

Strengthening rural and urban resilience to climate change and variability by the provision of water supply and sanitation in Chad

Part I: Project Information

GEF ID
10089

Project Type
FSP

Type of Trust Fund
LDCF

Project Title
Strengthening rural and urban resilience to climate change and variability by the provision of water supply and sanitation in Chad

Countries
Chad,

Agency(ies)
AfDB,

Other Executing Partner(s):
Ministry of Fisheries and Environment

Executing Partner Type

Government

GEF Focal Area

Climate Change

Taxonomy

Focal Areas, Climate Change, United Nations Framework Convention on Climate Change, Nationally Determined Contribution, Paris Agreement, Sustainable Development Goals, Climate Change Adaptation, Least Developed Countries, Mainstreaming adaptation, Climate finance, National Adaptation Programme of Action, Disaster risk management, Climate information, Adaptation Tech Transfer, Complementarity, Innovation, Livelihoods, Climate resilience, Ecosystem-based Adaptation, Community-based adaptation, National Adaptation Plan, Climate Finance (Rio Markers), Climate Change Adaptation 1, Climate Change Adaptation 2

Duration

48

In Months

Agency Fee(\$)

826,500

Submission Date

10/5/2018

A. Indicative Focal/Non-Focal Area Elements

Programing Directions	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
CCA-1	LDCF	7,399,000	10,000,000
CCA-2	LDCF	1,301,000	3,645,740
Total Project Cost (\$)		8,700,000	13,645,740

B. Indicative Project description summary

Project Objective

Strengthening rural and urban resilience to climate change and variability by the provision of water supply and sanitation in Chad

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Component 1: Mainstreaming Climate adaptation into the National water and sanitation masterplan	Technical Assistance	Outcome 1-1: Climate resilient water and sanitation masterplan prepared and adaptive capacity built	<p>Output 1-1-1: Water and sanitation masterplan updated to mainstream climate change adaptation (ii) technical guidelines for climate proofing investments in the water and sanitation sector prepared</p> <p>Output 1-1-2: Institutional capacity development to facilitate integration of climate risks in water supply and sanitation sector built (Capacity of ~than 40</p>	LDCF	250,000	610,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
			Water professionals' targeting public and private sector)			
Component 2: Improved access to climate-resilient water supply and sanitation	Investment	<p>Outcome 2-1: Increased reliability and improved quality of water supply (considering climate change induced risks in targeted areas.</p> <p>Outcome 2-2: Soil and water conservation practices undertaken by farmers/youth at selected project sites for improved source protection</p>	<p>Output 2-1-1: Production well prospecting, scheme design and construction of safe water supply systems (comprising solar powered production boreholes, reservoirs and distribution systems) for 30 unserved areas.</p> <p>Output 2-2-1: Soil and water conservation /reforestation of an estimated 1100 ha of degraded land associated with water sources (assistance to farmer/youth groups to apply forestry practices within communal and private woodlots)</p>	LDCF	7,150,000	9,845,740

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
			Output 2-2-2: Community awareness/capacity building/support services for soil and water conservation/agro forestry/etc.			
Component 3: Climate information & early warning systems strengthened	Investment	Outcome 3-1: Water Resources monitoring (including ground water and water quality) services issue timely and actionable weather, climate water quality and hydrogeological information at local levels and reduce the impact of climate risks on lives and	Output 3-1-1: (i) Expansion of weather and climate observing network (installation of 10+ meteorological monitoring stations with telemetry, archiving and data processing facilities) (ii) Expansion of ground water monitoring network (design and installation of 10+ GW monitoring stations with sampling piezometers) includes acquisition of remote sensed imagery (iii) Laboratory equipped for improved water quality monitoring (iv) development of strategy	LDCF	750,000	1,800,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
		livelihoods and improve the resilience of water supply investments in the project towns.	<p>for O & M and scaling up the climate, GW and WQ information systems</p> <p>Output 3-1-2: Tailored sector-specific early warning products that link climate, ground water, environment, socio-economic information on a range of timescales developed, based on identified user needs</p> <p>Output 3-1-2: Training of at least 20 officers to maintain and repair equipment, including cost-effective technologies to interface with existing equipment/software</p>			
Component 4: Knowledge Management and	Technical Assistance	Outcome 4-1: Lessons learned and best practices from project	Output 4-1-1: (i) Compilation of best practices on applicable technologies for dissemination and	LDCF	150,000	350,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Monitoring and evaluation		activities, capacity development initiatives and policy changes disseminated	replication by project partners with project support (ii) Knowledge based M & E system in place and operational and (iii) M & E reports and briefs prepared			
Sub Total (\$)					8,300,000	12,605,740
Project Management Cost (PMC)				LDCF	400,000	1,040,000
Total Project Cost (\$)					8,700,000	13,645,740

For multi-trust fund projects, provide the total amount of PMC in Table B and indicate the list of PMC among the different trust funds here:

C. Indicative sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
GEF Agency	African Development Bank Group	Grant	Investment mobilized	10,157,250
GEF Agency	African Development Bank Group ; RWSSI (Rural Water Supply and Sanitation Initiative), AfDB	Grant	Investment mobilized	3,488,490
Total Project Cost(\$)				13,645,740

Describe how any "Investment Mobilized" was identified

The Financing was mobilised following conclusion of the AfDB Country Assistance Strategy. The project is additional to the African Development Bank financed baseline project for water supply and sanitation in rural and peri urban communities for Climate Adaptation- Borkou, Ennedi, Mayo Kebbi, Tandjile, Logone Oriental, Logone Occidental, mandoul, Moyen Chari, salamat, Sila and Tisbesti in Chad

D. Indicative Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)
AfDB	LDCF	Chad	Climate Change		8,700,000	826,500
Total Project Cost(\$)					8,700,000	826,500

E. Project Preparation Grant (PPG)

PPG Amount (\$)

200,000

PPG Agency Fee (\$)

19,000

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)
AfDB	LDCF	Chad	Climate Change		200,000	19,000
Total Project Costs(\$)					200,000	19,000

Core Indicators at Project Identification Form (PIF)

Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment ⓘ

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	40,000			
Male	60,000			
Total	100000	0	0	0

Part II. Project Justification

1a. Project Description

Briefly Describe

- a. The global environmental and/or adaptation problems, root causes and barriers that need to be addressed;
- b. The baseline scenario or any associated baseline Programs;
- c. The proposed alternative scenario with a brief description of expected outcomes and components of the Program;
- d. alignment with GEF Focal Area and/or Impact Program Strategies
- e. Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, CBIT and co-financing;
- f. global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF); and
- g. Innovation, sustainability and potential for scaling up.

1. *Project Description.*

1-1: Adaptation problems, root causes and barriers that need to be addressed

Introduction. This PIF is for a proposed LDCF financed project on Strengthening rural and urban resilience to climate change and variability by the provision of water supply and sanitation in Chad. The project is additional to the African Development Bank financed baseline project for water supply and sanitation in rural and peri urban communities for Climate Adaptation- Borkou, Ennedi, Mayo Kebbi, Tandjile, Logone Oriental, Logone Occidental, mandoul, Moyen Chari, salamat, Sila and Tisbesti in Chad.

The entire project will be implemented in the semi-urban and rural populations of the above region and will contribute towards serving an estimated at 6,931,000 (4,787,000 direct and 2,144,000 indirect) out of 14,152,314 people (50.3% of them women) in the country (49 % of the total population of the country). The choice of the project area is justified by the increasingly variable climate, the extreme poverty level (50%), as well as the high percentage of people deprived of access to drinking water. Current access rates to drinking water are very low in the project areas. These include: Borkou-Ennedi-Tibesti (9,75%), West Mayo Kebbi (13%), Mayo Kebbi East (22%), Tandjilé (31%), Logone Occidental), Mandoul (19%), Middle Chari (37%), Salamat (28%) and Sila (19%). The

Bank is already active in four regions (Mayo Kebbi West, Tandjilé, Moyen Chari and Mandoul), through the PAEPA-CS project and intends to cover all the needs in these regions in order to reach the water SDGs by 2030.

Climate variability and change in Chad. Chad is located in Central Africa at 7-23° north of the equator, straddling the Sahel. The north of Chad extends well into the Sahara desert, whilst the south has a much wetter, and typically tropical, climate. The northern region of Chad receives little rainfall (~50mm) all year round. The southern, tropical savannah regions experience a wet season between May and October (receiving 150- 300mm per month), whilst the central sub-tropical regions have a shorter wet season between June and September (receiving 50-150 mm per month). In November and March, almost no rain falls at all. This seasonal rainfall is controlled by the movement of the Inter-Tropical Convergence Zone, ITCZ which oscillates between the northern and southern tropics over the course of a year. Variations in the latitudinal movements of the ITCZ from one year to another cause inter-annual and decadal variability in wet-season rainfall. A summary of key climate attributes is shown in Box 1 below.

Box 1: Key climate change related trends include the following

(Source: <http://sdwebx.worldbank.org/climateportal/countryprofile/home.cfm>, accessed, July 11, 2017)

EXTREMES

- The annual number of ‘hot’ nights has increased by 50 nights between 1960-2003.
- The number of ‘cold’ nights has decreased in all seasons (January-March, April-June, and October-December).
- A persistent drought in the region has contributed to increased desertification. The desert has been advancing at a rate of 3 km per year in the northern part of Chad.
- Southward shift in Sahel, Sudan and Guinean savanna vegetation in Chad over the latter half of the 20th century.
- Disruption in the normal cycle of seasons has been observed

RAINFALL

- No trend in mean annual rainfall has been determined since 1960. The period between 2000-2006 has seen abnormally high amounts of rainfall in the dry season, but no consistent trend has been detected.
- Precipitation exhibits high year-to-year and decade-to-decade variability, which are caused by changes in the movement of the Inter-tropical Convergence Zone.
- Meteorological station data in southern Chad indicate decreasing precipitation trends during the rainy season (May-October), over the period of 1951-2000.

TEMPERATURE

- Mean annual temperatures in Chad have increased by 0.7°C since 1960. The greatest rate of increase occurred in the wet season during the months of July-September at a rate of 0.36°C per decade.
- The Sahel and West Africa have experienced increasing near surface temperatures over the past 50 years.

Over the last ten years, Chad's Saharan and Sahelian zones have spread 150 km south. Likewise, Lake Chad has reduced in size from 25,000 km² in 1960 to 2,500 km² today. This reduction has considerably impacted upon crop and fish production, and forced inhabitants to move to wetter areas. (Intended Nationally Determined Contribution (INDC) for the Republic of Chad September 2015)

Irrespective of the projected frequency and intensity of floods and droughts, economic impacts are projected to increase even when the hazard remains constant because of increased exposure and vulnerability (Jiménez Cisneros et al. 2014). The main non-climate environmental pressures include population growth, deforestation, overgrazing, poaching, erosion, waste pollution (litter), soil pollution, brushfires and ground and surface water pollution ([1] <http://adaptation-undp.org/projects/community-based-climate-risks-management-chad>, accessed July 7, 2017)

In 2010, Chad's NAPA identified key vulnerabilities to climate change-induced temperature and precipitation shifts within major sectors of the economy including: agriculture, fisheries, forest resources, freshwater resources, population, transport, industry and human health, however, resources for its implementation are largely lacking. The LDCF project is focused on implementation of the NAPA priorities, in particular the reduction of the climate change related vulnerability of the populations and management of risks for inadequate water supply and sanitation (NAPA Project 10) and Improvement of the quality of seasonal forecast for rain fall and surface water flow and their integration into an overall strategy for vulnerability (NAPA project 7), mainstreaming climate adaptation into the water and sanitation masterplan (NAPA project 8) and Construction of infrastructure to protect and preserve soils for development of agricultural activities (NAPA Project 5). Activities implemented within this project will introduce approaches, that can be replicated within the sahel. The project will catalyse, the generation of social and economic benefits and lay the foundation for larger-scale projects through analytical work and capacity building.

Adaptation Problems

High Vulnerability to climate change. The Global Adaptation Index ranks Chad as one of the most vulnerable countries in the world, taking into account exposure, sensitivity and ability to cope with climate related hazards ([\[1 http://index.gain.org/ranking/vulnerability/exposure](http://index.gain.org/ranking/vulnerability/exposure), accessed July 5, 2017). Chad is faced with extreme climate events which, depending on the season and the agro climatic zone, may take the form of increasingly severe droughts or devastating floods. Vulnerability to such events is all the more critical since existing administrative structures have inadequate human and financial resources, capacities and means of action to respond. Climate change impacts are felt in agriculture, livestock breeding, fisheries, health and housing. Climate change will likely amplify hydro-meteorological disasters and reduces the predictability of water availability and quality, and increase water treatment needs. The effects are expected to be significant; droughts are likely to be the norm by 2030 leading to associated dynamics of desertification and land degradation. Coping with the impacts is a major challenge given that its negative effects are likely to be most severely felt by the poor due to their high dependence on natural resources and limited capacity to cope with the impacts of climate variability and extremes.

Decrease in rainfall and the change of its spatial and temporal distribution. Meteorological data from Agrhymet data show that there has been a decline in average annual rainfall throughout the country over the past 40 years. The median average rainfall in

N'Djamena was over 600 mm between 1950 and 1967, but under 450mm between 1968 and 1985. The 100 mm isohyet averaged about 200 km. north of Lake Chad between 1950 and 1967, but fewer than 50 km from the lake after 1968. Both the variability of the rainfall and the drop over the past thirty years have been greater in northern parts of the country than in the south. Repeated droughts have had substantial impacts on Chad's agricultural production and have affected up to 2.4 million people, like the one that occurred in 2006. Persistent drought has also aided in the acceleration of desertification in the northern part of the country, causing agro-pastoral areas to decline and livestock grazing areas to shift further south. Variations in the amount, timing and form of precipitation, have also contributed to the decreased recharge. The increased variability, in particular, has profound implications for production strategies and for natural resource degradation.

Increasing Water Scarcity. According to the NAPA (2010), there has been a general decline in flows (40-60% reduction) of the Logone Chari rivers. The loss of invaluable runoff due to non-harvested rainwater not only represents loss of natural capital but also carries opportunity costs to Chad. Such insightful implications suggest that promoting rainwater harvesting and sustainable ground water exploration and management can significantly contribute towards bridging the gap of the annual water deficit. Climate change is expected to decrease stream flow and ground water recharge and reduced annual average rainfall and run-off would aggravate desertification. CC impacts may add to existing pressure on groundwater resources by impeding recharge capacities in some areas.

Increasing exposure to floods. Flood risks are increasing as rainfall patterns have become more erratic and may become worse with climate change. Large sections of urban centers are flooded throughout the rainy season. Increases in heavy rainfall events in the southern part could lead to more flooding of the low lands, resulting in increased runoff that could affect agriculture and livestock production, cause destruction of infrastructure and have implications on siltation of water courses/lakes, deterioration of the quality of the water and waterborne diseases.

Inadequate access to water supply and sanitation. Inadequate coverage of safe drinking water and poor hygiene is a key cause of morbidity and mortality. Water supply systems in Chad, also depend on shallow groundwater aquifers which makes them vulnerable because drops in the level of the water table can render the wells dry. Chad has a high prevalence of endemic diseases such as malaria, and suffers from epidemics of cholera, measles, and meningitis. A heavy burden of communicable diseases and nutritional deficiencies reduces the populations productivity, their quality of life and their life expectancy. No formal sewerage systems exist in Chad. Most households in rural areas have no toilets (88.5% use the outdoors) and no systems for the disposal of human waste, solid waste, and waste water (PRSP 2010). In addition to naturally occurring contamination, groundwater quality is at a risk from improper sanitation systems. Climate change threatens to aggravate waterborne diseases through extreme events, increasing the population's

susceptibility. Extreme temperatures could also lead to water stress, increase in respiratory diseases, high consumption of water and increase of evaporation and evapotranspiration (NAPA 2010). These impacts may have significant consequences for achieving SDG 6 of ensuring universal access to water and sanitation.

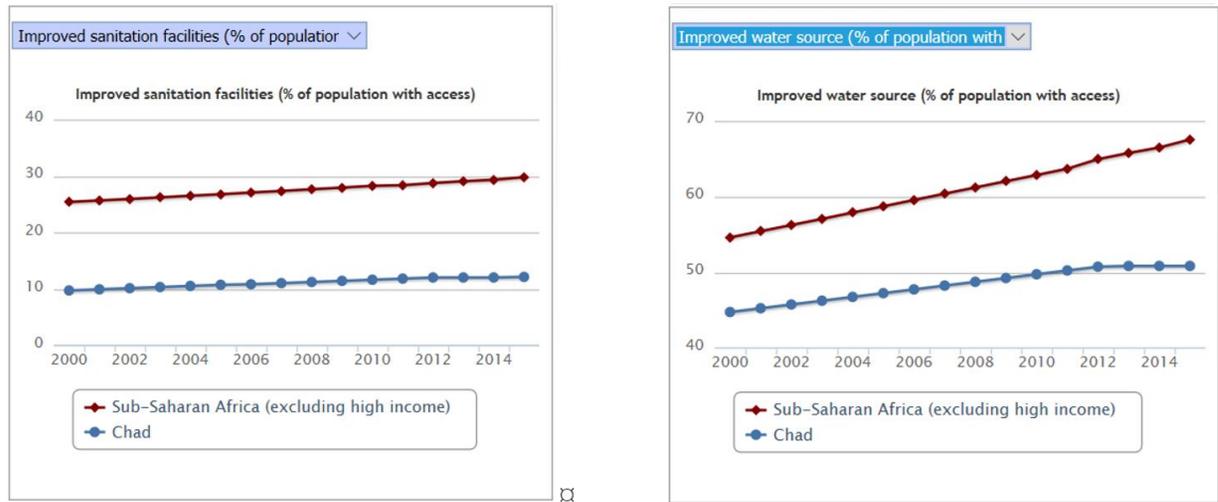


Figure 1: Trends in Vulnerability indicators related to water supply and sanitation

The Fifth Assessment Report (IPCC 2014, 15) also notes: that Climate change is projected to reduce raw water quality and pose risks to drinking water quality even with conventional treatment, due to interacting factors: increased temperature; increased sediment, nutrient, and pollutant loadings from heavy rainfall; increased concentration of pollutants during droughts; and disruption of treatment facilities during floods.

Increasing land degradation. Deforestation has led to a decrease in groundwater recharge and an increase in surface water runoff; which in turn leads to soil erosion and flooding downstream. Strong winds amplify the silting up of the village wells, lakes, rivers and cultures, the formation of dunes, storms of dust, dry mist, the outbreak of respiratory, cardiovascular, diseases (NAPA 2010). All of

these factors intensify the competition between livestock herders and farmers for the use of arable land and pasture resources. Silting up of the different rivers such as the Chari, Logone, Mayo Kebbi and others has been another effect of land degradation.

Current and future impacts of climate change on water supply and sanitation systems make adaptation urgent. Without adaptation, the negative effects of climate change will undermine years of development in Chad. Effective adaptation planning –in the context of this project and in particular for an increase in intensity and frequency of droughts, floods and severe storms requires (i) reduced vulnerability of people, livelihoods, physical assets and watersheds to the adverse effects of climate change, (ii) improved climate monitoring and early warning systems and (iii) Strengthening institutional capacities for effective climate change Adaptation.

Underlying causes

The underlying causes of Chad’s vulnerability to climate impacts are primarily socio-economic: high population growth and poverty rates with increasing inequalities inadequate access to basic social services, high illiteracy rate, low per capita income, food insecurity, a heavy dependence on natural resources, unclear land tenure, lack of effective governance, inadequate investment in infrastructure and inadequate policy or legal framework and environmental degradation.

Widespread Poverty. The relationship between poverty and environmental degradation is strong in the Chad with arid conditions coupling with human pressures such as unsustainable agricultural practices (PRSP 2010). The majority of the population has a low standard of living, shown through their high levels of inequality, poor housing, low standard of health, high infant mortality rate, high levels of malnutrition, lack of overall education (The net enrolment rate is 65.6% completion rate is 37% (including 28% for girls) in 2013) and high poverty levels. Maternal mortality which is still high (declined from 1,080 to 860 deaths per 100,000 live births between 2004 and 2014). High poverty levels in Chad are shown through its high poverty headcount at national poverty line with 55% of the population below the poverty line. All of these factors contribute to the low standard of living which is a result of Chad's lack of growth and development (<http://chadadevelopingnation.weebly.com/economic-development.html>, accessed July 4, 2017). More than 80% of the rural population is poor with 95% in rural areas of the target regions. Poverty is expected to increase due to declining access to water and decreasing agriculture productivity. Measures to tackle the environmental issues are limited by poverty.

Demographic challenges. Population growth means more water demand – at its worst in water-scarce areas. Population growth also means more pollution – at its worst where sanitation coverage is low. The population of Chad is projected to double by 2050. Chad also hosts an estimated 400,000 refugees and 100,000 internally displaced people according to a report by OCHA in June 2016 (i.e. close to 5% of the population), following the conflicts in neighbouring countries (Libya, Sudan, RCA, Nigeria). The vulnerability is

exacerbated by additional pressure on natural resources (land, water etc.) and additional demand for basic social services (water and sanitation, health, education, etc.), increasing the risk of inter-community tensions. This situation also diminishes the available water resources per capita, and adds to water stress. Current population trends and patterns of water use versus water availability show that Chad will exceed the limits of its economic usable, land-based water resources before 2025. Climate change will add both complexities and costs to addressing water sector challenges.

Degradation of natural systems. Land degradation plays a large role in the onset of flood events and contributes to agricultural drought as soils lose their capacity to store water for later release, either to streams/ evapotranspiration. Climate change is expected to increase the vulnerability of communities in the watersheds through higher-intensity rainfall and greater frequency of floods, landslides, and wildfires. Climate change is also likely to increase sediment loads in rivers through soil erosion processes coupled with land use changes. (World Bank 2014). Integrated land use management to address the impact of climate change is crucial.

Low institutional capacity. Planners in key sectors lack the means, information and systems to integrate climate change risks and concerns into decision-making processes. With Chad having recently undergone a civil war in 2010 and with rebuilding efforts well underway, increasing institutional capacity to cope with climatic change and variability would be timely.

Inadequate investment in water infrastructure. Economic growth in Chad will likely increase water demand for all uses, including energy, industrial activity, and food production from larger and wealthier populations. Rural areas are most at risk from climate change due to under investment in surface and ground water development, because that's where most of the population, and most of the poverty, is found. However, urban areas are not safe either, as the country's growing cities struggle to accommodate the arrival of new residents. In the event of floods, as happened in 2010, 2011 and 2012, the infrastructure cannot cope and untreated sewage could infect the water supply, creating a high risk of infectious diseases such as cholera.

Sparse and deteriorating hydro meteorological systems. Chad suffers from a shortage of timely and reliable information regarding the different components of vulnerability, resilience and adaptation. *Chad's* NAPA(2010) notes that there is still poor understanding of climate change and variability and hence inadequate adaptation measures currently in place in the country.. It is necessary to strengthen the capacity of the National Departments to provide efficient, timely and reliable weather and climate information especially at local level. This project aims in part at strengthening the surface and ground water monitoring systems through improving capabilities to generate and use climate information in the planning for and management of climate induced hazard risks.

Long-term solution and barriers to achieving it:

Strengthening the resilience of Chad communities will require a step change in current practices. The government of Chad has through the National Plan for development 2017 – 2021, prioritized actions along three axes (i) creating peace in Chad through regional/international engagement (ii) ensuring access to water and health, housing, energy and mobility for its citizens and (iii) strengthening Chad economically and environmentally. In its NAPA (2010), the government has prioritized policy efforts related to climate adaptation efforts in the following key sectoral areas:

(i) *Strengthening Water Resources Information Systems.* Data, information and knowledge are necessary for establishing climate change impacts, as well as for planning and designing adaptation measures. The government of Chad is providing support to the development of information systems to be used for the elaboration of national and national plans, programs designs, and for generating data for M&E activities for decision-making. Systematic hydro-meteorological, ground water and water quality data collection is needed to establish early warning systems for wind storms, drought, ground water pollution and other hazards, delivering reliable information to farmers, and increasing accessibility and reliability of agriculture insurance products.

(ii) *Strengthening access to safe water and sanitation services.* Water supply and sanitation (WSS) is vulnerable to projected changes in mean climate conditions such as mean temperature and rainfall, projected changes in climate variability, as well as projected changes in the frequency and intensity of extreme weather events (ADB, 2016). Building resilience of WSS to climate change impacts requires increased coverage and more resilient infrastructure as well as climate-responsive planning, management and governance of supply options. The government of Chad has prepared a 2003-2020 Water and Sanitation Master Plan for Chad (SDEA). The aim is to contribute to growth by expanding access to drinking water and sanitation in a manner consistent with the protection of ecosystems. The SDEA calls for supplying drinking water to about 225 settlements with more than 2,000 inhabitants, to drill approximately 12,000 boreholes equipped with manual pumps (PMH) and 2,000 modern wells in the sector not under concession, to serve roughly 5.2 million inhabitants.

(iii) *Capture of surface water for agriculture and provision of food for livestock.* Climatic crises such as droughts have led to large migrations of livestock herders throughout the country. The government has prioritized investments in climate resilient infrastructure such as storage reservoirs; provision of water points along routes and strengthening of the legal and regulatory framework by including provisions in the Water Code concerning the various pastoral and agro-pastoral uses

There are however, significant policies, institutional, financial, technological and informational barriers that prevent timely adaptation to climate variability in Chad. These barriers include the following:

- (i) *Barrier # 1: Inadequate legal, policy and institutional framework, for mainstreaming climate adaptation in water resources programs (NAPA 2010).* Institutional arrangements for regulation of surface and groundwater resources are inadequate. Integration of the NAPA into national policies and sectoral development remains a challenge. Without sustainable systems, including technical competencies to generate information on climate change risks and associated economic impacts, integrated climate resilient policy formulation is constrained.
- (ii) *Barrier # 2 Weak knowledge base on climate impacts, risks and opportunities.* Communities in Chad are not aware of climate risks and have not incorporated climate change impacts into their development planning (NAPA 2010). The knowledge base which could be used to assess the trends in water stress is inadequate. Climate risk information and knowledge are also not disseminated as needed to enable communities to cope with the adverse of climate changes. There is no learning system in place to capture, codify and inform scaling up efforts. Consequently there is limited public awareness of; i) climate change impacts; ii) adaptation measures to combat climate change; and iii) how human interaction can either diminish or exacerbate CC impacts.
- (iii) *Barrier # 3: Limited adaptive capacity to address future climate events.* Inadequate capacity for weather forecasting and related activities undermine the ability of the meteorological department to provide adequate support information to other sectors of the economy so that they can adapt to impacts of climate change. There is also limited dissemination of forecasts. Further, human resources capacity to process data and develop early warning packages, require recurrent income streams and annual budgets, which are inadequate.
- (iv) *Barrier # 4. Poor coordination of climate change adaptation initiatives (NAPA 2010).* Climate change being a cross sector issue calls for effective coordination of actions towards addressing it. There is hardly any effort to coordinate integration of climate change adaptation and mitigation actions in lower government development planning process. If they exist they are adhoc, responding to climate change impacts and disasters which have already happened and destroyed property and lives. This could partly be attributed to limited awareness on climate change issues and also lack of implementation of the NAPA and associated weak linkages between national level institutions working on climate change and local government stakeholders.

(v) *Barrier # 5. Climate change vulnerability and gender inequality.* Gender inequality is a key barrier to addressing climate adaptation in the rural communities in Chad. At household level in most Chad societies, women are charged with fetching water, cooking food, house keeping, caring for the children, the old and the sick among other household chores. Impacts of climate change manifesting as drying of rivers, springs and bore holes means that they have to move longer distances to look for water. Integration of gender equality through adaptation actions that target both men and women is key to attaining project objectives.

The proposed LDCF project will address these barriers that prevents the reduction of vulnerability of the water supply and sanitation systems to climate change impacts in an effective and sustainable manner. These barriers will be addressed within the context of a broader programmatic approach, following priorities in the NAPA (2010).

1-2: Baseline scenario or any associated baseline projects

There are several Government, UN and other development partner supported projects that form the baseline for the proposed LDCF project. These initiatives include ongoing measures to improve water management systems with particular focus on water supply and sanitation and water use. The underlying policy for these investments is the National Plan for development 2017 – 2021.

Previous interventions by the African Development Bank Group

The portfolio of active projects financed by the AfDB by September 30, 2016, includes seventeen (17) operations with a total commitment of UA 217,73 million. The distribution of the amounts approved by sector is as follows: water and sanitation (9.19%); Electricity (0.57%). Agriculture and natural resources (25,61%); Transport (93,39%) and; Governance (25.24%). Projects financed by the Bank during the period 2008 - 2017 include the following:

- National program of water supply and sanitation in rural areas (PNAER); 16,22 million UA (2006 to 2011).
- Supply of drinking water and sanitation in the secondary centers (PAEPACS) 22,58 million UA (2013 to 2018).
- Water supply, Sanitation and Electrification of 15 secondary towns (PAEPAE), UA 11.23 million (2008-2009).

- Inventors of the hydraulics (PIOH) works for an amount of 376, 000 UA (2008-2011).

Sectoral strengths and constraints noted during implementation of the above projects and taken into account during formulation of the baseline project are shown in box 2 below.

BOX 2: SECTORAL STRENGTHS AND WEAKNESSES

Sectoral strengths noted during the implementation included: the adoption of a master plan of water and sanitation (2003-2020) which is aligned with the national policy of water for various subsectors and the willingness by communities to finance and manage community-based water supply and sanitation systems.

Sectoral constraints included: multiplicity of actors and weak coordination between the various stakeholders; weak national private sector; mismatch between the financial, material and human resources and the needs of the sector; low ownership of the works by the decentralized authorities and unavailability of the matching funds from the State. With respect to sanitation, identified constraints include: lack of clear policy/strategy for management, operation and transfer; inadequate water treatment stations for industrial waste; and inadequate implementation of policy frameworks.

Baseline Scenario

The baseline intervention is the *Water Supply and Sanitation in Middle Semi Urban And Rural of 11 towns (2017-2022)*, to be financed by the African Development bank group. The baseline project is in line with the objectives of sustainable development of Chad, which are to improve the rate of population access to drinking water from 52% in 2015 to 95% in 2030 and the rate of access to sanitation services from 16% in 2015 to 50% in 2030. The program is in line with the Bank priority High Five of “Improve the quality of life for the people of Africa”

Specific Objectives: The program goal is to contribute to the improvement of the quality of life of the population through the provision of water supply and sanitation by the year 2030. These include the improvement of drinking water and sanitation needs

targeting 95% and 50% of the more than 6 million inhabitants in semi-urban and rural areas of eleven (11) prefectures in North, South and East of Chad, namely: Borkou-Ennedi-Tibesti, Mayo Kebbi, Tandjilé, Logone Oriental, Logone Occidental, Mandoul, Moyen Chari, Salamat and Sila.

Program Cost and Financing Arrangements: The cost of the PAEPA SU MR is estimated at UA 97.23 million The cost of the first phase is estimated at UA 44.37 million (implemented over a five-year period starting in 2018). A second phase, estimated at \$ 52.87 million, will be carried out from 2023-2028.

Component A-Development of Drinking Water and Sanitation Infrastructures: (cost = UA 36.20m or 81.60%):

Construction of 164 solar powered production boreholes, reservoirs and distribution systems including 15 by semi-urban center; Construction of 1000 PMH (wells equipped with hand pumps); Construction 88 mini solar powered micro irrigation systems for market gardening and agro forestry ; Construction of 238 public latrines (schools, health centers, markets, and bus stations); Installation of 22 piezometers; Contracting of service provider for the Information - Education - Communication (IEC) and Management structures of the water points and latrines.

Component B- Capacity Strengthening of the (UA 1.44m, or 3.24%)

Strengthening of the Directorate of Water and Sanitation (DGEA) including: Acquisition of eleven (11) vehicles; Acquisition of (22) computers and accessories for makers of antennas; Acquisition of (22) kits of reagents for water quality control; Acquisition of the material for the conditioning of the samples; Training of 16 extension workers; Training and equipment (607) for craftsmen (including one for 10 villages) and update of the water and sanitation master plan (SDEA) 2018-2028. Other activities include: the Organization of two (02) national workshops for validation of the results of the studies; (ii) the Organization of a Round Table of donors for the mobilization of resources and (iii) dissemination outcomes at the national and international levels.

Component C – Climate Change related activities: (cost = 3, 26 UA million or 7.34%)

Support for youth (cost = 0,856 MUC) including: (i) the training and equipping of 2200 young (200 per region) for the quarrying (sand, gravel, backfill, rock, etc.); (ii) the training and equipping of youth for the collection and sorting of plastic waste and solid waste; (iii) the equipment and the training of (22) associations of youth for reforestation; (iv) training of water user associations (88No); (v) the contracting of a provider for training, coaching and follow-up the activities selected for youth in targeted areas.

Support for women (cost = 2.41 UA million) including: i) the training and equipping of sixteen (22) women's associations for the management of latrines improved in markets and bus stations. (ii) delivery of drying racks (22 000 m2 of which 2000 m2 per region) of vegetable products and agricultural areas equipped with solar ovens; (iii) training (exchange tour to Burkina Faso) and equipping 44 women associations for management of solid waste; (vi) training of private sector water supply operators and; (vii) contracting of an implementation service provider for the Organization, training, coaching and follow-up of activities selected for support to women in the targeted areas.

Project management: (cost = 3,47UAmillion or 7,82%): (i) the strengthening of the current PAEPA-CS team by a team comprising an environment management, Sanitation, and Financial management specialists.

1-3: The proposed alternative scenario with a brief description of expected outcomes and components of the Program;

Proposed alternative Scenario (LDCF project)

Proposed LDCF project will increase the resilience of the baseline project and the livelihoods of local communities to climate change-induced hazards and long-term climatic change. The strategy will be to (i) Reduce vulnerability (ii) Increase Adaptive Capacity and (iii) enhance transfer of Adaptation Technology. Measures proposed under this project (aligned to the NAPA) include the following:

Measure	NAPA Priority	LDCF Objectives
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Mainstreaming Climate adaptation into the updated water and sanitation masterplan	NAPA project 8: National observatory for climate change adaptation policies	Objective 3: Foster Enabling Conditions for Effective and Integrated Climate Change Adaptation
Enhancing the capacity of hydro-meteorological system for delivery of more effective and targeted of climate information including early warnings. Also includes enhancing the water quality management network	NAPA project 7: Improvement of the quality of seasonal forecast for rain fall and surface water flow and their integration into an overall strategy for vulnerability	Objective 1: Reduce Vulnerability and Increase Resilience through Innovation and Technology Transfer for Climate Change Adaptation
Improve monitoring and evaluation and adaptive management	NAPA project 4 :Improvement of the information, education and communication for climate adaptation	Objective 1: Reduce Vulnerability and Increase Resilience through Innovation and Technology Transfer for Climate Change Adaptation
Enhanced access to safe water supply and sanitation among vulnerable communities in disaster prone areas and to strengthen community awareness on health impacts due to climate change	NAPA Project 10 on Reduction of the climate change related vulnerability of the populations/ management of risks	Objective 2: Mainstream Climate Change Adaptation and Resilience for Systemic Impact
Reduction of watershed degradation and water source protection	NAPA Project 5: Construction of infrastructure to protect and preserve soils for development of agricultural activities;	Objective 2: Mainstream Climate Change Adaptation and Resilience for Systemic Impact

Four components have been designed to make the baseline project climate-resilient, and to address priority needs as identified in the National Adaptation Programme of Action. Components 1 and 2 relate directly to the baseline intervention; whilst components 3 and 4 add weather and water resources monitoring and knowledge management to enable efficient, climate-resilient water management.

Component 1: Mainstreaming Climate adaptation into the updated water and sanitation masterplan

Justification: Climate impacts may not be the most important constraint on development objectives of the water and sanitation sector in Chad, but climate considerations need to be embedded in a planning process that considers all risks. Water abstraction, treatment, and distribution infrastructure as well as water resources availability and quality are highly vulnerable to the impacts of climate change. These impacts will have consequences for the design, construction, location, and operations of water supply and sanitation infrastructure. The process of climate proofing investment projects aims both at assessing the climate risk to a project's future costs and benefits and at undertaking a technical and economic analysis of options to alleviate or mitigate those risks. Inadequate attention to these impacts during the project preparation phases will increase the long-term costs of these investments, reduce their performance and increase the likelihood that such investments will fail to deliver their intended benefits.

Scope: LDCF funds will be used to support mainstreaming of climate adaptation ranging from policy and cutting across the project cycle, during the update of the Chad National Water and Sanitation Masterplan. This is a prerequisite for enabling climate smart investment. Accounting for climate change at the outset of the project cycle does imply that decisions about project design and the adoption and timing of climate-proofing measures be informed with the possible impacts of climate change in the initial phases of the project cycle and that decisions of an irreversible nature be avoided. The component is consistent with NAPA project 5: Improvement of the information, education and communication means for adaptation to climate change.

Outcome 1-1: Climate resilient water and sanitation masterplan prepared and adaptive capacity built

Output 1-1-1: (i) Water and sanitation masterplan updated to mainstream climate change adaptation (ii) technical guidelines for climate proofing investments in the water and sanitation sector prepared (step-by-step methodological approach to assist project teams in managing climate risk in the context of WSS investment projects)

Output 1-1-2: Institutional capacity development to facilitate integration of climate risks in water supply and sanitation sector built (Capacity of an estimated 40 Water professionals targeting both public and private sector)

Component 2: - Improved access to climate-resilient water supply and sanitation

Component 2-1: Increased reliability and improved quality of water supply (considering climate change induced risks) in targeted areas.

Justification: Water supply and demand in Chad is highly dependent on future changes of temperatures that may adversely affect evapotranspiration rates at water storage location, as well as changes in rainfall patterns that may adversely affect surface and ground water quantities as well as leading to drought in areas that practice rainfed agriculture. The principle outcome will be: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas.

Scope: Under this component, LDCF resources will be used to finance physical measures comprising borehole prospecting and drilling, storage, conveyance and distribution will be implemented in the towns and peri urban areas for 30 rural growth/peri urban centers. The LDCF funded activities will be undertaken in the prefectures of Borkou, Ennedi, Tibesti, western Logone and eastern Logone. The component is consistent with the NAPA Project 1 on Reduction of the climate change related vulnerability of the populations/ management of risks.

Outcome 2-1: Increased reliability and improved quality of water supply (considering climate change induced risks) in targeted areas.

Output 2-1-1: Production well prospecting, scheme design and construction of safe water supply systems (comprising solar powered production boreholes, reservoirs and distribution systems) for 30 unserved areas. It will include interventions to increase access to safe water supply to an estimated 100,000 people (ii) strengthened community awareness on health impacts due to climate change.

Component 2-2: Reduction of watershed degradation and water source protection

Justification: Changes in watershed vegetation may alter the recharge of groundwater aquifers and change the quantity and quality of runoff into surface waters. This may also cause operational challenges to aquifer storage and recovery and water reclamation facilities. It is essential to ensure the long term availability and improved quality of water supply through enhanced source protection (e.g., supporting water resources management activities and other measures to protect and rehabilitate catchment areas).

Scope: LDCF funds will be used to support soil and water management through participatory planning/monitoring and contributing in building the long-term resilience of selected communities. This is aimed at improving and better integration of watershed planning and management in response to climate uncertainty and impacts. This will aid in protection aquifers against pollution through appropriate land-use, effluent discharge and waste disposal practices. The LDCF funded activities will be undertaken to protect planned water source points in the prefectures of Borkou, Ennedi, Tibesti, western Logone and eastern Logone. This intervention is consistent with NAPA Project Priority 6: Construction of infrastructure to protect and preserve soils for the development of agricultural activities.

Outcome 2-2: Soil and water conservation practices undertaken by farmers/youth at selected project sites for improved water source protection

Output 2-2-1: Soil and water conservation/agro forestry/conservation agriculture of an estimated 1100 ha of degraded land associated with water sources (assistance to women/farmers/youth groups to apply forestry practices within their land) and financing campaigns to plant forest trees in communal and private woodlots)

Output 2-2-2: Community awareness/capacity building/support services for soil and water conservation/agro forestry/etc.

Component 3: Climate information and early warning systems strengthened

Justification: Rural populations in Chad are particularly concerned by the variability of precipitation and ground water quality and flows where the performance of their production systems depends on the climate. Changes in nature of rainfall pattern will likely lead to inadequate infiltration/groundwater recharge resulting in reduced flow and/or yield of water. A seasonal forecasting system exists controlled by a consortium (ABN-AGRHYMET-ACMAD). However the system doesn't provide information on the temporal distribution of the rainfall. This calls for a strengthened weather, ground water and water quality information system in the project towns and associated watersheds in order to provide early warning of potential threats to aquifer and groundwater supply quality. The component is consistent with NAPA project 8 on improvement of the quality of seasonal rainfall forecasts for rain fall and surface water flow and their integration into an overall strategy for vulnerability.

Scope: LDCF funds will be used to enhance the capacity of water resources monitoring system for predicting climatic events and associated risks and delivery of effective/targeted of climate information including early warnings. The ground water and water quality monitoring network will be specifically improved. The aim of the ground water monitoring system will be to (i) to facilitate the early warning of the onset of groundwater pollution from a given activity and allow the timely introduction of any necessary

control measures (ii) to provide advance warning of the arrival of polluted water at important groundwater supply sources and thus make provision for treatment and (iii) to identify any contamination reaching an aquifer from a potential major pollution source and thus take early remedial action. The project will consider the use of remote sensing—satellite imagery to provide objective baseline measurements at potentially large scales, with quasi-continuous cover per km² water flow and integration into a national strategy for vulnerability.

Outcome 3-1: Water Resources monitoring (including ground water and water quality) services issue timely and actionable weather, climate water quality and hydrogeological information at local levels; reduce the impact of climate risks on lives and livelihoods and improve the resilience of water supply investments in the project towns.

Output 3-1-1: (i) Expansion of weather and climate observing network (installation of 10+ meteorological monitoring stations with telemetry, archiving and data processing facilities) (ii) Expansion of ground water monitoring network (design and installation of 10+ GW monitoring stations with sampling piezometers) includes acquisition of remote sensed imagery (iii) Laboratory equipped for improved water quality monitoring (iv) development of strategy for O & M and scaling up the climate, GW and WQ information systems

Output 3-1-2: Tailored sector-specific early warning products that link climate, ground water, environment, socio-economic information on a range of timescales developed, based on identified user needs

Output 3-1-2: Capacity built. Activities include: Training of at least 20 officers to maintain and repair equipment, including cost-effective technologies to interface with existing equipment/software

Component 4: Knowledge management and monitoring and evaluation

Justification: Knowledge and experience of the approaches applied in the project will help Chad to better cope with similar urban and rural water supply challenges. Dissemination and replication of good practices and successful approaches would be essential in facilitating adoption of climate resilient water and sanitation practices in the Chad and the wider sahel region which is arid in nature. This component also involves the implementation of a participatory M&E system to monitor effects of the project on the investments and livelihoods. It is in line with NAPA project 5: Improvement of information, education and communication means for climate adaptation.

Scope: Includes (i) creation of public awareness of climate risk (Improving access to and dissemination of easy-to-understand and locally relevant climate information) and (ii) having in place an effective and resourced M&E framework, that will ensure that lessons are learnt, management decisions are taken based on relevant and up-to-date information, and regular progress reports are available for concerned parties.

Outcome 4-1: Lessons learned and best practices from pilot activities, capacity development initiatives and policy changes are disseminated. The planned project will promote and enhance climate change education, public awareness and capacity development through communication, training, information and knowledge management

Outputs 4-1-1: (i) Compilation of best practices on applicable technologies for dissemination and replication by project partners with project support (ii) Knowledge based M & E system in place and operational and (iii) M & E reports and briefs prepared

1- 4: Alignment with GEF Focal Area and/or Impact Program Strategies-LDCF eligibility criteria and priorities

The focus of the project on improving the resilience of water resources impacts of climate change is within the priorities of the LDCF programming paper and decision 5/CP.9 which recognizes the special challenges in the water sector in the context of climate change. Chad meets all three eligibility criteria of the LDCF. Chad is classified as a least developed country (LDC) due to its low income, weak human assets and high economic vulnerability. Chad is a party to the UNFCCC. Chad ratified the UN Convention on Climate Change (UNFCCC) in 1993 and the Kyoto Protocol in 2009 and is classified among the non-Annex 1 parties. By ratifying both the UNFCCC and the Kyoto Protocol, Chad is committed to the implementation of policies/measures designed to adapt to climate change and to manage existing climate risks, including enhancing preparedness and response capability to likely disasters. In implementing priority interventions identified in the NAPAs, the project is consistent with the Conference of Parties (COP-9) and also satisfies criteria outlined in UNFCCC Decision 7/CP.7 and GEF/C.28/18. The project approach also recognises the linkage between adaptation and poverty reduction (GEF/C.28/18, 1(b), 29) and is aligned with the scope of expected interventions in the LDCF programming paper and decision 5/CP.9. The NAPA project profiles that serve as a basis for this proposal include:

- Project priority 4 :Improvement of the information, education and communication means for adaptation to climate change
- Project Priority 5: Construction of infrastructure to protect and preserve soils for the development of agricultural activities;

- Project priority 7 on Improvement of the quality of seasonal forecast for rain fall and surface water flow and their integration into an overall strategy for vulnerability
- Project priority 8: National observatory for climate change adaptation policies and
- Project priority 10 , Reduction of climate change related vulnerability of the populations/ management of risks.

Through the above priorities, the project will respond to these challenges that are most relevant to an increasingly water-stressed country such as the Republic of Chad.

Consistency with the GEF focal area strategies. The project is consistent with the GEF 7 programming strategy on adaptation to climate change for the LDCF and the SCCF and Operational improvements (2018 to 2022) and contributes towards strengthening of resilience and reducing vulnerability to the adverse impacts of climate change in Chad. It also supports efforts to strengthen adaptive capacity. Within the Focal Area Strategy, this project addresses the three Climate area focal area objectives.

- *Objective 1: Reduce Vulnerability and Increase Resilience through Innovation and Technology Transfer for Climate Change Adaptation* (through enhancing the capacity of hydro-meteorological system for delivery of more effective and targeted of climate information including early warnings. The component also includes enhancing the water quality management network and through Improving monitoring and evaluation and adaptive management and provision of additional groundwater and rain gauges, and water quality information that improves access to information, together with appropriate training at local and national levels for staff to use that information for effective early warning.
- *Objective 2: Mainstream Climate Change Adaptation and Resilience for Systemic Impact* (through Enhancing access to safe water supply and sanitation among vulnerable communities in disaster prone areas, strengthening community awareness on health impacts due to climate change and through reduction of watershed degradation and water source protection measures)
- *Objective 3: Foster Enabling Conditions for Effective and Integrated Climate Change Adaptation* (enhancing adaptive capacity through updating the national water and sanitation masterplan, to address climate change. Training and awareness raising of climate-resilient Water, Sanitation and Hygiene (WASH) will also contribute to building adaptive capacity at the local level.

AfDB's comparative advantage and policy fit. Water supply and sanitation (WSS) is an important sector of investment supported by the AfDB and is in line with the Bank's High Five pillar 5 on "Improve the quality of life for the people of Africa". Expanding access to clean water and better sanitation is a strategic priority for the Bank. With a strong emphasis on rural communities and small and medium-sized towns, the Bank is providing sustainable water and sanitation services to the most underserved areas in Africa like Chad. The Bank has in particular implemented projects in Chad and is able to build upon previous lessons from Project Completion Reports. At national level, the Bank is the leader of the Committee of the PTF and participates in the thematic group on "Water and sanitation" through quarterly meetings. The Bank has significant experience working on water supply, sanitation and climate adaptation in Chad. The projects include (i) National program of water supply and sanitation in rural areas (PNAER) for 16,22 million UA (ii) Supply of drinking water and sanitation in the secondary centers (PAEPACS) 22,58 million UA (iii) Supply of drinking water, sanitation and Electrification of 15 secondary towns (PAEPAE), UA 11.23 million and (iv) Inventors of the hydraulics (PIOH) works for an amount of 376 000 UA. This experience provides the Bank with significant advantage in implementation of this project.

1-5: Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTE, LDCF, SCCF, CBIT and co-financing

Additionality. The aim of the project is to ensure that interventions within the baseline AfDB project (in the same project locations) are climate-resilient. Consistent with priority adaptation strategies identified by the Chad NAPA, LDCF funds will cover additional costs of increasing the resilience of the communities in the project area from climate variability and risks through: hard infrastructure, through incorporating climate change into the national water supply and sanitation masterplan, and using the local WASH committees to disseminate awareness of climate change and how to use water efficiently and plan for improved ground water management through strengthening the weather and ground water based monitoring, information, and early warning systems. Mapping of the groundwater resources and installation of ground water monitoring stations will enable certainty in siting of ground water wells which would not dry out during extreme dry weather events.

The additionality under the proposed LDCF funded activities is mainly related to baseline Project Component A-Development of Drinking Water and Sanitation Infrastructure. The baseline scenario (section 1-2), describes the 'business as-usual' development of water sources with no consideration of the likely implications of long-term climate change.

The alternative scenario (section 1-3) to be financed by the LDCF fund describes key outcomes that explicitly address climate change concerns. Components 1 and 2 relate directly to the baseline intervention whilst components 3 and 4 add weather and water resources monitoring and knowledge management to enable efficient, climate-resilient water management. Additionality related to component A therefore include:

- *Mainstreaming adaptation into sectoral programmes, through updating of the water supply and sanitation masterplan, development of technical guidelines for climate proofing investments in the water and sanitation sector and building adaptive capacity (outcome 1-1).* The additionality will enable the optimized use of up-scaled resources and shift them towards a climate-resilient development pathway for the water and sanitation sector in Chad.
- *Increasing water supplies to combat drought.* This is mainly through outcome 2-1, on increased reliability and improved quality of water supply (considering climate change induced risks in targeted areas and outcome 2-2. Soil and water conservation practices undertaken by farmers/youth at selected project sites for improved water source protection. Projected changes in temperature and precipitation as well as climatic hazards on the watersheds and ecosystem services, will constrain the recharge of ground water based resources, which are the planned water sources under the project. The additionality therein lies in the increase of coverage of water points to combat drought and strengthening of watershed practices in order to strengthen the resilience of the water sources to increasing droughts.
- *Expansion of adaptive capacity to deal with future and not only current risks,* this is mainly through (i) Institutional capacity development to facilitate integration of climate risks in water supply and sanitation sector (ii) Training of at least 20 officers to maintain and repair equipment, including cost-effective technologies to interface with existing equipment/software and (iii) Community awareness/capacity building/support services for soil and water conservation/agro forestry/etc.
- *Directly addressing impacts from climate change through improved understanding of groundwater resources in light of persistent drought.* This relates to outcome 3-1: strengthening climate and weather information services for issuance of timely and actionable climate and weather information as well as water quality and hydrogeological information at local levels to inform decision making, reduce the impact of climate risks on lives and livelihoods and improve the resilience of water supply investments in the project towns. Dissemination of tailored sector-specific early warning products across a range of timescales based on identified user needs is also additional.

Expected contribution from the baseline and Co-Financing Amount.

The AfDB will provide US\$ 13,645,740 as co-financing through its actions implemented under PAEPA SU MR project. Expected additional financing from the GEF LDCF is estimated at US\$ 8,700,000. Details of co-financing from the various windows include:

- US\$ 10,157,250; African Development Bank Group (ADF Grant)
- US\$ 3,488,490; RWSSI (Rural Water Supply and Sanitation Initiative), AfDB Grant,

1-6: Adaptation benefits (LDCF/SCCF)

The activities in this project have the overarching aims of improving public health – and in particular child health, as a contribution towards national goals and the national SDG 6 targets. An estimated 100,000 people are expected to benefit directly from the improved water supply and sanitation. By improving health, they will in turn bring about improvements in the quality of lives of the people of Chad, women and children in particular. In addition to bearing the brunt of water-borne illnesses, women typically take responsibility for collecting water, and if safe supplies are available near the homestead time will be freed up for productive activities and family welfare. Children, especially girls, will have more time for school work and welfare activities. In addition, provision of sanitation facilities in schools will enhance girl child school enrollment and attendance rates.

LDCF resources will help to foster improved awareness in communities about the impacts of climate change and enable access of risk and early warning information by communities in the rural towns. As well as improved quality of life, the formation and training of WASH committees, with emphasis on women representation, will empower vulnerable communities. Youth will be especially targeted for training in the operation & maintenance of the water supply and sanitation facilities with mandatory representation on the WASH committees. In addition to public health and social development benefits, this project is likely to contribute to environmental integrity through improved water management (quantity and quality) and reduced groundwater pollution due to human waste.

The mainstreaming of climate change risk management principles into the updated national water and supply masterplan will incentivize and lead to the identification of new development priorities, revised plans, evolution of supportive by-laws and law enforcement mechanisms. Weather stations and improved ground water and water quality monitoring will complement existing meteorological and hydrological support programmes under Agrhyment. Communities will immediately benefit through warnings related to ground water quality and aquifer management etc. Soil and water conservation, will increase resilience of local communities by protecting the water sources and aquifers. Water shed management has potential to contribute to broader adaptation to climate change.

1-7: Innovation, sustainability and potential for scaling up

Innovation. The project design aims at establishing a replicable model for mainstreaming climate adaptation into water and sanitation programs in arid areas that is readily amenable to scale-up at the national level through future WSS programs. The use of remote sensing—satellite or airborne sensors to provide a baseline for monitoring groundwater abstraction and use is an innovation, which help to overcome the limited data on ground water monitoring in the project towns. The technique can provide objective measurements at potentially large scales, with quasi-continuous cover at low cost per km², and its success will provide opportunities for replication. The project will also update knowledge bases to include ground water management, water quality management and salinity management. Analytical tools for water quality and quantity and ecosystem management. will also be updated to enhance decision-support capabilities for the national institutions in the water and sanitation sector.

Project Sustainability. The sustainability of benefits under the LDCF project components depends on the ability to strengthen institutions and incentives to retain the functionality of the WSS systems and maintain the services provided by the Hydromet systems after project closure. Sustainability issues arise in particular due to insufficient funding from government budgets for O&M, and insufficient cost recovery due to problems with tariff setting.

Strengthening institutional capacity. During project design, a capacity needs assessment will be undertaken to identify measures to enhance the capacity of various entities, including community, public and private sectors, to manage WSS day-to-day service delivery in an effective and sustainable manner. Training for WASH professionals at national and local levels (example pump mechanics) and

institutional strengthening will be undertaken during project preparation, implementation and after commissioning of assets. The project will also promote youth participation in service provision in line with the Bank strategic priorities 'high fives'.

Strengthening systems with sustainable funding flows for post construction support. In the secondary centers and villages, the project scoping mission discussed with the management committees concerning the recovery of mini-water towers bills and the difficulties arising therefrom. With the village communities directly benefiting from the water drilling equipped with hand pumps, the mission exchanged on the sustainability of the structures (financial contribution, spare parts available in stores, the frequency of repairs, financial participation of men in relation to women for the maintenance of works, etc.).

As part of project design, tariff studies will be undertaken aimed at introduction of incremental block tariff, stepped up to full O&M cost recovery. The building blocks will also consider mechanisms to allow tariffs and fees to be affordable to the most vulnerable population groups. This will contribute towards sustainability of project benefits. The program will also intervene in activities that will help reduce the Non-Revenue Water (NRW). Selection of reasonable technical solutions, and close monitoring of the system and strengthening of O&M will be emphasised.

Strengthening representation of water users' interests in catchment and local water management platforms. The project will facilitate CSO participation in the management of WSS more specifically participate in source protection plans (catchment protection and water safety planning) that improve the viability of WSS systems, affordability and production of quality water supply.

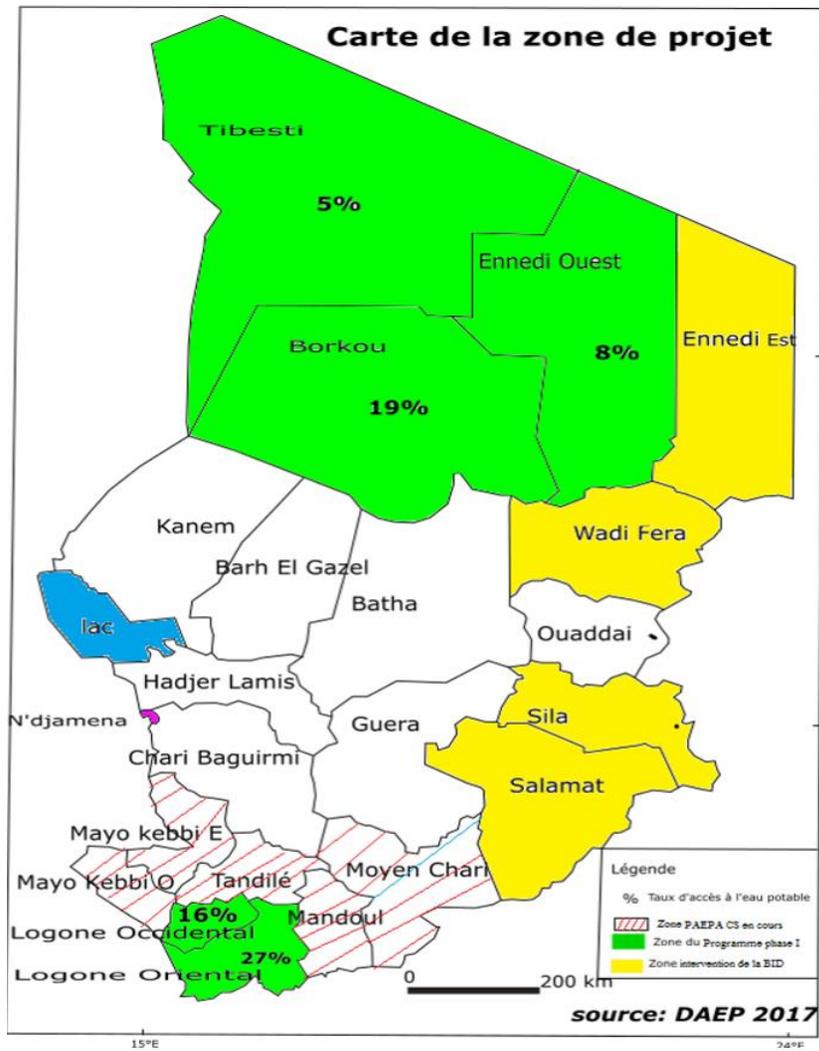
Strengthening CSO participation. Community facilitated management of the interventions is envisaged. Local communities will also participate in the selection of sites and constitution of the WASH Committees which will be responsible for O & M of the facilities, including the data collection and security of all installed hydrometric equipment. They will also be responsible for the collection of primary M&E data at their level of operation.

Strengthening Asset management and monitoring/ Private Sector Supply Chains for RWSS. Each beneficiary town will sign a sub-project implementation MOU with an Implementing Agency/CSO/Community based organisations for strengthened management of assets. The private sector will be involved in sector supply chains for O & M.

Strengthening the O & M of the meteorological, ground water and water quality system. Investments in meteorology, GW, WQ services require sustained financing of O & M costs, as well as a highly-skilled and motivated professional work force. As part of this project a strategy for O & M and scaling up the climate, Ground water and Water quality information systems, will be developed in order to ensure sustained monitoring of improved water supply.

1b. Project Map and Coordinates

Please provide geo-referenced information and map where the project interventions will take place.



2. Stakeholders

Select the stakeholders that have participated in consultations during the project identification phase:

Indigenous Peoples and Local Communities

Civil Society Organizations

Private Sector Entities

If none of the above ,please explain why:

The project will be implemented at the country level by the Ministry of Water and Sanitation (MEA). The day-to-day management will be carried out by the Coordination Unit of the PAEPA-CS, which will be strengthened by an Environmentalist, Sanitation Expert and a Gender Expert. The primary beneficiaries of the project are the local stakeholders in the towns. The approach taken by the project seeks for their direct involvement and active participation in the development process. Project preparation will be a participatory and inclusive process involving consultation with key stakeholders in the water and environment sectors including the private sector, government officials, development partners and civil society representatives.

Partnerships in water and sanitation sector financing. Partners engaged in financing the water and sanitation sector include: the French Agency for development (AFD), the European Union, the AfDB and Rural Water Supply and sanitation Initiative (RWSSI) and AWF, the World Bank, the Islamic Development Bank; BADEA, GIZ, KFW, the Kuwait Fund, the Saudi Fund and some UN agencies (UNICEF, UNFPA) and UNDP. The leadership of the water and sanitation sector is provided by the European Union, while that of WASH at the level of the UN agencies is provided by UNICEF. The Bank is the leader of the Committee of the Partnership Trust Fund and participates actively in the work of the thematic group "Water and sanitation" through quarterly meetings. These partners were consulted during project identification and will be involved during project preparation.

During the identification mission which took place from 17 April to 05 May 2017 in Chad, a consultative process was adopted through meetings and discussions with the Chad authorities, Technical and Financial Partners, stakeholders at the semi urban and rural (Prefects, mayors, management committees) and ASAG. In N'Djamena, dialogue with donors (Netherlands, AFD, EU, IDB and Swiss Cooperation), the UN system (UNICEF, UNFA and UNDP) and NGOs (Red Cross Chad /French Red Cross, Adventist Development Aid Agency, Center for Supporting Local Development Initiatives, Health-Nutrition-World Wide and Caritas Chad). The meeting was

essential in building synergies within the framework of the respective interventions in the program area. Key issues raised included: (i) delay in payment of counterpart funds from the Government; (ii) ownership of works by beneficiaries and administrative authorities (iii) updating of the 2003 Master Plan for Water and Sanitation; (v) definition of the ADB-EU-IDB common intervention in the regions concerned; (vii) difficulties in recovering the payment of water bills at the mini-water towers managed by the local councils; (viii) the comparative advantages among management models used for management of water supply and sanitation systems.

PPG resources will be utilized to engage key stakeholders at the national/sub-national and community level during the project design phase. A stakeholder analysis will be conducted to determine stakeholder needs vis-à-vis adaptation to potential climate change impacts, the effectiveness of current local responses, barriers to adaptation, expertise that might be helpful in implementing the project and those who may have been involved in similar initiatives. A stakeholder participation, engagement and coordination plan, will be developed as part of project preparation.

In addition, provide indicative information on how stakeholders, including civil society and indigenous peoples, will be engaged in the project preparation, and their respective roles and means of engagement.

Partnerships with Civil Society. The Bank cooperates with a broad range of civil society organizations (CSOs) to improve the effectiveness, quality, and sustainability of its WSS operations and to increase stakeholder ownership of project activities. CSOs include non-profit, non-state actors such as community-based organizations (CBOs), water-user associations (WUAs), and a variety of non-government organizations (NGOs). The Bank recognises that CSOs operating at the field level have developed an ability to i) Identify innovative approaches for specific WSS activities, drawing upon their close knowledge of local communities ii) encourage project implementation that responds to local needs and iii) nurture continuity in project work, especially when implementing agencies lack capacity. Under the LDCF project, CSOs, will thus be involved in capacity building; awareness generation, social mobilization, formation of WUAs/CBOs; interfacing between Government and community activities in source protection and as catalysts for post-construction support. During project preparation, the project design will: enhance the understanding of the capacities, requirements, and processes of CSOs and establish in advance a clear agreement on their role in facilitating community participation and service delivery in project implementation. Participation of CSOs will be presented as part of a participation strategy and costs included, within the main project components.

Social safeguards and indigenous people considerations. Chad is home to indigenous transhumant pastoral groups/ethnic minorities in the southern part of the country. The Bank Integrated Safeguards System, recognizes that some communities are vulnerable simply because their social or cultural identity is distinct from that of the dominant or mainstream society. At PIF stage, determination of the project impacts has been based on the assumption that proposed LDCF interventions, will not cause involuntary resettlement of people or adversely impact on protected areas and indigenous people. During preparation, however, the project design will identify potential social safeguard issues, including impacts on indigenous peoples/ ethnic minorities like pastoralists /herders in the project locations; and identify social risks and vulnerabilities (including access rights to natural resources) that could undermine the project's objectives or reduce its benefits. In the event that the risks are confirmed, indigenous people's plans, actions and costs will be prepared to take into account the needs of the ethnic minorities.

3. Gender Equality and Women's Empowerment

Briefly include below any gender dimensions relevant to the project, and any plans to address gender in project design (e.g. gender analysis).

The Constitution in Chad and the laws prohibit gender-based discrimination, but enforcement of these provisions within the water and sanitation sector remains a challenge (Chad ranked number 111 of 144 countries listed on the Global Gender Gap Index (GGI) of 2016). Reducing inequalities based on gender and empowering women to participate more fully is thus key to reducing poverty and achieving project goals. The project will ensure that all key results consider specific gender related concerns, such as the linkages between women and children and natural disasters and differences in access to key infrastructure between men and women. Specifically, gender concerns will be mainstreamed when designing soft and hard interventions that will be implemented by the government and the communities.

In line with the GEF gender equality action plan, and the Bank Group's Strategy 2013–2022, the project will ensure that the gender perspectives are reflected in the climate change risk management solutions. This will be through (i) undertaking a gender analysis in assessments of vulnerability; (ii) undertaking gender sensitive budgeting, so that interventions like livelihood options etc include specific budgeted activities to address women's adaptation needs; and (iii) the inclusion of women's perspectives at project development and implementation.

A gender action plan will be prepared. Gender indicators will be included in the M&E system. Although collecting outputs such as the number of women beneficiaries is important, the project will consider outcomes that enable opportunities for women's empowerment. Examples of interventions will include: targets for women's participation and/or access to project/program benefits (e.g., training programs, formation of beneficiary groups such as water user group etc); and/or for women representatives in project committees or local associations; and/or for the number or % of female staff, etc will be included as part of the project design in the gender action plan.

Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment? Yes

closing gender gaps in access to and control over natural resources;

improving women's participation and decision-making; and/or

generating socio-economic benefits or services for women.

Will the project's results framework or logical framework include gender-sensitive indicators?

Yes

4. Private sector engagement

Will there be private sector engagement in the project?

Yes

Please briefly explain the rationale behind your answer.

The private sector will play a key role in design and execution of construction activities, including the supply of goods for the water and sanitation infrastructure as well as in the dissemination of best practice guidelines. The purpose will be to enhance the effective participation of the small scale, rural-based, private sector in rural water supply service provision through the production and dissemination of best practice guidelines. During the PPG, efforts will be made to address constraints to private sector participation in provision of rural water supply, by addressing management, information flow, financial constraints, regulatory constraints, and technical constraints.

5. Risks

Indicate risks, including climate change, potential social and environmental risks that might prevent the Project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the Project design (table format acceptable)

Envisaged risks to attainment of project objectives and the proposed mitigation measures are as follows:

Risk and rating	Rating	Mitigation Measure
High vulnerability to climatic extremes and associated impacts. While the project is helping to reduce vulnerability to climate variability, extreme weather events could hamper project progress in all components, not least by restricting access to rural areas.	Moderate	The project will draw on analytical activities on mapping climate related vulnerabilities and also conduct targeted risk screening for relevant activity lines to identify risk mitigating options

Risk and rating	Rating	Mitigation Measure
Reluctance of local institutions to change the status-quo and promote Water harvesting sector that should help lift the pressures on the groundwater use	Low	Continuous stakeholder consultation and engagement will be employed by the project. Project will strengthen local community groups and associations and empower them to arrange for water rationing and distribution rules.
Availability of sufficient ground water resources	Low	Past assessments confirms sufficient availability of ground water resources in and around the project towns and rural areas
Limited capacity of local and national institutions	Low	Government capacity is not likely to represent a risk for the project because there is strong policy will behind this project. While capacities are short, efforts will be made to develop the capacities of key institutions to participate fully in project implementation.

6. Coordination

Outline the institutional structure of the project including monitoring and evaluation coordination at the project level. Describe possible coordination with other relevant GEF-financed projects and other initiatives.

In the process of designing the baseline intervention, AfDB have undertaken extensive consultations in-country with a variety of stakeholders in the government and nongovernment sectors. A strategy and plan for collaboration with relevant ongoing and planned initiatives will be prepared during the preparatory phase, including defining the roles and responsibilities of critical stakeholders. At national level development partner assistance is coordinated by the Ministry of Economic Planning and International Cooperation which interfaces with technical Ministries. This project is complementary with other GEF/LDCF and Climate financed projects in Chad. The planned investments will build on related investments described in the baseline section, ensuring no resource duplication. It will also be closely coordinated with the additional programmes (not described in the baseline) outlined below.

Community based climate risks management in Chad. UNDP, proposed LDCF Grant (US\$5.2 million). Expected outputs include: (i) Producing and disseminating relevant and timely climate information to enhance preparedness of national and local stakeholders and threatened communities to act appropriately and effectively in a timely manner in response to climate-related disaster risks and (ii) Promote financial risk transfer mechanisms to help rural households minimize losses and provide safety nets against climate-related shocks. Coordination/data sharing/lesson learning is envisaged for strengthening adaptive capacity in the rural areas.

Enhancing the resilience of the agricultural ecosystems– PARSAT; GEF ID: 5376; Implementing agency IFAD; LDCF Amount, US\$ 8 million. The aim of the project is to strengthen the resilience of smallholder farmers and improve food security. Components include (i) Intensified and resilient agricultural production (ii) Added value for agricultural activities and productions and (iii) Project management, M&E, and institutional support. Coordination/data sharing/lesson learning is envisaged for strengthening climate risk based management. Coordination/data sharing/lesson learning is envisaged for strengthening adaptive capacity in the rural areas.

Climate change adaptation and renewable energy development in Chad. €8 million (GCCA). Implementing agency: Global Climate Change Alliance. The project supports Chad in the implementation of a national response to climate change. The aim is to strengthen climate governance by mainstreaming climate change into a number of key sector policies and by implementing field projects aligned with the NAPA. Main outcomes include: (i) Practices supporting enhanced resilience of the climate-vulnerable people and sustainable use of natural resources tested and demonstrated in the field and (ii) Climate change adaptation and mitigation policies and strategies implemented, notably in the agriculture and livestock sector (adaptation) and the energy sector (clean energy development). *Coordination/data sharing/lesson learning is envisaged for strengthening climate risk based management.*

Chad National Adaptation Plan; GEF ID: 6968, project; Implementing Agency UNDP, LDCF Amount \$5,775,000. The project supports Chad in strengthening the capacity of Ministry of Planning, Finance and Environment in Chad to integrate medium and long-term climate change risks into existing planning and budgeting processes. The First outcome is the establishment of climate and socio-economic information databases to inform and guide climate-resilient policy and decision-making. This includes (i) assessment of the existing operational meteorological network and enhancing it through provision of equipment and materials (ii) putting in place climate monitoring and impact assessment tools for key sectors (iii) analysis of long-term climate trends under alternative scenarios and (iv) development of technical capacity for maintenance and use of the enhanced information system.

The Second Outcome is the establishment of required institutional and planning capacities to facilitate the integration of climate change adaptation in relevant budgeting and planning frameworks at national and territorial levels including budgeting, for key sectors classified as vulnerable to climate change. This includes (i) design and institutionalization of training kits and programmes on climate change mainstreaming for climate-sensitive sectors (ii) identification of adaptation options to address priority vulnerabilities and (iii) support the government to integrate climate change into existing national/sub-national and sectoral development.

Coordination is envisaged under *PIF-Component 1 on Mainstreaming Climate adaptation into the updated water and sanitation masterplan*. An improved understanding of climate change impacts from the NAP, process will inform the updating of the water and sanitation masterplan as well as development policies and strategies to ensure appropriate resource allocation in scaling up climate resilient water supply and sanitation in the sector. Lessons, herein, will inform, the multi-sector mainstreaming efforts under the wider NAP process.

Coordination is also envisaged under *PIF-Component 3 on strengthening Climate information & early warning systems*. Analytical work under the NAP process will inform the expansion of weather and climate observing network, in the planned 11 towns. There is no duplication between the proposed hydromet activities under this project and those of the Chad NAP project. This project will build onto efforts made under the CHAD NAP project to strengthen the density of the monitoring network, enhance synergy and avoid duplication. On the other hand, paleodata and Information generated from the planned expansion of the ground water and water quality monitoring network and information systems and development of strategy for O & M under the AfDB-LDCF Chad project will also contribute to the knowledge base, risk estimation and inform expectations for future climate scenarios with respect to conjunctive water use under the NAP process. Specific emphasis will be made onto improved climate and weather monitoring and linkages to ground water and water quality monitoring, so as to inform climate adaptation with respect to ground water management.. Mechanisms for coordination for hydromet services, including use of satellite information and data bases, will be detailed at the Project Preparation stage.

LDCF resources will be used to increase the number of beneficiaries of these projects across components of this project. The Ministry of Environment and Fisheries will build on existing coordination mechanisms to establish a platform, as part of a project communication and outreach strategy, to leverage partnerships and promote complementarity among relevant programs and stakeholders, with the aim to avoid overlaps and facilitate data sharing across institutions, and maximize service delivery potentialities to users, thereby enhancing adaptive capacity and sustainability. Details will be elaborated at full scale project proposal development phase.

Coordination with the GCF Funded Chad NAP Process and Readiness Program

Chad is engaged in the national adaptation plan (NAP) process which includes assessment of vulnerabilities, mainstreaming climate change risks, and addressing adaptation. The GCF financing is part of the process to support the formulation of the NAP, taking into consideration the UNFCCC NAP technical guidelines and the importance of coordination and complementarity with other NAP-related initiatives and support.

Chad submitted a request for a GCF Readiness and Preparatory Support Programme (2016). The aim of the Chad GCF financed readiness program is to provide preparatory support to strengthen the capacity of the National Designated Agency (NDA) so that the NDA can effectively discharge the GCF-related roles and responsibilities and speed up the process of facilitating the development of projects and programmes that are both aligned to the country's strategic priorities and the GCF investment framework. Expected outputs include (i) The capacities of the Focal Point built to effectively fulfil its roles and responsibilities in relation to the Fund and (ii) Development, through a stakeholder engagement process, of a country programme to include elements provided in the Fund's Initial general guidelines for country programmes, which will include programming priorities and programme/project concepts consistent with the Fund's Initial results management framework and Initial investment framework.

During the PPG process, the project preparation team will establish the extent of implementation of the Chad readiness program and identify mechanisms for synergy/complementarity or lessons that could be used to scale up the climate action in Chad.

7. Consistency with National Priorities

Is the Project consistent with the National Strategies and plans or reports and assessments under relevant conventions

Yes

If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc

The proposed project is country-driven, and focused on immediate needs of vulnerable people, especially young and women and poor rural communities. As part of the commitments to the UNFCCC a NAPA was prepared (2010). The water sector included as one of the priority vulnerability and adaptation issues. The project is also consistent with National priorities in terms of adaptation to climate change, as spelt out in the Chad Nationally Determined Contributions (2015). The INDC recognises that priority target zones (Kanem, Barh El Ghazal, Batha, Guéra, Hadjer Lamis, Wadi Fira; Ouaddai, Dar Sila, Lac, Moyen-Chari, Borkou, Tibesti, Ennedi Est, Ennedi Ouest) are especially vulnerable to the effects of climate change and, in part, to the arrival of displaced populations. Key measures addressed by this project include (i) Improvement of production techniques by developing water infrastructure, access to improved

and adapted inputs (ii) Informing, educating and communicating information relating to climate risk,(improve the observatory used to forecast meteorological events and develop the population's ability to react in the event of a catastrophe) (iii) Improving the seasonal forecast of precipitation and surface runoff and (iv) Management of climate risks.

The project is part of the National Development Plan (PND 2017-2021), whose aim is to lay the foundations for an emerging Chad. The project will also contribute towards SDG 6 on ensuring availability and sustainable management of WSS for all, through measures such as: protecting and restoration of water-related ecosystems, including forests, wetlands, rivers and aquifers; improving water quality by reducing pollution and managing water scarcity due to drought, through improved ground water governance and drought resilience. Chad's SDG 6 related targets also include raising the access rate of drinking water to 52% by 2015 to 95% in 2030 and the rate of access to sanitation services by 16 % In 2015 to 50% by 2030. In the long term, Chad intends to follow a climate-resilient and low-carbon growth pathway linked to the broader SDGs. Consultation with the Government has been made in respect of the principle of country ownership.

Chad is engaged in the national adaptation plan (NAP) process which includes assessment of vulnerabilities, mainstreaming climate change risks, and addressing adaptation. The GCF readiness support is part of the process to support the formulation of the NAP, taking into consideration the UNFCCC NAP technical guidelines and the importance of coordination and complementarity with other NAP-related initiatives and support.

During the PPG process, the project preparation team will establish the extent of implementation of the Chad readiness program, progress in implementation of the Second National Communication and identify mechanisms for synergy/complementarity or lessons that could be used to scale up the climate action in the water supply and sanitation sector in Chad.

8. Knowledge Management

Outline the Knowledge management approach for the Project, including, if any, plans for the Project to learn from other relevant Projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.

Under this project, the project will (i) strengthen knowledge-sharing and learning processes with respect to climate adaptation and the water and sanitation sector; (ii) equip the government agencies with a more supportive knowledge-sharing and learning infrastructure; (iii) foster partnerships for broader knowledge-sharing and learning; from other projects and initiatives and (iv) promote a supportive knowledge-sharing and learning culture.

Under component 1, a suite of knowledge management products will be created, led by an over-arching guide for incorporating Climate Change Adaptation Infrastructure Planning and Design. The aim will be will be to support the consideration of climate adaptation into water supply and sanitation infrastructure development activities. This guide will be useful for those considering specific engineering design options to make water supply and sanitation infrastructure more resilient in a climate altered future. The guide will provide engineering and non-engineering development professionals with an overview of potential impacts on sanitation activities and adaptation options, and guidance for utilizing a risk assessment methodology to determine appropriate design measures. Opportunities to reflect on learning and/or make adjustments will include annual reviews and work planning, partner meetings, portfolio reviews, after-action reviews, and upon completion of an evaluation.

For climate risk management, it will be important to consider (i) If actions being taken to manage climate risks in the water supply systems are effective and, if not, how they should be adjusted (ii) If climate risks that were accepted during the design stage should instead be addressed, and vice versa and (iii) whether new or additional climate risks have manifested during implementation and if/how they should be addressed.

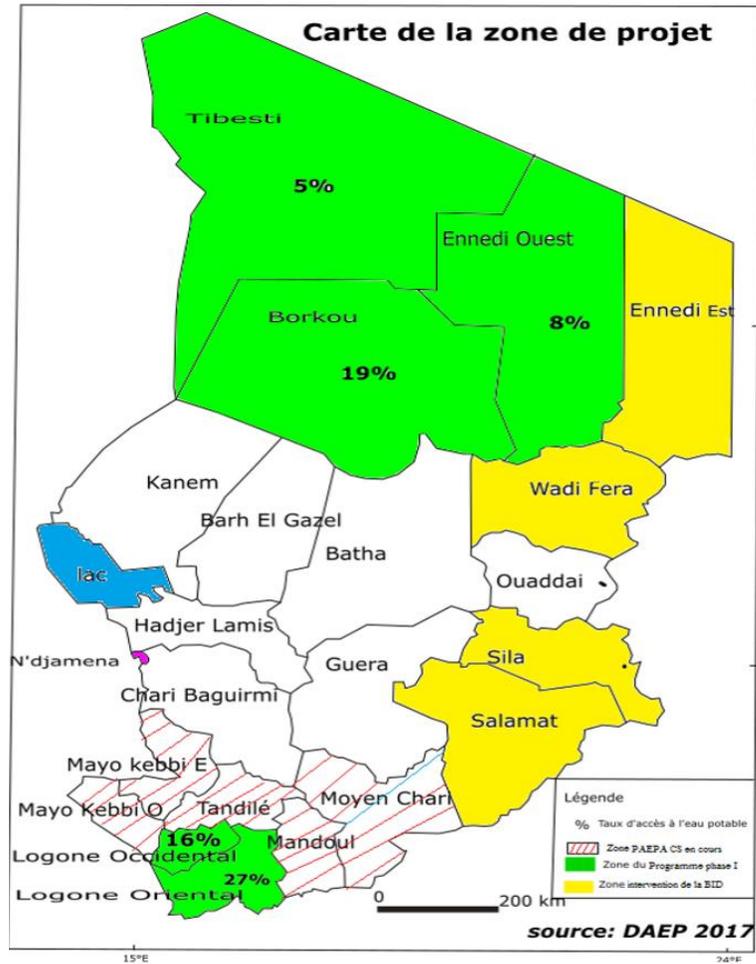
Part III: Approval/Endorsement By GEF Operational Focal Point(S) And Gef Agency(ies)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the Operational Focal Point endorsement letter with this template).

Name	Position	Ministry	Date
Monsieur Faycal Abdelkerim Gardia	Operational Focal Point since 2017-12-06 Point Focal Operationnel du Fonds pour l'Environnement Mondial	Ministere de l'Eau, de l'Environnement et de la Peche N'Djamena Chad	10/5/2018

ANNEX A: Project Map and Geographic Coordinates

Please provide geo-referenced information and map where the project intervention takes place



ANNEX B: GEF 7 Core Indicator Worksheet

Use this Worksheet to compute those indicator values as required in Part I, Table F to the extent applicable to your proposed project. Progress in programming against these targets for the program will be aggregated and reported at any time during the replenishment period. There is no need to complete this table for climate adaptation projects financed solely through LDCF and SCCF.

Not Applicable to this project.

ANNEX C: Project Taxonomy Worksheet

Use this Worksheet to list down the taxonomic information required under Part I by ticking the most relevant keywords/topics//themes that best describes the project

Climate Change Adaptation

- Paris Agreement,
- Sustainable Development Goals,
- Climate Change Adaptation,
- Least Developed Countries,
- Mainstreaming adaptation,
- Climate finance,
- National Adaptation Programme of Action,
- Disaster risk management,
- Climate information,
- Adaptation Tech Transfer,
- Complementarity,
- Innovation,
- Livelihoods, Climate resilience,
- Ecosystem-based Adaptation,
- Community-based adaptation,
- National Adaptation Plan,

United Nations Framework Convention on Climate Change,

- Nationally Determined Contribution,

Climate Finance (Rio Markers),

- Climate Change Adaptation 1,
- Climate Change Adaptation 2,
- Climate Change, Paris Agreement,
- National Adaptation Programme of Action