to contribute to sustainable development through the rational management of natural resources by following specific objectives: i) effectively combat all factors of environmental degradation (e.g. climate change, desertification and all forms of ecological pollution and natural disasters), ii) promote the conservation and rational use of national biological heritage and iii) guarantee access for all to natural resources, including land, genetic resources and related knowledge.
National Climate Change Strategy	The National Climate Change Strategy aims to build a more climate-resilient economy by 2030 and is part of a development pathway that emits less greenhouse gas. The Strategy's overall objective is to guide and bring together political, institutional, technical, scientific and financial initiatives to address climate change.
National Programme of Action to Combat Desertification	The National Programme of Action to Combat Desertification, adopted in 2000, the central objective of which is to contribute to combating desertification and mitigating the effects of drought for sustained and sustainable production. Specifically, it aims to protect, restore and develop productive potential; protect and safeguard critical and threatened oases ecosystems; strengthen national capacities to combat desertification.

E. Alignment with national technical standards

128. The relevant national technical standards need to be identified, and compliance stated in a logical manner. These standards include Environmental Impact Assessments (EIAs), building codes, water quality regulations, and sector-specific regulations. Regarding EIAs, depending on the sector and the size of the project, the category of impact assessment or management strategy that the project is expected to trigger will have to be outlined. At this stage of concept note compliance with relevant technical standards are explained in detail. In the next stage during the full proposal development, further analysis of the technical standards will be undertaken,

129. The process of compliance through the screening of proposed activities will include the need to secure relevant permits where required by law. Additionally, the screening will also ensure compliance with the Adaptation Fund's requirements in accordance to the Fund's Environmental and Social Policy, Gender Policy as well as OSS Environmental and Social Standards. Assessments and feasibility studies will outline in detail, what the national environmental standards are and how the project will comply with them. In doing so it will also detail how the project will address the 15 ESP principles as well as design an Environmental and Social Management Plan (ESMP). Controls will be put in place to ensure that the project will not exacerbate inequalities, negatively impact marginalised populations or harm the environment.

Table 2: Relevant technical standards that can be applied in the framework of the project

National Technical Standards	Description and Project Aligment
Law nº 016 / PR / 99 for the Water Code.	The Law covers inter alia special conditions for the collection, treatment, storage, supply of drinking water and sanitation; conditions surrounding the use of water; the approval mechanism for hydraulic works; and offenses and penalties for non-compliance. All water resources are a collective asset forming part of the public domain of the State and their exploitation is subject to declaration or authorization by the Ministry of Water.
Law nº 014 / PR / 98 defining the general principles of environmental protection.	This law is establishing the fundamental principles for the sustainable management of the environment and its protection against all forms of degradation, in order to safeguard and develop natural resources and improve the living conditions of the population.
Decree n ° 630 / PR / PM / MERH / 2010 OF AUGUST 04, 2010 regulating environmental impact studies.	This decree sets out the procedures for implementing the environmental impact studies. It requires that the prior authorization of the Minister responsible for the environment be submitted to all developments, structures and works likely to have incidences and significant effects, as well as harmful consequences on the biophysical and human environment, in particular in particularly sensitive areas such as forests, arid or semi-arid areas prone to desertification, oases and wetlands.
Decree n ° 904 / pr / pm / merh / 2009 regulating pollution and nuisances to the environment.	This Decree defines the rules relating to pollution and environmental nuisances, in accordance with Title V of Law No. 014 / PR / 98 of August 17, 1998. It aims to protect the environment against any form of degradation, alteration and its sustainable management, as well as the improvement of the framework and the living conditions of the population are of public order.
Law No. 24 on Land Tenure and Customary Rights.	This law establishes the procedure for the registration of land ownership. This procedure consists in the establishment and registration of a title deed called a land title. The project will at all times ensure compliance with the land tenure laws, and that the rights to land tenure of the project beneficiaries are ensured beyond the project cycle, hereby ensure project sustainability

F. Project duplication

130. A number of initiatives are underway or planned in the oasis of Chad, but no projects have been put in place to ensure efficient, sustainable knowledge for water resources management and land conservation.

Project	Objectives	Link with the Chad oases *(duplication/complementarity)*
IFAD / GEF – Enhancing the Resilience of the Agricultural Ecosystems USD 32 million (2015-2022)	The overall goal is to contribute to the sustainable improvement of food security and incomes of rural households and improve the resilience of agricultural systems and the economy of rural households to climate change and external shocks.	The project focuses on the areas of Borkou, Ennedi Ouest and Wadi-Fira. There is no geographical overlap with the project. Synergies or lessons learned may be explored during design consultations.
AfDB / Green Climate Fund (GCF) – Programme for integrated development and adaptation to climate change in the Niger Basin	This programme will implement a series of integrated and comprehensive actions that reduce the silting of the Niger River, improve natural resources management and enhance the population's ability to adapt to climate change. It also includes some mitigation	No geographical overlapping Synergies or lessons learned may be explored during design consultations.

(PIDACC/NB) USD 210 million (2018-2025)	activities, including through forestry and land use.	
UNDP / GEF - Chad National Adaptation Plan Advancement Project (USD 33.7 million) **(2018-2022)**	The project will contribute to the advancement of the Chad National Adaptation Plan (NAP) process. To this effect, the objective of the project is to facilitate the integration of adaptation to climate change into the medium- and long-term planning and budgeting processes of climate-sensitive sectors.	The UNDP / GEF NAP project was consulted during project concept note formulation. In fact, the Chad NAP was officially published on February 2022. This key document was one of the bases that were adopted when the activities of the concept note were formulated. The project will be aligned with the national priorities to adapt to climate change.
World Bank – Chad Local Development and Adaptation Project. USD 54.5 million (2020-2025)	The objective is to improve the management of natural resources and the livelihood of populations in selected climate vulnerable areas in and around the Wadi Rime and Wadi Achim (OROA) reserve in Chad.	There is no geographical overlap with the project. Synergies or lessons learned may be explored during design consultations.
AfDB / GEF – Strengthening rural and urban resilience to climate change and variability by the provision of water supply and sanitation in Chad. As part of the AfBD Semi-Urban and Rural Drinking Water Supply and Sanitation Program in Eleven Regions (PAEPA SU MR phase 1) USD 36.5 million (2020-2024)	The project aims to increase access to drinking water and sanitation services, as well as through job creation, especially for the youth and women. This will be achieved through the construction of boreholes, micro-irrigation systems, hand pumps, public latrines as well as the installation of piezometers and employment. The Water Supply and Sanitation Programme in semi-urban and rural areas rural areas (PAEPA SU MR) in eleven regions (Borkou, Ennedi, Tibesti, Mayo-Kebbi, Tanjile, Logone Oriental, Logone Occidental, Mandoul, Moyen-Chari, Salamat and Sila) stems from the Kigali Action Plan (KAP) initiative concluded by the Heads of State and Government of the African Union	There are no potential synergies in sanitation and water-related activities as the project will focus on water access for agricultural activities thus there is no overlap with the AF project.
FAO/AF- Strengthening Resilience to Climate and Covid-19 shocks through Integrated Water Management on the Sudan – Chad Border area (SCCIWM) USD 14.0 million (2022-2025)	The project objective is to strengthen the regional agro-ecology and sanitation resilience to climate change and COVID-19 in the Chari River basin, in the border area between Chad and Sudan. This will be achieved by enhancing regional water mapping, monitoring and governance capacity to better adapt to drought events; by improving water availability, water use efficiency; promoting adaptive agriculture production systems and multipurpose water technologies for improved livelihoods, food security and sanitation of rural households; and developing a Regional Natural Resource Management Plan.	There is no geographical overlap with the project. Synergies or lessons learned may be explored during design consultations.

G. Learning and knowledge management

131. The process of learning and knowledge management will take place throughout the implementation of the project in view of the specificity of this project which deals with oases and associated ecosystems that are not yet well documented. Indeed, the first component (through output 1.1) aims to improve knowledge on oases and associated ecosystems in the region of Borkou, West Ennedi and Wadi Fira by setting up monitoring/surveillance devices and equipment and collecting environmental data on oasis ecosystems in the project intervention areas. Component 3 also provided for learning and knowledge management actions through awareness raising and mobilization of the various stakeholders and target populations through appropriate communication and capacity building.

132. For the entire project, a communication strategy and plan will be developed. In addition, a special plan will be developed and implemented to raise awareness among grassroots communities on the issue of climate change and means of

adaptation, with particular emphasis on considering endogenous know-how. Knowledge management and learning will be done with two types of actors: practitioners, technicians and decision-makers; and the communities of the target areas. To this end, and with regard to technicians and decision-makers, it is envisaged to develop and operationalize a guide for integrating adaptation to climate change in planning documents at national, sectoral and local levels, considering other oasis ecosystems.

133. Finally, actions will be taken to ensure that the results and lessons learned from the project are properly appropriated.

H. Consultative process

134. The consultation process with stakeholders was done in four key steps. This process began on the side-lines of COP26. The project idea was discussed between representative from the chad official delegation and OSS officials. CHAD expressed the country's desire to formulate its first project with the Adaptation Fund noting that no project was initiated with the AF until then. The government representatives present at the COP also highlighted the efforts made by Chad in the fight against climate change, in particular the two ongoing processes of developing the updated NDC and the national adaptation plan. Chad expressed its intention to advance and concretize the objectives set out in these two plans through an adaptation project dedicated to the protection of the most vulnerable systems in chad, namely the oases and wadis.

135. After numerous stakeholders exchanges the ideas were then concretized by the Ministry of Environment, Fisheries and Sustainable Development with the support of the Woman Union for the fight against desertification (Union des Femmes pour la Lutte Contre la Désertification au Sahel UFLCDS) this led to a series of well-planned and organized consultations, and field visits during September 2022, with the broad objective to identify potential beneficiaries of the climate change resilience and adaptation project, analyse local resources in order to better adapt the project development strategy and to highlight certain vulnerability criteria for resilience to climate change. The consulted stakeholders included: (i) Local communities: The local communities are involved in project design particularly in identifying problems, specific needs related to resilience to climate change, sites for project implementation and the role they play in project implementation; (ii) Local and regional Government Authorities. (iv) Government Ministries and Institutions.

136. The third step was to hold a series of high-level consultation meetings to combine the information gathered through the broad consultation process at the local level and to link it to the local, regional and national priorities on enhancing sustainable agriculture and climate issues, how it affects the livelihoods of the farming communities of the oasis. The meetings were constructive and productive in providing validation of the preparatory work that has been conducted by OSS in the preparation of the Concept Note. Some of the concerns that were raised and have been addressed in the development of the proposal included protection of oases against dune movement, preservation of soil quality and fight against certification and preservation of oasis systems as an important source for local populations. The fourth steps the fourth and last step was triggered following the preparatory mission for the elaboration of the Concept Note of the Chad oasis project to be submitted to the Adaptation Fund. Conducted in October 2022 by OSS, this mission allowed to validate and finalize several aspects and crucial points regarding the process of elaboration of the concept note and to better sensitize the technical partners of a project in order to provide clear and accurate information. It also allowed for better sensitization and involvement of high-level decision-makers, notably the Minister of the Environment, Fisheries and Sustainable Development, the Minister of Agricultural Development and the State Counselor in charge of Agriculture and Livestock, and the Environment Counselor. As this is Chad's first project submission to the Adaptation Fund, this mission allowed for a good discussion of the Adaptation Fund's requirements in terms of project development and the next steps. The consultations involved ministerial-level and civil society / NGO presentations of an initial proposal that was shared in advance to ensure validation and participatory development. Consultations were held with ministries and civil society; the attendance lists of which are presented in annex 3.

137. Given the presence of indigenous people and minorities such as Mbororo (sub-group of the Fulani) and the Toubous, and in accordance with the Adaptation Fund requirements, special attention has been given to the Free, Prior and Informed Consent (FPIC) procedures. During the consultations with local institutions, traditional authorities, NGOs and communities, a first identification of indigenous people and preliminary mapping has been done. After this preliminary mapping it has been planned that additional and more specific consultations involving these minorities will be conducted. comprehensive community-level consultations will also be undertaking and will target project areas during the full proposal development stage. These consultations will focus on discussions with Indigenous Peoples and communities' representatives on the project activities and related risks. These consultancies will be conducted in the local language so that everyone attending will have the same opportunity of understanding and expressing his objection if any. Then, the consent of indigenous people will be required to ensure their commitment and involvement in the project. The project grievance mechanism will also be presented and promoted during these consultations. It should be also noted that other vulnerable groups such as women, youth and elders would be effectively integrated into the consultative process.

I. Justification of funding request

138. The beneficiary community in this proposal are all living below the poverty index. This is exemplified by the fact that Chad is the **poorest country** in the world according to the world bank ranking29They are also ranked as Heavily Indebted Poor Country (HIPC) thus, requiring them to seek International Monetary Fund (IMF) authorizations before acquiring new debt. Similarly, the decline in development aid flows coupled with rising interest expenditure is putting pressure on national budgets and balance of payments positions leaving no money to finance the urgent adaptation programmes to build the resilience of the vulnerable communities.

139. As for the majority of African countries, the water and agriculture sectors are crucial for their economic development. In Chad, the agricultural sector employs more than 80% of the working population and contributed an average of 54% to the countries' national Gross Domestic Product (GDP). with rain-fed agriculture being dominant. The rural farmers have to contend with climate shocks such as drought, rainfall deficits, floods and locust invasions and traditional resilience strategies are no longer as effective as they were. With funding from the A.F the project activities aim at sustainably increasing food and nutrition security and raising the income of rural households, the project will strengthen agricultural water infrastructure, rehabilitate rural roads, intensify and diversify family farming production systems, and support value addition for agropastoral products making the communities more resilient to the impacts of climate change.

140. There is lack of reliable data and information for long-term monitoring and planning for proper water/land resources management and adaptation to climate change in Chad and in the target area. This is due to insufficient policy and governance frameworks and monitoring tools. As a result, the natural resources are continuously exposed to climate variability and risks, resulting in damage and degradation. The effects of climate change will strongly impact the availability of water in the area and exacerbate already significant anthropogenic pressures with serious consequences on the environment (massive deforestation, destabilization of rivers, poor water quality, etc.). From this perspective, the vulnerability of local communities, especially in the target areas is very high due to livelihoods directly dependent on natural resources (rain-fed agriculture, pastoralism, etc.) combined with limited adaptive capacity and recurrent food crisis and water shortages

141. With the Adaptation Fund support, the following impacts could be achieved: Improved adapting practices that involve reducing the vulnerability of human and natural systems, and fall within the continuum between climatic and anthropogenic factors (related to development and essential services);Strengthening the climate vulnerable communities and ecosystem resilience through the implementation of various concrete adaptation actions (water, soil and land resources protection, livelihoods strengthening and diversification for vulnerable rural communities); Livelihoods improvement of the most vulnerable among smallholder farmers and pastoralists such as women, and youth; Elaboration of communication materials for the target groups including vulnerable communities, women, youth, smallholder farmers, pastoralists, artisans, Institutional capacities of stakeholders and country strengthened, Local communities are aware on the impacts of climate change (land degradation, desertification, etc.) and adaptation solutions and will be able to facilitate the implementation of adaptation actions with a possibility to scale up the interventions in other oasis areas.

J. Project sustainability

142. The project aims to strengthen the resilience of vulnerable communities in Borkou, West Ennedi and Wadi-Fira by building adaptive capacity to recurrent drought risks and promoting the sustainable management of oases and associated ecosystems. The specific objectives of the project are as follows:

- Ensure permanent monitoring of climate risks through the production of data and environmental information on oasis ecosystems in the communes of Faya, Fada, Kalaït, Biltine and Arada;
- Contribute to the strengthening of the regulatory and institutional framework for the management of oasis ecosystems;
- Implement concrete adaptation actions to improve the resilience of the most vulnerable communities in the project area;
- Strengthen the institutional and technical capacities of the project stakeholders in terms of adaptation to climate change and sustainable management of oasis ecosystems.

143. In terms of sustainability, the proposed project will build on the strengths and weaknesses of other similar programs/projects carried out in the region or elsewhere with the same climatic conditions in the areas of climate change adaptation, sustainable management of natural resources, and community development.

144. The improvement of oasis ecosystems' resilience and the establishment of new systems and equipment for monitoring/surveillance and the collection of environmental data on oasis ecosystems, are all factors that will help to guarantee the sustainability of the project achievements and results. In fact, this information that the project will produce

[29] https://data.worldbank.org/

will serve as a useful and valid database related to natural resources, CC, vegetation, etc. in the region and thus will help decision makers to adapt plans and strategy in order to preserve those ecosystems. In addition, the enhancement of the local populations' livelihoods and their reconciliation with natural resources will help to alleviate the pressure exerted on these resources and will contribute to maintain the ecological equilibrium of the oasis in the communes of Faya, Fada, Kalaït, Biltine and Arada.

145. Sustainable management of natural resources in general and of oasis ecosystems in particular must rely on an integrated plan for managing land, water, and biological resources, which considers the local population (producers and consumers) as an essential component of these ecosystems. The sustainability of the project will be further ensured by the participatory and consultative process to be adopted during the development of a climate change adaptation plan for the sustainable management of oasis and also for and during the implementation of all project activities which will help to encourage the project appropriation by the local authorities and communities.

146. The project will rely on financial resources mobilization for the implementation of the activities as well as of the Management Plans mentioned above, which will contribute to ensure the continuity of the process after the closure of the project, especially with the expected active participation of NGOs, populations and the private sector. While organizing consultations for the full proposal, issues of sustainability will be discussed with ministries, regional institutions and partners to encourage them to allocate some resources and ensure the sustainability of the project achievements.

147. To strengthen the economic and financial viability, the project will support the dissemination of practices, technologies, and techniques for improving the productivity of agricultural activities and the resilience of the households involved. Communication and knowledge sharing initiatives are an essential element for ensuring the program's sustainability.

148. The environmental sustainability of project actions will be researched using interventions adapted to area's climate conditions. For the water sector, the project has focused on actions that help sustainably improve water efficiency like Build/rehabilitate and equip more resilient hydro-agricultural infrastructure (drip irrigation system, etc.).

149. The project will intervene to promote and disseminate new irrigations techniques and infrastructures such as drip irrigation as well as the use of drainage network. To combat desertification, the project will carry out dune fixation works (mechanical and biological fixation) and Develop/rehabilitate runways and corridors around the oases.

150. For the component regarding ecosystem resilience, the project interventions will be implemented according to the procedures stated in the call for projects, which should encourage the involvement of local organizations and promote sustainability and the spread of adaptation actions.

K. Environmental and social impacts and risks

151. At the design stage of the proposed project, a preliminary E&S impacts and risks assessment was conducted in order to ensure that the project complies with the 15 principles of the AF's Environmental and Social Policy (ESP). The AF ESP requires that projects comply and respect the laws, people's rights, gender equity, heritage, biodiversity and environment management. At the Full Proposal development stage, the identification of Risks and Impacts will be conducted while ensuring the following points: (i) the formalization of USP approach; (ii) a comprehensive risks identification and impact assessment; (iii) the compliance with the ESP and GP for implementation of the project, taking into account the regional dimension; (iv) the adequate allocation of resources for mitigation measures; (v) the project management structure includes an external oversight/advisory component on environmental and social safeguarding. The initial results of screening are presented in the table below.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Compliance with the Law		X (Further consultations and detailed assessments will be done during the development of Environmental and social impact framework (ESMF) for the Project at full proposal stage. The final project design will be compliant with all relevant regional and national laws after extensive consultations with national and regional stakeholders as well as development of the detailed EMSF for the project at the country's levels.)
Access and Equity		X (During the full proposal development, an E&S assessment will be ensured as well as identification of selection criteria of target beneficiaries. The target communities without discrimination will access the project activities equally and equitably.)
Marginalized and		X (During the project full proposal development, the E&S

Vulnerable Groups		assessment and the consultations with the community's deep discussion will be conducted to identify the best approach to reach the marginalized and vulnerable groups especially; women, youth, orphans, disabled, female and child headed HHs, and HIV affected groups to make sure they will be targeted by the project activities).
Human Rights	X (The project activities are not discriminatory by tribe, age and gender or, level of education. The project design relied on the consultative approach involving various stakeholders. No activities are identified whose execution is not in line with the established international human rights. Project objectives promote basic human rights for fair and equitable access to resources to enhance their resilience to climate change in the beneficiary countries.)	
Gender Equality and Women's Empowerment		X (Further detailed gender analysis will be done at full proposal level to ensure that all gender aspects are fully incorporated into the proposal. The project has a special focus on women and youth groups especially for capacity building on breeding techniques for short-cycle species in the project area, strengthening and boosting women's associations and socio-professional groups to ensure that they fully participate and benefit from the project.)
Core Labour Rights		X (The Project will ensure that Labour laws are considered in activity implementation especially during carrying out dune fixation works, Developing or rehabilitating runways and corridors around the oases, Building and equipping the water supply infrastructure, and other concrete adaptation actions under components 1 & 2 of the proposed project. During the E&S assessment a special focus on National labour laws in force will be ensured. The respective country laws and regulations will be followed and children's work will be forbidden as well as remuneration inequity between men and women)
Indigenous Peoples		X (Given the presence of indigenous peoples and minorities in the project areas special attention will be paid to FPIC process. At full proposal development stage, a wide and targeted stakeholder consultation will be undertaken to elicit the participation and inclusion of both minority and majority indigenous peoples in the project.)
Involuntary Resettlement	X (The project will work with communities in their locations and on voluntary basis. Therefore, no resettlements or even displacement to new locations is expected.)	
Protection of Natural Habitats		X (Further assessment to identify the project risks on natural habitat is required, though an E&S assessment will be conducted in the full proposal development stage. The proposed project will be undertaking agricultural landscape management measures such as: The project component 1, via its outcome 1.2. This will be done by activities related to Carrying out dune fixation works (mechanical and biological fixation) and Developing/rehabilitating runways and corridors around the oases Also, Outputs 1.2.1 and 1.2.2 will enhance lands and soil conservation specifically through Promoting innovative practices for the sustainable management of the oasis soils, Train farmers to sustainable soil management techniques

Conservation of Biological Diversity		X (Further consultations and assessments will be required during the development of Environmental and social impact framework (ESMF) for the proposed project. At full proposal design stage, deliberate efforts taken to ensure that interventions are compliant with all relevant national and international laws on conservation of biological diversity. It is important to highlight that no invasive plant species will be planted.)
Climate Change	X (No further assessment required Project activities proposed are aimed to enhance the resilience of oasis ecosystems and populations to Climate change focusing on drought effects in the cross-border area along with food security and water management efficiency enhancement)	
Pollution Prevention and Resource Efficiency		X Minor risks related to potential water contamination of water reservoir through introduction of impurities, wastewater and solid waste is possible. Accordingly, a further assessment is required and an ESMF will be developed with the necessary mitigation measures and monitoring mechanism. Project activities will not generate pollution and loss of resources. It will contribute to sustainable land management; efficient water uses and prevention of water pollution.)
Public Health	X (The project interventions will among others also focus on developing a special awareness plan for communities on Climate Change and adaptation options, with considering endogenous know-how. This will include modules for trainings and capacity building related to all activities of the project, including water management. Communities will be sensitized on the need to reduce water intake and water use, which will contribute to water availability during dry periods and droughts. These efforts lead to avoidance of waterborne diseases and other epidemics hence contributing to public health). In addition, the project will support animal production by strengthening health and quality food systems (inputs and veterinary pharmacies, fattening, cultivation of fodder plants, etc.) through breeders' associations.	
Physical and Cultural Heritage		X Further detailed E&S and gender analysis will be done at full project proposal development stage in order to incorporate gender aspects including culture and other heritage within the cross-border area. The project will promote local knowledge and train communities to handle the new technologies without affecting cultural heritage. As regards to physical heritage the project will not implement activities that will target specific physical assets in the project sites.)
Lands and Soil Conservation		X (Further assessment on soil and land will be ensured during the full proposal. The project component 1, via its Output 1.2.1: Sand Dunes Movement is managed. This will be done by activities related to carrying out dune fixation works (mechanical and biological fixation) and Developing/rehabilitating runways and corridors around the oases. Also, Output 1.2.2 will enhance lands and soil conservation specifically through Promoting innovative practices for the sustainable management of the oasis soils, Train farmers to sustainable soil management techniques Therefore, no damages to soil, vegetation and land resources are expected to occur.)

PART III IMPLEMENTATION ARRANGEMENTS

A. Project alignment of project objectives/outcomes with Results Framework of the Adaptation Fund

Project Objective(s)[30]	Project Objective Indicator	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Strengthening the resilience of vulnerable communities in Borkou, Ennedi Ouest and Wadi Fira by developing their adaptation capacity to recurrent drought risks and by promoting the sustainable management of oases and related ecosystems	Number of staff trained in the production and analysis of environmental and climate data for more effective management of oasis ecosystems.	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic & environmental losses	2.1. Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased	**8,450,000**
	Number of communties sensitized and aware of predicted adverse impacts of climate change	Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.2 Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	
	Improved Infrastructure to strengthen the adaptative capacity of oasis ecosystem	Outcome 4: Increased adaptive capacity within relevant development sector services and infrastructure assets	4.2. Physical infrastructure improved to withstand climate change and variability-induced stress	
	Number of communities (by gender) strenghtened in relation to climate change impacts.	Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	6.1. Percentage of targeted population with sustained climate-resilient alternative livelihoods	
Project Outcome(s)	**Project Outcome Indicator(s)**	**Fund Output**	**Fund Output Indicator**	**Grant Amount (USD)**
Component 1: Enhance Sustainable water and land resources management in the oasis.				
Outcome 1.1 Water availability in the oasis is enhanced.	Number of iimproved water access infrastructures for the communities.	Output 4: Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability Output 5: Vulnerable ecosystem services and natural resource assets strengthened in response to climate change impacts, including variability	4.1.1. No. and type of development sector services modified to respond to new conditions resulting from climate variability and change (by sector and scale)	**4,850,000**
			4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by sector and scale)	
Outcome 1.2: Sustainable Land Management Practices are promoted	Number of hectares restorated Number of farmers equipped with materials Number/hectares of pastoral and rest areas created		5.1. No. of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type and scale)	
Component 2: Implementation of concrete adaptation measures to improve the resilience of oasis ecosystems and vulnerable local communities				
Outcome 2.1: Climate resilient livelihood are strengthened	Livestock with a short cycle life introduced in the oases. Number of processing units of agricultural products created.	Output 6: Targeted individual and community livelihood strategies strengthened in relation to climate	6.1.1.No. and type of adaptation assets (tangible and intangible) created or strengthened in support of individual or community livelihood strategies	**2,400,000**

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

	Number of training sessions on income generating activities organized. Number of women's associations for IGA activities (production of stoves) established/strengthened. Number of savings and credit cooperatives supported.	change impacts, including variability	6.2.1. Type of income sources for households generated under climate change scenario	
Component 3: Capacity building of the different stakeholders, knowledge sharing and awareness raising of all stakeholders				
Outcome 3.1: Capacity of stakeholders to adapt to CC risk in the oasis is enhanced	Number of stakeholders mobilized and sensitized through communication and capacity building activities	Output 3.1: Targeted population groups participating in adaptation and risk reduction awareness activities Output 3.2: Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	3.1.1 No. of news outlets in the local press and media that have covered the topic 3.2.1 No. of technical committees/associations formed to ensure transfer of knowledge 3.2.2 No. of tools and guidelines developed (thematic, sectoral, institutional) and shared with relevant stakeholders	**800,000**
Outcome 3.2 Awareness and ownership of adaptation and climate risk reduction processes of the targeted populations strengthened.	Number of community awareness training sessions on climate change impacts and adaptation carried out			**300,000**

B. Project implementation and management arrangements

152. The proposed institutional arrangement of the project is as follows:

153. **Implementing Entity:** The project will be implemented by the Sahara and Sahel Observatory (OSS), which will serve as the Regional Implementing Entity (RIE) and will be responsible for all financial, monitoring, and reporting aspects of the Adaptation Fund.

154. **Executing Entities:** The project will be supported by a "Project Management Unit" (PMU) hosted by the Ministry of Environment, Fisheries and Sustainable Development through the general directorate for forest wildlife and fisheries resources and will involve stakeholders from the Union of women for the fight against desertification in the Sahel and various sectors (water, environment, and agriculture). As the project includes important activities of national and local scope, the PMU will lead the activities implementation at the local level through various NGOs and beneficiary groups (representatives of professional/community organizations), women's cooperatives, youth cooperatives, etc.

155. **Project Steering Committee (PSC):** The PSC will be the highest decision-making body for the whole project. It will provide guidance for the effective management of the project and will periodically assess the extent to which project results are in line with expectations. Its core membership will consist of representatives of the following structures and institutions:

Institution	Number of representatives
Ministry of the Environment, Fisheries and Sustainable Development	2
Ministry of Agricultural Production and Transformation	1
Ministry of Livestock and Animal Productions	1
Union of women for the fight against desertification in the Sahel	1
Representative of civil society organizations	1
OSS (observer)	2
Others	1
Total	**9**

156. Depending on the thematic and topics discussed, the PSC may invite representatives of other relevant institutions or resource persons who will bring their expertise and guidance to the project.

157. The members of the PSC must be represented at a level that allows them to take decisions independently.

PART IV ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government

Mr. Porgo HOUNLY, Adaptation Fund National Designated *Authority, Ministry of Environment, Fishery and Sustainable Development*	*Date: December 04, 2022*

B. Implementing Entity certification

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 (NAPA, NAP, NDC,..) and subject to the approval by the Adaptation Fund Board, commit to implementing the project 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.

Mr. Nabil BEN KHATRA – *Executive Secretary of the Sahara and Sahel Observatory (OSS) as the Implementing Entity Coordinator*

Date: **January 9, 2023**	Tel.: **(+216) 71 206 633** Email: nabil.benkhatra@oss.org.tn; boc@oss.org.tn
Project Contact Person: **Mrs. Khaoula JAOUI**	
Tel. and Email: **(+216) 71 206 633 – khaoula.jaoui@oss.org.tn**	

Annex 1: Endorsement Letter

ADAPTATION FUND

Letter of Endorsement by Government

N'Djamena, December 04, 2022

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 Reversing the degradation trend in the oases of Borkou, Ennedi West and Wadi Fira through strengthening adaptation measures and improving resilience to climate change of vulnerable communities.

In my capacity as designated authority for the Adaptation Fund in Chad, I confirm that the above national grant 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 the oases of **Borkou, Ennedi West and Wadi-Fira regions of Chad**.

Accordingly, I am pleased to endorse the above grant proposal with support from the Adaptation Fund. If approved, the project will be implemented by the Sahara and Sahel Observatory (OSS) and executed by Ministry of Environment, Fisheries and Sustainable Development through the General Directorate of Forest, Wildlife and Fisheries Resources; in collaboration with the Union of Women for the Fight against Desertification in the Sahel.

Sincerely,

M. Porgo HOUNLY

Ministry of Environment, Fishery and Sustainable Development

Project Formulation Grant (PFG)

Submission Date: January 9, 2023

Adaptation Fund Project ID:	
Country:	Chad
Title of Project:	Reversing the degradation trend in the oases of Borkou, Ennedi West and Wadi Fira through strengthening adaptation measures and improving resilience to climate change of vulnerable communities
Type of IE :	RIE
Implementing Entity:	Sahara and Sahel Observatory (OSS)
Executing Entities:	General Directorate of Forest, Wildlife and Fisheries Resources; in collaboration with the Union of Women for the Fight against Desertification in the Sahel

A. Project Preparation Timeframe

Start date of PFG	Upon Concept Note approval date
Completion date of PFG	**One year after Concept Note approval date**

B. Proposed Project Preparation Activities ($)

Describe the PFG activities and justifications:

List of Proposed Project Preparation Activities	Output of the PFG Activities	USD Amount
Environment Impact Studies/Reviews	• Assessment of the project areas intervention and preliminary baseline establishment with additional stakeholder mapping. • Environmental Impact assessment according to the AF 15 safeguards and OSS E&S policy. • Review of project interventions identified to cause disharmony to the environment and socio-economic setup of the communities. • Development of an ESMP detailing the mitigation actions and its M&E system.	7 000
Cost-effectiveness	• Assess the economic and financial contribution for the project zones' beneficiaries. • Analyze the profitability of project activities considering the cost-effectiveness of the proposed, water management infrastructure, climate-resilient farming practices, IGAs as well as the project added-value at the environmental, social and economic levels.	5 000
Gender analysis	• Assess extent of gender mainstreaming into regional and national disaster risk management related policies with regards to governance, management, and	4 000

	emergency action plans. • Analyze the existing gender strategies on addressing gender in water, agriculture and fishing related policies. • Monitoring and Evaluation interventions to measure progress and/ or impact of gender mainstreaming • Propose a gender specific action plan for the project	
Consultation process	• Concertation workshops with stakeholders and local communities' representatives	18 000
Design of the full project proposal	• A complete funding proposal document including all the technical outcome from the preparatory studies and consultation workshops will be developed and validated before submission to the AF	5 000
Travel/participation	• Travel costs and technical support	10 000
Other costs	• Management fees	1 000
Total Project Formulation Grant		**50 000**

C. Implementing Entity

This request has been prepared in accordance with the Adaptation Fund Board's procedures and meets the Adaptation Fund's criteria for project identification and formulation

Implementing Entity Coordinator, IE Name	Signature	Date (Month, day, year)
Mr. Nabil Ben Khatra, OSS' Executive Secretary (RIE)		01/09/2023

Project Contact Person	Telephone	Email Address
Mrs. Khaoula Jaoui, Climate Department Coordinator	(+216) 71 206 633	boc@oss.org.tn

Annex 2: Reports of the different consultations with stakeholders

The consultation process adopted during the various stages of preparation of this project was a process that succeeded in bringing together all the key actors in Chad. High-level meetings, technical consultation meetings with experts from the various ministries involved or local consultation processes with the inhabitants of the project sites, including women and young people, all resulted in a consensus on the problems and challenges but also on the measures to be adopted in perfect harmony with the expectations of the local population and the priorities of the country at the national level.

The consultation process with stakeholders was conducted in four key steps. This process began on the sidelines of COP26. The project idea was discussed between representative from the chad official delegation and OSS officials. CHAD expressed the country's desire to formulate its first project with the Adaptation Fund noting that no project had been initiated with the AF until then. The government representatives present at the COP also highlighted the efforts made by Chad in the fight against climate change, in particular the two ongoing processes of developing the updated NDC and the national adaptation plan. Chad expressed its intention to advance and concretize the objectives set out in these two plans through an adaptation project dedicated to the protection of the most vulnerable systems in chad, namely the oases and wadis.

Figure 1 Meetings with representatives of the Chadian delegation with the OSS on the sidelines of the COP 26

After numerous stakeholders exchanges the ideas were then concretized by the Ministry of Environment, Fisheries and Sustainable Development with the support of the Woman Union for the fight against desertification (Union des Femmes pour la Lutte Contre la Désertification au Sahel "**UFLCDS**") this led to a series of well-planned and organized consultations, and field visits during September 2022, with the broad objective to identify potential beneficiaries of the climate change resilience and adaptation project, analyze local resources in order to better adapt the project development strategy and to highlight certain vulnerability criteria for resilience to climate change. The consulted stakeholders included:

i. Local communities: The local communities are involved in project design particularly in identifying problems, specific needs related to resilience to climate change, sites for project implementation and the role they play in project implementation;
ii. Local and regional Government Authorities.
iii. Government Ministries and Institutions.

Figure 2 Working meeting between OSS, Ministry of Environment and UFLCDS

Figure 3 Images of the different sites visited during the preparatory mission of this project

During the various exchanges and consultations with the key actors, including the local population, and by ensuring the active participation of women and youth, a list of criteria was adopted in order to refine the choice of the project's areas of intervention and to identify the priorities in terms of intervention, with a view to achieving tangible results from the project with a strong involvement and appreciation of the local population. key information was collected on the number of farmers in the sites, the number of spaces that can contain about 10 groups on an oasis , the rainfall in the area , the number of people concerned by the project, the food crisis in the locality and some information on the vulnerability such as the degree of exposure to climate change the potential of Reduction of greenhouse gas emissions by developing vegetable crops in the vegetable crops in the country's ouadi and oasis producing areas, the Sensitivity to change, the burning heat, the Rainfall variability, Food insecurity, Resilience to extreme events;

Figure 3 Very active participation of women in the different consultation processes

A preparatory mission for the elaboration of the Concept Note of the Chad oasis project to be submitted to the Adaptation Fund was conducted in October 2022 by OSS. This mission allowed to validate and finalise several aspects and crucial points regarding the process of elaboration of the concept note and to better sensitise the technical partners of a project in order to provide clear and accurate information. It also allowed for better sensitization and involvement of high-level decision-makers, notably the Minister of the Environment, Fisheries and Sustainable Development, the Minister of Agricultural Development and the State Counselor in charge of Agriculture and Livestock, and the Environment Counselor. As this is Chad's first project submission to the Adaptation Fund, this mission allowed for a good discussion of the Adaptation Fund's requirements in terms of project development and the next steps.


Figure 4 : Biltine Images Wadi Taouss et Langar de Bokoy


Figure 5 : Commune d'Arada


Figure 6 : Commune de Kalaït : Wadis Soukaya

Figure 7(a) : Commune de Fada : Wadis INOU

Figure 7(b) : Commune de Fada : Wadis OKOU

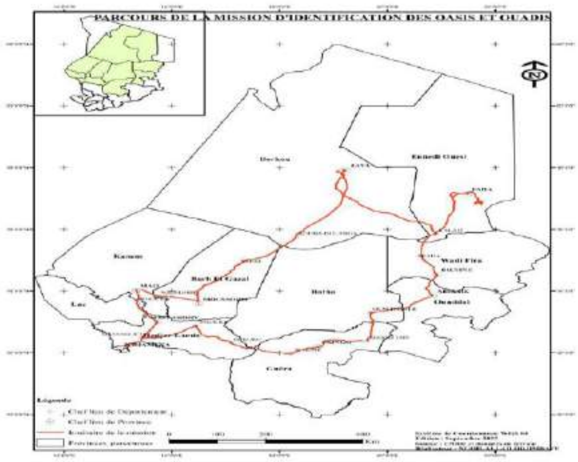

Figure 8 Map of the itinerary of visited cities

The lists of participants in these meetings are presented below:

Date : 11/10/2022
Lieu : Direction des Forêt et de la lutte Contre la Desertification; Ministère de l'eau; Conseiller à la présidence; Ministère de l'agriculture
Objet : Réunion de préparation de la Note Conceptuelle du projet portant sur les Oasis

Liste des participants

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18							
19							

Date : 12-10-2022
Lieu : ANLA
Objet : Réunion de préparation de la Note Conceptuelle du projet portant sur les Oasis

Liste des participants

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ADAPTATION FUND

Date : 13/10/2020

Lieu : ANLA

Objet : Réunion de préparation de la Note Conceptuelle du projet portant sur les Oasis

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Annex 3: Summary of the initial Gender Assessment in line with the Fund's Gender Policy

Background and purpose of the assessment

The current report on the gender assessment is a desk and consultation-based analysis of the gender situation for the Chad Republic. It is being prepared in light of the proposed project « **Reversing the degradation trend in the oases of Borkou, Ennedi West and Wadi Fira through strengthening adaptation measures and improving resilience to climate change of vulnerable communities**» that is being funded by the Adaptation Fund. The project aims to the overall objective of the project is to strengthen the resilience of vulnerable communities in Borkou, West Ennedi and Wadi-Fira through the development of adaptive capacity to recurrent drought risks and by promoting sustainable management of oases and related ecosystems. This will be done through the three components below:

- **Component 1**: Development of knowledge and strengthening of the legal and institutional framework to support the sustainable management of oasis ecosystems and the adaptation of vulnerable communities;
- **Component 2**: Implementation of concrete adaptation measures to improve the resilience of oasis ecosystems and vulnerable local communities;
- **Component 3**: Capacity building of various stakeholders, knowledge sharing and awareness raising of beneficiaries at different scales.

All the data and information gathered allows to provide a global overview of the vulnerability degree as well as the resilience to external influencing factors, in particular climatic risks. As all the data and information required for the gender analysis is not specifically available for the basin at this time, such data from the target countries, will be exploited instead. The outcome of this initial gender assessment is to make more gender-sensitive contributions throughout the project. A specific Gender Action Plan (GAP) (with clear timelines, responsible parties, indicators and budget allocations) will be developed during the preparation of the full project proposal. The GAP will ensure that project results are achieved with gender-sensitive targets, and that environmental benefits are distributed inclusively across the project activities.

This report is organized as follow: ***(i)*** Basic overview gender-related information in the countries (health, education; level of women's involvement in socio-economic and development activities and gender based violence in the countries, etc.), ***(ii)*** Gender-responsive considerations for the Project outcomes and ***(iii)*** a summary of the legal-institutional instruments and initiatives aimed at strengthening women's empowerment is also provided and ***(iv)*** Gender vis-a-vis the Project outcomes and activities.

Basic gender related socio-economic characteristics in the countries

Global indicators

Indicators have been developed to objectively compare gender parity in different countries.

- *The Gender Inequality Index (GII)* is a three-dimensional composite measure (reproductive health, empowerment, and labour) established by the United Nations Development Program in 2010. Most of the countries have improved since 2000; In 2021, the Republic of Chad was ranked 165 out of 189 with a GII index of 0.65231.
- Another similar indicator is the Gender Gap Index (GGI), calculated annually by the World Economic Forum, which highlights the gap between men and women in each country. *The Global Gender Gap* Index benchmarks the current state and evolution of gender parity across four key dimensions (Economic Participation and Opportunity, Educational Attainment, Health and Survival, and Political Empowerment). It is the longest-standing index which tracks progress towards closing these gaps over time since its inception in 2006 (World Economic Forum, 2021). **The GGI score for Chad republic is 0.579 (rank 142th out of 146) in the 2022. Figure 1** shows the situation of this indicator in the country

[31]https://hdr.undp.org/data-center/thematic-composite-indices/gender-inequality-index?utm_source=EN&utm_medium=GSR&utm_content=US_UNDP_PaidSearch_Brand_English&utm_campaign=CENTRAL&c_src=CENTRAL&c_src2=GSR&gclid=Cj0KCQjw08aYBhDIARIsAA_gb0ctkAjrxNBna7u04GQyM3B1J6Quw25kzw7ICz-MpPzxrc-rD-C6Z-oaApwZEALw_wcB#/indicies/GII

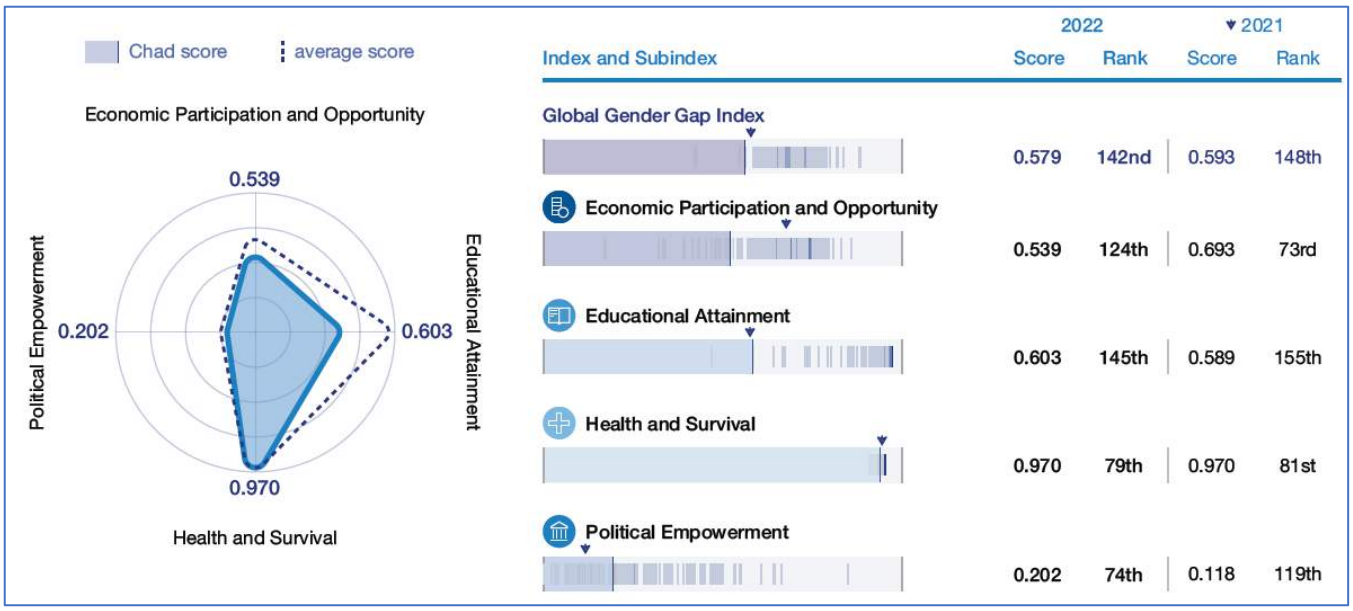

Figure 1: Scores for the four sub-indicators of the GGI for the years 2021 and 2022 (Source: WEF 2022[32])

Demography

The most recent population estimation for the country is reported in the table 1. It is estimated that an average of 50.08% of the population in the countries are women. Population structure by gender is presented in the figure below (Figure 10).

Table1: Demography characteristics in 2022 (Source: WEF, 2022)

Parameters	Value
Population (millions of inhabitants)	16.43
Density (Persons per sq. km.)	13.22
Average Annual Growth Rate (%) – 1961 to 2021	3.26
Total Fertility Rate (Births per woman)	5.65
Under 5 Mortality Rate (Per 1,000)	110
Life Expectancy at Birth, Both Sexes (Years)	55.95

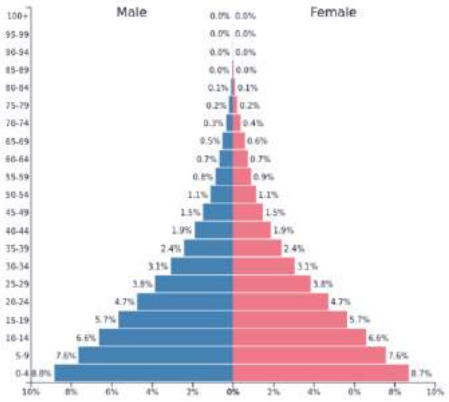

Figure 2 Population pyramid by age and gender (Source: CIA 2022)

Female headed households amount for the year 2018 is **22.1 %** (World Bank Group, 2022). Female-headed households are more common among women with higher levels of education, and while they are not always well integrated in rural areas, they are increasingly common in urban locations.

[32] https://www3.weforum.org/docs/WEF_GGGR_2022.pdf

Health

As indicated in the section above, life expectancy is quiet low compared to other African countries even a slight increase is observed during the last years. Family planning is not a common practice in Chad. Indeed, the contraceptive prevalence, considering any method (% of married women ages 15-49) is 8%[33].

Regarding the maternal mortality rates, the current highest value is 110/1000. Recent figures from the world Bank (2022) indicate that 1,140 women die per 100,000 live births due to pregnancy-related causes.

Gender consideration in education systems

Access to education for girls is currently quite weak in Chad. Population with at least some secondary education[34] is estimated at 7.7% in 2022 for female whereas for male it is almost three times higher (24.4%).

It is interesting to note that over half of the primary students are females, with numbers dropping in secondary and tertiary (**Table 2**). Female representation in tertiary education is dismally low in all the country like in several countries in the region. However, it should be noted that these figures have been growing steadily for the past 40 years.

Table 2 Female education enrolment figures for the four countries (Source: World Bank Group, 2022)

Degree	Value
Primary enrolment	83%
Secondary enrolment	14%
Tertiary enrolment	3%

Women in economic activities

According to the UN Women, some progress on women's rights has been globally achieved even some work still needs to be done to achieve gender equality. Indeed, women, especially in rural areas, still face constraints related to their position in comparison to men. They are often assigned an inferior position and this situation considerably limits their ability to engage in economic and profit-making activities. Their role is sometimes limited to providing labour for their husbands or fathers. Their access to land and credit is sometimes limited even if this situation is not supported by official laws or rules. Women in polygamous unions are often heads of households since it is each woman alone who is responsible for herself and her children with sporadic assistance from the husband[35].

Some of indicators giving an overview on women participation rate in the labour force (estimation of year 2019) in the country are presented in the table 3 below. The figures show that in the country, only half of women participate in the labor force in contrast with nearly three-quarters of men.

Table 3: Overview on women participation rate in the labour force in the country (Source: World Bank Group, 2022)

Indicators	Female	Male
Labor force, female (% of total labor force)	40.4	-
Ratio of female to male labor force participation rate (%)	67.7	-
Firms with female top manager (% of firms)	12	-
Labor force participation rate (% population ages 15+)	49.3	72.8

In 2019, the situation of **female employment** in the main activities sectors (agriculture, industry and services is as follow (World Bank Group, 2022):

- **Agriculture**: 73%;
- **Industry:** 1% and
- **Services:** 26%

Given the above described situation, the government of Chad have made significant efforts to reverse the trend. Gender equality is being considered as a driver of economic inclusion and a development goal in the country. This recognition is in line with the regional strategies and regulations which call on "Member States" to formulate, harmonise, coordinate and implement the appropriate policies and mechanisms to improve the economic, social and cultural conditions of women.

Gender-Based Violence

[33] Indicator: Women making their own informed decisions regarding sexual relations, contraceptive use and reproductive health care (% of women age 15-49).

[34] Percentage of the population ages 25 and older that has reached (but not necessarily completed) a secondary

[35] World Bank (2002). STRATEGIC COUNTRY GENDER ASSESSMENT. 35p.

Gender based violence (GBV) is an important issue in Chad as Violence against Women and Girls (VAWG) is still occurring. A survey from USAID reported that an average of nearly 70 percent of women will be victims of gender-based violence in their lifetimes in Chad. The UN Women most recent data (2018) on different forms of violence against women in the countries are reported in the **table 4** below.

Table 3 Different forms of violence against women in the four countries (Source: World Bank Group, 2022)

Form of Gender Based Violence	Rate (%)
Child Marriage (under 15 years)	29.7
Child Marriage (20 to 24 years)	60.6
Female Genital Mutilation/Cutting	34,1
Proportion of women subjected to physical and/or sexual violence in the last 12 months[36]	17.5
Lifetime Physical and/or Sexual Intimate Partner Violence	28.6

The above figures are regarded as a prevalent and critical hindering factor for human development and peace building.
In recent years, the country puts in place important legal and institutional arrangements (see Table below) to enhance the fight against gender-based violence (see section 3), though their efficacy is debatable due to a variety of reasons including lack of awareness, social stigma, etc.
Several national and international civil society organizations are active in the region with scope to fight against gender-based violence.

Gender Policy and Legislation

The **tables 5 and 6** below highlight the country stance towards key international, regional and national gender rights text.

Table 4 International protocols and frameworks ratified by countries in support of gender equality, women's empowerment and Human Rights

International
UN Declaration on Human Rights (1948)
Protocol II Additional to the Geneva Conventions of 12 August 1949 on the Protection of Victims of non-international ArmedConflict
UN International Covenant on Economic, Social and Cultural Rights (1966)
UN Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) (1979)
UN International Covenant on Civil and Political Rights
Convention on the Rights of the Child (1989)
Vienna Declaration and Program of Action from the Vienna World Conference on Human Rights (1993)
Beijing Declaration and Platform for Action (1995)
UN Security Council Resolution 1325 on Women, Peace and Security (2000)
Convention on the Rights of Persons with Disabilities (2008)
The Sendai Framework for Disaster Risk Reduction (SFDRR)
The Adaptation Fund Gender Policy AND Gender Action Plan (2021)
United Nations Framework Convention on Climate Change and its Gender Action Plan
Regional
African Charter on Human and Peoples' Rights (1981)
African Charter on the Rights and Welfare of the Child (1990)
African Union's Protocol to the African Charter on Human and People's Rights on the Rights of Women (Maputo Protocol, 2003)
Solemn Declaration of Gender Equality in Africa (2004)
Action Plan for Implementation of the Central Africa Gender Responsive Regional Strategy for Risk Prevention, Disaster Management and Climate Change Adaptation (2015)
Draft Africa climate change strategy (2020 – 2030)
The AU Gender Policy (2009)
The 2018-2027 AU Strategy for Gender Equality and Women's Empowerment (GEWE)
AU Agenda 2063 (2014)
Regional Agreement against Trafficking in Persons, Especially Trafficking in Women and Children

[36] % of ever-partnered women ages 15-49; Data is from year 2015

Table 5 National frameworks, policies, plans and programs on gender equality

Policies, plans and programs on gender equality
• The National Gender Policy (NGP) • National Strategy to Combat Gender-Based Violence • National Plan to Fight Against Trafficking and Sexual Exploitation of Minors • Law No. 19 on HIV/AIDS • Listening Center • Article 18 & 20 of the Constitution • Law on the Promotion of Reproductive Health (FGM, Early Marriage) • Legal Clinics • Campaign Against Female Genital Mutilation • Criminal Code • Diagnostic Study on Gender-Based Violence • Project for Assistance to Women and Girls Victims of Sexual Abuse

Gender vis-a-vis the Project outcomes and activities

Gender and Land

Women's rights to land ownership are guaranteed by the Chadian Civil Code and Constitution. Access to land is specifically governed by laws 23, 24 and 25 of July 22, 1967, which guarantee the right to free possession. These laws were reinforced by Law No 7 of 5 June 2012 which strengthens the capacities of rural communities in the management of natural resources and Decree No 215 of April 24, 2002 which establishes a national land observatory. Nevertheless, discriminatory inheritance practices are major obstacles to women's land ownership. According to the government this is due to social and cultural norms prevented women from accessing land and that women were further disadvantaged by their low economic status. There is currently no data on the exact gap in land ownership between men and women[37].

Water

In general, women are mainly responsible for daily water related chores, including sourcing, transporting and stocking it. They are also viewed as the main water users as they are also responsible for most daily domestic chores including cooking, cleaning, health, food processing, etc.

In certain rural area, it has been reported that men tend to be the ones with decision wielding power over water management despite women being more involved in water usage even if sometimes the election of women in key decision-making position are encouraged.

Gender and rural agricultural labor

Women play a major role in agricultural production and are responsible for subsistence farming, while men participate in both subsistence and commercial agriculture. In the pastoral sector and traditional rainfed agriculture, women play an important role. Their role specifically involves farming, primarily on household or spousal farms, where they grow crops that are largely used for family consumption (green vegetables, tomatoes, cowpeas, okra, millet, corn, etc.). In terms of the provision of labor, women and men work side-by-side in almost all the agricultural tasks on the land, while men are responsible for marketing the agricultural products.It is also reported that “in terms of agricultural and general economic activity, a woman is not solely in charge of her income. The husband has a right of inspection and management over the income of his wife and only rarely does that income serve for the personal fulfilment of the woman at home

Gender and adaptation to climate risks

The actual and potential climate risks remain a serious challenge to inclusive socio-economic development, peace, and security in the basin. They aggravate pre-existing social inequalities. Indeed, women and other marginalized groups (the elderly and/or disabled) are often the most affected by the effects of climate change and disasters such as floods because of their limited access to resources and their dependence on agriculture and natural resources for their livelihoods, which are also highly sensitive to climate variability. This vulnerable group faces many gender-specific barriers that limit their ability to cooperate and adapt to climate change. Nevertheless, women and other marginalized groups continue to be nominal stakeholders in decision-making in the implementation of projects and programs in Chad.

Under this project, actions will be put in place to reduce the damage caused by these climate risks. The implementation of the planned activities will fully involve vulnerable groups (women and marginalized groups) by adapting the intervention strategy that will respect the habits and customs of the basin populations.

The integration activities will mainly concern the involvement of women and marginalized people in the monitoring of climate risks and in the collection of data as well as the dissemination of climate information.

[37] https://www.genderindex.org/wp-content/uploads/files/datasheets/TD.pdf

Gender and ecosystems preservation, management and valorization

Component 2 which is the most important targeting adaptation measures implementation on the ground focuses on the resilience of oasis ecosystems and vulnerable local communities.

As it can be seen from the information reported above, the most vulnerable groups to climate change in the basin are women and are more impacted by the adverse effect of climate change. Indeed, a significant effort will be made to take gender into account in the implementation of these activities.

It is thus important to identify gender-sensitive strategies that respond to these crises for women to improve gender mainstreaming in these activities.

Gender and paradigm shift for climate risks management

The involvement of gender (women and marginalized groups) is essential for a paradigm shift in climate risk management in the project areas. According to Margareta Wahlström (UN Secretary General for Disaster Risk Reduction), "Countries that do not actively promote women's full participation in education, politics and the workforce will find it harder than ever to reduce risk and adapt to climate change.

In the Chad Republic, beyond social inequalities, women play a very crucial role in the education of children (and therefore of nations) and in socio-economic development. They can also help relay information to households.

Within the framework of the current project, capacity-building and awareness-raising activities on climate risk adaptation practices are planned. These activities will benefit both men and women as well as marginalized groups.

Conclusion

The climate variability and change impacts felt particularly through extreme and recurrent flooding events contribute to the exacerbation of gender-related vulnerability in the various countries. The solutions being proposed by this project will strengthen and operationalize an enabling and transformative gender environment to reduce this differentiated vulnerability, particularly of women, girls and children. The project activities implementation will necessarily include gender mainstreaming. **Therefore, in line with the Adaptation Fund procedure[38], a detailed gender assessment analysis will be carried out at the full proposal stage and a Gender action Plan (GAP) will be provided to ensure the effective involvement of women and marginalized groups in the planned activities.** To this end, a Gender Assessment is planned among the thematic studies to be carried out during the full proposal phase and a significant budget has been allocated in the PFG.

[38] **Adaptation Fund (2022).** UPDATED GENDER GUIDANCE DOCUMENT FOR IMPLEMENTING ENTITIES ON COMPLIANCE WITH THE ADAPTATION FUND GENDER POLICY. 68p

SAHARA AND SAHEL OBSERVATORY

The– Sahara and Sahel Observatory member countries are predominated by hyperarid to arid desert climates, characterized by extremes in daily high and low temperatures, with hot summers and cold winters, and little rainfall per year for semi-arid and desert regions. These regions emerge as one of the hotspots for worsening extreme heat, drought, and aridity conditions. Warming has been observed in the region since the 60s and, in the present days, temperature has recorded an even faster increase rate.

In the region, oases are the best place to live in the desert region as they have reliable water supply from lakes and springs and their microclimate allows the existence of an important vegetation diversity which, itself, is a source of great animal diversity. Besides, the presence of date palms allows the existence of other crops by acting as a windbreaker, providing shade and reducing the degree of dryness of the air, thus creating a microclimate (OSS, 2014). Also, these ecosystems can act as carbon sinks, especially when three levels of culture is applied (also called the three-level oases).

Like in other ecosystems, climate change (CC) is projected to have substantial and complex effects on oasis areas. Indeed, these changes threaten food production, pushing tens or even hundreds of millions of people to emigrate by the end of the 21st century. Also, oasis agriculture has long been the only viable crop production system throughout the hot and arid regions. CC impacts will have a negative socioeconomically impact on local populations. Based on the above, one can see that the whole region has similar oases ecosystem with little to no differences between the involved countries, and face a common threat. Indeed, the projects that OSS is intending to implement share many activities and could thus adopt a programmatic approach, based on the following:

1. **Program relevance to national priorities:**
   The involved countries won't be hindered in their endeavor of achieving their respective national priorities for their closely similar activities, would create a synergy that could fasten the achievement of their objectives of the various regional and national priorities (see concept note documents for more details).

2. **Geographical similarity:**
   All three countries belong to the same biome and thus share the same CC challenges. This implies that the required projects' activities are quite similar and could easily be part of the above-mentioned approach, thus further fastening the implementation process.

3. **Similar local administrative barriers:**
   As legislative and regulatory frameworks of the involved countries do not address the specificity of the oases areas, nor do national development plans integrate their particular needs and priorities linked to CC, a programmatic approach would therefore improve knowledge management and, as stated above, facilitate experience sharing.

4. **Similar socioeconomic challenges and terrorism threat:**
   Local communities are facing the same CC impacts and require similar assistance to improve their economic resilience in order to reach self-sufficiency. By bettering their livelihood, one tackles the root cause of for local populations to join terrorist and criminal groups. The absence of holistic and integrated adaptation and mitigation approaches may result in different forms of political and economic marginalization.

5. **Similarity to Small Island Developing States (SIDS):**
   According to UNCCD's convention, oases are regarded as SIDS in terms of CC vulnerabilities and thus require the same urgency of action in order to cope with the rapidly degrading ecosystem. Therefore, adopting a programmatic approach for the three projects would comply with this state of things as it

Hence, based on the ecological status of the oasian ecosystem, the local populations' resources and the global vulnerability to CC, integrating all the three projects into a single program will contribute to addressing several barriers and oases degradation and vulnerability main root causes at once thus saving time and effort and running implementation in a more efficient manner.

Though as each of the three projects have their own specificities and could not be merged into a regional proposal, they still harbor many similarities to be addressed with a programmatic approach.