Part I: Project Information

GEF ID
10883

Project Type
FSP

Type of Trust Fund
LDCF

CBIT/NGI
CBIT **No**
NGI **No**

Project Title
Co-management of climate extremes for agriculture resilience via innovative technologies for irrigation in S?o Tom? and Pr?ncipe

Countries
Sao Tome and Principe

Agency(ies)
AfDB-

Other Executing Partner(s)
Ministry of Agriculture and Rural Development (MADR)

Executing Partner Type
Government

GEF Focal Area
Climate Change

Sector
Climate Change Adaptation Sector

Taxonomy

Focal Areas, Climate Change, Climate Change Adaptation, Climate information, Least Developed Countries, Mainstreaming adaptation, Complementarity, Climate resilience, Influencing models, Strengthen institutional capacity and decision-making, Stakeholders, Awareness Raising, Communications, Beneficiaries, Gender Equality, Gender Mainstreaming, Sex-disaggregated indicators, Capacity, Knowledge and Research, Learning, Adaptive management, Capacity Development

Rio Markers

Climate Change Mitigation

No Contribution 0

Climate Change Adaptation

Principal Objective 2

Biodiversity

No Contribution 0

Land Degradation

No Contribution 0

Submission Date

3/12/2023

Expected Implementation Start

9/2/2024

Expected Completion Date

9/1/2026

Duration

48In Months

Agency Fee($)

848,580.00

A. FOCAL/NON-FOCAL AREA ELEMENTS

Objectives/Programs	Focal Area Outcomes	Trust Fund	GEF Amount($)	Co-Fin Amount($)
CCA-1	Reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation	LDCF	5,848,153.00	5,500,000.00
CCA-2	Mainstream climate change adaptation and resilience for systemic impact	LDCF	1,151,847.00	2,420,000.00
CCA-3	Foster enabling conditions for effective and integrated climate change adaptation	LDCF	1,932,420.00	1,700,000.00
		Total Project Cost($)	**8,932,420.00**	**9,620,000.00**

B. Project description summary

Project Objective

Promote innovative technologies and co-management of drought, flood, and water depletion for irrigation as a means to increase the resilience of the farming systems in S?o Tom?.

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing ($)	Confirmed Co-Financing ($)
1. Reduce vulnerability and strengthen climate resilience of agricultural systems and livelihoods including those households led by women	Investment	1.1Technologies and solutions for water storage and irrigation piloted and deployed to reduce climate-related risks and enhance resilience of agricultural systems and livelihoods.	1.1.1 Surface water storage technologies (ponds and tanks for rainwater harvesting) constructed/rehabilitated to reduce vulnerability of crops to water scarcity. 1.1.2 Groundwater storage technologies (ponds, trenches, wells) constructed to reduce vulnerability to flash- floods and for aquifer recharge. 1.1.3 Soil moisture storage techniques using soil and water conservation measures implemented. 1.1.4 Small-scale off-grid PV pumps and irrigation kits installed in farms with diverse characteristics to enhance access to water for irrigation including for women and efficient irrigation technologies (drip irrigation kits) installed.	LDCF	4,000,000.00	4,500,000.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing ($)	Confirmed Co-Financing ($)
2. Mainstream climate resilience of agricultural systems through water storage and irrigation technologies	Technical Assistance	2.1 Conducive implementation policy framework designed and implemented.	2.1.1 Hydrological modeling and relevant research conducted to inform design, location and effectiveness of water harvesting and storage technologies. 2.1.2 Cross-sectoral structured dialogues on water storage and irrigation and climate change implemented to define a road map for the replication of technologies. 2.1.3 National Promotion Programme adopted for innovative water storage technologies and climate change and solutions to foster replication across the country.	LDCF	1,151,847.00	1,000,000.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing ($)	Confirmed Co-Financing ($)
3. Strengthen key value chains and market linkages to enhance resilience and socio-economic benefits	Technical Assistance	3.1 Value chains strengthened through market access and agrifood transformation units and supportive business model and incentive mechanism identified, designed and implemented	3.1.1 Rural roads improved to enable markets access. 3.1.2 Agrifood transformation units improved and producers? capacities strengthened 3.1.3 Financial incentive mechanisms identified and extension officers trained to provide assistance for supporting the development of farmers? business plans (specially women and youth)	LDCF	1,848,153.00	2,420,000.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing ($)	Confirmed Co-Financing ($)
4. Foster enabling conditions for effective and integrated climate change adaptation in the agricultural and water sectors	Technical Assistance	4.1 Increased institutional and local capacities, including information and extension services to respond to climate change.	4.1.1Capacity of institutional staff from the water, agriculture and energy sector enhanced for improved climate change governance. 4.1.2 Climate change and sustainable water management solutions integrated into the agricultural extension program to strengthen local capacity to address water-related climate risks. 4.1.3 Local leadership councils and/or Resource Users Association established/strengthened to facilitate stakeholder engagement and ownership of adaptation technologies. 4.1.4 The capacity of local communities is strengthened to apply and maintain water storage and irrigation technologies and solutions.	LDCF	1,337,067.00	1,000,000.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing ($)	Confirmed Co-Financing ($)
5. M&E and Adaptation Learning		5.1 Lessons learned and best practices from pilot activities, capacity development initiatives disseminated. 5.2 M&E aptly pursued, and lessons captured and widely disseminated.	5.1.1 Knowledge management system in place and operational. 5.1.2. Development and dissemination of knowledge and learning materials on climate change, rural infrastructure and ecosystem management through existing networks and platforms. 5.2.1 M&E system designed and implemented at all levels. 5.2.2 M&E project reports, briefs and other. 5.2.3 Compilation of project good practices and lessons learned documented and disseminated to raise awareness on effective adaptive management options.	LDCF	170,000.00	200,000.00
			Sub Total ($)		**8,507,067.00**	**9,120,000.00**

Project Management Cost (PMC)		
LDCF	425,353.00	500,000.00
Sub Total($)	**425,353.00**	**500,000.00**

Project Management Cost (PMC)		
Total Project Cost($)	**8,932,420.00**	**9,620,000.00**

Please provide justification

C. 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($)
GEF Agency	African Development Bank	Grant	Investment mobilized	9,620,000.00
			Total Co-Financing($)	**9,620,000.00**

Describe how any "Investment Mobilized" was identified

AfDB will provide US$150,650 for supervision and monitoring of this project. In addition, the project will also support entrepreneurs to secure funding from financial institutes / commercial banks in the form of soft loans or normal commercial loans to finance the investments foreseen in project component 3. The project will finance the capacity building of extension officers that will facilitate young entrepreneurs and investors in the development of the documentation necessary for the loan applications from selected financial institutes/ commercial banks. This project will also encourage beneficiaries, including entrepreneurs, farmer associations, and local communities to make equity investments, increasing beneficiary ownership of project initiatives. In component 3, output 3.1.3, different types of ownerships and business models will be studied that will support maintaining long-term sustainability of the project outcomes.

D. 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($)	Fee($)	Total($)
AfDB	LDCF	Sao Tome and Principe	Climate Change	NA	8,932,420	848,580	9,781,000.00
			Total Grant Resources($)		**8,932,420.00**	**848,580.00**	**9,781,000.00**

E. Non Grant Instrument

NON-GRANT INSTRUMENT at CEO Endorsement

Includes Non grant instruments?**No**

Includes reflow to GEF?**No**

F. Project Preparation Grant (PPG)

PPG Required **true**

PPG Amount ($)

200,000

PPG Agency Fee ($)

19,000

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount($)	Fee($)	Total($)

Total Project Costs($)

Meta Information - LDCF

LDCFtrue
SCCF-B (Window B) on technology transfer false
SCCF-A (Window-A) on climate Change adaptation false

Is this project LDCF SCCF challenge program?
false

This Project involves at least one small island developing State(SIDS). true

This Project involves at least one fragile and conflict affected state.false

This Project will provide direct adaptation benefits to the private sector. false

This Project is explicitly related to the formulation and/or implementation of national adaptation plans (NAPs). false

This Project has an urban focus. false

This Project covers the following sector(s)[the total should be 100%]:*

Agriculture	**10.00%**
Natural resources management	**20.00%**
Climate information services	**10.00%**
Coastal zone management	**0.00%**
Water resources management	**50.00%**
Disaster risk management	**10.00%**
Other infrastructure	**0.00%**
Health	**0.00%**
Other (Please specify:)	**0.00%**
Total	**100%**

This Project targets the following Climate change Exacerbated/introduced challenges:*

Sea level rise false

Change in mean temperature false

Increased climatic variability true

Natural hazards true

Land degradation false

Coastal and/or Coral reef degradation false

Groundwater quality/quantity true

Core Indicators - LDCF

CORE INDICATOR 1

Total

Male

Female

% for Women

Total number of direct beneficiaries

0

0

0

0%

CORE INDICATOR 2

Area of land managed for climate resilience (ha)

0.00

CORE INDICATOR 3

Total no. of policies/plans that will mainstream climate resilience

0

CORE INDICATOR 4

Male
Female
% for Women
Total number of people trained
2,238
1,342
896
40.04%

To calculate the core indicators, please refer to Results Guidance

OBJECTIVE 1

Reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaption

OUTCOME 1.1

Technologies and innovative solutions piloted or deployed to reduce climate-related risks and / or enhance resilience

View

OUTCOME 1.2

Innovative financial instruments and investment models enabled or introduced to enhance climate resilience

View

OBJECTIVE 2

Mainstream climate change adaption and resilience for systemic impact

OUTCOME 2.1

Strengthened cross-sectoral mechanisms to mainstream climate adaption and resilience

View

OUTCOME 2.2

Adaptation considerations mainstreamed into investments

View

OUTCOME 2.3

Institutional and human capacities strengthened to identify and implement adaptation measures

View

OBJECTIVE 3

Foster enabling conditions for effective and integrated climate change adaption

OUTCOME 3.1

Climate-resilient planning enabled by stronger climate information decision-support services, and other relevant analysis, as a support to NAP process and/or for enabling activities in response to COP guidance

View

OUTCOME 3.2

Increased ability of country to access and/or manage climate finance or other relevant, largescale, pragmatic investment, as a support to NAP process and/or for enabling activities in response to COP guidance

View

OUTCOME 3.3

Institutional and human capacities strengthened to identify and implement adaptation measures as a support to NAP process and/or for enabling activities in response to COP guidance

View

Part II. Project Justification

1a. Project Description

In order to address comments received during the project review process at the PIF stage (please see Annex B) and in order to reflect changes in the project co-financed activities, Part II will present adaptation problem and root causes that have been enhanced and revised on the description of project components and expected outcomes. In addition, Component 3- Strengthen key value chains and market linkages to enhance resilience and socio-economic benefits has been added to the project scope.

?**1) The global environmental and/or adaptation problems, root causes and barriers that need to be addressed**

The national food production system in Sao Tome and Principe (STP) primarily consists of smallholder agriculture, which contributes 56% of STP?s total commodities exports but is considered fragile due to small markets and low profitability caused by poor infrastructure and limited public investments and coordination Agricultural land accounts for about 46% (44,000 ha) of the country's total land area, with average land access of 3ha per farmer. Agriculture employs about 19% of the total population, and almost 9% of the country?s workforce are women working in agriculture .

Agricultural production is mainly concentrated on staple food and cash crops. The staple food such as maize, banana and taro are for domestic consumption while cash crops such as cocoa, coffee, pepper, and palm oil are more export oriented. The overall agriculture, forestry, and fishery sectoral production in 2020 is estimated at $34.499 million USD against $ 34.526 million USD in 2010 FAOSTAT,2023). The sector accounted for 13.99% of the GDP in 2020 against 11.26% of the GDP in 2010 (FAOSTAT,2023). Efforts to diversify food production for domestic consumption have increased smallholder production of bananas, cassava, and maize, but it remains below the levels required to meet domestic needs. As a result, between the years 2010 and 2020, while total national food production has decreased from 116,840 tons to 107,810 tons, food import increased from 33,070 tons to 480,500 tons (FAOSTAT, 2023). Similarly, domestic food supply decreased from 149,880 tons to 141870 tons translating to high expenditure in food import. For instance, the value of food imports in the total merchandise export ranged from 88% to 282%. In the years 2018 ? 2021 35 % of the population lived on less than $1.90 per day (in 2011 PPP terms) and the prevalence of undernourishment was worryingly high at between 14.7% and 11.9%. The country depends heavily on food imports to improve its protein supply rate of 53g/per capita/day, which is still low.

In the northeast part of the island of S?o Tom? there is water scarcity during the Gravana, in most of this area, it is difficult to maintain horticultural crops without irrigation systems, so many farmers opt not to grow vegetables from mid-May to mid-June producing crops more suited to the dry period such as plantains, matabala, sweet potatoes and cassava. They, especially women, sometimes give up the practice of horticulture/agriculture because combined with the lack of water, it is a very difficult activity. In the dry season, they are forced to go and collect water from far places, walking in steep slopes, making it difficult to carry the water. There have been severe droughts in the past years in S?o Tom? and Principe, two of the more severe occurred in 1983 and in 2010. In 1983 drought caused severe damages to agriculture leading to food scarcity, East and Northeast of S?o Tom? and the central area of Principe were the most affected. In 2010 the gravana period extended for 3 to 6 months also causing a severe drought. Nowadays, farmers are complaining that the gravana season (dry season) is having higher duration exacerbating water scarcity issues.

The role of agriculture for Sa?o Tome? and Pri?ncipe economy and local communities? livelihoods and the need for climate resilience building in the sector is further highlighted by the country?s Nationally Determined Contributions (NDC) objectives and targets. Specific actions to achieve the updated NDC commitments, are outlined in the Implementation Plan prepared in 2018 through a comprehensive stakeholder engagement process supported by the NDC Partnership. The NDC Implementation Plan is currently being implemented in a coordinated manner with support from several Partnership members and beyond. This project aims to build on existing efforts to advance the climate-development objectives of STP and harmonize with existing initiatives happening on the ground.

Despite the country?s effort to improve its agricultural production through a national agricultural investment program for food security and nutrition (PNIASAN 2016-2020) to align with the Comprehensive Africa Agriculture Development Programme (CAADP), the sector shrank by 3.3% in 2018 and 1.1% in 2021. STP?s agricultural yields are systematically below the average of neighbouring West African countries and other small island developing countries. Average yields are significantly lower than benchmark countries. A key driver for the reduced agricultural production is climate change and the impacts from floods and droughts on water availability for irrigation and crop production.

Baseline
Adaptation challenges

Climate change is expected to cause major impacts on the agricultural sector affecting crop production and value chains in STP. In the agricultural sector, extended dry seasons and the increase in torrential rains are a potential threat to food security and soil management. Given that the majority of the rural population in the country relies on agricultural production for food security and livelihoods, climate change impacts may be severe unless climate resilient agricultural practices are adopted, which will require water harvesting for irrigation, efficient water use, soil and water conservation practices, among others. As most of the population lives in the northern part of the country, where the annual precipitation is generally below 1000mm, they will be more vulnerable to longer dry periods and agriculture may require irrigation. In addition to drought tendencies, the characteristics of the country's terrain also make it prone to flash floods, landslides, coastal erosions, and associated risks. A study on Social Protection Targeting Through Satellite Data in S?o Tom? and Pr?ncipe estimates that more than 33,000 households are in areas exposed to drought, of which slightly more than 10,000 households are poor. Although this study points to lower exposure to flooding, the National Spatial Planning indicates that erosion, floods and landslides are the main risks of the country. Fact that is intensified by land cover changes, and poor infrastructure.

Rainfall regime and water scarcity
S?o Tom? and Principe, second smallest country in the Africa climatic domain, is located in the Gulf of Guinea, near the equator, with a hilly topography ranging in elevation from 0 to approx. 2000 m (see Figure 1).

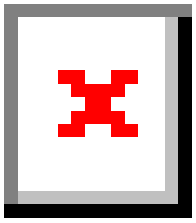

Figure1: Digital Elevation Model of S?o-Tome and PrincipeThe annual average precipitation in S?o Tom? and Pr?ncipe Islands decreases from South to North. It ranges from less than 1000 mm to more than 5000 mm from the northeast to the southwest of Sao Tome Island. On the island of Principe, it varies from 2000 mm to 5000 mm from north to south. See Figure 2.

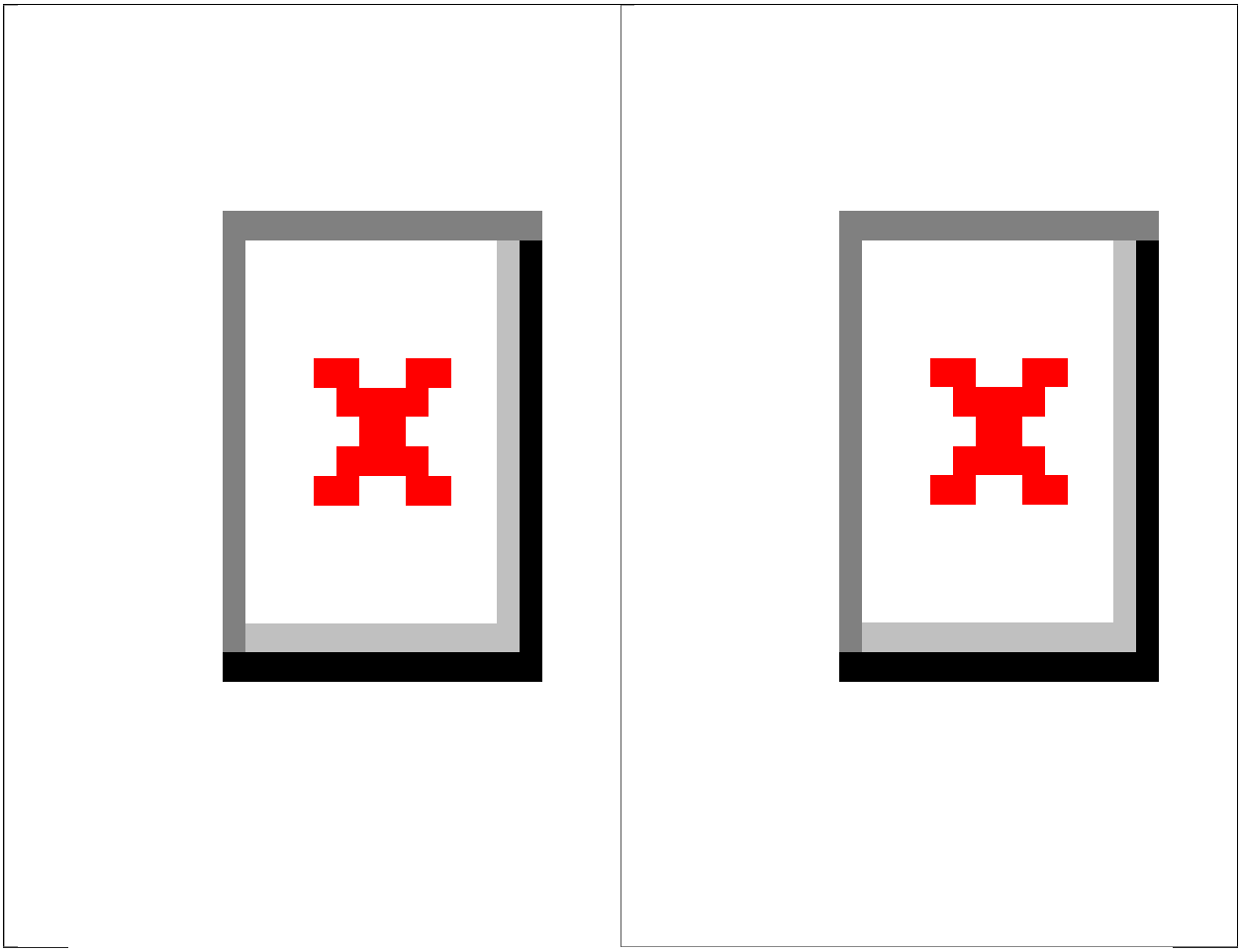

Figure 2. Rainfall distribution in S?o Tom? island (left) and Principe island (rigth)

The country is characterized by a tropical climate, with a rainfall regime characterized by two wet seasons interrupted by a short and well-defined dry season as follows:
- Two well define rainy seasons with the first rainy season occurring between February and May and the second rainy season between October and December. The rainy seasons are punctured by a brief

dry spell between January and February which has been prolonged in some years. During the rainy season, the country receives abundant and unevenly distributed rainfall, both spatially and temporally. The two rainy seasons are characterized by violent storms causing extremely strong and rapid flooding (flash floods).. The northern region of the country received less rainfall compared to the southern part in the past 40 years. For instance, the mean annual pentad rainfall distribution across the main six (6) districts and 3 catchments varied between 1109mm to 2639 mm for the period 1981-2022 (Figure 3).. Furthermore, analysis of means annual 3 to 12 months of precipitation for the same period indicates a trend of heavy rainfall across the country punctuated by some years of dry spells .

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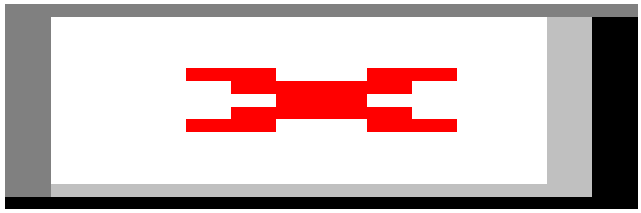
a) District pentad rainfall distribution (mm)



b) Basin pentad rainfall distribution (mm)

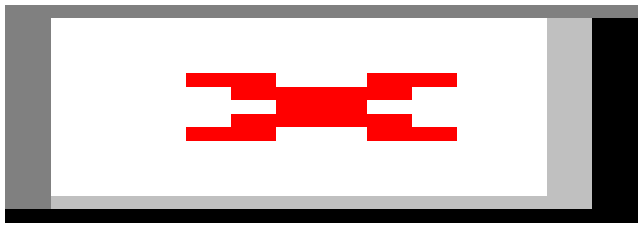


Figure 3: CHIRPs mean annual Pentad rainfall distribution at district and catchment level for 1981-2022

One well-defined very dry season between June and August corresponds to the period of ?Gravana?, where the deficit in rainfall pattern results in a moderately dry season as indicated by distribution of the standard precipitation index (SPI) (Figure 4: Series of accumulated CHIRPS rainfall in 3 months; 6 months and 12 months).

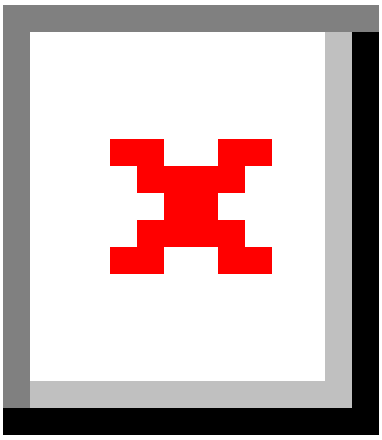


Figure 4: Series of accumulated CHIRPS rainfall in 3 months; 6 months and 12 month

According to the water deficit analysis from the National Irrigation Strategy (ENI), the northern region of S?o Tom? has an area of 188km^2 averagely under water deficit. However, the country has, in general, a positive water balance[i]. As for the island of Pr?ncipe, this estimate suggests that there will be no deficit on average.

Despite the abundant rainfall, S?o Tom? and Principe is a medium to high water scarsity-risks country. The spatial distribution of the rainfall is unequal. Furthermore, the country experiences a relatively low to moderate seasonal rainfall variability while the exposure to drought and flood risks is relatively high.

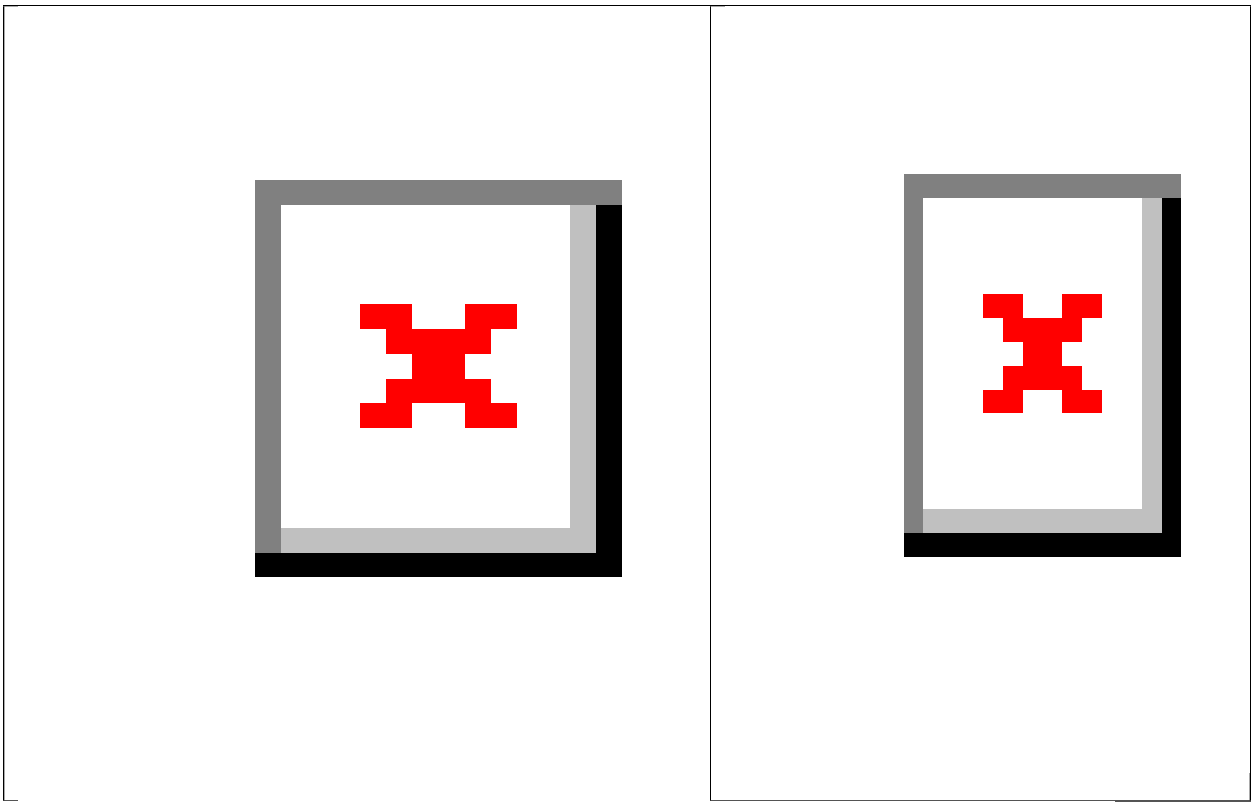


Figure 5. Water deficit in S?o Tom? and Principe (Adapted from ENI, 2018)

In the northeast part of the island of S?o Tom?, where Lobata and part of Cantagalo are located, rainfall is under 1000 mm/year. In the north (in ?gua Grande and Lobata), precipitation during the Gravana is under 50 mm/month and there is water scarcity during this period. In most of these areas and communities, it is difficult to maintain horticultural crops without irrigation systems. Many farmers choose not to grow vegetables from mid-May to mid-June producing crops more suited to the dry period such as plantains, taro, sweet potatoes and cassava. According to the National Irrigation Strategy (ENI) part of Lobata and Cantagalo districts present a water deficit that can reach values higher that -930 mm/year (Figure 5), Pr?ncipe Island, however, doesn?t present water deficit. Figures 6 and 7 show current and future water risk drivers in S?o Tom? and Principe.

Figure 6- Water risks drivers in S?o Tom? and Principe

Figure 7- Future water risks drivers in S?o Tom? and Principe

In Cantagalo district, in one part of the Alg?s community, called Pinheira Praia by many of the inhabitants, the demand for water for horticulture is a major problem, leading producers to give up their activity. Women are usually the most affected and the ones giving up the practice of horticulture more commonly . In the dry season, they must collect water from the Manuel Jorge River, which has a steep slope, making the transport difficult. In addition, women are often exposed to theft on the plots.There are also conflicts over a water pipe in the river Manuel Jorge that runs through many of the land of the horticulturists. Farmers make their own drilling to conduct water to their plot, which generates disputes among them.

The Me-Zochi district, where two important rivers originate from, the Manuel Jorge and the Abade, also suffers from water deficits, as Cantagalo and Lobata. The Manuel Jorge flows from Me-Zochi to the border between Me-Zochi and Cantagalo into the ocean. And the Abade river flows from Me-Zochi to Catangalo, where it ends in the Atlantic Ocean. These rivers are an important source of water. The Manuel Jorge River has 3 superficial water abstraction: S. Nicolau, S. Nicolau Velho, Cang?/Obolongo.

Climate change
According to MOPIRNA climate change is already being felt in S?o Tom? and Pr?ncipe, with: increased incidence of flash floods and decrease in precipitation and consequent decrease in river flows.

Historical trends: According to the Third National Communication (2019) annual temperature trends show an increase with 0.6?C between the years 1960 and 2016, that is, an average of about 0.01?C per year (see Figure 8). The five warmest years in the country happened during the last 20 years, and 1998 was the one with the highest annual mean temperature so far. Data from the World Bank Climate Change Knowledge Portal data corroborate the warming trends, showing that the mean temperature monthly trends has been warming since the 1990 decade (see Figure 9).

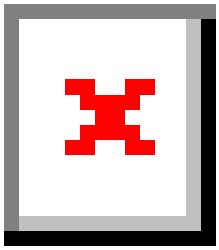


Figure 8. Time series of annual mean air temperature (?c) from local observations at the S?o Tom? airport station

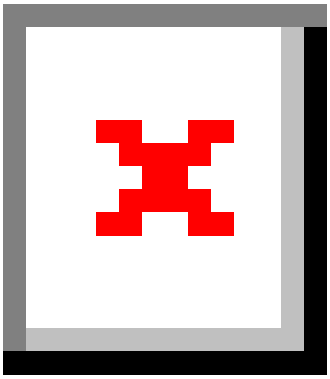


Figure 9. Mean temperature monthly tend in S?o Tom? and Principe

Further to the temperature, analysis of the net evapotranspiration data across the island [7] districts during the historical period of 2000 to 2020 using Modis data at 0.5 km resolution, indicates that overall evapotranspiration has increased from 170mm/day to 290.20 mm/day in each district. This means in average 38.60% increase over 20 years enhancing crops and human water requirement across districts. Mean Evapotranspiration and potential evapotranspiration in July are respectively estimated at 11 mm/month and 275mm/month. See Figure 10 for annual evapotranspiration and average monthly actual and potential evapotranspiration for the period between 2000 and 2020.

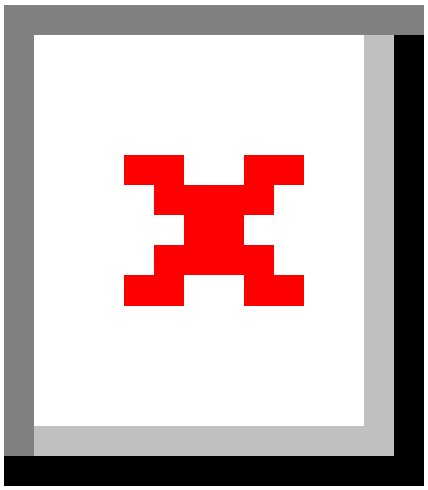


Figure 10: Mean Evapotranspiration

The observed rainfall data does not show a clear trend. However it shows a decrease in precipitation between the years 1951 and 2010, when precipitation decreased at an average annual rate of 1.7 mm per year and a delay was observed in the onset of the rainy season . Also, farmers have observed that the length of the rainy season has shortened from 2016-2021. The observation shows a clear drier period (*Gravana)* between June and September, with total precipitation generally less than 25mm/month and a maximum precipitation in the southern and southwestern part of the S?o Tom? Island. Data from the observed series in the Third National Communication in Climate Change (TNC) and the Climate Prediction Center MORPHing Technique shows a small trend of reduction in annual precipitation. However, data from the Climate Hazards Group InfraRed Precipitation with Station data (CHIRPS) does not present the same trend. Data from the World Bank Climate Change Knowledge Portal also does not confirm the trend as the precipitation monthly trend does not show a clear pattern of change (see Figure 11 and 12).

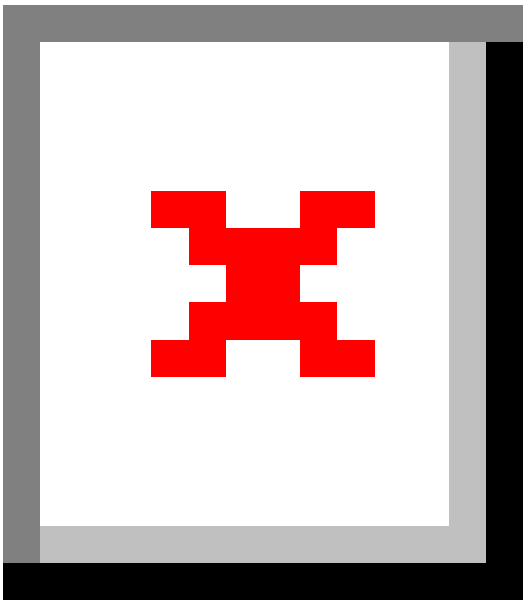


Figure 11. Rainfall time series a) annual (mm/year), b) rainy season (october tomay) and c) dry season (june to september) from local observations (blue curve), the chirps (red curve) and cmcrph (green curve) for the airport station (Source: Third National Communication in Climate Change)

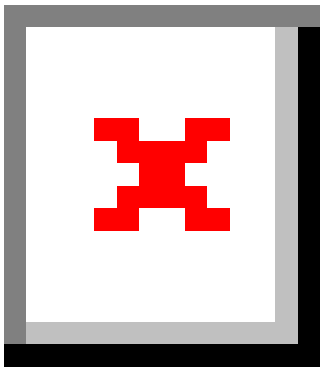


Figure 12. Precipitation monthly trends, S?o Tom? and Principe (Source: World Bank Climate Change Knowledge Portal

Climate projections: According to Eta model local-scale (downscaling Global CanESM2 model to 4 km resolution) climate change projections for the future period between the years 2041 and 2070 under the scenarios RCP4.5 and RCP8.5 shows a heating pattern on both islands in STP, with the increase in temperature being more intense in RCP8.5 (see Figure 13). Changes in temperature will reach approximately 2,5?C on RCP4.5 and 3?C on RCP8.5, both on dry and wet seasons. Projections for **temperature** show that most pronounced changes are likely to occur between October and May, although there is no change in the annual temperature cycle. During the "*gravana*", warming will be greatest in the central part of the island of Sa?o Tome? with high altitudes.

Regarding **rainfall**, the projections show large uncertainty between RCP4.5 and RCP8.5 scenarios for the period 2041-2070. Both scenarios project opposite variations, particularly between the months of October and May. In the RCP4.5 scenario, the projections indicate an increase in precipitation between the months of October and May, whereas in the RCP8.5 scenario, the projections indicate a decrease in precipitation, more accentuated in the rainy season (October to May). However, both scenarios project a decrease in precipitation from June to September, the ?gravana? period where water scarcity is already felt, for Lobata, part of Cantagalo and Pr?ncipe Island (see Figure 14).

Projections indicate an increase in accumulated rainfall per year for the RCP4.5 scenario and a decrease in the same for the RCP8.5 scenario. The decrease in rainfall for the RCP 8.5 scenario occurs in all the potential communities? areas being higher in Lobata district and Principe Island. For both scenarios, an increase in heavy rainfall is expected. There is also an increase in the number of consecutive dry days, which indicates an extension of the dry period (Gravana period), for both scenarios, although more intense for RCP8.5 for the regions of Lobata, Cantagalo and Princ?pe. Both scenarios predict warming with increasing heat waves, hot days, annual maximum temperature and annual minimum temperatures. In the projections, heavy precipitation increases in both islands in the RCP4.5, but only in the south-southwestern part of S?o Tom? Island in the RCP8.5. The increase in the dry period and in the precipitation? intensity have serious implications for agriculture, water supply, and hydroelectric power generation in the country.

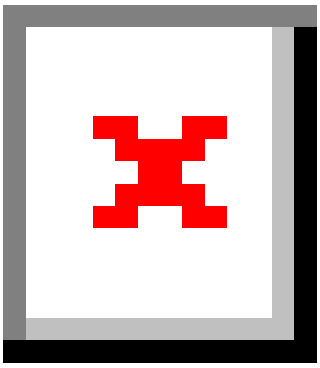


Figure 13. Temperature changes at 2 m average (? C) from October to May (rainy season) and from June to September (dry season) projected by the Eta-4km model for the period 2041-2070 in scenarios RCP4.5 and RCP8.5 for the period 1971-2000 for the Sa?o Tome? and Pri?ncipe Islands.

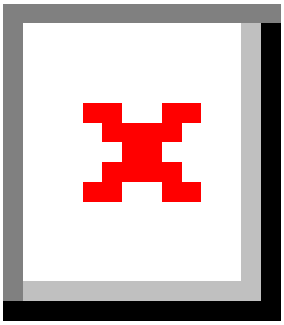


Figure 14. Change in cumulative precipitation (mm) from October to May (rainy season) and from June to September (dry season) projected by the Eta-4km model for the period 2041-2070 in scenarios RCP4.5 and RCP8.5 for the period 1971-2000 for the Sa?o Tome? and Pri?ncipe Islands.

Drought, flooding and groundwater levels

There have been severe droughts in the past years in S?o Tom? and Principe, two of the more severe occurred in 1983 and in 2010. In 1983 drought caused severe damages to agriculture leading to food scarcity, East and Northeast of S?o Tom? and the central area of Principe were the most affected. In 2010 the ?gravana? period extended for 3 to 6 months also causing a severe drought.

Extensive rainfall onto graduated or compacted soils (as seen in agricultural systems) and degraded landscapes can result in high levels of increased surface run-off. Water infiltration rates reduce under these conditions resulting in a lack of ground water recharge, greater soil erosion, and downstream flooding as watercourses become inundated. Although this indicates a potential increase of water availability, the reality is that with underdeveloped water infrastructure, flooding results in unpotable stagnated water sources (that increase levels of disease, particularly malaria) and a lack of retention of water in terrestrial systems.

Intensive agriculture and land use changes contribute to soil erosion across Sao Tome and Principe inland (ESRI,2023) and heightened flood vulnerability (Figure 15). Based on historical flood events, the country has experienced an average of 2 flood events per year since 1981 (World Bank, 2022). Between December 2021 and March 2022, the country was affected by two consecutive floods of varying severity, resulting in infrastructure damage in the northern and northwestern districts of Lemba, Me-Zochi, and Agua Grande. Lemba and Me-Zochi districts were heavily impacted, with Lemba being more vulnerable due to its socio-economic situation compared to the other affected districts. Analysis of the Topographic Wetness Index (TWI) indicates a variation between 1.57 and 21.91, with the country's slope ranging from 1.72 to 90 degrees (Figure 16). This suggests a susceptibility to flood events occurring during heavy rain across the S?o Tom? and Pr?ncipe islands with high susceptibility in Lemba; Me-Zochi and Agua Grande district.

Seasonal floods are already a common occurrence within river basins, causing economic and social losses in Sa?o Tome?. During the rainy season, large volumes of excess runoff from the upstream parts of the basins often cause damages downstream. In the dry season some of the same regions face water shortages due to year-round rain fed agriculture production. Large quantities of water pumped for agriculture, especially in the dry season when surface water is limited, are likely to exceed the amount recharged by rainfall. This causes groundwater levels to fall, with significant consequences for all users of the resource. Therefore, STP, without intervention of modern climate resilient agricultural and water infrastructure technologies will suffer a reduction in useable water availability under current climate predictions.

. In Principe Island the communities of Gaspar and Bela Vista are referred to have inundation issues in PNAEPAR. In Cantagalo District the community of Ant?nio, and part of Uba Budo community, are referred to have flood issues. In December 2021, and in March 2022 intense rains caused severe floods especially in the North of the island of S?o Tom? causing damages in Lemb?, Lobata, ?gua Grande, M?-Zochi and Cantagalo districts. In May 2022 in Principe Island intense rains caused floodings that led to severe damages.

Figure 15: Land Use Land Cover Changes between 2017 and 2022 Across Sao Tome and Principe

Figure 16: Flood Susceptibility Maps

According to a study conducted on Social Protection Targeting Through Satellite Data in S?o Tom? and Pr?ncipe, Me-Zochi, Cantagalo and Lobata are districts with higher exposure to drougths, and Cantagalo, Lobata and Principe are on the four districts more prone to floods.

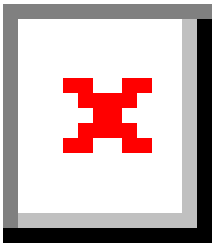


Figure 17. Estimated exposure to floods and drougths (source: Fisker, P., Gallego-Ayala, J., Malmgren Hansen, D., Sohnesen, T. P., & Murrugarra, E. (2022). Guiding Social Protection Targeting Through Satellite Data in S?o Tom? and Pr?ncipe)

Within the scope of the National Land Use Plan of S?o Tom? and Pr?ncipe the main natural hazards and the most vulnerable areas were identified, using a system for mapping risks and vulnerabilities in the entire territory of S?o Tom? and Pr?ncipe (Figure 18). The lack of some information induced to the simplification of some criteria conventionally used in the identification of vulnerable areas and highlighted the need of a more rigorous assessment, through more in-depth studies for each vulnerability class. Lobata and Cantagalo districts have areas threatened by floods and have also strategic infiltration areas.

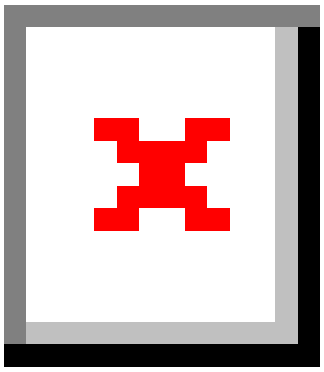


Figure 18. System of risks and vulnerabilities

Based on an analysis of climate vulnerability, two districts in particular were chosen for the project area: Cantagalo and Lobata districts, both on the island of S?o Tom?. Both districts have been having increasing problems with regards to water availability in recent years.
Cantagalo District has the greatest potential for the production of crops such as matabala (taro), banana and cocoa, and Pinheira in the district in particular grows a diverse range of crops such as manioc, corn, pumpkin, papaya, guava, watermelon, tomatoes, peppers, chillies, onions, green beans, etc. Even as an area with high agricultural potential, the community still lacks an efficient irrigation system that can guarantee sufficient water for all farmers.

Lobata District has some of the highest potential in the country for growing vegetables, corn, and cassava. Cocoa is also a dominant crop for the area, which is usually grown in association with matabala (taro) and banana. As it is one of the districts in the country responsible for supplying the national market with horticultural products, several communities in the District of Lobata use water to irrigate vegetable elds, though this is mainly in areas with access to water from rivers (Rio do Ouro, Rio A?gua Casada, and others). A number of projects in the area such as the COMPRAN project which provided a manual pump for irrigation of an eld above the level of the river, have not achieved sustained success due to issues of coordination, capacity, and maintenance of the equipment, so the agricultural potential of the district continues to lag.

In addition to these two districts, the Principe Island has also been identified, during the consultation workshop conducted with different stakeholders, as a priority area of intervention and will also be targeted due to expected impacts of climate change on agriculture.

The communities that will be targeted by the project based on a climate change vulnerability assessment, potential for agriculture and irrigation and ensuring there wouldn?t be duplication and overlapping with other synergy projects. The communities that will be targeted in this project are presented in table 1. See Annexes 1a, 1b and 1c on the project target communities (temperature and precipitation, agriculture and potential for irrigation in the two beneficiary districts).
Table 1: Target communities:

	Community	**District**
1	Canavial	Lobata
2	Ob? Moro	Lobata
3	Morro Peixe	Lobata
4	S?o Bernardo	Lobata
5	Fern?o Dias	Lobata
6	Pinheira	Cantagalo
7	Agostinho Neto	Lobata
8	Pedroma	Cantagalo
9	Uba Budo	Cantagalo
10	Santa Clara	Lobata
11	?gua Casada	Lobata
12	Oqu? M?quina	Lobata
13	Reta de Micol?	Lobata
14	Praia Nazar?	Lobata
15	Caldeiras	Lobata
16	S?o Domingo (entre Caldeiras e Agostinho Neto)	Lobata
17	Boa Esperan?a	Lobata
18	Santa Luzia	Lobata
19	Plancas 1	Lobata
20	Plancas 2	Lobata
21	?gua Sampaio	Lobata
22	Praia das Conchas	Lobata
23	Mutamba	Lobata

24	Santa Rita	Principe
25	Aeroporto	Principe
26	Azeitona	Principe
27	Porto Real	Principe
28	Monte Alegre	Principe
29	S Joaquim	Principe
30	Picate	Principe

Expected impacts of climate change on agriculture

Temperature and precipitation are two climate factors that severely affect the productive capacity of the soil. The increased length of the dry period and the increase in precipitation intensity are likely to have severe implications for agriculture in Sa?o Tome? island. The extended absence of water in the soil significantly reduces the soil productivity. On the other hand, the concentration of rain in a smaller period can lead to the loss of chemical nutrients, erosion and leaching. The loss of soil in high slope areas with low permeability can also occur due to flooding, as well as crop loss. An analysis of soil loss across S?o Tom? and Pr?ncipe (STP) using the Revised Universal Soil Loss Equation (RUSLE) and modeling in Google Earth Engine indicates a significant annual soil loss across the country's catchments. Between 2015 and 2022, S?o Tom? experienced an average of 12,038.13 hectares of soil loss, while Pr?ncipe Inland experienced an average of 7,482.76 hectares of soil loss (Figure 19). This high level of soil loss across S?o Tom? and Principeincreases the risk of reduced water infiltration for groundwater recharge and the destruction of agricultural land and agricultural production, especially during heavy rainfall

A study using high-resolution 4-km downscaled climate change projections using Eta regional climate model found that four of STP?s major crops (2 cash crops: cocoa and pepper, and 2 subsistence crops: taro and maize) all have increased risks to agricultural production due to future climatic conditions for the period 2041-2100. For these cultures the Crop Risk Index was estimated based on specific indicators of risk of water stress, heat stress and susceptibility to disease. For Taro an increase in the Crop Risk Index occurs for both scenarios, with most of the districts of Lobata, and Cantagalo presenting a high to very high risk and Principe Island a moderate to very high risk for RCP 4.5 scenario and high to very high risk for RCP 8.5 scenario. For Corn the Crop Risk index presents a moderate to high risk in the Lobata and Cantagalo districts for scenario RCP 4.5 and a high to very high risk in the districts of Lobata and Cantagalo for scenario RCP 8.5. For the cocoa a moderate risk occurs for RCP 4.5 for the whole S?o Tom? Island, for scenario RCP 8.5 most of Lobata district presents a very high risk and Cantagalo district a high risk. The increase in the risk occurs mainly due to water deficit due to the expected decrease in precipitation in the future and the extended dry periods. For Pepper the Crop Risk Index varies from moderate to high in the Lobata district, from high to very high for the Cantagalo district and is very high for Principe Island for scenario RCP 4.5, while for scenario 8.5 the Risk is very high in most of Principe Island, high in Lobata district and moderate to high in Cantagalo district.

These climate risks, combined with the low level of agricultural inputs including human capacities and inadequate infrastructure development (water storage facilities; irrigation schemes; energy access, roads, etc.) will limit the country's ability to develop the agricultural value chains . This project aims to increase the resilience of STP?s smallholder farmers to climate change while contributing to improved nutrition of the population and maintaining the ability of the country to export cash crops. Productivity of participating farmers will be increased and their vulnerability to the impacts of changes in precipitation patterns will be reduced by the introduction of measures to improve water management including stored surface water, increased and efficient groundwater recharge, solar powered irrigation. For a country so reliant on agriculture both for its economy and its food security, any sustained improvements in the agricultural sector?s adaptive capacity will have vital impacts on the country.

Figure 19: Soil loss mapping between 2015 and 2022 in Sao Tome and Principe

Barriers to the adoption of sustainable agricultural practices
The project will address the following barriers hindering the sustainable development of the agriculture sector and systemic drivers for its vulnerability to climate change:

Barrier 1: Limited access to innovative climate resilient water management technologies and services, including limited access to finance by communities and vulnerable populations

One of the major obstacles that S?o Tom? and Pr?ncipe faces in achieving and sustaining a low-emissions and climate resilient future is the limited access to relevant technologies. Some of these technologies would be virtually impossible to fund privately for smallholder farmers who are already vulnerable to extreme weather events like flooding, and whose climate-related risks are only projected to increase in the coming years. This is due both to the high cost of capital and to the restricted access to loans. The lending rates in Sao Tome and Principe are over 19% and have reached levels above 37% in previous years, and loan rates can be even higher for those working in agriculture (and may increase further as climate change increases financial risks), particularly for smallholder farmers. This creates a vicious cycle where the most vulnerable lack access to finance and technology, and therefore cannot access productive assets to repay loans.

Furthermore, the only asset most farmers have as a guarantee is land, but since land is owned by the Government of Sao Tome and Principe, banks do not accept agricultural land as a guarantee to obtain credit. Since most farmers and women in rural areas do not have qualified collateral nor banking profiles, they are normally automatically excluded from most formal financial instruments. However, the government has recently pledged USD 3 million in loans as a COVID-19 recovery package for people working in the productive sector, where land can be used as a guarantee and where the interest rate will be between 3.5% and 5%. Since this money is meant to cover a large sector, including farmers, breeders, fishers, processors, and traders/exporters of agricultural products, the impact of this money to allow smallholder farmers to access climate resilient and adaptation technologies for their farms remains to be seen. And even if it is successful in this respect, there are further barriers in terms of capacity and coordination, particularly for adaptation technologies which necessarily require community-level management.

In order to close the gap between current production levels and the agricultural potential of the country (even just to meet production levels of similar benchmark countries), irrigation technologies will be needed as a means of increasing efficiency. . Not only can some irrigation technologies be more water

efficient and therefore climate resilient, but they can also make work more time efficient for farmers, who may have more and more time constraints caused by future climate impacts ? particularly for women, who generally have more intensive obligations related to household and family duties.

Barrier 2: Limited national policy and institutional frameworks and coordination mechanisms to support and engage farmers in mainstreaming climate resilience and adaptation technologies and services in the water, agriculture and energy sectors

While there are a number of policies in place that promote sustainable agriculture, water management and energy efficiency, they are mainly focused on fisheries and on cash crops. These policies do not elaborate on how to support and engage farmers ? and smallholder farmers in particular. to deliver sustainable solutions to climate change problems. Policies are needed to actively promote mainstreaming climate resilience and adaptation technologies and services.

It is important to coordinate policies across sectors, and in particular the agriculture, water, and energy sectors. Policies need to encourage exchange of solutions and experiences across sectors and to provide mechanisms for joint action. The lack of an effective cross-sectoral coordination can cause a duplication of efforts and a misallocation of available resources. Given the interrelatedness of the water, agriculture and energy sectors, there are efficiency gains and opportunities for synergies that can be realised through an integrated approach.

Barrier 3: Low capacities to adopt and sustain climate resilient technologies and practices for irrigation at community level and insufficient capacity to provide technical assistance to farmers on innovative technologies.

Local traditional adaptation mechanisms and strategies are becoming inadequate in the face of increasing climate variability and extreme events. Small-holder farmers do not have enough access to the knowledge and skills required to sustainably adopt climate resilient innovative practices and technologies. While there are initiatives to increase the technical assistance given to farmers in STP, the country still lags behind in agricultural productivity potential and adoption of innovative resilient technologies. This is particularly the case for subsistence farming, which is vital to STP?s economic and food security. STP needs to increase agricultural productivity under climate change scenarios to reduce the reliance on food imports. A barrier analysis for the Government of STP funded by the GEF and UNEP determined lack of awareness to be a major barrier to the implementation of technologies for climate change adaptation. While the national technical assistance and rural extension service was institutionalized in 2012, it has already faced challenges and has been scaled back from five original regional delegations to cover the island of Sao Tome down to three. There are only 20 extension officers working for the Centre for Support of Rural Development of the Ministry of Planning and Development (CADR) to provide education and extension services for farmers across the entire island. Institutional and local capacities still need to be strengthened, and education is needed on climate resilient agricultural innovative techniques and water management strategies.

Barrier 4: Market barriers- Underdeveloped agricultural value chain

There is an underdeveloped agricultural value chain in STP affected by a lack or difficult access to capital (specially by women and youth) as well as to appropriate techniques for the storage and processing phases. In STP the proportion of female-headed households is about 40%, making it one of the highest in Africa. In rural areas, women engage in multiple activities and are strongly present in the agricultural (processing, marketing, etc.) and fisheries (as sellers) sectors. An analysis of the situation of women and children in STP, published by UNICEF in 2009, reveals that the country?s achievement of certain MDGs contrasts with a social picture that is characterized by family poverty, low participation of children and women, and lack of basic social services as reflected in the high incidence of water-borne diseases and

the low internal efficiency of basic education. In 2012, poverty continued to affect women (71.3%) more than men (63.4%). The number of women with a monthly income below the minimum wage (44.5%) was twice that of men (20.8%). This context demonstrates the need to promote high participation of rural women in the project, given the leading role they play within the household and society. In addition, producers have difficult access to markets due to a poor road network that is often affected by flooding and landslides. There is a need to track and improve existing processing units (associations and cooperatives), supporting their needs in terms of equipment, transport of raw materials to factories, storage, transformation and commercialization processes.

Barrier 5: Weak local organisational structures for the governance of water resources for irrigation

Farmer associations and producer organizations in Sao Tome and Principe are weak. In general, rural producers are little or not at all involved or implicated in the debates on policy issues and strategies for agricultural and rural development. The emergence of farmers' associations started in 1989 with the NGO Cooperative Union of the United States, with funding from the U.S. Agency for International Development, and later, with the International Fund for Agricultural Development (IFAD), under the Food Crops Development Project.

Global environmental problems	Root causes	Barriers	Project approach
nal flooding expected to e as a result of climate r dry seasons and more t droughts singly erratic and intense r events due to climate e run-off and topsoil and loss expected to e as a result of climate nd nutritional insecurity	y r inequalities rity, remoteness, and n as a SIDS apacity for extension s sive electricity reliant ssil fuel imports policy dialogue n government and lder farmers roductivity agriculture	Limited access to climate resilient and adaptation technologies and services, including limited access to finance by communities and vulnerable populations	C1: Reduce vulnerability and strengthen climate resilience of agricultural systems and livelihoods
		Limited national policy and institutional frameworks and coordination mechanisms to support and engage farmers in mainstreaming climate resilience and adaptation technologies and services in the water, agriculture and energy sectors	C2: Mainstream climate resilience of agricultural systems
		Lack of appropriate techniques for the storage and processing phases, difficult access to markets and lack of access to credit, support systems, and technology by women and youth.	C3: Improve access to markets and agro-transformation units. Gender mainstreaming throughout project components, activities, outcomes and outputs

		Low awareness of climate adaptation and resilience technologies and services, and capacity to provide technical assistance to farmers.	C4: Foster enabling conditions for effective and integrated climate change adaptation in the agricultural and water sectors

2) The baseline scenario and any associated baseline projects

Sao Tome and Principe has high agricultural potential given its fertile soil and rainfall. However, the country lags behind its potential, maintaining low agricultural productivity, low per capita GDP, and relatively high food deficits. Estimations are however outdated and additional assessments are needed to define the water availability under climate change scenarios.

According to the latest MAPDR survey on irrigation systems in S?o Tom? there are about 1,553 ha of irrigated land. The recent evolution of the irrigation situation is marked by:

- development of small-scale irrigation with the introduction of water-saving techniques: drop-by-drop systems
- development of irrigated crops in greenhouses

The key challenge is the lack of water during the dry season (*gravana*). As described in Section 1, climate change poses risk on water security and access for irrigation in STP. To cope with this problem, some farmers have built small storage basins that they use for supplemental irrigation during the dry season. However, these efforts are not coordinated and due to lack of guidelines and standards for such small- scale installations, often they end up not being operational.

Until recently, analysis showed that the absence of a strategy for the coherent and coordinated development of irrigation, particularly in regions that suffer from water scarcity was resulting in scattered efforts to establish irrigation systems. However, important advances have been reached with the process for formulation of the National Strategy for Irrigation. Initial analysis underpinning the design of the strategy identify that the main strategic issues and challenges related to irrigation development in Sao Tome and Principe are the following:

- Effective contribution of irrigated agriculture in achieving the national strategy for food security;
- Reasonable trade-offs between export ranks and irrigated food crops;
- Creation of conditions for the framework of the proximity of irrigation;
- Mobilization of water resources for irrigation;
- Role of irrigation in agricultural diversification;
- Contribution of irrigated agriculture to the development of population resilience to climate change;
- Management of environmental risks associated with the development of irrigation.

Regarding key value chains and agrifood transformation, the main challenges identified are:

- Reasonable conditions to access markets from communities where producers are based;
- Improvement, in terms of equipping and tracking existing processing units (associations and cooperatives), transport acquisition , which will help them transport raw materials to factories and support in the commercialization process;

•Improvement of the Legislative Framework for the promotion, export and protection of local products, as well as support for standardization, liberalization of raw material products and obtaining bar codes and labeling;
•Continuous training and/or training with emphasis on the specialization of target groups, in terms of farinaceous products and/or bread-making, (among others e.g. soap, fisheries) given that these are highly relevant activities that impact the lives of the population;
•More and better support for the CIAT laboratory, with regard to the training and qualification of its technical staff in terms of food quality control, HACCP, etc., with the aim of helping to improve the quality of agro-food products produced in different transformation units or factories;
•Installation of conservation units for fresh products in areas with greater potential;
•Mapping of the different segments of transformers and creation of networks to facilitate the commercialization of their products.

MAPDR as the sector's high-level governance leader has a clear strategic vision for transforming and developing the agricultural sector so that it plays its role in achieving the goals of economic growth, poverty reduction, and food security. Although this leadership is clearly embodied in the agricultural charter, it needs to be further entrenched. Mainly because the role of guiding or managing collective action that should be played by MAPDR at different territorial levels suffers from a lack of harmonization and coordination/articulation between the different departments and services at central and decentralized levels.

In order to achieve the highest possible degree of efficiency and effectiveness, critical analysis of the current situation highlights the need to implement structural reforms aimed at adopting innovative climate resilient technologies for agricultural production and climate-proof irrigation systems. In this context, the management capacities of the technical directorates must be strengthened to plan, coordinate and supervise their activities, through the adoption of results-based management (RBM), which should eventually become the programming and monitoring-evaluation framework for MAPDR action.

Associated baseline projects

The GEF-AfDB project entitled ?*PRIASA II - Rehabilitation Project of Infrastructures for Food Security Support*? (2015 ? 2021) seeked to improve food security and nutrition in S?o Tom? and Pr?ncipe by increasing the supply and value of agricultural and fisheries products throughout the year. In addition to basic infrastructure (roads, irrigation networks, markets, etc.), the project disseminated new techniques to improve the quality, conservation, processing and marketing of the products. These activities were accompanied by capacity building to develop national skills crucial to managing these innovations from all perspectives (technical, sanitary, legislative, etc.). PRIASA II was a continuation of PRIASA, which ran from 2010 to 2016, implemented by AfDB and MAPDR. The objective was to improve and increase agricultural and fishery production and to develop expertise and skills in various aspects of food production (irrigation, quality control, etc.) and through the rehabilitation and modernisation of essential infrastructure. The components of PRIASA II focused on rural infrastructure development, capacity development, and project management. PRIASA II emphasised essential agricultural and fisheries infrastructure and promoted interventions in the access to markets, the modernisation, production, the promotion of value chains, and the development of knowledge and new technologies. The proposed project will complement and build on PRIASA II project, by financing some activities that were part of the PRIASA II scope that couldn?t be implemented since its funding was used to address some emergency activities caused by the severe floods that affected the country in the end of 2021 and the beginning of 2022. PRIASA II was the baseline project for the LDCF project ?Strengthening Resilience and Adaptive Capacity to Climate Change in S?o Tom? and Pr?ncipe?s Agricultural and Fisheries Sectors? (GEF Project ID 9113), which was approved for implementation in

2019. Many of the activities of the existing project (GEF Project ID 9113) focused on fisheries, whereas the proposed project will be focused on the agriculture sector only. With regards to irrigation, GEF Project 9113 is installing irrigation systems and kits. Lessons learned about the most appropriate context for irrigation system installation will inform the deployment of irrigation systems for this project. Another activity of GEF Project 9113 is to pilot a hillside dam and construct water storage basins. Lessons learned from this activity will act as a baseline and inform the proposed Underground Taming of Floods for Irrigation (UTFI) activities of the project.

This proposed GEF7 project will be co-financed by the AFDB PRIASA III ? ?Co-management of climate extremes for agriculture and fisheries resilience? which has been developed to scale up and ensure continuity to PRIASA II and to complement the activities proposed in this GEF7 project. PRIASA III has as objective to promote agriculture and fisheries value chain development with innovative technologies and co-management of drought, flood, and water depletion to increase the resilience of the farming systems in S?o Tom? and Principe. PRIASA III complements this project with activities focused on enhancing value chains with the constructions of storage and processing facilies and by investing in the restoration of important rural roads on which farmers depend to access markets.

In addition, this project will build on and is complementary to the following projects (see Annex 2 on synergy projects):

GEF-DCF Project (PIMS 4645) ?*Enhancing capacities of rural communities to pursue climate resilient livelihood options in the S?o Tom? and Principe districts of Cau?, Me-Zochi, Principe, Lemba, Cantagalo, and Lobata (CMPLCL)*? implemented by UNDP (2015 ? 2019) seeked to strengthen the resilience of rural community livelihood options to climate change impacts in the 6 districts of S?o Tom? and Pr?ncipe. To achieve its objective, the project delivered the following three main outcomes: i) Strengthen the institutional capacity of key stakeholders; ii) Implemented adaptation interventions such as irrigation systems and erosion control measure to address identified climate risks in the project sites.; iii) Adoption of climate change adaptation solutions by the community and in particular access to micro-credit at community level was planned but later substituted by other community adaptation solutions such a vegetable greenhouses. The project has resulted in three irrigation systems installed in Santa Luzia (Lobata District), Rio Lima, Bom Sucesso and Saudade (M?-Z?chi District). Even though the project design focused its interventions in the development of rainfall utilization systems, it lacked the strategy for research, testing and introduction of new technologies at low costs potentially appropriate in some country areas. Therefore, rainfall harvesting technologies were not installed. While the project delivered a series of capacity building on climate resilient agricultural technologies, the Terminal Evaluation of the project highlights that MAPDR requires additional capacity development to be able to guide the establishment of policies, strategies and implementation of activities related to adaptations to climate change in the agriculture sector. Additionally, the evaluation report indicated that the technical staff from the extension services CADR have also indicated the need to further capacity development with regards to technological innovations e.g. rainwater harvesting and erosion control techniques.

The European Commision project entitled: ?*Landscape - Improving the use and management of land and natural resources through an integrated landscape management approach, contributing to sustainable access to food, income and the preservation of the ecosystems of the Ob? Natural Park and the High Conservation Value Forests of S?o Tom*?? (2021 ? 2025) seeks to strengthen the landscape management approach through climate smart solutions to promote biodiversity and ecosystem conservation.

In parallel, IFAD has been supporting the Government of S?o Tom? and Pr?ncipe in the agriculture and fisheries sector and its latest project entitled ?*Smallholder Commercial Agriculture Project ? PAPAC*? (2015-2020) had as objectives to reduce rural poverty and food insecurity through 1. Development of three inclusive value chains for organic cacao, coffee and pepper, 2. Development of family plantations, 3. Strengthening of producer associations. A successor project is currently seeking co-financing under GEF-7 support to marketing, agricultural productivity and nutrition (COMPRAN). COMPRAN will focus on extending the practices and the cooperative approach to other farmers and commodities which support the national policies of MADR to gradually reduce food imports and replace them with local products and expand the production base by increasing and diversifying agricultural production, livestock and fisheries.

The Participatory Smallholder Agriculture and Artisanal Fisheries Development Programme (PAPAFPA) (2001 ? 2015) is financed by IFAD and executed by the MAPDR. In general, the project had the goal provide support and empowerment to the rural areas and sectors. This would be achieved by the following components: restructuring of the rural secto; strengthening of services provided to the rural sector; and support to economic activities and innovation.
The project Early Warning Project (EWS) "Strengthening climate information and early warning systems in the S?o Tom? and Principe through the development of resilience and adaptation to climate change (2014-2021)
(GEF Project ID 5004) is financed by the GEF with PNUD as Executing Agency and the National Institute of Meteorology- National Council for preparation and responses to disasters as implementing Agency. This project intended to establish a network of climate monitoring stations for meteorological, hydrological and severe weather, in order to build climate understandin and EWS to increase resilience to climate-related shocks. In addition, systems were created to processes the data collected interpret and communicate to the intended users.

The project, Reducing Climate Vulnerability in STP - (2014-2019), financed by the European Union, is focused in the districts of Lemb? and M?-Z?chi with the objective of providing technical assistance for the development of District Adaptation Plan (PDA).

The Landscape Restoration for Ecosystem Functionality and Climate Change Mitigation in the Republic of S?o Tom? e Pr?ncipe (2018-2023) will have its implementation period extended until 2025. It is a project financed by the GEF and co-financed by the World Bank, with IFAD as Implementing Agency and the MAPDR as Executing Agency. The project?s objective is to promote the restoration and sustainable management of the forest ecosystems of S?o Tom? and Pr?ncipe.

3) The proposed alternative scenario with a brief description of expected outcomes and components of the project

The project's overall objective is to promote innovative technologies and co-management of drought, flood, and water depletion for irrigation as a means to increase the resilience of the farming systems in Sao Tome. The project adopts an integrated approach to water management for the agricultural sector, which will promote innovative technology and practices for water storage and aquifer recharge and soil management practices for water retention. In parallel, the project will strengthen local capacities and governance structures to create enabling environment and scaled-up opportunities. The specific project objectives include:

- To mitigate floods and manage droughts through aquifer storage for irrigation to boost agricultural productivity and enhance livelihoods, particularly for women-led households.

•To enhance the access to, maintenance of, and use by smallholder farmers of innovative, efficient, and context-appropriate irrigation equipment such as solar water pumps and drip irrigation kits.
•To promote sustainable soil and water management practices to enhance soil water retention.
•To improve market access and agrifood transformation to enhance key value chains.
•Create supportive enabling environment for replication and scaling up via strengthened local and national capacities and improved governance mechanisms.

The project?s strategy for reducing vulnerability to climate change is to climate-proof current productive activities through enhancing the ability of small farmers to cope with increasing climate variability and future climate change. Through the introduction of innovative solutions as water storage infrastructure, efficient irrigation technologies and conservation agriculture in addition to improvement of market access and transformation units:

Water storage infrastructure: Two categories of small-scale water storage will be implemented: 1) groundwater storage and 2) surface storage. The techniques that store water as soil moisture work by preventing (or significantly reducing) water runoff from an area using structures to hold water and thus encourage infiltration; this increases the proportion of rainfall entering soil storage, where it can later be used directly by plants. Water that infiltrates past the root zones of crops may percolate into aquifers and be stored as groundwater. Some water harvesting techniques collect runoff to encourage infiltration to increase groundwater storage, and others store water at the surface in natural or man-made ponds or tanks. The project will adopt the approach known as Underground Taming of Floods for Irrigation (UTFI). Water is later withdrawn for irrigation or other productive uses.

Conservation agriculture practices for preserving water and soil resources: Conservation agriculture involves minimum tillage, permanent soil cover with crop residues and live mulches and crop rotation and intercropping. This type of intervention helps increase crop productivity because it reduces erosion rates, improves moisture retention and increases organic matter content in soils. In terms of risk reduction, the promotion of minimum tillage and no-till farming expedites the soil preparation process and sowing at the beginning of the rainy season. These techniques are less labor intensive and tend to be easily adopted by women since in general they are affected by labor scarcity. Furthermore, implementing conservation agriculture practices will enhance soil carbon sequestration across the inland areas, thereby increasing the project's mitigation co-benefit. S?o Tom? and Pr?ncipe's dominant land cover is forested, offering significant carbon sequestration potential. To maximize the country's carbon sink capacity, the development of 520 hectares of irrigation land will prioritize the conversion of degraded land and the promotion of agroforestry or alley cropping systems. This approach holds the potential for a positive mitigation impact, with an estimated net reduction of 2,143.2 tons of CO_2 equivalent annually, equivalent to 10,716 tons of CO_2 over a five-year period (See Figure 20) .

Efficient irrigation technologies: The use of solar PV pump systems and irrigation technologies such as drip irrigation kits will enhance the access to water of remote farm, increase the efficiency of water management and increase savings for farmers, in particular women who have less access to cash, which will contribute to their adaptive capacity.

Enhanced value chains and financial instruments: Improving rural roads will enable producers to access markets. Enhancing transformation units with infrastructural support, as well as training and qualification, will enable to improve the quality of the product and income-generation for many low-income families. Building the capacities of extension officers to support the development of business plans to access tailored financial instruments will enable women and youth working in the food production and transformation to improve their production and income generation.

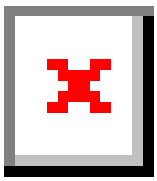


Figure 20: Carbon Footprint for the 520 ha of irrigation schemes

Project structure:
To achieve the abovementioned objectives, the project is structured around the following outcomes:
Outcome 1. Technologies and solutions for water storage and irrigation piloted and deployed to reduce climate-related risks and enhance resilience of agricultural systems and livelihoods
Outcome 2. Conducive implementation policy framework and supportive business model and incentive mechanism identified, designed and implemented
Outcome 3. Value chains strengthened through market access and agrifood transformation units and supportive business model and incentive mechanism identified, designed and implemented.
Outcome 4. Increased institutional and local capacities, including information and extension services to respond to climate change

The project will be implemented through four interrelated components described below.

Component 1. Reduce vulnerability and strengthen climate resilience of agricultural systems and livelihoods adopting innovative technologies
Outcome 1.1. Technologies and solutions for water storage and irrigation piloted and deployed to reduce climate-related risks and enhance resilience of agricultural systems and livelihoods
The objective of Component 1 is to reduce climate-related risks and the enhancement of resilience of agricultural systems and livelihoods. This will be achieved through piloting and deploying technologies and solutions for water storage and irrigation in alignment with the guidelines and priorities of the National Strategy for Irrigation. This component will focus on the promoting technologies and solutions for water storage and irrigation, which will be piloted and deployed to reduce climate-related risks and enhance resilience of agricultural systems and livelihoods, including those of women-headed households. The outputs of this component will provide a diversified suite of technologies to ensure water security for irrigation amid increased climate change risks for smallholder farmers in the S?o Tom? island. Women farmers will be closely engaged in the identification of their specific needs and tailoring of the technological suite to be gender responsive.

In particular, this component will include activities to pilot the practice Underground Taming of Floods for Irrigation (UTFI) for the first time in the context of Sao Tome and Principe. While Africa has among the highest potential for UTFI techniques, this is the first time it will be trialled in West Africa.

The benefits are two-fold: the UTFI technology will mitigate against the damage caused by floods by retaining water that would otherwise be washed downstream, and it also can be used as a means of adaptation by providing a source of water during dry seasons or droughts. Rainwater that is harvested can either be stored in tanks or ponds, or it can be allowed to percolate into the soil and recharge the underground aquifers. The aquifers can then be accessed to provide irrigation water throughout the year.

Once water storage technologies have been introduced, accompanied by soil and water conservation measures, there is a need for farmers to have technologies to access the stored water and use it for irrigation, including women farmers who may have less access to natural resources such as water. Wherever possible, irrigation systems will be gravity-fed, but in situations that require it, pumps will provide power for accessing irrigation water and operation irrigation systems, increasing irrigation capacity and avoiding the need for time consuming manual labour to transport water. PV pumps are an emerging technology that can replace conventional pumps powered by diesel fuel. Solar pumps save farmers operating costs in terms of the purchase of diesel fuel and avoid the emission of greenhouse gases and other air pollutants associated with the use of diesel fuel. The activities under this component will install off-grid PV pumps in farms, enhancing the farmers? access to irrigation water, including women farmers. Farmers will be trained in the use and maintenance of this technology, and farmer associations will be helped to create a fund to guarantee the maintenance of the equipment so that their sustainability is guaranteed. Start-up funds will be provided for the maintenance fund and farmers will be supported in putting systems in place to ensure top-ups when needed (Component 3).

The objective of Component 1 will be achieved by:

1.1.1 Surface water storage technologies (ponds and tanks for rainwater harvesting) constructed/rehabilitated to reduce vulnerability of crops to water scarcity.
1.1.2 Groundwater storage technologies constructed to reduce vulnerability to flash- floods and for aquifer recharge.
1.1.3 Soil moisture storage techniques using soil and water conservation measures implemented.
1.1.4 Small-scale off-grid PV pumps and drip irrigation kits installed in farms with diverse characteristics to enhance access to water for irrigation including for women.

Irrigation helps to extend and guarantee farming seasons and to ensure rational and efficient use of water resources. Micro-irrigation techniques (drip and micro-sprinkler) make it possible to take advantage of small water sources allowing for scheduled irrigation, applying water, agrochemicals and fertilizers as needed, thus saving inputs and reducing production cost, while increasing productivity and crops quality. The adaptation measures presented below will be chosen with the communities through a participative process, after which an inventory and feasibility study will be conducted (see Component 2) for their implementation (See Annex 3 for assessment on water storage and irrigation technologies used in the target communities and Annex 4 for further information on technologies proposed). Measures implemented will be selected considering potential social and environmental risks (see Annex 8a on Environmental and Social Management Plan- ESMP).

1. **Water Reservoirs**

The Nacional Irrigation Strategy presents estimations on potential evapotranspiration and crop water needs. According to this report, it is required 3,800m^3/ha of water from the month of June to September, during Gravana?s, for the North area of S?o Tome Island. The selection of the targeted storage was made considering cost limitations for the project, the fact that irrigation is managed by different factors and not just the storage. The defined target is to create approx. 15,000 m^3 of storages, which is equivalent to 2 days of storage of the required water to irrigate 250 ha.

2. **Underground Taming of Floods for Irrigation (UTFI)**

Underground Taming of Floods for Irrigation is a method that consists in using flood excess water to a recharge aquifer. This benefits the downstream communities of a catchment by reducing the risks of floods, and the upstream communities by providing water in the dry periods of the year. The technique consists of two main components, an aquifer with adequate storage capacity and productivity, and an infiltration area. The direct benefits of the UTFI method are enhanced in environmental assets (flood, ground water, baseloads). The indirect benefits are linked to sustainable drinking water provision, improved livelihood activities, and enhanced economic well-being. Form a general analysis of the vulnerability map presented in the National Territorial Planning, the Abade River could meet the conditions for the implementation of the technique, but so also could the Manuel Jorge and d?Ouro, as both present downstream flood issues and infiltration area. This project will target an assessment, feasibility study and scaling-up plan (Component 2) and in this component, the implementation of pilots in some of the targeted communities to be identified during the inception phase of the project implementation.

3. **Implementation of climate resilient agriculture practices and reforestation**

Resilient agricultural practices include agronomic techniques such as weeding, harrowing, grafting, and mulching. Weeding and defoliation help in reducing soil water losses. Cover crops play a role in reducing soil erosion and increasing soil organic matter. Harrowing prevents moisture loss by breaking soil into small fragments. Grafting techniques can mitigate yield losses due to drought. Mulching, when combined with no-tillage, minimizes crop exposure to heat stress and aids in retaining soil moisture. The half-moon method improves fertilizer efficiency by concentrating nutrients in a planting hole and reduces soil erosion while increasing nutrient deposition. Similarly, Za? pit systems enhance fertilizer efficiency, reduce soil erosion, and trap water close to crop root systems. This method also provides crops with protection from strong winds. Terracing is another method that curtails soil erosion and enhances nutrient deposition. Agroforestry is multifaceted, intersecting both traditional and modern practices. The integration of trees in farming is fundamental in many ecosystems, highlighting the importance and adaptability of agroforestry in sustainable agriculture. Reforestation involves restoring forested land that was previously deforested or degraded. Though the restored forest might not be as diverse as the original, reforestation offers both ecological and economic advantages, and is key in addressing climate change. It's crucial to differentiate reforestation from afforestation, the latter referring to introducing forests on lands that never had forests historically. In this activity, crop and tree species will be selected based on local cultural acceptance and considering potential social and environmental risks. No invasive species will be included in the systems. See Annex 4 for suggested species to be used in this activity (according to consultations conducted for the project development).

4. **Small-scale off-grid PV pumps and drip irrigation kits**

From the information in the National Irrigation Strategy (2018), it was estimated that the area within the selected communities for irrigation, is approximately 2,500 ha. The project intends to maximize the benefits, reaching a considerable number of communities members. Two measurements were considered fundamental for the quantification of the positive outcomes of the project, the hectares of land where drip irrigation kits are installed and the number of members of the community with adapted means of irrigation. Considering the broad scale of this project and the large amount parcels within this communities, the method for this estimating the quantities use a top-down approach.

It was defined that from the 2,500 ha of estimated potential areas, 20,8% would be covered by irrigation drip kits, benefiting 1,040 ha (The estimations assumed that the general farmlands area in STP ranges from 500 m^2 to 1ha. The project targets 936 plots of 0.5ha and 52 of 1ha) within cooperatives and organized community members. It is estimated that 7,280 people (2,912 being women) will benefit from this activity as well as from implementation of climate resilient agriculture practices and reforestation.

Component 2. Mainstream climate resilience of agricultural systems

Outcome 2.1 Conducive implementation policy framework designed and implemented

The objective of Component 2 is to create a supportive enabling environment for replication and scaling up of the innovative resilience building practices by enhancing research, fostering cross-sectoral collaboration and designing a concrete vision for upscaling of climate resilient agricultural technologies.

In particular this component will include activities, which will strengthen the scientific background and guidelines for the design and installation of the technological suite for water harvesting and storage from Component 1. Therefore, activities will seek to conduct hydrological modelling and system planning to inform about the decision of the location, design specifics and implementation modalities of the technological suite. All of the required models (groundwater, catchment hydrology and river hydraulic) will be developed with the aim of working in tandem so as to get a more accurate representation of potential scenarios of designs and effectiveness. Final models will answer questions such as how UTFI interventions may impact downstream canal water flows during both the dry and wet seasons. The models also evaluate the potential of UTFI to enhance the level of delivery of ecosystem services such as flood control, groundwater recharge and dry season water availability.

In parallel, the project will seek to foster cross-sectoral collaboration between the water, agriculture, energy and development sectors. Activities will focus on organizing and moderation three (3) structured cross-sectoral dialogues to define collaboration and governance models and opportunities at national level for the replication and upscaling of the project interventions to other districts in the country. It is expected that the outcome of these dialogues will be a roadmap for cross-sectoral collaboration for achieving agricultural resilience and a model for replication/upscaling of the innovative technologies and practices, including actions needed for replication of the technologies, the budget required and potential sources of finance.

This component aims as well to contribute to the policy framework and mainstream climate resilient agriculture and irrigation practices in the National Strategy for Irrigation. To achieve this, activities will aim to build upon the prepared roadmap and design a National Promotion Program which will provide guidelines, standards and identified opportunities for the replication of the resilient agricultural technologies and practices.

The objective of Component 2 will be achieved by:
2.1.1 Research on hydrological modelling for the planning and design of the water storage and harvesting technologies andpreparation of guidelines and standards for the implementation of adaptive agriculture practices. 2.1.2 Organisation of cross-sectoral structured dialogues to enhance national governance for climate resilient agricultural interventions and develop a road map to foster collaboration.

- 2.1.3 Design of a National Promotion Program for replication and upscaling of the climate resilient agricultural practices and technologies.

1. **Research/assessment on hydro-meteorological characterization and water allocation and Guideline on adaptive agriculture**

In this activity, assessments will be conducted to support the implementation of activities proposed under Component 1 and to enable long term climate resilience of agricultural systems in STP (see Annex 4 for further information on activities proposed). It also includes developing a meteorological database as follows:

- Report with the state of the hydrogeological system, water availability (for different conditions) and allocation within the limits of the project. This should present the assessment of water availability and water demand for the wet, dry and average hydrological year, also results of modelling for water harvesting and underground storage. The report should also provide adequately the information for public awareness, that will be included in the guidelines for the farmers on water use.
- First prompt assessment of the project area and review of the target technologies, identifying the main challenges and opportunities, providing specific goals for the next stages, identifying the list of

activities that could promptly be implemented as first phase measures to improve irrigation, such as communities that that will receive first package of storage and irrigation kits. The target is a diagnosis and first measures report.

- A thorough study on the techniques for soil management, crop selection, diversification, improvement and scheduling, and irrigation management. This task should communicate with the *Hydro-meteorological characterization and Water allocation* task, which will allow to determine the water availability for agriculture and the requirements. The purpose of the study is to determine the exact measures regarding storage and other infrastructures, irrigation systems and management, soil management, support of equipment such as pumps and PV panels, capacity building and trainings, and the implementation plan. The target is the preparation of the final Guideline on adaptive agriculture report.
- Implement 3 rainfall stations and create conditions for community-based rain monitoring.
- Creation of a meteorological database to help centralize data for the country and establish a communication channel with farming communities, that would issue seasonal reports and extreme events alerts.

2. **Cross-sectoral structured dialogues**

The project will fund the creation of national cross-sectoral working group for participatory and multi-governance dialogues on climate change and resilient agriculture and to implement recommendations that address regulatory and policy gaps hindering the adoption of climate resilient approaches. This will improve inter-institutional coordination and cooperation through the development of a roadmap to promote the replication of the resilient agricultural technologies and practices and definitions of responsibilities of relevant stakeholders. The dialogues will be led by the MAPDR in annual meetings that will gather other government institutions as well as financial and technical partners. The implementation of this action will require the involvement of stakeholders from public sector including ministries and government bodies, private sector, civil society organization, research institutions and international agencies working in STP. The target will be the establishment of an official governance mechanism of coordination between the institutions including public, private and CSOs sectors of STP and the establishment of a working group for donors? coordination on climate adaptation projects in the agriculture sector.

3. **National Promotion Program for replication and upscaling climate resilient agricultural practices and technologies**

This activity entails the compilation of all the background information of the project areas, of interventions, technologies selected and practices to be adopted to promote climate adaptive irrigation. This would set the road map for the integrated and successful implementation of the proposed technologies and a strategy to promote, replicate and scale-up these technologies in other communities and districts in STP. Based on the Guideline on adaptive agriculture as well as on the outcomes of the national dialogues, a National Promotion Program will be designed and launched through a communication campaign. There are approximately 225,000 in STP and it is considered that 25% of the population is rural. Through the National Promotion Program, it is expected that 56,250 people are made aware of climate change impacts and appropriate adaptation in STP.

Component 3. Strengthen key value chains and market linkages to enhance resilience and socio-economic benefits

Outcome 3.1 Value chains strengthened through market access and agrifood transformation units and supportive business model and incentive mechanism identified, designed and implemented

The objective of Component 3 is to strengthen key value chains in STP and improve market access in order to enhance resilience and socio-economic benefits. This will be achieved by i) improving rural roads to facilitate access to markets and improving agro transformation units, ii) building the producers and relevant staff capacities and iii) identifying tailored financial mechanisms to support producers and building the capacity of extension officers to support the development of business plans.

Component 3 objective will be achieved through:
3.1.1 Rural roads improved to enable markets access.
3.1.2 Agrifood transformation units improved and producers? capacities strengthened
3.1.3 Financial incentive mechanisms identified, and extension officers trained to provide assistance for supporting the development of farmers? business plans (specially women and youth)

1. **Rehabilitation of rural roads**

This activity will be co-financed by AFDB through the project PRIASA III for the rehabilitation of rural roads to improve access to markets of the communities benefiting from the implementation of resilient agriculture measures. The priorities for the rehabilitation of rural lanes were the following: communities with the greatest productive potential (those that most contribute to supplying the national market with basic products in the countries? diet (bananas and taro) and cocoa (export product). Will benefit from this intervention a large number of farmers with greater difficulties in selling their production and who simultaneously suffered greater degradation with the floods of December 2021, as well as Communities with interventions related to irrigation and that have roads in poor conditions. Through this activity, the project will support the rehabilitation of 31 km of tracks in the S?o Tom? and Principe islands.

2. **Agrifood transformation units and capacity building**

Regarding the improvement of the agrifood transformation sector in STP, the project will support tracking existing transformation units for key value chains (such as cacao, sugar cane, fisheries, flour- to be defined during the project execution), will support their improvement with equipment and with the implementation of storage facilities. The Sao -Tome Principe National Agriculture Investment Plan targets small, medium and large producers with the potential to produce for the market, and small and medium-sized enterprises (SMEs) that market agricultural inputs and/or technologies. The implementation approach is based on the concept of value chain focusing on the generation and transfer of technology, provision of agricultural and fisheries inputs, processing and marketing activities that add value to agricultural, livestock, fishery, forestry and wildlife products and sustainable management of natural resources. The project will attempt to raise yield and productivity by improving access to modern technologies and inputs through the provision of irrigation systems and kits farm inputs including high quality seeds and market potential varieties (Component 1), and support to the extension services (Component 4).

In this activity, the project will improve access to markets for inputs and outputs and raise profitability of farmer organizations producing vanilla, cocoa, and pepper and linking them to existing markets for the commodities. In addition, the project will provide some mini processing equipment/machines for value addition in order to address the problem of post-harvest losses during peak production seasons. In addition to vanilla, cocoa and pepper, the key value chains to be promoted under the project are tomato, cabbages, cucumbers, onion, beef and goat production. The project will finance an assessment on markets, transformation, and storage units; and the construction/rehabilitation of 22 processing/storage units (including market, storage infrastructure, transformation unit, drying areas and nursery) in the target communities.

In addition, staff members from the CIAT will be trained on food quality control and producers will have their capacity built on production and processing techniques to improve their production and income generation. PRIASA III will co-finance the improvement of fisheries storage and processing facilities.

3. **Financial mechanisms**

This activity will be co-fonanced by AfDBand include an assessment of existing financial instruments to support farmers improving their resilience and production. Extension officers will be trained in Component 4 and will provide support to producers to develop their business plans to access financing. The support to producers will be provided in annual workshops held at the community level and financing granted by AfDB.

Component 4. Foster enabling conditions for effective and integrated climate change adaptation in the agricultural and water sectors

Outcome 4.1 Increased institutional and local capacities, including information and extension services to respond to climate change

The objective of Component 4 is to create a supportive enabling environment for replication and scaling up by strengthening local and national capacities. This will be achieved through capacity building of (i) institutional staff at national and district level, (ii) strengthening of the skills of extension officers from Rural Development Support Center (CADR) to respond to climate change and (iii) local communities.

Some of the technologies of this project will be implemented and maintained at the community level; therefore, it will be critical to maintain engagement on the ground with local leadership and with community groups, including women-led groups, throughout all phases of the project in order to optimise its success. Existing community level organisations in the communities where the project will be active will be identified and strengthened in order to enable them to take ownership of the technologies, and in particular of those technologies that are implemented at the community level rather than at the farm level, such as the UTFI systems. The project aims to establish/strengthen the capacities of at least 7 local leadership councils and/or Resource Users Associations (of whom at least 3 will be women-led) will be established and/or strengthened. The project will build on existing institutions such as the agricultural extension services, to deliver its training and awareness-raising activities.

The objective of Component 4 will be achieved by:
4.1.1Capacity of institutional staff from the water, agriculture and energy sector enhanced for improved climate change governance.
4.1.2 Climate change and sustainable water management solutions integrated into the agricultural extension program to strengthen local capacity to address water-related climate risks.
4.1.3 Local leadership councils and/or Resource Users Association established/strengthened to facilitate stakeholder engagement and ownership of adaptation technologies.
4.1.4 The capacity of local communities is strengthened to apply and maintain water storage and irrigation technologies and solutions.

1. **Capacity building at the institutional level**

The capacity of institutions at national and district levels will be strengthened in terms of collection, management, processing, integration of climate information into sectoral analysis and dissemination of data for investment planning. Capacities will be built to extend the analysis of hydrometeorological information to the sectors of agriculture, livestock, food security, health, fisheries, and water resources management. Enhancing information services for climate change adaptation in these sectors through the introduction and integration of climate and water-related analytical tools will develop government capacity to overcome the current gap in water-monitoring and climate and will promote the use of climate information for climate resilient agriculture. This will result in effective and improved government capacity to manage water resources and information for a climate-resilient agriculture sector. The capacity building will be achieved through annual workshops targeting technical staff from different directorates of the Ministries of Agriculture, Environment, Energy, Planning and Finance and the District Chambers (40% women). Technical staff trained will also be involved in the Hydro-meteorological characterization and water allocation in Component 2. At least 24 technical staff will be trained in this activity.

2. **Integration of climate change into the agricultural extension program**

This activity involves developing an agricultural extension training program which will include and sustainable water management solutions, climate resilient agriculture practices as well as financial mechanisms and business plan development. Extension officers will be trained in annual workshops and will provide support to local farmers to access financing, implement and maintain climate resilient measures. At least 30 extension officers will be trained in this activity (40% women).

3. Establish/strengthen existing local leadership councils and/or Resource Users Association to facilitate stakeholder engagement and ownership of adaptation technologies

This activity entails an assessment of the local community organizations and the establishment or enhancement of at least 1 local leadership councils and/or Resource Users Associations per community targeted by the project. The project will support the assessment and the organization of the first meeting, as well as the development of Terms of Reference in which will be established the objectives, structure, and operation of the Community Resource Users Associations.

4. **Enhance capacity of local communities to apply and maintain water storage and irrigation technologies**

Climate resilient agriculture systems will be implemented in the communities through a farmer field school approach in which farmers learn by doing during capacity building sessions conducted at the community level. Community members trained, (40% women) will be trained for implementing resilient measures and also for the operation and maintenance of infrastructure and equipment integrating the technologies implemented. In addition, community leaders will be engaged and will have their capacity built for supporting the collection of meteorological data and provide inputs for the meteorological database established under Component 2. It should be aimed in this activity 30% of the community members benefiting from the technologies (7,280 people), which would represent 2,184 community members.

Review of complementary projects on which the project builds on/ is complementary to

S?o Tom? and Principe has an active thematic donors? Coordination of Development Partners of the Agricultural Sector of S?o Tom? and Pr?ncipe (GTSA-ACHA) led by UNDP and composed by the AfDB, WB, FAO and EU. The platform provides a simple and effective way to ensure complementarity, harmonization, coordination, and avoid duplication of efforts. The Development Partners are supporting STP to implement reforms including fiscal consolidation, strengthening the central bank?s independence, domestic revenue mobilization (introduction of the Value Added Tax-VAT) and reforms in the energy sector to improve the performance and recovery of the economy from the impact of Covid-19 pandemic. AFDB is the leading donor supporting the development of fishery and agriculture infrastructure to facilitate production, storage, and distribution capacity.

The following are baseline and complementary projects that have been identified in order to build on lessons and tools/instruments to help implement the project, and for cooperation and support.

PROJECTS	IMPLEMENTING AGENCY / FUND	DESCRIPTION	COMPLEMENTARITY
PRIASA III - Co-management of climate extremes for agriculture and fisheries resilience (2024-2028)	Implementing: Ministry of Agriculture, Fisheries and Rural Development (MADR Funding: African Development Fund	Promote agriculture and fisheries value chain development with innovative technologies and co-management of drought, flood, and water depletion to increase the resilience of the farming systems in S?o Tom? and Principe	PRIASA III will strengthen agriculture and fisheries value chains and market linkages to enhance resilience and socio-economic benefits; strengthen climate resilience of agricultural and Fisheries value chain and livelihoods adopting innovative technologies and Capacity building; and improve the enabling conditions for effective and integrated climate change adaptation in the Agricultural and fisheries sectors. This GEF7 project will benefit from PRIASA III co-financing in all its components. The project will be complemented by PRIASA III through value chain activities such as process and storage facilities and the rehabilitation of rural roads to improve market access.

PROJECTS	IMPLEMENTING AGENCY / FUND	DESCRIPTION	COMPLEMENTARITY
PRIASA II ? ?Rehabilitation Project of Infrastructures for Food Security Support? (2015 ? 2021)	Implementing: Ministry of Agriculture, Fisheries and Rural Development (MADR Funding: African Development Fund	To reduce the vulnerability of agricultural and fisheries communities to the adverse impacts of climate change in S?o Tom? and Pr?ncipe through adaptation measures meant to enhance the resilience of affected sectors, natural systems and communities	Some elements that must be observed while implementing this project are: Adopt and scale-up climate-silient technologies and actices for reduced sectoral lnerability and ecosystem-sed adaptation trengthen physical assets and tural systems for improved silience of the agriculture and heries sectors and mmunities Diversify livelihoods and urces of income of useholds and communities r enhanced resilience and od security trengthen awareness, chnical and institutional pacities to identify, develop d implement effective aptation and NRM strategies mprove data and technical owledge base for better sessment of vulnerabilities, reats and preparedness This project will ensure continuity to PRIASA II activities, complementing it with the implementation of adaptation measures in target communities, capacity building and enhancement of value chains. The project will build on all lessons learned from the implementation of PRIASAII.

PROJECTS	IMPLEMENTING AGENCY / FUND	DESCRIPTION	COMPLEMENTARITY
Landscape Restoration for Ecosystem Functionality and Climate Change Mitigation in the Republic of S?o Tom? e Pr?ncipe (2018-2023- extension to 2025)	Financed by the GEF and co-financed by the World Bank. IFAD as executing Agency. MADR as implementing Agency.	Promote the restoration and sustainable management of the forest ecosystems of S?o Tom? and Pr?ncipe.	The project focus is to enhance the national commitment to Forest and Landscape Restoration in STP; to improve and the policy framework for the conservation, restoration, and sustainable management of STP forest; and to promote interventions to enhance ecosystem services and mitigate climate change in vulnerable natural forest areas. The project is being implemented and has resulted in the development of a restoration plan for STP on which this GEF7 project will build on for identifying priority areas for reforestation in the target communities and for avoiding duplication and overlapping of the 2 projects. Also, this project will benefit from the reforestation activities undertaken in the district of M?-Zochi, where two important rivers that are responsible for superficial water resources in the target districts of Lobata and Canta Galo originate from, the Manuel Jorge and the Abade. These activities implemented in M?-Zochi contribute to the provision of water in the target districts by improving the recharge of superficial and underground water and avoiding soil erosion and silting up of the Manuel Jorge and the Abade rivers.

PROJECTS	IMPLEMENTING AGENCY / FUND	DESCRIPTION	COMPLEMENTARITY
The restoration initiative (TRI)	Financed by the GEF. IUCN, UNEP and FAO as implementing agencies.	Promote a better land use practices and the creation of an environment conducive to the restoration of degraded forest landscape and the sustainable management of natural resources.	In the TRI project an evaluation of forest and landscape restoration options has been conducted for the different regions of STP, divided into landscape Center (M? Zochi and Cantagalo), landscape South (Cau?) and landscape North (Lemb? and Lobata) and landscape RAP (North of Principe Island). This project will benefit from the assessments and recommendations developed under the TRI project in order to select (with the communities) the areas to be reforested and to avoid duplication of efforts. The project management unit of the project will work in coordination with the implementing agencies of the TRI to seek synergies and complementarities.

PROJECTS	IMPLEMENTING AGENCY / FUND	DESCRIPTION	COMPLEMENTARITY
LDCF project ?Strengthening Resilience and Adaptive Capacity to Climate Change in S?o Tom? and Pr?ncipe?s Agricultural and Fisheries Sectors? (GEF Project ID 9113)	Executing Agencies: African Development Bank Implementing Agencies: Ministry of Agriculture, Fisheries and Rural Development (MADR) Funding Source: Least Developed Countries Fund	The project is structured in the following components: Strengthening resilience of the agricultural and fisheries sectors, natural systems and communities to climate change and variability; Enhancing technical and institutional capacities for adaptation to climate change at all levels; Monitoring, evaluation and knowledge management for effective adaptation	This GEF project has some points aligned with the project: Climate-resilient technologies and practices adopted and scaled up for reduced sectoral vulnerability and ecosystem-based adaptation, including climate-smart agriculture, irrigation systems such as drip kits, efficient water use. This complemented by Physical assets and natural systems strengthened for improved resilience of sectors and communities, through climate resilient water resources management, reforestation, and soil conservation. Livelihoods and sources of income of households and communities diversified for enhanced resilience and food security. Awareness, technical and institutional capacities strengthened to identify, develop and implement effective adaptation and natural resources management strategies. Improved data and technical knowledge base for better assessment of vulnerabilities, threats and preparedness. The proposed GEF7 project will be implemented in close coordination with the GEF6 9113, building on lessons learned and ensuring complementarity by targeting different areas.

PROJECTS	IMPLEMENTING AGENCY / FUND	DESCRIPTION	COMPLEMENTARITY
GEF-DCF Project (GEF Project ID 5184) ?Enhancing capacities of rural communities to pursue climate resilient livelihood options in the Sao Tome and Principe districts of Cau?, Me-Zochi, Principe, Lemba, Cantagalo, and Lobata (CMPLCL)? (2015 ? 2019)	Funding: UNDP / GEF Implementation: Direc??o da Agricultura, PNUD e CONPREC	The project is structured in the following components: Developing capacities of the key institutions of relevance to rural development and livelihoods to effectively support communities resilience and adaptation to climate change; Investments for the protection of communities livelihoods against climate risks; Diffusion of climate resilient livelihoods strategies in the most vulnerable communities.	Strengthening the capacities of CATAP, CIAT, DGA, CADR, civil society organizations, community organizations, local authorities. Creation of ?infrastructures and mechanisms? for protection against erosion, floods and droughts risks. Adaptation strategies are designed and transferred to strengthen communities climate resilience in the 30 most vulnerable villages, including credit access, agro-sylvo-pastoral adaptation technologies, prioritization and coordination. Also, strengthen institutional and community capacity This project will focus on the districts of Cantagalo and Lobata and will scale up activities implemented under the GEF-DCF by focusing on other vulnerable communities. This GEF7 project will build on all lessons learned from GEF-DCF, ensuring consultation and coordination with partners such as the PNUD during its implementation.

PROJECTS	IMPLEMENTING AGENCY / FUND	DESCRIPTION	COMPLEMENTARITY
?Landscape - Improving the use and management of land and natural resources through an integrated landscape management approach, contributing to sustainable access to food, income and the preservation of the ecosystems of the Ob? Natural Park and the High Conservation Value Forests of S?o Tom?? (2021 ? 2025)	European Commission (EC)	Strengthen the landscape management approach through climate smart solutions to promote biodiversity and ecosystem conservation	Develop public-private partnerships for ecotourism development, provide technical and financial support for a forest surveillance and monitoring system, and organize local workshops to engage key stakeholders in forest management and governance. Develop and pilot community-based agroforestry models, supported through capacity building and production plans for organized agricultural producers. Organize and promote participation and deliver capacity building for all stakeholders. This project will be implemented in close coordination with the Ob? Natural Park project in order to exchange lessons learned on agroforestry models. In addition, this GEF7 project complements this conservation EC project by focusing on value chains and market access which also contributes to reduce pressure on natural ecosystems.

PROJECTS	IMPLEMENTING AGENCY / FUND	DESCRIPTION	COMPLEMENTARITY
Project for support to marketing, agricultural productivity, and nutrition (COMPRAN)	Main financial support: IFAD (Fonds international de d?veloppement agricole) Implementing Agency: Ministry of Agriculture, Fisheries and Rural Development (MADR)	(i) support for wealth creation will impact 75 per cent of supported households, which will report an increase in income, as well as micro-project promoters and young micro-entrepreneurs; (ii) 75 per cent of supported producer organizations will declare a profit growth of around 30 per cent; (iii) a significant improvement in nutritional status; (iv) the adoption of environmentally friendly and climate resilient production techniques, technologies and practices by supported producers; and (v) the development of structural infrastructure to improve the resilience of production systems.	Component A: Scale up the achievements of PAPAC. Facilitating access to market opportunities for 6,500 small producers. Develop 35 business plans with agribusiness that will engage in a stable business relationship with producers. Capacity building actions of the different actors involved. Develop micro-projects for income-generating activities while meeting basic food and nutritional needs. Support 700 young rural people in their initiatives to create or develop micro-enterprises. Component B: Supported small producers in adopting appropriate resilient technologies, and practices. Improve access to inputs, advisory services and environmental education. Sustainable improvement of infrastructure (facilities, runways, market rehabilitation, storage warehouses and drying areas). This GEF project will build on lessons learned from COMPRAM and will scale up and be complementary to it by promoting similar interventions such as climate resilient agriculture practices and enhancing value chains in different target areas.

PROJECTS	IMPLEMENTING AGENCY / FUND	DESCRIPTION	COMPLEMENTARITY
Smallholder Commercial Agriculture Project (PAPAC) (2015-2020)	Main financial support: FIDA (Fonds international de d?veloppement agricole) Implementing Agency: Ministry of Agriculture, Fisheries and Rural Development (MADR)	The overall aim of PAPAC will be to continue the work begun by PNAPAF (National Smallholders Support Programme) and PAPAFPA (Participatory Smallholder Agriculture and Artisanal Fisheries Development Programme) in reducing rural poverty and food insecurity. Its specific objective will be to: "to provide 4,750 of the most vulnerable rural households (i.e. 18,500 inhabitants) with sustainable opportunities to access income from the equitable valorization of their plant and animal production on niche export and domestic markets".	(i) "Development of family plantations", the aim of which will be to enable around 3,650 target households (i.e. 14,220 inhabitants) to have, by the end of the project, a viable and professional farm in the sectors already supported during PAPAFPA (cocoa, coffee and pepper), (ii) "Consolidation of producers' organizations" with the aim of bringing the four exporting cooperatives for cocoa (2), pepper (1), arabica coffee (1) created with PAPAFPA support and the associations linked to them to be increasingly efficient, robust and autonomous (institutionally and financially) and "connected sustainably and equitably" with external partners (commercial and technical). (iii) "New areas of intervention", which, through the introduction of adapted micro-irrigation techniques and the development of integrated models ("contract farming") with national private operators specializing in quality pork and poultry, should enable around 1,100 households (i.e. 4,300 people) to gain access to new sustainable cash income opportunities and/or boost the profitability of activities they are already engaged in; (iv) "Project coordination, management and monitoring-evaluation". As for COMPRAM, this GEF project will build on lessons learned from the PAPAC project, scaling up and be complementing it by promoting climate resilient agriculture practices, water

PROJECTS	IMPLEMENTING AGENCY / FUND	DESCRIPTION	COMPLEMENTARITY
			use and storage technologies, enhancing value chains, and market access in different target areas.
Participatory Smallholder Agriculture and Artisanal Fisheries Development Programme (PAPAFPA) (2001 ? 2015)	Main financial support: FIDA (Fonds international de d?veloppement agricole) Implementing Agency: Ministry of Agriculture, Fisheries and Rural Development (MADR)	In general, the project had the goal provide support and empowerment to the rural areas and sectors. This would be achieved by the following components: Restructuring of the rural sector; Strengthening of services provided to the rural sector; Support to economic activities and innovation.	Regarding the rural restructuring, the project as the aim to promote community organization and professional associations such as cooperatives. To strengthen the services provided to the needs and demands of smallholder farmers and fishers, national support was envisioned for a NGOs. Other activities were developed to: empower smallholders to improve their incomes by developing new products and activities and enable grass-roots organizations to lead value chain development activities, including exports; develop economic infrastructure such as small irrigation schemes and access road rehabilitation; implement environmentally friendly technologies such as solar panels and energy derived from windmills. This project builds on the PAPAFPA lessons learned and scales up its results by implementing adaptation measures in other target areas.

PROJECTS	IMPLEMENTING AGENCY / FUND	DESCRIPTION	COMPLEMENTARITY
Early Warning Project (EWS) "Strengthening climate information and early warning systems in the STP through the development of resilience and adaptation to climate change. (2014-2021) (GEF Project ID 5004)	PNUD-GEF/LDCF Implementing agencies: National Institute of Meteorology; National Council for preparation and responses to disasters	The goal of the project is to strengthen STP EWS, through improvement of national capacity and use of climate information for risk management. This, by implementing the following components: Transfer of climate technologies and environmental monitoring infrastructures and; Integrated climate records in development plans and early warning systems. There is no risk mapping. [i]	This project intended to establish a network of climate monitoring stations for meteorological, hydrological and severe weather, in order to build climate understanding and EWS to increase resilience to climate-related shocks. In addition, systems were created to processes the data collected interpret and communicate to the intended users. This would include the installation of workstations to strengthen the capacity of S?o Tom? Airport Forecasting Centre, and development of the human capacity to make such a system work. The project selected the Ribeira Afonso as one of the pilot sites for the implementation of Integrated Community Based EWS. This location is prone too flash floods, on average 23 days a year. This GEF7 project will build on lessons learned regarding the production of tailored information for farmers and will coordinate with the PNUD to ensure possibilities of scaling up this initiative, challenges and solutions are discussed during the national dialogues on climate adaptation that will be promoted by the project.

PROJECTS	IMPLEMENTING AGENCY / FUND	DESCRIPTION	COMPLEMENTARITY
Reducing Climate Vulnerability in STP - (2014-2019)	European Union	Concrete actions on the ground to achieve tangible benefits for the most vulnerable groups in the districts of Lemb? and M?-Z?chi, which are considered the most sensitive to climate vulnerability. Creation of institutional conditions, at national level, conducive to greater coordination of actions and greater impact of actions on the ground.[i]	The project ?Projeto AMCC - Redu??o da Vulnerabilidade Clim?tica na RDSTP? had the goal of providing technical assistance for the development of District Adaptation Plan (PDA) for Lemba and Me-Zochi. The preparation of this plan gathered an inventory of STP sectors, including agriculture, water resources and forestry. The plan also presents measures for the same sectors, such as management measures, infrastructures, techniques and technologies, as well as the associated costs. This GEF7 project will build on lessons learned regarding the development of a District Adaptation Plan and will ensure possibilities of scaling up this initiative, challenges and solutions are discussed during the national dialogues on climate adaptation that will be promoted by the project.

Figure 8 below presents the project Theory of Change diagram:

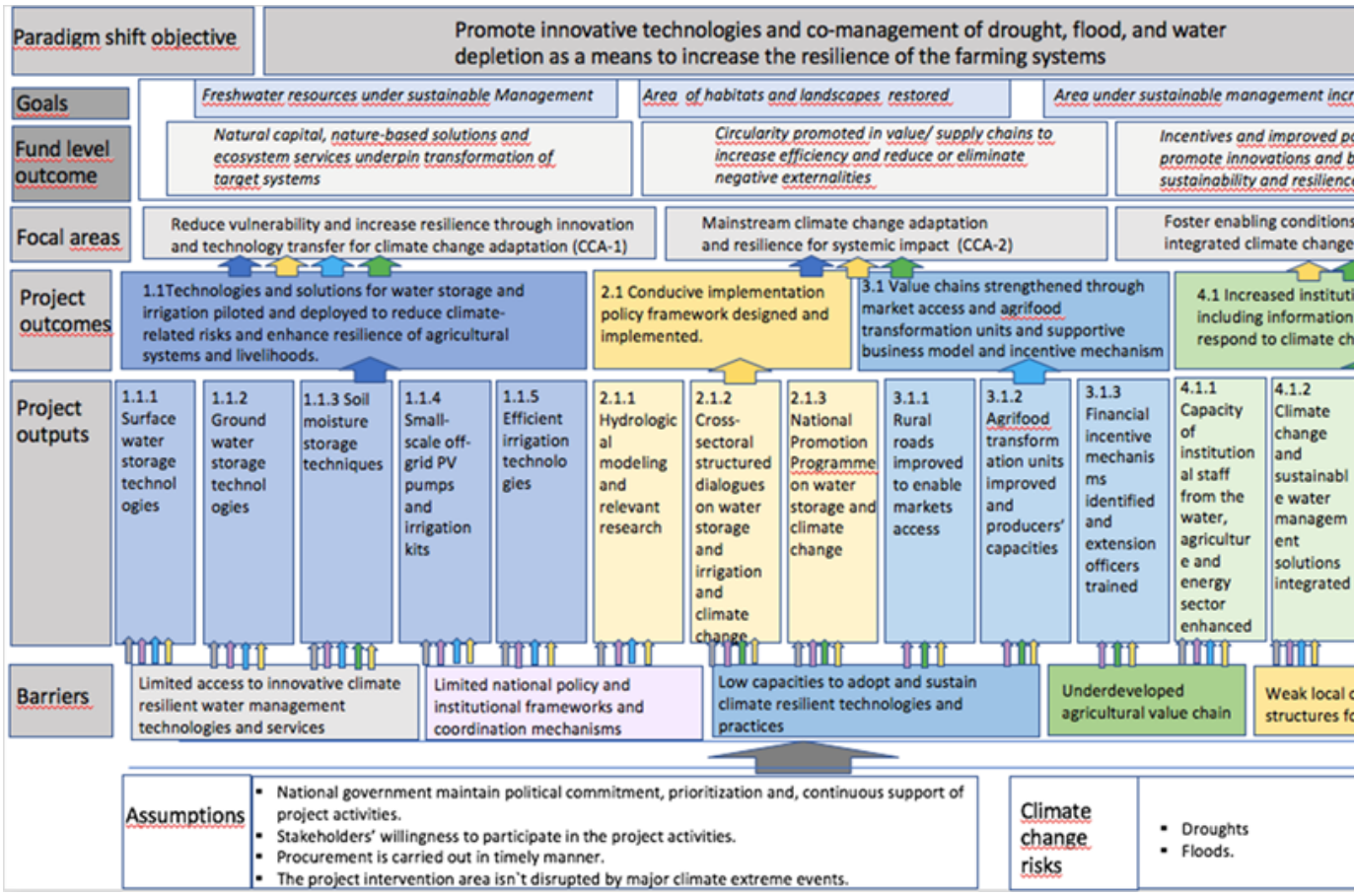


Figure 8. Theory of Change Diagram

Knowledge management and project M&E:
Effective knowledge management ? including the collection, generation, and dissemination of information ? is an important component of climate change adaptation. Access to current and detailed information on climate trends and adaptation techniques is essential for project stakeholders such as government agencies, agricultural extension services and local communities to implement prioritized adaptation intervention effectively and sustainably on the ground. Component 5 in the project includes the design and implementation of a knowledge management (KM) plan, which will consist of capturing, documenting, and disseminating lessons learned from the project activities both at the local and institutional levels for targeting and improving adaptive capacity of smallholder farmers (Please see Section 8). Further detail on the Project M&E is presented in Section 9.

Theory of Change

The project Theory of Change (ToC) demonstrates how S?o Tom? and Pr?ncipe?s agriculture sector currently operating at the producers and national government level with a limited focus on integrating a climate resilience lens and characterized by a fragile socio-economic environment will be transformed

through the implementation of innovative irrigation and water storage technologies, the improvement of value chains, the implementation of a policy framework and capacity building to face current and projected climate adaptation challenges.
In the rural communities, providing improved agricultural infrastructure without addressing the real cause is not enough to ensure climate-proof agricultural production. It requires having adequate human, infrastructural, and institutional capacity to ensure the reliant access to irrigation water during prolonged drought events. Farmers also need to adopt best agricultural and land use, practices which is currently threatening the sustainability of agricultural productivity. The project promotes cross-cutting and strong synergies among the components and enables local and national agencies to strengthen their capabilities to mainstream climate change considerations in the water resource and agricultural management in S?o Tom? and Pr?ncip. The project activities are expected to improve the livelihoods of the vulnerable households in the Districts of Cantagalo and Lobata vulnerable to climate change induced hazards. The synergy of interlinked intervention measures such as infrastructural capacity (agricultural irrigation technologies, rehabilitated roads, transformation units), human capacity (local capacity building, government, cooperatives) and institutional capacity (policy framework) are aimed to building climate resilience to avoid and/or minimize climate-induced risks.
As a result, the project is expected to: (i) reduce the vulnerability and strengthen climate resilience of agricultural systems and livelihoods including those households led by women; (ii) integrate climate resilience as a key factor in agricultural planning and management; and (iii) strengthen the capacity at local and national level regarding innovative irrigation techniques, soil management and conservation; and (iv) enhance cross-sectoral structured dialogues to enable replication of water storage and irrigation technologies. These outputs are expected to enable rural communities to increase climate-smart agricultural investments that translate into higher yields, assets and incomes that improve food security and livelihoods throughout the seasons. The project outcomes are expected to contribute to Climate Change Adaptation by:
- Reducing vulnerability and increase resilience through innovation and technology transfer for climate change adaptation (CCA-1).
- Mainstreaming climate change adaptation and resilience for systemic impact (CCA-2).
- Fostering enabling conditions for effective and integrated climate change adaptation (CCA-3).

3) The proposed alternative scenario with a brief description of expected outcomes and components of the project

The project's overall objective is to promote innovative technologies and co-management of drought, flood, and water depletion for irrigation as a means to increase the resilience of the farming systems in Sao Tome. The project adopts an integrated approach to water management for the agricultural sector, which will promote innovative technology and practices for water storage and aquifer recharge and soil management practices for water retention. In parallel, the project will strengthen local capacities and governance structures to create enabling environment and scaled-up opportunities. The specific project objectives include:

? To mitigate floods and manage droughts through aquifer storage for irrigation to boost agricultural productivity and enhance livelihoods, particularly for women-led households

? To enhance the access to, maintenance of, and use by smallholder farmers of innovative, efficient, and context-appropriate irrigation equipment such as solar water pumps and drip irrigation kits.

? To promote sustainable soil and water management practices for enhance soil water retention.

? To improve market access and agrifood transformation to enhance key value chains.

? Create supportive enabling environment for replication and scaling up via strengthened local and national capacities and improved governance mechanisms.

The project?s strategy for reducing vulnerability to climate change is to climate-proof current productive activities through enhancing the ability of small farmers to cope with increasing climate variability and future climate change. Through the introduction of innovative solutions as water storage infrastructure, efficient irrigation technologies and conservation agriculture in addition to improvement of market access and transformation units:

Water storage infrastructure: Three categories of small-scale water storage will be implemented: 1) groundwater storage and 2) surface storage. The techniques that store water as soil moisture work by preventing (or significantly reducing) water runoff from an area using structures to hold water and thus encourage infiltration; this increases the proportion of rainfall entering soil storage, where it can later be used directly by plants. Water that infiltrates past the root zones of crops may percolate into aquifers and be stored as groundwater. Some water harvesting techniques collect runoff to encourage infiltration to increase groundwater storage, and others store water at the surface in natural or man-made ponds or tanks. The project will adopt the approach known as Underground Taming of Floods for Irrigation (UTFI). Water is later withdrawn for irrigation or other productive uses.

Conservation agriculture practices for preserving water and soil resources: Conservation agriculture involves minimum tillage, permanent soil cover with crop residues and live mulches and crop rotation and intercropping. This type of intervention helps increase crop productivity because it reduces erosion rates, improves moisture retention and increases organic matter content in soils.17 In terms of risk reduction, the promotion of minimum tillage and no-till farming expedites the soil preparation process and sowing at the beginning of the rainy season. These techniques are less labor intensive and tend to be easily adopted by women since in general they are affected by labor scarcity.

Efficient irrigation technologies: The use of solar PV pump systems and irrigation technologies such as drip irrigation kits will enhance the access to water of remote farm, increase the efficiency of water

management and increase savings for farmers, in particular women who have less access to cash, which will contribute to their adaptive capacity.

Enhanced value chains and financial instruments: Improving rural roads will enable producers to access markets. Enhancing transformation units with infrastructural support, as well as training and qualification, will enable to improve the quality of the product and income-generation for many low-income families. Building the capacities of extension officers to support the development of business plans to access tailored financial instruments will enable women and youth working in the food production and transformation to improve their production and income generation.

Project structure:

To achieve the abovementioned objectives, the project is structured around the following outcomes:

Outcome 1. Technologies and solutions for water storage and irrigation piloted and deployed to reduce climate-related risks and enhance resilience of agricultural systems and livelihoods

Outcome 2. Conducive implementation policy framework and supportive business model and incentive mechanism identified, designed and implemented

Outcome 3. Value chains strengthened through market access and agrifood transformation units and supportive business model and incentive mechanism identified, designed and implemented.

Outcome 4. Increased institutional and local capacities, including information and extension services to respond to climate change

The project will be implemented through four interrelated components described below.

Component 1. Reduce vulnerability and strengthen climate resilience of agricultural systems and livelihoods adopting innovative technologies

The objective of Component 1 is to reduce climate-related risks and the enhancement of resilience of agricultural systems and livelihoods. This will be achieved through piloting and deploying technologies and solutions for water storage and irrigation in alignment with the guidelines and priorities of the National Strategy for Irrigation. This component will focus on the promoting technologies and solutions for water storage and irrigation, which will be piloted and deployed to reduce climate-related risks and enhance resilience of agricultural systems and livelihoods, including those of women-headed

households. The outputs of this component will provide a diversified suite of technologies to ensure water security for irrigation amid increased climate change risks for smallholder farmers in Sao Tome island. Women farmers will be closely engaged in the identification of their specific needs and tailoring of the technological suite to be gender responsive.

In particular, this component will include activities to pilot the practice Underground Taming of Floods for Irrigation (UTFI) for the first time in the context of Sao Tome and Principe. While Africa has among the highest potential for UTFI techniques, this is the first time it will be trialled in West Africa. The benefits are two-fold: the UTFI technology will mitigate against the damage caused by floods by retaining water that would otherwise be washed downstream, and it also can be used as a means of adaptation by providing a source of water during dry seasons or droughts. Rainwater that is harvested can either be stored in tanks or ponds, or it can be allowed to percolate into the soil and recharge the underground aquifers. The aquifers can then be accessed to provide irrigation water throughout the year.

Once water storage technologies have been introduced, accompanied by soil and water conservation measures, there is a need for farmers to have technologies to access the stored water and use it for irrigation, including women farmers who may have less access to natural resources such as water. Wherever possible, irrigation systems will be gravity-fed, but in situations that require it, pumps will provide power for accessing irrigation water and operation irrigation systems, increasing irrigation capacity and avoiding the need for time consuming manual labour to transport water. PV pumps are an emerging technology that can replace conventional pumps powered by diesel fuel. Solar pumps save farmers operating costs in terms of the purchase of diesel fuel and avoid the emission of greenhouse gases and other air pollutants associated with the use of diesel fuel. The activities under this component will install 11 off-grid PV pumps in farms, enhancing the farmers? access to irrigation water, including women farmers. Farmers will be trained in the use and maintenance of this technology, and farmer associations will be helped to create a fund to guarantee the maintenance of the equipment so that their sustainability is guaranteed. Start-up funds will be provided for the maintenance fund and farmers will be supported in putting systems in place to ensure top-ups when needed (Component 3).

The objective of Component 1 will be achieved by:

? Construction and/or rehabilitation of surface water storage technologies such as ponds and tanks for rainwater harvesting in 7 communities, reducing the vulnerability to water scarcity of the crops grown by the inhabitants of the communities.

? Adoption of soil moisture storage techniques using soil and water conservation measures implemented

? Installation of small-scale off-grid PV pumps in farms with diverse characteristics to enhance access to water for irrigation

? Installation of efficient irrigation technologies (irrigation kits)

Component 2. Mainstream climate resilience of agricultural systems

The objective of Component 2 is to create a supportive enabling environment for replication and scaling up of the innovative resilience building practices by enhancing research, fostering cross-sectoral collaboration and designing a concrete vision for upscaling of climate resilient agricultural technologies.

In particular this component will include activities, which will strengthen the scientific background and guidelines for the design and installation of the technological suite for water harvesting and storage from Component 1. Therefore, activities will seek to conduct hydrological modelling and system planning to inform about the decision of the location, design specifics and implementation modalities of the technological suite. All of the required models (groundwater, catchment hydrology and river hydraulic) will be developed with the aim of working in tandem so as to get a more accurate representation of potential scenarios of designs and effectiveness. Final models will answer questions such as how UTFI interventions may impact downstream canal water flows during both the dry and wet seasons. The models also evaluate the potential of UTFI to enhance the level of delivery of ecosystem services such as flood control, groundwater recharge and dry season water availability.

In parallel, the project will seek to foster cross-sectoral collaboration between the water, agriculture, energy and development sectors. Activities will focus on organizing and moderation three (3) structured cross-sectoral dialogues to define collaboration and governance models and opportunities at national level for the replication and upscaling of the project interventions to other districts in the country. It is expected that the outcome of these dialogues will be a roadmap for cross-sectoral collaboration for achieving agricultural resilience and a model for replication/upscaling of the innovative technologies and practices, including actions needed for replication of the technologies, the budget required and potential sources of finance.

This component aims as well to contribute to the policy framework and mainstream climate resilient agriculture and irrigation practices in the National Strategy for Irrigation. To achieve this, activities will aim to build upon the prepared roadmap and design a National Promotion Program which will provide

guidelines, standards and identified opportunities for the replication of the resilient agricultural technologies and practices.

The objective of Component 2 will be achieved by:

? Research on hydrological modelling for the planning of the water storage and harvesting technologies

? Preparation of guidelines and standards for the design and installation of the water storage and harvesting technologies

? Organisation of cross-sectoral structured dialogues to enhance national governance for climate resilient agricultural interventions and develop a road map to foster collaboration

? Design of a National Promotion Program for replication and upscaling of the climate resilient agricultural practices and technologies

Component 3. Strengthen key value chains and market linkages to enhance resilience and socio-economic benefits

The objective of Component 3 is tho strengthen key value chains in STP and improve market acces in oder to enhance resilience and socio-economic benefits. This will be achieved by i) improving rural roads to facilitate acces to markets; by improving agro transformation units and building the producers and relevant staff capacities and by iii) identifying tailored financial mechanisms to support producers and building the capacity of extion officers to support the development of business plans.

According to INAE ? National Road Institute, the road network of S?o Tom? and Pr?ncipe is organized and identified in National Roads (EN), Secondary Roads (ES) and Dirt Roads (ET), the latter being the one that makes up the majority of rural lanes. Table 1 below shows the rural roads identified in STP and their condition (poor, regular, good).

Table: Rural roads per district in STP

	Dirt Roads (Km)	**Paved**

Districts	Total	Condition			Road (Km)
		Poor	Regular	Good	
Lobata	118,041	107,77	0,949	11,907	12,421
Interdistrict	58,003	58,003		1,75	25,021
Mexochi	195,067	192,227	1,94	0,9	0,9
Interdistrict	21,785	19,92	1,865		1,865
Cantagalo	164,98	147,27	4,531	13,18	10,597
Interdistrict	31,456	31,456			
Lemba	146,711	141,959		2,82	9,374
Caue	86,486	83,965	1,906	0,615	1,396
Rap	82,1729	57,2819	8,543	16,348	13,196
Total	904,702	839,851	19,734	47,520	74,770
Total %		92,832	2,181	5,253	8,265

As shown in be seen in the table above, more than 92% of the dirt tracks are in poor condition and represent 839 km in length. The experience of recent years, and taking into account the volume of financial resources spent, the rehabilitation of rural lanes only on beaten earth is not effective and, on the other hand, the lanes rehabilitated on pavement have shown greater longevity. According to this assumption, it was assumed as an intervention methodology, the rehabilitation of rural paved roads only. On the island of S?o Tom?, the priorities for the rehabilitation of rural lanes were the following: Communities with the greatest productive potential (those that most contribute to supplying the national market with basic products in the countries? diet (bananas and taro) and cocoa (export product). Will benefit from this intervention a large number of farmers with greater difficulties in selling their production and who simultaneously suffered greater degradation with the floods of December 2021, as well as Communities with interventions related to irrigation and that have roads in poor conditions of degradation. Communities identified during the stakeholder consultation are: i) in Lobata: Sugarcane fields; St Bernard; Obo Moro/ Mouro Peixe; Saint Clara and ii) in Cantagalo: Pine tree.

Regarding the improvement of the agrifood transformation sector in STP, the project will support tracking existing transformation units for key value chains (such as cacao, sugar cane, fisheries, flour- to be defined during the project execution), will support their improvement with equipment and with the implementation of storage facilities. In addition, staff members from the CIAT will be trained on

food quality control and producers will have their capacity built on production and processing techniques to improve their production and income generation.

Finally, activities under Component 3 include an assessment of existing financial instruments to support farmers improving their resilience and production and the capacity building of extension officers that will support producers developing their business plans to access financing.

Component 3 objective will be achieved through:

? Restoration of rural roads to enable markets access.

? An assessment of agrifood transformation units and their conditions.

? Procurement of equipment to improve processing and storage.

? Capacity building of producers to improve production an increaseincome generation.

? Capacity building of CIAT staff to improve Food quality control.

? Assessment of financial instruments available to producers.

? Capacity buiding of extension officers to support the development of business plans.

Component 4. Foster enabling conditions for effective and integrated climate change adaptation in the agricultural and water sectors

The objective of Component 4 is to create a supportive enabling environment for replication and scaling up by strengthening local and national capacities. This will be achieved through capacity building of (i) institutional staff at national and district level, (ii) strengthening of the skills of extension officers from CADR to respond to climate change and (iii) local communities.

Some of the technologies of this project will be implemented and maintained at the community level; therefore, it will be critical to maintain engagement on the ground with local leadership and with community groups, including women-led groups, throughout all phases of the project in order to optimise its success. Existing community level organisations in the communities where the project will

be active will be identified and strengthened in order to enable them to take ownership of the technologies, and in particular of those technologies that are implemented at the community level rather than at the farm level, such as the UTFI systems. The project aims to establish/strengthen the capacities of at least 7 local leadership councils and/or Resource Users Associations (of whom at least 3 will be women-led) will be established and/or strengthened. The project will build on existing institutions such as the agricultural extension services, to deliver its training and awareness-raising activities.

The objective of Component 4 will be achieved by:

? Capacity strengthening of institutional staff from the water, agriculture and energy sector for improved climate change governance

? Integrate climate change and sustainable water management solutions into the agricultural extension program to strengthen local capacity to address water-related climate risks

? Establish/strengthen existing local leadership councils and/or Resource Users Association to facilitate stakeholder engagement and ownership of adaptation technologies

? Enhance capacity of local communities to apply and maintain water storage and irrigation technologies and solutions.

Component 5 includes knowledge management and the project M&E.

Effective knowledge management ? including the collection, generation and dissemination of information ? is an important component of climate change adaptation. Access to current and detailed information on climate trends and adaptation techniques is essential for project stakeholders such as government agencies, agricultural extension services and local communities to effectively and sustainably implement prioritized adaptation intervention on the ground. Component 5 in the project includes the design and implementation of a knowledge management (KM) plan, which will consist of capturing, documenting and disseminating lessons learned from the project activities both at the local and institutional levels for targeting and improving adaptive capacity of smallholder farmers (Please see Section 8). Further detail on the Project M&E is presented in Section 9.

4) Alignment with GEF focal area and/or Impact Program strategies

The project is in full alignment with the strategic objectives of the LDCF. In particular, the project is aligned with Objective 1: Reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation and Objective 2: Mainstream climate change adaptation and resilience for systemic impact.

Article 10 of the UNFCCC Paris agreement states, ?Parties share a long-term vision on the importance of fully realizing technology development and transfer in order to improve resilience to climate change and to reduce greenhouse gas emissions.? Technology transfer is recognised as a vital aspect of sustainable growth and development for LDCs, and the project incorporates innovative approaches of technology use to aid in Sao Tome and Principe?s growth and development in the face of climate change. As such, the project is aligned with LDCF?s strategic objective to reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation. This is particularly true in terms of the LDCF Outcome 1.1: Technologies and innovative solutions piloted or deployed to reduce climate-related risks and/or enhance resilience. The project will be piloting Underground Taming of Floods for Irrigation (UTFI) for the first time in the context of Sao Tome and Principe. While Africa, along with Asia, has the highest potential for UTFI techniques[3][1], this is the first time it will be trialed in West Africa. The project will also be deploying complementary irrigation technologies to enhance the resilience of farmers, particularly in dry seasons and in times of drought.

The project works across sectors ? particularly water, agriculture, and energy ? and across governance levels from national to local levels. As stated in Article 7 of the UNFCCC Paris agreement, ?adaptation is a global challenge faced by all with local, subnational, national, regional and international dimensions, and that it is a key component of and makes a contribution to the long-term global response to climate change to protect people, livelihoods and ecosystems.? Climate change causes cross-cutting, systemic challenges which will require cross-cutting, systemic solutions like the ones presented in the project to increase resilience and the capacity for people, livelihoods, and ecosystems to adapt to climate change. The project aligns with LDCF?s strategic objective to mainstream climate change adaptation and resilience for systemic impact. It contributes to both LDCF Outcome 2.1: Strengthened cross-sectoral mechanisms to mainstream climate adaptation and resilience and Outcome 2.2: Adaptation considerations mainstreamed into investments. These will be achieved through structured dialogues, programmes for adaptation technology promotion, and developed business models for the sustainability of the technologies used. The project will also work towards LDCF?s strategic objective to mainstream climate change adaptation and resilience for systemic impact through capacity development of local communities and institutions across sectors and the establishment and strengthening of local leadership councils and resource users? associations.

5) Additional cost reasoning and expected contributions from the baseline, the LDCF, and co-financing

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Without the LDCF funding, S?o Tom? and Pr?ncipe?s fragile socio-economic-environmental system will continue being vulnerable as a result of climate change impacts, in particular drought and floods. The levels of poverty in STP will remain high: currently more than two-thirds of the population lives in

poverty, and more than one-fifth lives in extreme poverty.[4][2] The country will continue to rely on imports to fill the gap in national agricultural production. Smallholder farmers will continue to get low and erratic crop yields due to floods eroding topsoil and droughts preventing the growth of crops. The people of STP will continue to lack proper food security and nutrition due to the agricultural sector?s vulnerability to climate change and to underutilized water resources for agriculture. Women will continue to lack access to training and to natural resources and will continue to be particularly vulnerable to the impacts of climate change. Without unlocking the potential of STP?s water resources to build the resilience and of local food systems and livelihoods to climate change and other shocks, and without mainstreaming climate change adaptation and improving the effectiveness of public and private investments in agriculture, the country will not fully achieve its development goals.

The proposed LDCF project will build the resilience of smallholder farmers to the expected climate change hazards including floods and prolonged droughts by enhancing capacities and promoting innovative technologies and practices for soil and water management. This will be achieved by: i) enhancing the institutional and technical capacity of municipal and district authorities, extension services and farmers to implement interventive irrigation techniques; ii) strengthening local governance structured for inclusive water management; iii) implementing on-the-ground technologies for water harvesting and irrigation; iv) developing business models for sustainability. The additional cost reasoning for each component of the proposed LDCF project is described below.

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Component 1. Reduce vulnerability and strengthen climate resilience of agricultural systems and livelihoods adopting innovative technologies

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Business as usual scenario:

Agriculture in S?o Tom? is predominantly rain-fed and there is only about 1,553 ha of irrigated land. Climate change projects show the high likelihood that the agricultural sector will be affected by prolonged droughts and floods. The ongoing PRIASA II project aimed to construct water conservation, harvesting or collection basins to store water and create a strategic reserve in times of shortage. Specifically, the outputs include pilot hillside dam(s) in Pinheira/ Pedroma; construction of water conservation, harvesting or collection basins in Pinheira or Agostino Neto (including assessment and monitoring) to store water and create a strategic reserve.

The planned PRIASA III aims to implement irrigation and water storage technologies implement irrigation and water storage technologies.

In a business-as-usual scenario, cost-effective adaptation interventions that focus on ecosystems and consider climate change are unlikely to be implemented. Consequently, communities vulnerable to

climate change will not receive ecosystem-derived benefits such as increased food security, protected material belongings and lives, secured water supply and protected water and infrastructure.

Adaptation scenario with LDCF project:

The LDCF funds, the project will design technological interventions that are low cost, low-tech, robust and easily managed by farmers and local communities. With the help of baseline data (collected in Component 2), this will feed into the design and pilot scale implementation. In particular, LDCF resources will be used to implement a range of innovative technologies for water harvesting, storage and efficient irrigation adopting a strong gender-responsive approach. Scientifically rigorous protocols, developed in collaboration with national and international experts and based on international best practice, will guide the planning, design and implementation of the interventions. Workshops and outreach activities in target communities will encourage a participatory approach, promote support from local communities and build adaptive capacity. In line with the proposed technological suite, agricultural practices will be shifted towards soil and water conservation to increase the water retention capacity of the soil and thus increase resilience to the effects of climate change,

The interventions in this component will be cost-effective as well as environmentally and socially applicable to the selected sites. This will include using scientific, transparent and participatory process when selecting project sites. Similarly, the site-specific interventions will be guided by scientifically rigorous protocols and community preferences (Component 2).

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The proposed LDCF project will build upon the ongoing activities of the baseline projects and in particular PRIASA II and the planed PRIASA III. The cofinancing is estimated to be USD 2,218,000 for this component.

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Component 2. Mainstream climate resilience of agricultural systems

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Business as usual scenario:

3) The proposed alternative scenario with a brief description of expected outcomes and components of the project

The project's overall objective is to promote innovative technologies and co-management of drought, flood, and water depletion for irrigation as a means to increase the resilience of the farming systems in Sao Tome. The project adopts an integrated approach to water management for the agricultural sector, which will promote innovative technology and practices for water storage and aquifer recharge and soil management practices for water retention. In parallel, the project will strengthen local capacities and governance structures to create enabling environment and scaled-up opportunities. The specific project objectives include:

- To mitigate floods and manage droughts through aquifer storage for irrigation to boost agricultural productivity and enhance livelihoods, particularly for women-led households.
- To enhance the access to, maintenance of, and use by smallholder farmers of innovative, efficient, and context-appropriate irrigation equipment such as solar water pumps and drip irrigation kits.
- To promote sustainable soil and water management practices to enhance soil water retention.
- To improve market access and agrifood transformation to enhance key value chains.
- Create supportive enabling environment for replication and scaling up via strengthened local and national capacities and improved governance mechanisms.

The project?s strategy for reducing vulnerability to climate change is to climate-proof current productive activities through enhancing the ability of small farmers to cope with increasing climate variability and future climate change. Through the introduction of innovative solutions as water storage infrastructure, efficient irrigation technologies and conservation agriculture in addition to improvement of market access and transformation units:

Water storage infrastructure: Two categories of small-scale water storage will be implemented: 1) groundwater storage and 2) surface storage. The techniques that store water as soil moisture work by preventing (or significantly reducing) water runoff from an area using structures to hold water and thus encourage infiltration; this increases the proportion of rainfall entering soil storage, where it can later be used directly by plants. Water that infiltrates past the root zones of crops may percolate into aquifers and be stored as groundwater. Some water harvesting techniques collect runoff to encourage infiltration to increase groundwater storage, and others store water at the surface in natural or man-made ponds or tanks. The project will adopt the approach known as Underground Taming of Floods for Irrigation (UTFI). Water is later withdrawn for irrigation or other productive uses.

Conservation agriculture practices for preserving water and soil resources: Conservation agriculture involves minimum tillage, permanent soil cover with crop residues and live mulches and crop rotation and intercropping. This type of intervention helps increase crop productivity because it reduces erosion rates, improves moisture retention and increases organic matter content in soils. In terms of risk reduction, the promotion of minimum tillage and no-till farming expedites the soil preparation process and sowing at the beginning of the rainy season. These techniques are less labor intensive and tend to be easily adopted by women since in general they are affected by labor scarcity. Furthermore, implementing conservation agriculture practices will enhance soil carbon sequestration across the inland areas, thereby increasing the project's mitigation co-benefit. S?o Tom? and Pr?ncipe's dominant land cover is forested, offering significant carbon sequestration potential. To maximize the country's carbon sink capacity, the development of 520 hectares of irrigation land will prioritize the conversion of degraded land and the promotion of agroforestry or alley cropping systems. This approach holds the potential for a positive mitigation impact, with an estimated net reduction of 2,143.2 tons of CO_2 equivalent annually, equivalent to 10,716 tons of CO_2 over a five-year period (See Figure 20) .

Efficient irrigation technologies: The use of solar PV pump systems and irrigation technologies such as drip irrigation kits will enhance the access to water of remote farm, increase the efficiency of water management and increase savings for farmers, in particular women who have less access to cash, which will contribute to their adaptive capacity.

Enhanced value chains and financial instruments: Improving rural roads will enable producers to access markets. Enhancing transformation units with infrastructural support, as well as training and qualification, will enable to improve the quality of the product and income-generation for many low-

income families. Building the capacities of extension officers to support the development of business plans to access tailored financial instruments will enable women and youth working in the food production and transformation to improve their production and income generation.

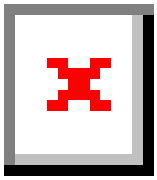


Figure 20: Carbon Footprint for the 520 ha of irrigation schemes

Project structure:
To achieve the abovementioned objectives, the project is structured around the following outcomes:
Outcome 1. Technologies and solutions for water storage and irrigation piloted and deployed to reduce climate-related risks and enhance resilience of agricultural systems and livelihoods
Outcome 2. Conducive implementation policy framework and supportive business model and incentive mechanism identified, designed and implemented
Outcome 3. Value chains strengthened through market access and agrifood transformation units and supportive business model and incentive mechanism identified, designed and implemented.
Outcome 4. Increased institutional and local capacities, including information and extension services to respond to climate change

The project will be implemented through four interrelated components described below.

Component 1. Reduce vulnerability and strengthen climate resilience of agricultural systems and livelihoods adopting innovative technologies
Outcome 1.1. Technologies and solutions for water storage and irrigation piloted and deployed to reduce climate-related risks and enhance resilience of agricultural systems and livelihoods
The objective of Component 1 is to reduce climate-related risks and the enhancement of resilience of agricultural systems and livelihoods. This will be achieved through piloting and deploying technologies and solutions for water storage and irrigation in alignment with the guidelines and priorities of the National Strategy for Irrigation. This component will focus on the promoting technologies and solutions for water storage and irrigation, which will be piloted and deployed to reduce climate-related risks and enhance resilience of agricultural systems and livelihoods, including those of women-headed households. The outputs of this component will provide a diversified suite of technologies to ensure

water security for irrigation amid increased climate change risks for smallholder farmers in the S?o Tom? island. Women farmers will be closely engaged in the identification of their specific needs and tailoring of the technological suite to be gender responsive.

In particular, this component will include activities to pilot the practice Underground Taming of Floods for Irrigation (UTFI) for the first time in the context of Sao Tome and Principe. While Africa has among the highest potential for UTFI techniques, this is the first time it will be trialled in West Africa. The benefits are two-fold: the UTFI technology will mitigate against the damage caused by floods by retaining water that would otherwise be washed downstream, and it also can be used as a means of adaptation by providing a source of water during dry seasons or droughts. Rainwater that is harvested can either be stored in tanks or ponds, or it can be allowed to percolate into the soil and recharge the underground aquifers. The aquifers can then be accessed to provide irrigation water throughout the year.

Once water storage technologies have been introduced, accompanied by soil and water conservation measures, there is a need for farmers to have technologies to access the stored water and use it for irrigation, including women farmers who may have less access to natural resources such as water. Wherever possible, irrigation systems will be gravity-fed, but in situations that require it, pumps will provide power for accessing irrigation water and operation irrigation systems, increasing irrigation capacity and avoiding the need for time consuming manual labour to transport water. PV pumps are an emerging technology that can replace conventional pumps powered by diesel fuel. Solar pumps save farmers operating costs in terms of the purchase of diesel fuel and avoid the emission of greenhouse gases and other air pollutants associated with the use of diesel fuel. The activities under this component will install off-grid PV pumps in farms, enhancing the farmers? access to irrigation water, including women farmers. Farmers will be trained in the use and maintenance of this technology, and farmer associations will be helped to create a fund to guarantee the maintenance of the equipment so that their sustainability is guaranteed. Start-up funds will be provided for the maintenance fund and farmers will be supported in putting systems in place to ensure top-ups when needed (Component 3).

The objective of Component 1 will be achieved by:

1.1.1 Surface water storage technologies (ponds and tanks for rainwater harvesting) constructed/rehabilitated to reduce vulnerability of crops to water scarcity.
1.1.2 Groundwater storage technologies constructed to reduce vulnerability to flash- floods and for aquifer recharge.
1.1.3 Soil moisture storage techniques using soil and water conservation measures implemented.
1.1.4 Small-scale off-grid PV pumps and drip irrigation kits installed in farms with diverse characteristics to enhance access to water for irrigation including for women.

Irrigation helps to extend and guarantee farming seasons and to ensure rational and efficient use of water resources. Micro-irrigation techniques (drip and micro-sprinkler) make it possible to take advantage of small water sources allowing for scheduled irrigation, applying water, agrochemicals and fertilizers as needed, thus saving inputs and reducing production cost, while increasing productivity and crops quality. The adaptation measures presented below will be chosen with the communities through a participative process, after which an inventory and feasibility study will be conducted (see Component 2) for their implementation (See Annex 3 for assessment on water storage and irrigation technologies used in the target communities and Annex 4 for further information on technologies proposed). Measures implemented will be selected considering potential social and environmental risks (see Annex 8a on Environmental and Social Management Plan- ESMP).

1. **Water Reservoirs**

The Nacional Irrigation Strategy presents estimations on potential evapotranspiration and crop water needs. According to this report, it is required 3,800m^3/ha of water from the month of June to

September, during Gravana?s, for the North area of S?o Tome Island. The selection of the targeted storage was made considering cost limitations for the project, the fact that irrigation is managed by different factors and not just the storage. The defined target is to create approx. 15,000 m^3 of storages, which is equivalent to 2 days of storage of the required water to irrigate 250 ha.

2. **Underground Taming of Floods for Irrigation (UTFI)**

Underground Taming of Floods for Irrigation is a method that consists in using flood excess water to a recharge aquifer. This benefits the downstream communities of a catchment by reducing the risks of floods, and the upstream communities by providing water in the dry periods of the year. The technique consists of two main components, an aquifer with adequate storage capacity and productivity, and an infiltration area. The direct benefits of the UTFI method are enhanced in environmental assets (flood, ground water, baseloads). The indirect benefits are linked to sustainable drinking water provision, improved livelihood activities, and enhanced economic well-being. Form a general analysis of the vulnerability map presented in the National Territorial Planning, the Abade River could meet the conditions for the implementation of the technique, but so also could the Manuel Jorge and d?Ouro, as both present downstream flood issues and infiltration area. This project will target an assessment, feasibility study and scaling-up plan (Component 2) and in this component, the implementation of pilots in some of the targeted communities to be identified during the inception phase of the project implementation.

3. **Implementation of climate resilient agriculture practices and reforestation**

Resilient agricultural practices include agronomic techniques such as weeding, harrowing, grafting, and mulching. Weeding and defoliation help in reducing soil water losses. Cover crops play a role in reducing soil erosion and increasing soil organic matter. Harrowing prevents moisture loss by breaking soil into small fragments. Grafting techniques can mitigate yield losses due to drought. Mulching, when combined with no-tillage, minimizes crop exposure to heat stress and aids in retaining soil moisture. The half-moon method improves fertilizer efficiency by concentrating nutrients in a planting hole and reduces soil erosion while increasing nutrient deposition. Similarly, Za? pit systems enhance fertilizer efficiency, reduce soil erosion, and trap water close to crop root systems. This method also provides crops with protection from strong winds. Terracing is another method that curtails soil erosion and enhances nutrient deposition. Agroforestry is multifaceted, intersecting both traditional and modern practices. The integration of trees in farming is fundamental in many ecosystems, highlighting the importance and adaptability of agroforestry in sustainable agriculture. Reforestation involves restoring forested land that was previously deforested or degraded. Though the restored forest might not be as diverse as the original, reforestation offers both ecological and economic advantages, and is key in addressing climate change. It's crucial to differentiate reforestation from afforestation, the latter referring to introducing forests on lands that never had forests historically. In this activity, crop and tree species will be selected based on local cultural acceptance and considering potential social and environmental risks. No invasive species will be included in the systems. See Annex 4 for suggested species to be used in this activity (according to consultations conducted for the project development).

4. **Small-scale off-grid PV pumps and drip irrigation kits**

From the information in the National Irrigation Strategy (2018), it was estimated that the area within the selected communities for irrigation, is approximately 2,500 ha. The project intends to maximize the benefits, reaching a considerable number of communities members. Two measurements were considered fundamental for the quantification of the positive outcomes of the project, the hectares of land where drip irrigation kits are installed and the number of members of the community with adapted means of irrigation. Considering the broad scale of this project and the large amount parcels within this communities, the method for this estimating the quantities use a top-down approach.

It was defined that from the 2,500 ha of estimated potential areas, 20,8% would be covered by irrigation drip kits, benefiting 1,040 ha (The estimations assumed that the general farmlands area in STP ranges from 500 m^2 to 1ha. The project targets 936 plots of 0.5ha and 52 of 1ha) within cooperatives and organized community members. It is estimated that 7,280 people (2,912 being

women) will benefit from this activity as well as from implementation of climate resilient agriculture practices and reforestation.

Component 2. Mainstream climate resilience of agricultural systems

Outcome 2.1 Conducive implementation policy framework designed and implemented

The objective of Component 2 is to create a supportive enabling environment for replication and scaling up of the innovative resilience building practices by enhancing research, fostering cross-sectoral collaboration and designing a concrete vision for upscaling of climate resilient agricultural technologies.

In particular this component will include activities, which will strengthen the scientific background and guidelines for the design and installation of the technological suite for water harvesting and storage from Component 1. Therefore, activities will seek to conduct hydrological modelling and system planning to inform about the decision of the location, design specifics and implementation modalities of the technological suite. All of the required models (groundwater, catchment hydrology and river hydraulic) will be developed with the aim of working in tandem so as to get a more accurate representation of potential scenarios of designs and effectiveness. Final models will answer questions such as how UTFI interventions may impact downstream canal water flows during both the dry and wet seasons. The models also evaluate the potential of UTFI to enhance the level of delivery of ecosystem services such as flood control, groundwater recharge and dry season water availability.

In parallel, the project will seek to foster cross-sectoral collaboration between the water, agriculture, energy and development sectors. Activities will focus on organizing and moderation three (3) structured cross-sectoral dialogues to define collaboration and governance models and opportunities at national level for the replication and upscaling of the project interventions to other districts in the country. It is expected that the outcome of these dialogues will be a roadmap for cross-sectoral collaboration for achieving agricultural resilience and a model for replication/upscaling of the innovative technologies and practices, including actions needed for replication of the technologies, the budget required and potential sources of finance.

This component aims as well to contribute to the policy framework and mainstream climate resilient agriculture and irrigation practices in the National Strategy for Irrigation. To achieve this, activities will aim to build upon the prepared roadmap and design a National Promotion Program which will provide guidelines, standards and identified opportunities for the replication of the resilient agricultural technologies and practices.

The objective of Component 2 will be achieved by:
2.1.1 Research on hydrological modelling for the planning and design of the water storage and harvesting technologies andpreparation of guidelines and standards for the implementation of adaptive agriculture practices. 2.1.2 Organisation of cross-sectoral structured dialogues to enhance national governance for climate resilient agricultural interventions and develop a road map to foster collaboration.

- 2.1.3 Design of a National Promotion Program for replication and upscaling of the climate resilient agricultural practices and technologies.

1. **Research/assessment on hydro-meteorological characterization and water allocation and Guideline on adaptive agriculture**

In this activity, assessments will be conducted to support the implementation of activities proposed under Component 1 and to enable long term climate resilience of agricultural systems in STP (see Annex 4 for further information on activities proposed). It also includes developing a meteorological database as follows:

•Report with the state of the hydrogeological system, water availability (for different conditions) and allocation within the limits of the project. This should present the assessment of water availability and water demand for the wet, dry and average hydrological year, also results of modelling for water harvesting and underground storage. The report should also provide adequately the information for public awareness, that will be included in the guidelines for the farmers on water use.
•First prompt assessment of the project area and review of the target technologies, identifying the main challenges and opportunities, providing specific goals for the next stages, identifying the list of activities that could promptly be implemented as first phase measures to improve irrigation, such as communities that that will receive first package of storage and irrigation kits. The target is a diagnosis and first measures report.
• A thorough study on the techniques for soil management, crop selection, diversification, improvement and scheduling, and irrigation management. This task should communicate with the *Hydro-meteorological characterization and Water allocation* task, which will allow to determine the water availability for agriculture and the requirements. The purpose of the study is to determine the exact measures regarding storage and other infrastructures, irrigation systems and management, soil management, support of equipment such as pumps and PV panels, capacity building and trainings, and the implementation plan. The target is the preparation of the final Guideline on adaptive agriculture report.
•Implement 3 rainfall stations and create conditions for community-based rain monitoring.
•Creation of a meteorological database to help centralize data for the country and establish a communication channel with farming communities, that would issue seasonal reports and extreme events alerts.

2. **Cross-sectoral structured dialogues**

The project will fund the creation of national cross-sectoral working group for participatory and multi-governance dialogues on climate change and resilient agriculture and to implement recommendations that address regulatory and policy gaps hindering the adoption of climate resilient approaches. This will improve inter-institutional coordination and cooperation through the development of a roadmap to promote the replication of the resilient agricultural technologies and practices and definitions of responsibilities of relevant stakeholders. The dialogues will be led by the MAPDR in annual meetings that will gather other government institutions as well as financial and technical partners. The implementation of this action will require the involvement of stakeholders from public sector including ministries and government bodies, private sector, civil society organization, research institutions and international agencies working in STP. The target will be the establishment of an official governance mechanism of coordination between the institutions including public, private and CSOs sectors of STP and the establishment of a working group for donors? coordination on climate adaptation projects in the agriculture sector.

3. **National Promotion Program for replication and upscaling climate resilient agricultural practices and technologies**

This activity entails the compilation of all the background information of the project areas, of interventions, technologies selected and practices to be adopted to promote climate adaptive irrigation. This would set the road map for the integrated and successful implementation of the proposed technologies and a strategy to promote, replicate and scale-up these technologies in other communities and districts in STP. Based on the Guideline on adaptive agriculture as well as on the outcomes of the national dialogues, a National Promotion Program will be designed and launched through a communication campaign. There are approximately 225,000 in STP and it is considered that 25% of the population is rural. Through the National Promotion Program, it is expected that 56,250 people are made aware of climate change impacts and appropriate adaptation in STP.

Component 3. Strengthen key value chains and market linkages to enhance resilience and socio-economic benefits

Outcome 3.1 Value chains strengthened through market access and agrifood transformation units and supportive business model and incentive mechanism identified, designed and implemented

The objective of Component 3 is to strengthen key value chains in STP and improve market access in order to enhance resilience and socio-economic benefits. This will be achieved by i) improving rural roads to facilitate access to markets and improving agro transformation units, ii) building the producers and relevant staff capacities and iii) identifying tailored financial mechanisms to support producers and building the capacity of extension officers to support the development of business plans.

Component 3 objective will be achieved through:
3.1.1 Rural roads improved to enable markets access.
3.1.2 Agrifood transformation units improved and producers? capacities strengthened
3.1.3 Financial incentive mechanisms identified, and extension officers trained to provide assistance for supporting the development of farmers? business plans (specially women and youth)

1. **Rehabilitation of rural roads**

This activity will be co-financed by AFDB through the project PRIASA III for the rehabilitation of rural roads to improve access to markets of the communities benefiting from the implementation of resilient agriculture measures. The priorities for the rehabilitation of rural lanes were the following: communities with the greatest productive potential (those that most contribute to supplying the national market with basic products in the countries? diet (bananas and taro) and cocoa (export product). Will benefit from this intervention a large number of farmers with greater difficulties in selling their production and who simultaneously suffered greater degradation with the floods of December 2021, as well as Communities with interventions related to irrigation and that have roads in poor conditions. Through this activity, the project will support the rehabilitation of 31 km of tracks in the S?o Tom? and Principe islands.

2. **Agrifood transformation units and capacity building**

Regarding the improvement of the agrifood transformation sector in STP, the project will support tracking existing transformation units for key value chains (such as cacao, sugar cane, fisheries, flour- to be defined during the project execution), will support their improvement with equipment and with the implementation of storage facilities. The Sao -Tome Principe National Agriculture Investment Plan targets small, medium and large producers with the potential to produce for the market, and small and medium-sized enterprises (SMEs) that market agricultural inputs and/or technologies. The implementation approach is based on the concept of value chain focusing on the generation and transfer of technology, provision of agricultural and fisheries inputs, processing and marketing activities that add value to agricultural, livestock, fishery, forestry and wildlife products and sustainable management of natural resources. The project will attempt to raise yield and productivity by improving access to modern technologies and inputs through the provision of irrigation systems and kits farm inputs including high quality seeds and market potential varieties (Component 1), and support to the extension services (Component 4).

In this activity, the project will improve access to markets for inputs and outputs and raise profitability of farmer organizations producing vanilla, cocoa, and pepper and linking them to existing markets for the commodities. In addition, the project will provide some mini processing equipment/machines for value addition in order to address the problem of post-harvest losses during peak production seasons. In addition to vanilla, cocoa and pepper, the key value chains to be promoted under the project are tomato, cabbages, cucumbers, onion, beef and goat production. The project will finance an assessment on markets, transformation, and storage units; and the construction/rehabilitation of 22 processing/storage units (including market, storage infrastructure, transformation unit, drying areas and nursery) in the target communities.

In addition, staff members from the CIAT will be trained on food quality control and producers will have their capacity built on production and processing techniques to improve their production and

income generation. PRIASA III will co-finance the improvement of fisheries storage and processing facilities.

3. **Financial mechanisms**

This activity will be co-fonanced by AfDBand include an assessment of existing financial instruments to support farmers improving their resilience and production. Extension officers will be trained in Component 4 and will provide support to producers to develop their business plans to access financing. The support to producers will be provided in annual workshops held at the community level and financing granted by AfDB.

Component 4. Foster enabling conditions for effective and integrated climate change adaptation in the agricultural and water sectors

Outcome 4.1 Increased institutional and local capacities, including information and extension services to respond to climate change

The objective of Component 4 is to create a supportive enabling environment for replication and scaling up by strengthening local and national capacities. This will be achieved through capacity building of (i) institutional staff at national and district level, (ii) strengthening of the skills of extension officers from Rural Development Support Center (CADR) to respond to climate change and (iii) local communities.

Some of the technologies of this project will be implemented and maintained at the community level; therefore, it will be critical to maintain engagement on the ground with local leadership and with community groups, including women-led groups, throughout all phases of the project in order to optimise its success. Existing community level organisations in the communities where the project will be active will be identified and strengthened in order to enable them to take ownership of the technologies, and in particular of those technologies that are implemented at the community level rather than at the farm level, such as the UTFI systems. The project aims to establish/strengthen the capacities of at least 7 local leadership councils and/or Resource Users Associations (of whom at least 3 will be women-led) will be established and/or strengthened. The project will build on existing institutions such as the agricultural extension services, to deliver its training and awareness-raising activities.

The objective of Component 4 will be achieved by:
4.1.1Capacity of institutional staff from the water, agriculture and energy sector enhanced for improved climate change governance.
4.1.2 Climate change and sustainable water management solutions integrated into the agricultural extension program to strengthen local capacity to address water-related climate risks.
4.1.3 Local leadership councils and/or Resource Users Association established/strengthened to facilitate stakeholder engagement and ownership of adaptation technologies.
4.1.4 The capacity of local communities is strengthened to apply and maintain water storage and irrigation technologies and solutions.

1. **Capacity building at the institutional level**

The capacity of institutions at national and district levels will be strengthened in terms of collection, management, processing, integration of climate information into sectoral analysis and dissemination of data for investment planning. Capacities will be built to extend the analysis of hydrometeorological information to the sectors of agriculture, livestock, food security, health, fisheries, and water resources management. Enhancing information services for climate change adaptation in these sectors through the introduction and integration of climate and water-related analytical tools will develop government capacity to overcome the current gap in water-monitoring and climate and will promote the use of climate information for climate resilient agriculture. This will result in effective and improved government capacity to manage water resources and information for a climate-resilient agriculture

sector. The capacity building will be achieved through annual workshops targeting technical staff from different directorates of the Ministries of Agriculture, Environment, Energy, Planning and Finance and the District Chambers (40% women). Technical staff trained will also be involved in the Hydro-meteorological characterization and water allocation in Component 2. At least 24 technical staff will be trained in this activity.

2. **Integration of climate change into the agricultural extension program**

This activity involves developing an agricultural extension training program which will include and sustainable water management solutions, climate resilient agriculture practices as well as financial mechanisms and business plan development. Extension officers will be trained in annual workshops and will provide support to local farmers to access financing, implement and maintain climate resilient measures. At least 30 extension officers will be trained in this activity (40% women).

3. Establish/strengthen existing local leadership councils and/or Resource Users Association to facilitate stakeholder engagement and ownership of adaptation technologies

This activity entails an assessment of the local community organizations and the establishment or enhancement of at least 1 local leadership councils and/or Resource Users Associations per community targeted by the project. The project will support the assessment and the organization of the first meeting, as well as the development of Terms of Reference in which will be established the objectives, structure, and operation of the Community Resource Users Associations.

4. **Enhance capacity of local communities to apply and maintain water storage and irrigation technologies**

Climate resilient agriculture systems will be implemented in the communities through a farmer field school approach in which farmers learn by doing during capacity building sessions conducted at the community level. Community members trained, (40% women) will be trained for implementing resilient measures and also for the operation and maintenance of infrastructure and equipment integrating the technologies implemented. In addition, community leaders will be engaged and will have their capacity built for supporting the collection of meteorological data and provide inputs for the meteorological database established under Component 2. It should be aimed in this activity 30% of the community members benefiting from the technologies (7,280 people), which would represent 2,184 community members.

Knowledge management and project M&E:

Effective knowledge management ? including the collection, generation, and dissemination of information ? is an important component of climate change adaptation. Access to current and detailed information on climate trends and adaptation techniques is essential for project stakeholders such as government agencies, agricultural extension services and local communities to implement prioritized adaptation intervention effectively and sustainably on the ground. Component 5 in the project includes the design and implementation of a knowledge management (KM) plan, which will consist of capturing, documenting, and disseminating lessons learned from the project activities both at the local and institutional levels for targeting and improving adaptive capacity of smallholder farmers (Please see Section 8). Further detail on the Project M&E is presented in Section 9.

Theory of Change

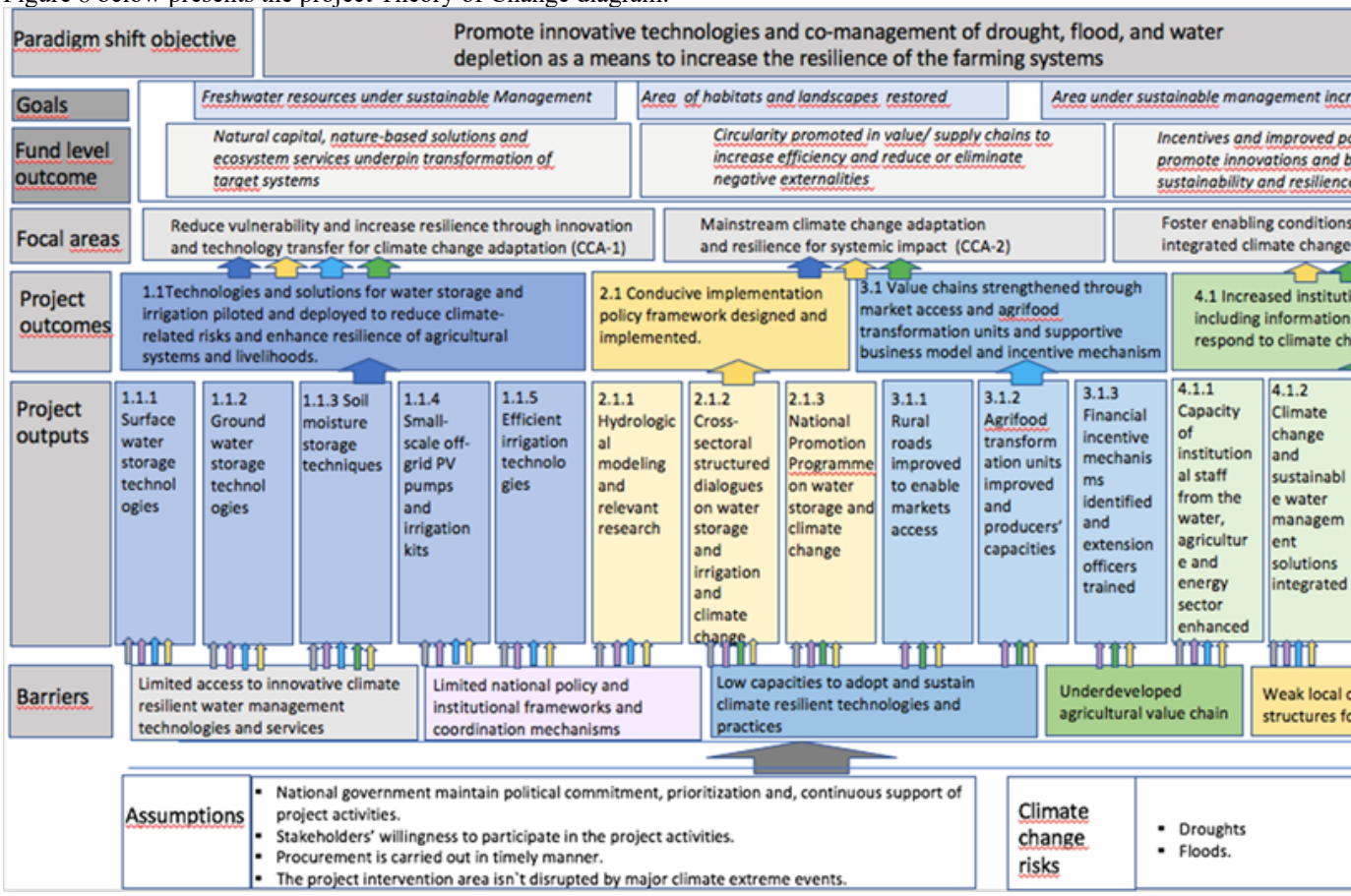
The project Theory of Change (ToC) demonstrates how S?o Tom? and Pr?ncipe?s agriculture sector currently operating at the producers and national government level with a limited focus on integrating a climate resilience lens and characterized by a fragile socio-economic environment will be transformed through the implementation of innovative irrigation and water storage technologies, the improvement of value chains, the implementation of a policy framework and capacity building to face current and projected climate adaptation challenges.

In the rural communities, providing improved agricultural infrastructure without addressing the real cause is not enough to ensure climate-proof agricultural production. It requires having adequate human, infrastructural, and institutional capacity to ensure the reliant access to irrigation water during prolonged drought events. Farmers also need to adopt best agricultural and land use, practices which is currently threatening the sustainability of agricultural productivity. The project promotes cross-cutting

and strong synergies among the components and enables local and national agencies to strengthen their capabilities to mainstream climate change considerations in the water resource and agricultural management in S?o Tom? and Pr?ncip. The project activities are expected to improve the livelihoods of the vulnerable households in the Districts of Cantagalo and Lobata vulnerable to climate change induced hazards. The synergy of interlinked intervention measures such as infrastructural capacity (agricultural irrigation technologies, rehabilitated roads, transformation units), human capacity (local capacity building, government, cooperatives) and institutional capacity (policy framework) are aimed to building climate resilience to avoid and/or minimize climate-induced risks.
As a result, the project is expected to: (i) reduce the vulnerability and strengthen climate resilience of agricultural systems and livelihoods including those households led by women; (ii) integrate climate resilience as a key factor in agricultural planning and management; and (iii) strengthen the capacity at local and national level regarding innovative irrigation techniques, soil management and conservation; and (iv) enhance cross-sectoral structured dialogues to enable replication of water storage and irrigation technologies. These outputs are expected to enable rural communities to increase climate-smart agricultural investments that translate into higher yields, assets and incomes that improve food security and livelihoods throughout the seasons. The project outcomes are expected to contribute to Climate Change Adaptation by:

- Reducing vulnerability and increase resilience through innovation and technology transfer for climate change adaptation (CCA-1).
- Mainstreaming climate change adaptation and resilience for systemic impact (CCA-2).
- Fostering enabling conditions for effective and integrated climate change adaptation (CCA-3).

Figure 8 below presents the project Theory of Change diagram:



4) Alignment with GEF focal area and/or Impact Program strategies

The project is in full alignment with the strategic objectives of the LDCF. In particular, the project is aligned with Objective 1: Reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation and Objective 2: Mainstream climate change adaptation and resilience for systemic impact.

Article 10 of the UNFCCC Paris agreement states, ?Parties share a long-term vision on the importance of fully realizing technology development and transfer in order to improve resilience to climate change and to reduce greenhouse gas emissions.? Technology transfer is recognised as a vital aspect of sustainable growth and development for LDCs, and the project incorporates innovative approaches of technology use to aid in Sao Tome and Principe?s growth and development in the face of climate change. As such, the project is aligned with LDCF?s strategic objective to reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation. This is particularly true in terms of the LDCF Outcome 1.1: Technologies and innovative solutions piloted or deployed to reduce climate-related risks and/or enhance resilience. The project will be piloting Underground Taming of Floods for Irrigation (UTFI) for the first time in the context of Sao Tome and Principe. While Africa, along with Asia, has the highest potential for UTFI techniques, this is the first time it will be trialed in West Africa. The project will also be deploying complementary irrigation technologies to enhance the resilience of farmers, particularly in dry seasons and in times of drought.

The project works across sectors ? particularly water, agriculture, and energy ? and across governance levels from national to local levels. As stated in Article 7 of the UNFCCC Paris agreement, ?adaptation is a global challenge faced by all with local, subnational, national, regional and international dimensions, and that it is a key component of and makes a contribution to the long-term global response to climate change to protect people, livelihoods and ecosystems.? Climate change causes cross-cutting, systemic challenges which will require cross-cutting, systemic solutions like the ones presented in the project to increase resilience and the capacity for people, livelihoods, and ecosystems to adapt to climate change. The project aligns with LDCF?s strategic objective to mainstream climate change adaptation and resilience for systemic impact. It contributes to both LDCF Outcome 2.1: Strengthened cross-sectoral mechanisms to mainstream climate adaptation and resilience and Outcome 2.2: Adaptation considerations mainstreamed into investments. These will be achieved through structured dialogues, programmes for adaptation technology promotion, and developed business models for the sustainability of the technologies used. The project will also work towards LDCF?s strategic objective to mainstream climate change adaptation and resilience for systemic impact through capacity development of local communities and institutions across sectors and the establishment and strengthening of local leadership councils and resource users? associations.

5) Additional cost reasoning and expected contributions from the baseline, the LDCF, and co-financing

Without the LDCF funding, S?o Tom? and Pr?ncipe?s fragile socio-economic-environmental system will continue being vulnerable as a result of climate change impacts, in particular drought and floods. The levels of poverty in STP will remain high: currently more than two-thirds of the population lives in poverty, and more than one-fifth lives in extreme poverty. The country will continue to rely on imports to fill the gap in national agricultural production. Smallholder farmers will continue to get low and erratic crop yields due to floods eroding topsoil and droughts preventing the growth of crops. The people of STP will continue to lack proper food security and nutrition due to the agricultural sector?s vulnerability to climate change and to underutilized water resources for agriculture. Women will continue to lack access to training and to natural resources and will continue to be particularly vulnerable to the impacts of climate change. Without unlocking the potential of STP?s water resources to build the resilience and of local food systems and livelihoods to climate change and other shocks, and without mainstreaming climate change adaptation and improving the effectiveness of public and private investments in agriculture, the country will not fully achieve its development goals.

The proposed LDCF project will build the resilience of smallholder farmers to the expected climate change hazards including floods and prolonged droughts by enhancing capacities and promoting innovative technologies and practices for soil and water management. This will be achieved by: i) enhancing the institutional and technical capacity of municipal and district authorities, extension services and farmers to implement interventive irrigation techniques; ii) strengthening local governance structured for inclusive water management; iii) implementing on-the-ground technologies for water harvesting and irrigation; iv) developing business models for sustainability. The additional cost reasoning for each component of the proposed LDCF project is described below.

Component 1. Reduce vulnerability and strengthen climate resilience of agricultural systems and livelihoods adopting innovative technologies

Business as usual scenario:
Agriculture in S?o Tom? is predominantly rain-fed and there is only about 1,553 ha of irrigated land. Climate change projects show the high likelihood that the agricultural sector will be affected by prolonged droughts and floods. The ongoing PRIASA II project aimed to construct water conservation, harvesting or collection basins to store water and create a strategic reserve in times of shortage. Specifically, the outputs include pilot hillside dam(s) in Pinheira/ Pedroma; construction of water conservation, harvesting or collection basins in Pinheira or Agostino Neto (including assessment and monitoring) to store water and create a strategic reserve.
In a business-as-usual scenario, cost-effective adaptation interventions that focus on ecosystems and consider climate change are unlikely to be implemented. Consequently, communities vulnerable to climate change will not receive ecosystem-derived benefits such as increased food security, protected material belongings and lives, secured water supply and protected water and infrastructure.

Adaptation scenario with LDCF project:
The LDCF funds, the project will design technological interventions that are low cost, low-tech, robust and easily managed by farmers and local communities. With the help of baseline data (collected in Component 2), this will feed into the design and pilot scale implementation. In particular, LDCF resources will be used to implement a range of innovative technologies for water harvesting, storage and efficient irrigation adopting a strong gender-responsive approach. Scientifically rigorous protocols, developed in collaboration with national and international experts and based on international best practice, will guide the planning, design and implementation of the interventions. Workshops and outreach activities in target communities will encourage a participatory approach, promote support from local communities and build adaptive capacity. In line with the proposed technological suite, agricultural practices will be shifted towards soil and water conservation to increase the water retention capacity of the soil and thus increase resilience to the effects of climate change,

The interventions in this component will be cost-effective as well as environmentally and socially applicable to the selected sites. This will include using scientific, transparent and participatory process when selecting project sites. Similarly, the site-specific interventions will be guided by scientifically rigorous protocols and community preferences (Component 2).

The proposed LDCF project will build upon the ongoing activities of the baseline projects and in particular PRIASA II and the planed PRIASA III.

Component 2. Mainstream climate resilience of agricultural systems

Business as usual scenario:

Various initiatives on enhancing the access to water for irrigation have taken place in STP, including PRIASA and PRIASA II, GEF PIMS 4645. Such efforts have not been coordinated and have not followed a comprehensive long-term plan to achieve the optimum benefits from water resources and avoid potential environmental and social impacts. This has resulted in isolated water harvesting and irrigation installation, many of which currently not functioning due to technological challenges or lack

of water resources needed for their operationalization. The analysis underpinning the National Strategy for Irrigation is highlighting that (i) the potential for access to water in STP is not exploited, (ii) there is a need for detailed hydrological modelling for identifying design and location of new installations and (iii) there is a need for a integrated planning of future interventions for irrigation as well as (iv) the current governance arrangement and weak collaboration among sectors and stakeholders are resulting in challenges which impact the implementation of interventions on the ground.

Activities under PRIASA II aim to implement irrigation and water storage technologies. However, there is a limited focus on integrating a climate resilience lens to those interventions and the projects will benefit from strengthening the portfolio of climate resilient technologies to complement the efforts for sustainable irrigation.

At present, the MAPDR's coordination and concertation role with the other surrounding institutional parties, in particular other institutional departments, implementation units of donor funded programmes and projects is insufficiently exercised resulting in uncoordinated efforts and missed opportunities for collabotation. There is need for strengthening the capacity for coordination and articulation between public institutions, programs and projects via structured multi-stakeholder dialogues.

Adaptation scenario with LDCF project:

With LDCF funding, the proposed LDCF project will foster supportive and engaging conditions for the effective adoption, governance, replication and upscaling of climate resilient agricultural practices. To achieve this, the project activities will (i) significantly contribute to creating a knowledge database and advance research on hydrological modelling, potential recharge rates and identification of suitable locations for installation of water harvesting and storage technologies, (ii) foster cross-sectoral collaborations, and (iii) design a comprehensive national promotion program to ensure a clear guidance and roadmap for the upscaling and replication of the climate resilient technologies to achive higher impact.

The hydrological knowledge database will not only benefit this LDCF project but will also inform other water management related initiatives in the country with science-based and downscaled information and be a basis for long-term planning in the agriculture sector aligned with the National Strategy for Irrigation. To complement the science-based approach of this project, effective governance and collaboration with be another focus of the proposed LDCF project. The project will aim to bring together in structured cross-sectoral dialogues all relevant actors, including representatives of the technical services of the ministries involved, agricultural professional organizations, as well as civil society organizations and development partners.

The proposed LDCF project will build upon the ongoing activities of the baseline projects and in particular PRIASA II and the planed PRIASA III.

Component 3. Strengthen key value chains and market linkages to enhance resilience and socio-economic benefits

Business as usual scenario:

The precarious conditions of rural roads have prevented producers to access markets in STP. Experience of recent years and taking into account the volume of financial resources spent, has shown that the rehabilitation of rural lanes only on dirt roads is not effective and, on the other hand, the lanes rehabilitated on pavement have shown greater longevity. Regarding agrifood transformation, a number of stakeholders are involved in the transformation process based on local products, both governmental and non-governmental. However, there is lack of coordination, limited technical capacities in the production, processing, storage and commercialization phases in addition to difficult access capital to enable improvements in the production (specially for women and youth).

Adaptation scenario with LDCF project:

With the PRIASA III co-financing, producers of Cantagalo and the Lobata districts will be able to take their production to markets. In a perspective of not pulverizing financial resources available and achieve effective impact, the rehabilitation of paved roads in the rural area will be prioritized as they have been identified by the team developing the PRIASA III project as the most effective type of intervention. Priority roads (connecting Sede ?gua Iz? to Claudino Faro, in the District of Cantagalo and the section that connects Liceu M?-Xinh?/ Canavial/ Fern?o Dias, in the District of Lobata, with an extension that is around 4 km) have been selected due to the productive potential of the corridor and the state of degradation of this road, which has suffered great deteriorated with the floods of December 2021. With LDCF funding, agro transformation units will be tracked and improved and producers will have their capacity built to increase their resilience and production. Also, with LDCF funding, financial mechanisms to support producers will be assessed and extention officers will have their capacity improved to support farmers developing business plans to increase their income.

The proposed LDCF project will build upon the ongoing activities of the baseline projects and in particular PRIASA II and COMPRAN and on the co-financing project PRIASA III. The co-financing is estimated to be USD 9,320,000.00 for this component to support i) the rehabilitation of rural roads and improve market access, to support improving transformation and storage units and iii) to assess and develop financial mechanisms and make it available for producers in the target communities in form of grants.

Component 4. Foster enabling conditions for effective and integrated climate change adaptation in the agricultural and water sectors

Business as usual scenario:
A number of initiatives are underway or have taken place, both nationally and locally, to increase the institutional and technical capacity of government to plan and implement adaptation interventions for climate change in STP ? see Section 3 for details. Despite these efforts, there is limited knowledge and capacity in STP to plan and execute activities that will increase the resilience of local communities to climate change through innovative water management practices and technologies such as the use of flood water to recharge groundwater and solar pums for irrigation.

Additionally, while previous projects have included local governance dimensions ? see Section 3 for details - local associations and producer group have weak governance structures and often do not operate after the end of projects. However, examples from the UNDP project PIMS 4645 in Ro?a Santa Luzia (District Lobata), demonstrates that when producer associations are organized around the management of irrigation systems, they have successfully established into strong organizational structures which are responsible for the maintenance and operation of the irrigation system. There are however only very few examples of such best practices and there is a need to learn and replicate in other communities and districts.

Adaptation scenario with LDCF project:
With LDCF funding, the proposed LDCF project will strengthen the institutional and technical capacity of national experts, municipal and district authorities, as well as extension services to plan and implement water and soil conservation practices and innovative technologies for irrigation in the Lobata and Cantagallo districts. To achieve this, existing gaps in information, knowledge, shortfalls of planning and barriers to implementation will be identified within government departments, CADR and CIAT. The proposed LDCF project will collate and tailor best-practice guidelines on water harvesting and irrigation. This will include knowledge derived from other successful projects such as PRIASA II and Africa. These guidelines will be developed and accessible to municipal and district authorities among other stakeholders during and after the proposed LDCF project. It is proposed to engage with CIAT for the delivery of required climate and hydrological research which will inform the project. MAPDR staff will benefit from specific high-level training and expertise to effectively exercise their role in overseeing, monitoring-evaluating and capitalizing on the experiences of the programs and projects for which the Ministry is the recipient.

With LDCF funding, the LDCF project will strengthen the local institutional structures for the management of the irrigation systems and infrastructure in a long run. The project will seek to enhance gender equality and equity through its activities for local governance. It will in particular strengthen the role of women in decision-making for water management and leadership of the local governance structures. The project will build on the best practices and experiences in the country to design and implement effective models for local governance and enhance existing or create new Local Leadership Councils.

The proposed LDCF project will build upon the ongoing activities of the baseline projects and in particular PRIASA II and the planed PRIASA III

6) Adaptation benefits

The project will benefit people across S?o Tom? and Pr?ncipe from the national-level activities, working on governance mechanisms, policy frameworks, and capacity building at the national level. The project will also particularly benefit smallholder farmers in Lobata and Cantagalo districts with the implementation of water management technologies for climate change adaptation and resilience. The project is expected to directly affect about 10,000 people, 40% of which will be women. There are at least 20,007 people living in Lobata and 18,194 people living in Cantagolo District. The rural population of country is 25% of the total population. He project will directly benefit 5,304 people living in the 30 target communities (40% women).

The project addresses the adaptation needs of the country laid out in S?o Tom? and Pr?ncipe?s NAPA and the NDC, which both highlight the particular need of adaptation activities dealing with water management, particularly in the agricultural sector. The project will take a holistic approach to tackling climate vulnerabilities and enhancing the resilience of farms, farmers, food systems, ecosystems, and the people that rely upon them. The project will be in full alignment with several of the priority areas of the LDCF, particularly in terms of food security, natural resources management, and capacity building.

One of the main adaptation benefits of the project will be the enhancement of food security, both at a national level as well as within the project area in the districts of Cantagalo and Lobata. By contributing to the increase of the agricultural productivity and production and the resilience to changes in climate and extreme weather events, the project will stimulate an increase in the food availability and security in STP and in the amount of the national diet that is produced within the country. The current level of food crop production does not fulfil the country needs, so the country relies heavily on filling the gap with food imports, which leaves the food security of the country in a vulnerable position. The technologies that are implemented along with skills promotion and capacity building, both at the community level and at the national level through the country?s extension services, will lead to enhanced food production. The project will pay particular attention to enhancing the climate change resilience of women who are key actors in rural areas but often lack access to training and assets that would unlock their potential as smallholder farmers and natural resources managers. Through all of the project?s gender-mainstreamed activities, this project will increase the food availability and agricultural resilience to climate change within the country, reduce the needs of food imports and consequently improve the food security, nutrition, and health of the population at the national and local levels.

The technologies implemented by the project will address climate change vulnerabilities from different angles in a complementary way. To mitigate the increase of flooding that is predicted to occur in the country, the project will be trialling a technology for the first time in West Africa: Underground Taming of Floods for Irrigation (UTFI). Reservoirs will be built to capture some of the water that would contribute to erosion and other flooding damage. In conjunction, the project will implement other rainwater harvesting devices along with irrigation technologies. So, in order to increase resilience to drought and to otherwise increase agricultural productivity during the dry season, water

collected and stored during the rainy season can be used to irrigate crops during times of the year when that agricultural land is currently unproductive.

7) Innovation, sustainability and potential for scaling up.

The project design seeks to address the barriers towards the use of technologies for water storage, aquifer recharge and efficient irrigation in the agricultural sector in S?o Tom? and Pr?ncipe.

Innovativeness of the project: The project is innovative in its introduction of a package of water resource management technologies and solutions to address water-related climate risks, including technologies that are new to the country. These technologies include international best practices in small-scale water groundwater storage and surface storage, conservation agriculture and efficient irrigation technologies. For instance, this project will be piloting Underground Taming of Floods for Irrigation (UTFI) for the first time in the context of S?o Tom? and Pr?ncipe. And while Africa has among the highest potential for UTFI techniques, this will the first time it will be trialled in West Africa. Given the vulnerability of Sao Tome and Principe in terms of agriculture, food security, nutrition, and livelihoods, such innovations are needed for climate change adaptation.

Sustainability: Components 2 and 3 of the project deal with the sustainability of the technologies for climate change resilience and adaptation introduced in Component 1. Components 2 and 3 will foster an enabling environment for the continued use of these technologies, including the design and implementation of policies, business models, incentive mechanisms, as well as the fostering of capacity building, knowledge management, and information and extension services, which will all provide a strong foundation for the sustainability of the impacts of the project. Beyond this, the introduction of technologies in Component 1 will be done in such a way as to maximise their sustainability. The beneficiaries of the technologies will be trained in the maintenance and repair of the technologies and in the case of technologies that need the intervention of professionals for repairs, such as solar-powered pumps, systems will be put in place to ensure that funds to pay such professionals are set aside. The communities and farmers associations will be helped to create their own fund for the maintenance and repair of the technologies, which will not only augment their ownership of the project and the associated technologies but will provide the means for their sustained use.

Vision of how the innovation will be scaled up: The project?s sustainability stems from the climate-resilience of the package of technologies and practices introduced and its support to farmers to adopt proven adaptation technologies that comprise best practice in water management. The resilience of participating farmers will be increased and the vulnerability of their livelihoods reduced. The investments made by the project will have a powerful demonstration impact, and these techniques and technologies can be disseminated to other areas of the country through the project?s capacity building activities. With an enhanced agricultural extension service trained to support farmers in increasing their resilience to climate change, farmers throughout the country will be able to benefit from the services of the extension service, replicating the impacts of this project in other areas. The institutional capacity developed will allow for resilient water management by smallholder farmers to be replicated across the country, and beyond this serving as a demonstration within the West African region. With the diverse portfolio of water management technologies introduced by the project, those most contextually appropriate can be picked up by other agricultural communities and farmers? associations.

1b. Project Map and Coordinates

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


N
W
E
S
LOBATA
EN1
ÁGUA GRANDE
MÉ ZÓCHI
EN3
EN2
LEMBA
CANTAGALO
CAUÉ
Legenda
Limite administrativo
Comunidade Identificada
Comunidade do Projeto CMPLCL
Vias_Princ_CM
0 1,1 2,2 4,4 6,6 Kilometers

1c. Child Project?

If this is a child project under a program, describe how the components contribute to the overall program impact.

2. Stakeholders

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

Civil Society Organizations Yes

Indigenous Peoples and Local Communities Yes

Private Sector Entities

If none of the above, please explain why:

Several actions were carried out with the aim of engaging stakeholders during phase 1 of the project, in order to encourage society and all interested parties, including communities, to contribute to the preparation of the project proposal and its implementation.

The first was the Initial Project Workshop held on November 8, 2022 in S?o Tom?, at Hotel Praia/ Praia Nazar? ? ?gua Grande District, was the first public consultation for the development of the project. The workshop, conducted in a hybrid format (virtual and face-to-face), had the objective of gathering the project's main stakeholders, in order to obtain the necessary inputs to consolidate the project methodology.
Specifically, the workshop was designed to:
•Validate the scope and structure of the project (Components, results, products, activities, main issues related to dry climate change - floods / floods - and whether the proposed approach responds to them);
•Identify barriers to the adoption of storage and irrigation technologies to increase the resilience of agricultural systems;
•Identify project intervention areas (Lobata and Cantagalo districts/communities);
•Identify beneficiaries and institutions to be involved in each activity;
•Identify other relevant projects and: i) assess potential for complementarity; ii) draw and integrate lessons learned.

Fifty-six stakeholders were invited (list of guests in annex 1), of which 40 (71 %) were present (list of participants present in annex 2), 35 (87.5 %) attended face-to-face and 5 (12.5%) virtually. Therefore, the consulting team had the possibility of consulting 40 stakeholders in total representing:
•Government entities (Central and Regional)
•NGOs
•Local authorities
•Communities
•Civil Society
•The private sector
•International Organisations

After the initial workshop, which helped define the scope and the broad methodology of the project, a second step of public consultations was carried out, this time with the objective of gathering more specific information depending on the position and the expertise of the consulted stakeholders. For this step, the team decided to conduct consultations through semi-structured interviews (December 2022- January

2023). As the cross-cutting nature of the project required data collection from a variety of sources, the consulting team developed differentiated questionnaires for each group . In total, 27 stakeholders, mirroring the groups included in the initial workshop, were therefore interviewed, sharing pertinent information that helped to design the project. The inputs provided ensured the project was actually rooted in the reality of the country, and specifically of the selected target areas. Other meetings were held with differente Directorates of the MAPDR and visits were conducted at the communities.

In addition, a validation workshop will be conducted after receiving and addressing the GEF Secretariat comments in order to present the final project and engage relevant stakeholders.

See Annex 6 on the Stakeholder Engagement Plan.

Please provide the Stakeholder Engagement Plan or equivalent assessment.

Please find attached the updated stakeholder engagement plan.

In addition, provide a summary on how stakeholders will be consulted in project execution, the means and timing of engagement, how information will be disseminated, and an explanation of any resource requirements throughout the project/program cycle to ensure proper and meaningful stakeholder engagement

Project supervision will be carried out by the Ministry of Agriculture, Rural Development and Fisheries (MADRP), which will preside over the National Steering Committee (CNP). Created by order of the MADRP, this Committee will include the ministries that have a strategic interest within which focal points will be appointed; Autonomous Region of Principe, FENAPA, Chamber of Commerce, Research Centre, educational institution, Banks, etc.

The National Steering Committee (CNP) will define the guidelines for the operational management of the project, ensuring its alignment with sectoral strategies and priorities.

The project's action will be inscribed in complementarity and synergy with development partners in the agricultural sector to optimize its interventions and maximize its impact with the beneficiaries. In addition to approving work programs and activity reports, the CNP will ensure the monitoring of implementation, but also the recommendations that it may have to formulate during its monitoring missions in the field.

In line with its favourable approach to the territorial visibility of the Autonomous Region of Principe, the project will create a Regional Participatory Planning Committee (CRPP) there. It will be chaired by the Secretary for Economic Affairs of the Region and will be composed of representatives of producers (associations), agricultural communities; Technical directorates of the regional ministries involved, representative of the Chamber of Commerce; FENAPA representative, local investigation and demonstration unit, etc.

The CRPP will be mandated by MADRP to: (i) organize community and socio-professional consultations prior to the preparation of the Work Program and annual budget; ii review and validate the annual work program before its transmission to the National Coordination for consolidation in the PTBA of the project; (iii) monitor the implementation of activities, reviews and validate activity reports; iv Ensure that the territory's priorities are in line with the project's strategy.

Project implementation will be based on a series of result-oriented partnerships considering: i institutional partnerships; ii performance-oriented operational collaborations with facilitation advice and support on various specialist skills; iii partnerships with professional organizations; iv Synergies and complementarities with other project/programme stakeholders, technical and financial partners, local communities.

Furthermore, in continuation of the guidelines already followed during phase 1 of the project, thefield activities involving communities, producers, etc., will be implemented through a participatory process involving the actors interested in the planning and implementation phases of the actions.

Select what role civil society will play in the project:

Consulted only; Yes

Member of Advisory Body; Contractor;

Co-financier;

Member of project steering committee or equivalent decision-making body;

Executor or co-executor;

Other (Please explain)

3. Gender Equality and Women's Empowerment

Provide the gender analysis or equivalent socio-economic assesment.

Gender mainstreaming and promoting women?s empowerment, by delivering environmental results, have been progressively given importance by both the GEF and the African Development Bank. Having launched its initial gender policy in 2011, GEF approved a reinforced policy in October 2017, shifting the focus from a ?gender-aware, do no harm? approach to a ?gender-responsive, do good? approach. This requires robust standards in design, implementation and evaluation of GEF activities, and introducing measures that will allow GEF, over time, to better leverage strategic opportunities to address gender gaps critical to the achievement of

global environmental benefits. The GEF Council also approved a new GEF Policy on Gender Equality (GEF, 2017c) in November 2017, which has informed the design of this GAAP. The Policy marks GEF?s increased ambition to ensure gender equality and promote women?s empowerment across its operations. AfDB?s 2021-2025 gender strategy calls for a sustained focus on gender mainstreaming into projects, programmes and gender initiatives. The strategic vision for gender equality and women and girls? empowerment is to transform the continent?s key sectors into grounds of accessible opportunities where women, girls, men and boys, regardless of their background, enjoy equal access and control over productive resources and benefit from supportive infrastructure and services to thrive.

Thus, in keeping with the policies and prerogatives of both the GEF and AfDB, the imperative of the Gender Assessment and Action Plan conducted during the project development (see Annex 7) is the successful mainstreaming of gender-sensitive and gender-responsive elements throughout the proposed project. Alongside, the development of a dedicated Gender Action Plan in the preparation stage (with clear timelines, responsible parties, indicators and budgetary allocations to be refined in the implementation phase) based on the Assessment, will ensure that the project generates gender-equitable and accessible benefits, promotes greater gender equality, and the empowerment of vulnerable gender demographics in context-specific locales.

The Gender Assessment has explored both explicit and implicit gender and socioeconomic issues that could be addressed through the project components. The findings from the Assessment also form the basis for the Gender Action Plan (Section 8 of Annex 7), which will specify this GEF proposal?s desired results, corresponding actions, indicators, timelines, responsible parties, and budget allocations, through the results framework. As gender equality gains priority in the GEF?s, AfDB?s and other agencies? portfolio, this project partakes in the international conversation on gender mainstreaming and gender-responsive planning in rural resilience, water management and climate change adaptation efforts. If implemented effectively, this project has the potential to become a good practice gender mainstreaming guide for future interventions in STP (nationally), in other SIDS and in sub-Saharan Africa (regionally), and globally.

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; Yes

Improving women's participation and decision making Yes

Generating socio-economic benefits or services or women Yes

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

Yes

4. Private sector engagement

Elaborate on the private sector's engagement in the project, if any.

5. Risks to Achieving Project Objectives

Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):

6. Institutional Arrangement and Coordination

Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.

Governance:
A Project Steering Committee (PSC) will be established to provide strategic guidance for the project and as the highest level of the project governance. The PSC have the function to: provide overall guidance and recommendations; ensure the project maintains its objectives and achieves expected outcomes; address project issues as raised by the Project Management Unit (PMU); review and validate the project annual workplan; monitor project risks and mitigation measures implemented and validates the annual project implementation report. The PSC will be chaired by the MAPDR and will have AfDB as Secretariat and is expected to meet at least every 12 months. To improve the coordination and planning of activities, a technical committee composed of the main project partners (National Institute for the Promotion of Gender Equality (INPG); Equality Directorate of Agriculture and Rural Development (DADR), General Directorate of Environment (DGA), Directorate of Forests and Biodiversity (DFB), General Directorate of Natural Resources and Energy (DGRNE), National Directorate of Fisheries (DGP), MARAPA, National Roads Institute (INAE), the National Water Institute (INA) and the National Institute of Meteorology (INM), Agriculture and Technology Research Center (CIAT), Agriculture Training Center (CATAP), etc.) will be established and shall meet each quarter. Other institutions can be invited ad-hoc to participate in specific meetings of the technical committee according to the project needs. The technical committee shall be consulted and shall provide technical advice when requested by the PSC.

Implementation:
The MAPDR, as implementing agency, will recruit a Project Management team to establish with large experience in managing multilateral financing investments. The PMU will be recruited competitively, and will be composed by a Project Coordinator, Monitoring and Evaluation officer, Procurement officer an Accountant, Gender expert and Infrastructure Officer. The PIU will be reinforced with an Environmental and Social Safeguards Specialist to screen sites and develop site specific ESMPs based on the ESMF. It is under the supervisory authority of MAPDR and will be supplemented with one assistant at the Principe Island. The Project will competitively engage professionals and technicians to support the PMU in the implementation of the project activities.

The implementing of productive (soft activities) will also be coordinated with the other partners organizations, such as FAO, IFAD and WFP that are supporting the above organizations while the Bank concentrates largely on infrastructures. NGOs will be recruited competitively and will provide backup by conducting activities related to guidance, training and organisation of farmers around value chains and the processing sector. Focal points will be appointed within the structures concerned to facilitate implementation. Similarly, a focal point will be appointed in Principe to ensure better follow-up of activities on that island and another appointed in S?o Tom? within INPG to attend to aspects related to gender and nutrition.

The diagram below illustrates the project implementation arrangements:

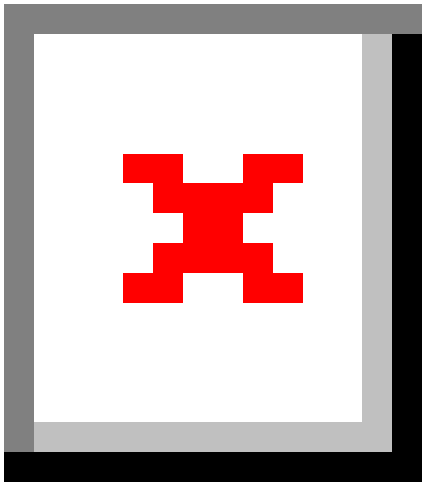


Figure 22- Implementation arrangement

7. Consistency with National Priorities

Describe the consistency of the project with national strategies and plans or reports and assesments under relevant conventions from below:

NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.

This project is aligned with and supports the priorities and strategies of S?o Tom? and Pr?ncipe national planning and frameworks and has embedded country ownership by systematically providing new pathways for increased domestic agricultural production, increased food security at the household and community level, increased uptake and utilization of innovative practices and strengthening the adaptive capability of agriculture and households.

This project has been prepared under the NDC Partnership framework, which aims to support the coherent and integrated implementation of the country?s climate change adaptation framework in general and the

NDC in particular. Through this collaboration, the Government of S?o Tom? and Pr?ncipe, with the support of the NDC Partnership, conducted an inclusive multi-stakeholder process to translate the NDCs and previous national efforts into a NDC Implementation Plan. The Plan builds on national and sectoral priorities reflected in national policies and plans, and extensive consultations including multiple government officials - from the ministerial to the technical level ?, international development partners, multilateral development banks, NGOs and private sector with the aim to advance the national climate and development agenda. The NDC Implementation Plan outlines outcomes, outputs and indicators to advance adaptation, mitigation, and cross cutting initiatives in line with the national development agenda. Furthermore, the Plan serves coordinates and tracks contributions form national and international stakeholders, including more than 10 development partners committed to support STP in advancing its climate- development targets. The proposed project intervention is aligned with the actions outlined in the NDC Implementation Plan and will contribute to its objectives to:

- Reduce climate-related risks and increase the resilience of communities and sectors;
- Increase in the share of renewables in the energy matrix;
- Reduce deforestation and forest degradation, and create socioeconomic alternatives for forest-based products;
- Promote resilient and low carbon land use management.

The updated NDC (2021) for S?o Tom? and Pr?ncipe includes contributions in terms of adaptation. The updated NDC outlines the country?s priorities on adaptation in the different sectors including agriculture, water, and energy, which are all relevant to the project. The project is particularly aligned with adaptation measures relating to water:

- Construction and rehabilitation of the water distribution grid, dams, and reservoirs
- Implementation of low-cost technologies, adapted and of easy community management, to ensure potable water access for isolated communities
- Elaboration and implementation of the integrated watershed management plan and water security

The project is also aligned with the NDC?s mitigation measure to increase the use of renewable energy.

In the Third National Communication to the UNFCCC (2019), S?o Tom? and Pr?ncipe highlights agriculture as one of the three sectors most sensitive to the adverse effects of climate change, including risks to both the main cash crops for export (cacao) and the major crops for domestic consumption (taro and maize), and the project will mitigate those risks.

The project is also aligned with S?o Tom? and Pr?ncipe?s national priorities relating to sustainable development. The National Development Plan 2017-2021 outlines a number of objectives and programs the country plans to develop, particularly those dealing with the objective of ?Diversification of the economy and expansion of its productive base? and ?Increased production and diversification of food crops and expansion of export crops?:

5.1.1.2. Increased productivity of traditional sectors of the Sa?o Tome? economy, such as agriculture, shing and tourism and the promotion of small and medium-sized shing and agricultural products industries, in a logic of improving food security and reducing imports, but also to support the development of tourism and the export of some products with high added value.

5.1.2.2. Sustainable intensification and diversification of agro-pastoral production with specific objectives of promoting the growth, diversification and quality of agricultural production for domestic consumption and export crops.

5.1.2.3. Integrated rural development aimed at strengthening the capacity of rural communities most exposed to the effects of climate change.

5.1.2.4. Sustainable management of natural resources, which provides a set of measures to promote the preservation of a healthy environment and sustainable use of forest resources, including non-timber, improve water management and combat deforestation.

5.1.2.6. Review of the Zero Hunger Strategy currently underway, and assistance to small farmers, its strategic orientation for development, with the objective of providing them with the necessary support to increase productivity, facilitate the process of their production chain and access to the market, which will further contribute to poverty reduction, increase income generation at the community level, and reduce dependence on imported agricultural products and post-harvest loss while promoting home-grown foods.

The project is also aligned with S?o Tom? and Pr?ncipe?s Vision 2030: The Country We Need to Build. There are nine aspirations for the Country Transformation Agenda built on the 2030 Vision, a number of which are aligned with the project. Firstly, the aspiration of economic growth. Since the majority of the country?s economy relies on agriculture, creating a more climate resilient agricultural sector and one which can be productive even in dry seasons or droughts will aid in the development of the country?s economy. Secondly, the project deals with the aspiration of adequate infrastructure for the promotion of the national development. One of the key aspects of this project is the deployment of technologies to enhance the resilience of food production systems in STP, including solar irrigation and oodwater management and harvesting technologies. Thirdly, the project aligns with the aspiration of decent work. The project will help to build a more climate-resilient workforce in agriculture, providing the means for agricultural work even in the dry season and after extreme weather events like droughts and oods. Finally, the project deals with the aspiration of food and nutritional security. S?o Tom? and Pr?ncipe relies heavily on food imports. This project will help to develop a more robust and resilient food production system, with the potential to increase both the country?s food security as well as the nutritional security of the local population.

Lastly, the project is in alignment with AfDB?s Ten Year Strategy (2013-2022). It addresses agriculture and food security as well as technological change, equitable growth, infrastructure development, and gender issues, which are all pillars of AfDB?s Ten Year Strategy.

Annex 5 ?

Alignment to national plans and strategies

Review of national strategies and plans to which the project is aligned

The following are strategies and plans to which the project is aligned, in order to find synergies, lessons and tools/instruments to help implement the project, for cooperation and support.

PLANS AND STRATEGIES	IMPLEMENTING AGENCY / FUND	DESCRIPTION	COMPLEMENTARITY
Plans and Strategies			
Multisectoral Investment Plan for S?o Tom? and Pr?ncipe (2017) [i]	World Bank	Following the two other projects supported by the World bank, PANA (National Action Plan for Adaptation to Climate Change) and PAMCZC (Adaptation to Climate Change in Coastal Zones Project), the Multisectoral investment plan was developed for the adaptation to the predicted climate changes, with the flowing goals: rengthening knowledge, lysis and institutional acities educing the risk of nate change and asters: A. Policies and titutional support limate and disaster risk uction: B. Investments nvestment components creasing the resilience communities and tors: A. Policies and titutional support creasing the resilience communities and tors: B. Investments or estment components	The plan was defined with activities to be implemented, the costs and other required resources. Some of the activities involved the development of the country knowledge, such as soils, vulnerabilities, hydrology and water resources use, considering the climate change. It also involved activities regarding regulations for climate resilience, this includes spatial planning and forestry. It also indicated the development of climate resilient infrastructure, such as transport infrastructure that is fundamental for the distribution of agricultural products. Specifically, relevant activities identified in the plan are the study of the impact of climate change on fish stocks and fishing activities and proposal of adapted fishing techniques/strategies; the identification of best practices adapted to agriculture and forestry in the context of climate change; and resforastation.

PLANS AND STRATEGIES	IMPLEMENTING AGENCY / FUND	DESCRIPTION	COMPLEMENTARITY
Integrated Water Resources Management Implementation Plan (PGIRH, 2017).	UNPD	The PGIRH gather strategies, that aim the coordination between institutions and stakeholders for the sustainable exploration and management of the resources within its areas, including measures to manage climate change.	Several actions and measures are extremely interconnected and relevant for the sustainable agriculture development such as: Water availability, drought and flood monitoring to increase water security; Improve information access and data sharing on water resources; Create more synergy, communication, training, awareness and ownership; Guarantee adequate water allocations to strategic economic sectors for the country
National Irrigation Strategy/Estrat?gia Nacional de Irriga??o ? ENI (2018)	Nigeria Technical Cooperation Fund (NTCF)	The ENI defined several activities with the goas of mobilizing water resources for irrigation, ensure the sustainable development of irrigated areas and encourage the valorisation of irrigation products, and strengthen capacities for good irrigation governance. It also presents the water resources required and numbers related to covered areas and required infrastructure.	To achieve the purpose, several activities important to adaptive irrigation were planned: Water mobilization works; Strengthening research and velopment in the field of igation, including support CIAT the university of TP; Strengthen MADR's anagement, communication d monitoring-evaluation pacities; Support sustainable water anagement in agriculture, cluding methods that reduce aste, require less water, roforestry and organic rming irrigation.

PLANS AND STRATEGIES	IMPLEMENTING AGENCY / FUND	DESCRIPTION	COMPLEMENTARITY
National Territorial Order Plan/Plano Nacional de Ordemento territorial ? PNOT (2020)	AfDB	The aim of the study is to contribute to the sustainable reduction of poverty by ensuring a harmonious development of the national territory and a better distribution of population and activities, paying particular attention to the limitations and potential of the natural environment, the socio-economic specificities of the regions and environmental protection. The specific objective of the study is to provide the Central Administration and local authorities with a planning framework that prioritizes a coherent, integrated and inclusive approach to national land use.	Several activities in that plan complement those in this project: he development of relevant formation such as the eation of geological and soil aps, water monitoring in rms of hydrology, draulics, ecology and emically, and further lineation of areas under tural risks and vulnerable ritories; he introduction of good riculture practices, raising areness and inform the pulation about the use and anagement of water nsumption. In the same ntext is also the plementation of tariff stems reation of a network of rvices to support ricultural activity, echanisms for logistics and sistance to the organization the productive class. romotion of new Supply arkets where the major ows of producers from the rious productive sectors of e islands can converge: bata, M?-Z?chi and ntagalo, and also small cal markets in the various pulation centres.

PLANS AND STRATEGIES	IMPLEMENTING AGENCY / FUND	DESCRIPTION	COMPLEMENTARITY
Integrated River Basin Management Plans-IRBMP Manuel Jorge / Planos de Gest?o Integrada de Bacias Hidrogr?ficas-PGIBH Manuel Jorge (2021)	UNPD	The Manuel Jorge is a river that rises in the center of the country, and eventually flows along the border between Me-Zochi and Cantagalo. This plan presents a characterization of the catchment, and the activities for the integrated management as well as the costs associated. OE1 - Ensure the efficient use and sustainable management of water resources by allocating and ensuring the necessary availability of water, for all sectors, at standards of quantity and quality appropriate to their respective uses, taking into account the long-term protection of available water resources.	Some similar and interconnected to the activities within this project are: dentification of water needs the sectors by stematically collecting and dating registers and ventories of infrastructures, es and users. Establishment of water source allocation plans for ch sector, making the needs entified compatible with ater availability and vironmental needs Assessment of future water ailability, considering fferent climate scenarios dentification of measures to apt to, defend against and duce natural risks Maintain operation and date information on the onitored hydro-eteorological networks and ater quality variables. Definition of a pricing policy r the use of water and water sources that is considered ir and sustainable in order guarantee the quality of rvices

PLANS AND STRATEGIES	IMPLEMENTING AGENCY / FUND	DESCRIPTION	COMPLEMENTARITY
Technological Action Plan for the Adoption and Dissemination of Climate Change Adaptation Technologies in the Water Sector / Plano de Ac?a?o Tecnol?gico para Adop??o e Difus?o de Tecnologias de Adapta?a?o ?s Mudan?as Clim?ticas no Sector de ?gua (Outubro 2021)	Fund: GEF Implementation: UNEP	The Technological Action Plan for Climate Change Adaptation elaborated a multi criteria analysis that identified as priority measures the Construction and Maintenance of Existing Water Reservoirs, which included the Construction of small dams and water reservoirs, as well as Water Safety Plan (PSA) that includes Operationalization the National Water Information System (Section III of Law No. 7/2018).	The activities to be outlined in this plan, with regard to the project, are: Drawing up guidelines and ojects for dam construction. Analysis of market ailability and launching of e tender for the execution of e work. Construction of two (2) igation dams. Operationalization of the ational Water Information ystem, based on the gulations established for is purpose Creation of a database with formation on water at tional level. Creation of a coordination echanism between various ater, sanitation and hygiene stitutions, with a view to aring information and aking decisions

8. Knowledge Management

Elaborate the "Knowledge Management Approach" for the project, including a budget, key deliverables and a timeline, and explain how it will contribute to the project's overall impact.

Effective knowledge management ? including the collection, generation and dissemination of information ? is an important component of climate change adaptation. Access to current and detailed information on climate trends and adaptation techniques is essential for project stakeholders such as government agencies, agricultural extension services and local communities to effectively and sustainably implement prioritized adaptation intervention on the ground. Component 5 in the project includes the design and implementation of a knowledge management (KM) plan, which will consist of capturing, documenting and disseminating lessons learned from the project activities both at the local and institutional levels for targeting and improving adaptive capacity of smallholder farmers.

The project will identify and analyze knowledge products in existing projects in the country, focused on climate resilient and sustainable agriculture to serve as a basis for the knowledge management activities that this project will implement. This basis will also allow the project to understand where knowledge ow needs to improve to improve the project?s outcomes as well. Thus, the project will define specific targets for its KM plan in order to identify the most appropriate knowledge products for these targets and define

the most relevant events for knowledge access and sharing such as regular physical or virtual workshops. Tools and methods for knowledge sharing: The project will generate various knowledge products (e.g. Farmer Field Schools curriculum to be used by CATAP trainings as well, water infrastructure, solar energy equipment, climate smart agroecological approaches and techniques, sustainable practices on soil, water and biodiversity conservation), conduct studies (success stories, surveys, etc.), organize study visits/peer-learning events, different meetings/workshops/exhibitions for one to one communication with actual and potential beneficiaries, thereby establishing diligent internal and external information circulation ow available for not only for project stakeholders but for also wider audience. The Project will package and disseminate information to the respective stakeholders including beneficiaries in the appropriate formats (e.g. brochures, studies, articles, newsletter, social media and web). This knowledge-sharing process will be supported by a well-focused series of workshops and joint learning events. A communication strategy will be established and implemented to disseminate in the project results within and beyond the project intervention zone through a number of existing information sharing networks and forums. ?

9. Monitoring and Evaluation

Describe the budgeted M and E plan

The PRIASA II steering committee will be reappointed to serve as the supreme policy organ of PRIASA III. To improve the coordination and planning of activities, a technical committee composed of the main project partners will be established and shall meet each quarter. Internal monitoring and evaluation of project activities shall be conducted by the monitoring and evaluation officer of the PMU, in conjunction with the various services and partners concerned (CADR, CIAT, CATAP, etc.). The monitoring and evaluation system of PRIASA II will be adjusted to project needs. The PMU will be supported by an expert consultant who will help with the establishment of the baseline situation. The PMU shall produce quarterly and annual progress reports, detailing the execution status of the various components, relative to the performance indicators in the logical framework. Gender-disaggregated data will be systematically fed into the monitoring and evaluation mechanism and a simple geographical information system shall be set up. Special attention will be paid to the impact obtained, by heavily involving the partners present on the ground. At least two external evaluation missions will be organised each year by MADR. The project will also be supervised by the African Development Bank through periodic supervision missions (the target is two supervisions per year). A mid-term review will be conducted in the third year through a consultancy rm. Upon project completion, the Bank and the Government shall produce a PRIASA III completion form within the required time frame. The table below presents the estimated M&E budget.

Table 5: M&E estimated budget.

GEF M&E requirements	Indicative cost (USD)	Co-financing (USD)	Timeframe
Inception workshop/Report	20,000.00	25,000.00	Three month after disbursement

Core indicators and results framework	30,000.00	100,000.00	Annually; Mid-term, End-of-project.
Project implementation report	20,000.00	25,000.00	Annually (at closure of first semester)
Monitoring (Gender action plan, ESMP, Stakeholders engagement plan)	50,000.00	50,000.00	During Project execution.
Mission (Supervision)	-	-	-
Mission (Learning)	-	-	-

10. Benefits

Describe the socioeconomic benefits to be delivered by the project at the national and local levels, as appropriate. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCF/SCCF)?

The project will benefit people across Sao Tome and Principe from the national-level activities, working on governance mechanisms, policy frameworks, and capacity building at the national level. The project will also particularly benefit smallholder farmers in Lobata and Cantagalo districts with the implementation of water management technologies for climate change adaptation and resilience. The project is expected to directly affect about 10,000 people, 40% of which will be women. There are at least 20,007 people living in Lobata and 18,194 people living in Cantagolo District[i][i]. The rural population of country is 25%[ii][ii] of the total population, so the project will directly benefit 9,797 of the 38,201 people living in the districts of Cantagalo and Lobata.

The project addresses the adaptation needs of the country laid out in Sao Tome and Pincipe?s NAPA and the NDC, which both highlight the particular need of adaptation activities dealing with water management, particularly in the agricultural sector. The project will take a holistic approach to tackling climate vulnerabilities and enhancing the resilience of farms, farmers, food systems, ecosystems, and the people that rely upon them. The project will be in full alignment with several of the priority areas of the LDCF, particurly in terms of food security, natural resources management, and capacity building.

One of the main adaptation benefits of the project will be the enhancement of food security, both at a national level as well as within the project area in the districts of Cantagalo and Lobata. By contributing to the increase of the agricultural productivity and production and the resilience to changes in climate and extreme weather events, the project will stimulate an increase in the food availability and security in STP and in the amount of the national diet that is produced within the country. The current level of food crop production does not fulfil the country needs, so the country relies heavily on lling the gap with food imports, which leaves the food security of the country in a vulnerable position. The technologies that are implemented along with skills promotion and capacity building, both at the community level and at the

national level through the country?s extension services, will lead to enhanced food production. The Project will pay particular attention to enhancing the climate change resilience of women who are key actors in rural areas but often lack access to training and assets that would unlock their potential as smallholder farmers and natural resources managers. Through all of the project?s gender-mainstreamed activities, this project will increase the food availability and agricultural resilience to climate change within the country, reduce the needs of food imports and consequently improve the food security, nutrition, and health of the population at the national and local levels.

The technologies implemented by the project will address climate change vulnerabilities from different angles in a complementary way. To mitigate the increase of ooding that is predicted to occur in the country, the project will be trialling a technology for the rst time in West Africa: Underground Taming of Floods for Irrigation (UTFI). Reservoirs will be built to capture some of the water that would contribute to erosion and other ooding damage. In conjunction, the project will implement other rainwater harvesting devices along with irrigation technologies. So, in order to increase resilience to drought and to otherwise increase agricultural productivity during the dry season, water collected and stored during the rainy season can be used to irrigate crops during times of the year when that agricultural land is currently unproductive.

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[i] National Statistics Institute. 2013. Resultados Distritais do IV Recenseamento Geral da Populac?a?o e da Habitac?a?o 2012.
[ii] World Bank. 2020. Based on the United Nations Population Division's World Urbanization Prospects: 2018 Revision. https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?locations=ST Accessed 31/08/2021

11. Environmental and Social Safeguard (ESS) Risks

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

Overall Project/Program Risk Classification*

PIF	CEO Endorsement/Approval	MTR	TE
Low	Medium/Moderate		

Measures to address identified risks and impacts

Elaborate on the types and risk classifications/ratings of any identified environmental and social risks and impacts (considering the GEF ESS Minimum Standards) and any measures undertaken as well as planned management measures to address these risks during implementation.

Supporting Documents

Upload available ESS supporting documents.

Title	Module	Submitted
Annex 8a- Environmental and social safeguards v1	**CEO Endorsement ESS**	
GEF Review Sheet	**Project PIF ESS**	

ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

Objective	**Outcomes indicators**	**Baseline**	**Mid-term target**	**End-of-project target**
Promote innovative technologies and co-management of drought, flood, and water depletion as a means to increase the resilience of the farming systems	Indicator 1 (GEF7 Core indicator 3): Area of land restored (Hectares)	0		
	Indicator 2 (GEF7 Core indicator 4): Area of landscapes under improved practices (excluding protected areas) (Hectares)	0		
	Indicator 3 (GEF7 Core indicator 7): Number (#) of shared water ecosystems (fresh or marine) under new or improved cooperative management	0		
	Indicator 4 (GEF7 Core indicator 11): Number of direct project beneficiaries disaggregated by gender	0		
Component 1 Reduce vulnerability and strengthen climate resilience of agricultural systems and livelihoods including those households led by women				
Outcome 1.1 Technologies and solutions for water storage and irrigation piloted and deployed to reduce climate-related risks and enhance resilience of agricultural systems and livelihoods	Indicator 4: # of surface water storage technologies (ponds and tanks for rainwater harvesting) constructed/rehabilitated	0		
	Indicator 5: # of groundwater storage technologies (ponds, trenches, wells) constructed	0		

	Indicator 6: # of hectares with soil moisture storage techniques using soil and water conservation implemented	0		
	Indicator 7: # of small-scale off-grid PV pumps and irrigation kits installed in farms	0		
	Indicator 8: # of drip irrigation kits installed	0		
Outputs to achieve outcome 1.1	1.1.1 Surface water storage technologies (ponds and tanks for rainwater harvesting) constructed/rehabilitated to reduce vulnerability of crops to water scarcity. 1.1.2 Groundwater storage technologies (ponds, trenches, wells) constructed to reduce vulnerability to flash- floods and for aquifer recharge. 1.1.3 Soil moisture storage techniques using soil and water conservation measures implemented. 1.1.4 Small-scale off-grid PV pumps and irrigation kits installed in farms with diverse characteristics to enhance access to water for irrigation including for women. 1.1.5 Efficient irrigation technologies (drip irrigation kits) installed.			
Component 2 Mainstream climate resilience of agricultural systems through water storage and irrigation technologies				
Outcome 2.1 Conducive implementation policy framework designed and implemented	Indicator 9: # of hydrological modeling and relevant research conducted	0	1	1
	Indicator 10: # of cross-sectoral structured dialogues conducted	0	2	4
	Indicator 11: # National Promotion Programme developed and implemented	0	0	1
Outputs to achieve outcome 2.1	2.1.1 Hydrological modeling and relevant research conducted to inform design, location and effectiveness of water harvesting and storage technologies. 2.1.2 Cross-sectoral structured dialogues implemented to define a road map for the replication of water storage and irrigation technologies. 2.1.3 National Promotion Programme adopted for innovative water storage technologies and solutions to foster replication across the country.			

Component 3 Strengthen key value chains and market linkages to enhance resilience and socio-economic benefits				
Outcome 3.1 Value chains strengthened through market access and agrifood transformation units and supportive business model and incentive mechanism identified, designed and implemented	Indicator 11: # of Km of rehabilitated rural roads	0		
	Indicator 12: # of agrifood transformation units equiped	0		
	Indicator 13: # of producers participating in trainings	0		
	Indicator 14: # of extension officers participating in trainings	0		
	Indicator 15: # of CIAT staff members participating in trainings	0		
	Indicator 16: # of business plans prepared and submitted to financial institutions	0		
Outputs to achieve outcome 3.1	3.1.1 Rural roads improved to enable markets access. 3.1.2 Agrifood transformation units improved and producers? capacities strengthened. 3.1.3 Financial incentive mechanisms identified and extension officers trained to provide assistance for supporting the development of farmers? business plans (specially women and youth).			
Component 4 Foster enabling conditions for effective and integrated climate change adaptation in the agricultural and water sectors				
Outcome 4.1 Increased institutional and local capacities, including information and extension services to respond to climate change.	Indicator 17: # of government staff members participating in trainings	0		
	Indicator 18: # of extension officers participating in trainings	0		
	Indicator 19: # of local leadership councils and/or resource users association established	0		
	Indicator 20: # of meetings held by members of local leadership councils and/or resource users association in target communities	0	3	6

Outputs to achieve outcome 4.1	4.1.1 Capacity of institutional staff from the water, agriculture and energy sector enhanced for improved climate change governance. 4.1.2 Climate change and sustainable water management solutions integrated into the agricultural extension program to strengthen local capacity to address water-related climate risks. 4.1.3 Local leadership councils and/or Resource Users Association established/strengthened to facilitate stakeholder engagement and ownership of adaptation technologies. 4.1.4 The capacity of local communities is strengthened to apply and maintain water storage and irrigation technologies and solutions.			
Component 5 M&E and Adaptation Learning				
Outcome 5.1 Lessons learned and best practices from pilot activities, capacity development initiatives disseminated.	Indicator 21: # of platform for sharing information on knowledge and best practices developed and implemented	0	0	1
	Indicator 22: # of communication products for replication and scaling-up successful experiences and project results disseminated	0		
Outputs to achieve outcome 5.1	5.1.1 Knowledge management system in place and operational. 5.1.2 Development and dissemination of knowledge and learning materials on climate change, rural infrastructure and ecosystem management through existing networks and platforms.			
Outcome 5.2 M&E aptly pursued, and lessons captured and widely disseminated.	Indicator 23: M&E plan progress/implementation	0	50%	100%
Outputs to achieve outcome 5.2	5.2.1 M&E system designed and implemented at all levels.			

ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

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Table (a): GEF Secretariat Review for Full Sized Project - Review January 2024		
Comment	**Response**	**Reference in CEO Endorsement Document**
Part I ? Project Information		
Focal area elements		

1. Is the project/program aligned with the relevant GEF focal area elements in Table A, as defined by the GEF 7 Programming Directions? Adjustment requested: Thank you. Please consider changing project title in the document.	Project title was adjusted in the Word document as suggested ?Co-management of climate extremes for agriculture climate resilience in Sa?o Tome? and Pri?ncipe?. However, the AfDB team responsible for GEF projects encountered difficulty to amend the project title while submitting the revised project in the Portal.	PART I: PROJECT INFORMATION
Project description summary		
2. Is the project structure/design appropriate to achieve the expected outcomes and outputs as in Table B and described in the project document? Yes.	-	-
3. If this is a non-grant instrument, has a reflow calendar been presented in Annex D? N/A	-	
Co-financing		
4. Are the confirmed expected amounts, sources and types of co-financing adequately documented, with supporting evidence and a description on how the breakdown of co-financing was identified and meets the definition of investment mobilized, and a description of any major changes from PIF, consistent with the requirements of the Co-Financing Policy and Guidelines? Co-finance letter submitted.		
GEF Resource Availability		

5. Is the financing presented in Table D adequate and does the project demonstrate a cost-effective approach to meet the project objectives? Budget table is still missing in Annex E. Please address.	The Budget table has been now submitted at the GEF Portal.	-
Project Preparation Grant		
6. Is the status and utilization of the PPG reported in Annex C in the document? Annex C is still missing. Please address.	Annex C on 'Status of Utilization of Project Preparation Grant' was now submitted.	ANNEX C.
Core indicators		
7. Is there potential for innovation, sustainability and scaling up in this project? The ratio of male to female beneficiaries for the LDCF Core Indicator 1 is less than 40%. Please revise as indicated in your response.	Number of female beneficiaries was revised accordingly, both in the Core Indicators sheet and description of each one of the core Indicators in pages 5 and 6 of the Ceo Endorsement request form and in ?Annex F- CCA_results_framework_gef7-revMar24?	Annex F- CCA_results_framework_gef7-revMar24?
Part II ? Project Justification		
1. Is there a sufficient elaboration on how the global environmental/adaptation problems, including the root causes and barriers, are going to be addressed? Yes, this is well described.	-	-
2. Is there an elaboration on how the baseline scenario or any associated baseline projects were derived? Yes.	-	-
3. Is the proposed alternative scenario as described in PIF/PFD sound and adequate? Is there sufficient clarity on the expected outcomes and components of the project and a description on the project is aiming to achieve them? Yes.	-	-

4. Is there further elaboration on how the project is aligned with focal area/impact program strategies? Yes.	-	-
5. Is the incremental reasoning, contribution from the baseline, and co-financing clearly elaborated? Yes, the grant contribution from the baseline project is clearly elaborated.		
6. Is there further and better elaboration on the project?s expected contribution to global environmental benefits or adaptation benefits? Yes.	-	-
7. Is there further and better elaboration to show that the project is innovative and sustainable including the potential for scaling up? Yes.	-	-
Project Map and Coordinates		
Is there an accurate and confirmed geo-referenced information where the project intervention will take place? Yes.	-	-
Child Project		
If this is a child project, is there an adequate reflection of how it contributes to the overall program impact? N/A	-	-
Stakeholders		

Does the project include detailed report on stakeholders engaged during the design phase? Is there an adequate stakeholder engagement plan or equivalent documentation for the implementation phase, with information on Stakeholders who will be engaged, the means of engagement, and dissemination of information? Yes, a Stakeholder Engagement Plan has been uploaded.	-	-
Gender Equality and Women?s Empowerment		

Has the gender analysis been completed? Did the gender analysis identify any gender differences, gaps or opportunities linked to project/program objectives and activities? If so, does the project/program include gender-responsive activities, gender-sensitive indicators and expected results? Clarity is requested. Please discuss why, as per Core Indicator 1, a much higher ratio of men will directly benefit from this project than women. A Gender Assessment and Action Plan has been uploaded. The project will engage in specific targeting of women in community-based water management committees and other mechanisms, as well as in community-level trainings; it will target female headed households for the construction and distribution of irrigation and water pumping kits, as appropriate; and engage in extensive gender-specific consultations with women organizations and communities to ensure the needs of women (and other vulnerable groups, such as people living with disabilities) are taken into account when deciding on the location, the process and the usage of water technologies. Please see comment above on core indicator 1	In S?o Tom? and Principe, the percentage of female population is approximately 50.4% and it is considered that about 41% of adult women are heads of household. It would be suitable to have an equal rate of male and female beneficiaries, but according to the gender expert supporting the development of the Gender Assessment and Action Plan, based on the implementation experience and lessons learned from of other projects, it is considered more realistic to target 40% (female headed households) of women participating and benefiting from the project activities than 50% (ratio male-female population in the country).	Section 3 and Annex 7- Gender Assessment and Action Plan
Private Sector Engagement		

If there is a private sector engagement, is there an elaboration of its role as a financier and/or as a stakeholder? N/A	-	-
Risks to Achieving Project Objectives		
Has the project elaborated on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved? Were there proposed measures that address these risks at the time of project implementation? Comment cleared.		
Coordination		
Is the institutional arrangement for project implementation fully described? Is there an elaboration on possible coordination with relevant GEF-financed projects and other bilateral/multilateral initiatives in the project area? The updated section on implementation arrangements is well noted. Comment cleared.		
Consistency with National Priorities		
Has the project described the alignment of the project with identified national strategies and plans or reports and assessments under the relevant conventions? Yes.	-	-
Knowledge Management		

Is the proposed ?Knowledge Management Approach? for the project adequately elaborated with a timeline and a set of deliverables? Yes.	-	-
Environmental and Social Safeguard (ESS)		
Are environmental and social risks, impacts and management measures adequately documented at this stage and consistent with requirements set out in SD/PL/03? Yes, comment cleared.		
Monitoring and Evaluation		
Does the project include a budgeted M&E Plan that monitors and measures results with indicators and targets? Yes.	-	-
Benefits		
Are the socioeconomic benefits at the national and local levels sufficiently described resulting from the project? Is there an elaboration on how these benefits translate in supporting the achievement of GEBs or adaptation benefits? Yes.	-	-
Annexes		
Are all the required annexes attached and adequately responded to?	All Annexes have been completed and submitted through the Portal Entry.	
Project Results Framework		
Comment cleared.		
GEF Secretariat comments		
Comment cleared.		
Council comments		
Cleared. No Council comments were received.	-	-

STAP comments		
Yes.	All STAP comments received both, at PIF and Ceo Endorsement request phases, have been addressed.	
Convention Secretariat comments		
-	-	-
Other Agencies comments		
-	-	-
CSOs comments		
-	-	-
Status of PPG utilization		
No. This is missing and needs to be submitted (as Annex C).	Annex C has been completed with the information on status of PPG utilization.	ANNEX C
Project maps and coordinates		
Yes.	-	-
Does the termsheet in Annex F provide finalized financial terms and conditions? Does the termsheet and financial structure address concerns raised at PIF stage and that were pending to be resolved ahead of CEO endorsement? (For NGI Only) N/A	-	-
Do the Reflow Table Annex G and the Trustee Excel Sheet for reflows provide accurate reflow expectations of the project submitted? Assumptions for Reflows can be submitted to explain expected reflows. (For NGI Only) N/A	-	-
Did the agency Annex H provided with information to assess the Agency Capacity to generate and manage reflows? (For NGI Only) N/A	-	-
GEFSEC DECISION RECOMMENDATION		

Is CEO endorsement recommended? (applies only to projects and child projects) No. Please address the review questions/comments. Also, several required items are missing in this submission, e.g., risk matrix, ESG assessment, PPG utilization table, project budget, cofinance letters, etc.	All comments have been addressed and all pending sections and Annexes have been completed.	Please see Table (b) and references to the Ceo Endorsement document in this table.

Table (a): GEF Secretariat Review for Full Sized Project **- Review April 2023**		
Comment	**Response**	**Reference in CEO Endorsement Document**
Part I ? Project Information		
Focal area elements		
1. Is the project/program aligned with the relevant GEF focal area elements in Table A, as defined by the GEF 7 Programming Directions? Adjustment requested: In the Project Objective, could you please change "resilience" to "climate resilience"? Thank you.	The title was adjusted as requested.	PART I: PROJECT INFORMATION
Project description summary		
2. Is the project structure/design appropriate to achieve the expected outcomes and outputs as in Table B and described in the project document? Yes.	-	-
3. If this is a non-grant instrument, has a reflow calendar been presented in Annex D? N/A	-	
Co-financing		

4. Are the confirmed expected amounts, sources and types of co-financing adequately documented, with supporting evidence and a description on how the breakdown of co-financing was identified and meets the definition of investment mobilized, and a description of any major changes from PIF, consistent with the requirements of the Co-Financing Policy and Guidelines? No. Co-finance letters are missing.	The co-financing letter will be submitted as soon as the co-financing project PRIASA III has been approved by the AfDB board to be held at the end of November 2023.	Co-financing letter to be submitted through the Portal Entry at the end of November 2023.
GEF Resource Availability		
5. Is the financing presented in Table D adequate and does the project demonstrate a cost-effective approach to meet the project objectives? Please ensure the project budget table is included in Annex E of the Portal Entry. It is currently missing.	The Budget table has been submitted at the GEF Portal Entry together with the other project documents.	-
Project Preparation Grant		
6. Is the status and utilization of the PPG reported in Annex C in the document? No. Annex C on 'Status of Utilization of Project Preparation Grant' is missing.	Annex C has been completed with the status of utilization of the PPG.	ANNEX C.
Core indicators		
7. Is there potential for innovation, sustainability and scaling up in this project? Please discuss why there is such a high ratio of male to female beneficiaries. We aspire for gender equality in GEF projects.	Ratio of male to female beneficiaries currently being considered in all project activities is 40% Please see Annex 7 with the Gender Assessment and Action Plan.	Annex 7- Gender Assessment and Action Plan.
Part II ? Project Justification		
1. Is there a sufficient elaboration on how the global environmental/adaptation problems, including the root causes and barriers, are going to be addressed? Yes, this is well described.	-	-

2. Is there an elaboration on how the baseline scenario or any associated baseline projects were derived? Yes.	-	-
3. Is the proposed alternative scenario as described in PIF/PFD sound and adequate? Is there sufficient clarity on the expected outcomes and components of the project and a description on the project is aiming to achieve them? Yes.	-	-
4. Is there further elaboration on how the project is aligned with focal area/impact program strategies? Yes.	-	-
5. Is the incremental reasoning, contribution from the baseline, and co-financing clearly elaborated? Review response is pending availability of co-finance letters.	The co-financing letter will be submitted as soon as the co-financing project PRIASA III has been approved by the AfDB board to be held at the end of November 2023.	Co-financing letter to be submitted through the Portal Entry at the end of November 2023.
6. Is there further and better elaboration on the project?s expected contribution to global environmental benefits or adaptation benefits? Yes.	-	-
7. Is there further and better elaboration to show that the project is innovative and sustainable including the potential for scaling up? Yes.	-	-
Project Map and Coordinates		
Is there an accurate and confirmed geo-referenced information where the project intervention will take place? Yes.	-	-
Child Project		
If this is a child project, is there an adequate reflection of how it contributes to the overall program impact? N/A	-	-

Stakeholders		
Does the project include detailed report on stakeholders engaged during the design phase? Is there an adequate stakeholder engagement plan or equivalent documentation for the implementation phase, with information on Stakeholders who will be engaged, the means of engagement, and dissemination of information? Yes, a Stakeholder Engagement Plan has been uploaded.	-	-
Gender Equality and Women?s Empowerment		

Has the gender analysis been completed? Did the gender analysis identify any gender differences, gaps or opportunities linked to project/program objectives and activities? If so, does the project/program include gender-responsive activities, gender-sensitive indicators and expected results? Clarity is requested. Please discuss why, as per Core Indicator 1, a much higher ratio of men will directly benefit from this project than women. A Gender Assessment and Action Plan has been uploaded. The project will engage in specific targeting of women in community-based water management committees and other mechanisms, as well as in community-level trainings; it will target female headed households for the construction and distribution of irrigation and water pumping kits, as appropriate; and engage in extensive gender-specific consultations with women organizations and communities to ensure the needs of women (and other vulnerable groups, such as people living with disabilities) are taken into account when deciding on the location, the process and the usage of water technologies.	A Gender assessment have been conducted during the project development exploring both, explicit and implicit gender and socioeconomic issues that could be addressed through the project components. The findings from the assessment also form the basis for the Gender Action Plan, which will specify this GEF proposal?s desired results, corresponding actions, indicators, timelines, responsible parties, and budget allocations, through the results framework. If implemented effectively, this project has the potential to become a good practice gender mainstreaming guide for future interventions in STP (nationally), in other SIDS and in sub-Saharan Africa (regionally), and globally. 40% of beneficiaries of the project activities will be female.	Section 3 and Annex 7- Gender Assessment and Action Plan
Private Sector Engagement		
If there is a private sector engagement, is there an elaboration of its role as a financier and/or as a stakeholder? N/A	-	-
Risks to Achieving Project Objectives		

Has the project elaborated on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved? Were there proposed measures that address these risks at the time of project implementation? No. The Risk matrix needs to be provided in the Portal entry, identifying the range of potential risks and measures to mitigate them.	Risk matrix have been added for i) Risk to results, ii) Climate risks and iii) Environmental and social safeguards screening. Annex 8a- Environmental and Social Management Plan and Annex 8b- Full Environmental and Social Impact Assessment conducted by the Government of STP and the GEF Agency, including co-financed activities, have been provided through the Portal Entry.	Section 4 and Annexes 8a and 8b.
Coordination		
Is the institutional arrangement for project implementation fully described? Is there an elaboration on possible coordination with relevant GEF-financed projects and other bilateral/multilateral initiatives in the project area? No. This section is missing and needs to be provided. Please discuss (i) coordination with related GEF and non-GEF initiatives in the country and (ii) aspects of institutional and project-level coordination.	The section on Implementation arrangements have been completed (please see Section 6). Additional information on complementarity and coordination with other GEF projects or bilateral/multilateral initiatives in the project area has also been presented in Annex 2.	Section 6 and Annex 2.
Consistency with National Priorities		
Has the project described the alignment of the project with identified national strategies and plans or reports and assessments under the relevant conventions? Yes.	-	-
Knowledge Management		
Is the proposed ?Knowledge Management Approach? for the project adequately elaborated with a timeline and a set of deliverables? Yes.	-	-
Environmental and Social Safeguard (ESS)		

Are environmental and social risks, impacts and management measures adequately documented at this stage and consistent with requirements set out in SD/PL/03? No. The environmental and social screening and assessment documentation has not yet been uploaded to the Documents section. The agency is requested to ensure that it also includes consideration of the risks posed by climate change to the envisioned project activities and outcomes.	Risk matrix have been added for i) Risk to results, ii) Climate risks and iii) Environmental and social safeguards screening. Annex 8a- Environmental and Social Management Plan and Annex 8b- Full Environmental and Social Impact Assessment conducted by the Government of STP and the GEF Agency, including co-financed activities, have been provided through the Portal Entry.	Section 4 and Annexes 8a and 8b.
Monitoring and Evaluation		
Does the project include a budgeted M&E Plan that monitors and measures results with indicators and targets? Yes.	-	-
Benefits		
Are the socioeconomic benefits at the national and local levels sufficiently described resulting from the project? Is there an elaboration on how these benefits translate in supporting the achievement of GEBs or adaptation benefits? Yes.	-	-
Annexes		
Are all the required annexes attached and adequately responded to?	All Annexes have been completed and submitted through the Portal Entry.	
Project Results Framework		
Adjustments are needed. Most of the "mid-term target" and "end of project target" values are missing from the table. Kindly complete the table.	The project results framework has been completed. Please see Annex A.	ANNEX A
GEF Secretariat comments		

Not yet. The comments provided during PIF review for consideration at CEO endorsement are shown in the last row of the GEF Sec section of Annex B ("Additional comments"). The response column states this is "Work in progress".	All comments received at the PIF phase have been answered to. Please see table (b) below.	ANNEX B: Table (b).
Council comments		
Cleared. No Council comments were received.	-	-
STAP comments		
Yes.	All STAP comments received both, at PIF and Ceo Endorsement request phases, have been addressed.	
Convention Secretariat comments		
-	-	-
Other Agencies comments		
-	-	-
CSOs comments		
-	-	-
Status of PPG utilization		
No. This is missing and needs to be submitted (as Annex C).	Annex C has been completed with the information on status of PPG utilization.	ANNEX C
Project maps and coordinates		
Yes.	-	-
Does the termsheet in Annex F provide finalized financial terms and conditions? Does the termsheet and financial structure address concerns raised at PIF stage and that were pending to be resolved ahead of CEO endorsement? (For NGI Only) N/A	-	-
Do the Reflow Table Annex G and the Trustee Excel Sheet for reflows provide accurate reflow expectations of the project submitted? Assumptions for Reflows can be submitted to explain expected reflows. (For NGI Only) N/A	-	-
Did the agency Annex H provided with information to assess the Agency Capacity to generate and manage reflows? (For NGI Only) N/A	-	-

GEFSEC DECISION RECOMMENDATION		
Is CEO endorsement recommended? (applies only to projects and child projects) No. Please address the review questions/comments. Also, several required items are missing in this submission, e.g., risk matrix, ESG assessment, PPG utilization table, project budget, cofinance letters, etc.	All comments have been addressed and all pending sections and Annexes have been completed.	Please see Table (b) and references to the Ceo Endorsement document in this table.

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Table (b): Secretariat Comment at PIF/Work Program Inclusion		
Comment	**Response**	**Reference in CEO Endorsement Document**
Part I- Project Information		
1. Is the project/program aligned with the relevant GEF focal area elements in Table A, as defined by the GEF 7 Programming Directions? Further information is requested. Project duration: please explain why a six-year project implementation duration has been proposed. This is unusually long for an LDCF project. On-the-ground context/needs can change in six years. Cleared.	This is well noted. The length of the project was on the basis of the proposed innovation approach of Underground Taming of Floods for Irrigation (UTFI). Innovation usually takes longer time to be properly tested on ground. Nevertheless, after discussion with the agriculture and water resources experts, it was clarified that the innovation part has to do with the combination of the different elements, it is considered that four years will be sufficient. Thus, this information will be corrected in the PIF. The project duration has been changed to 60 months.	Part I- Project Information.

Indicative project/program description summary 2. Are the components in Table B and as described in the PIF sound, appropriate, and sufficiency clear to achieve the project/program objectives and the core indicators? Further information is requested. (a) The investment measures proposed appear to be targeting current climate variability. Please discuss how the activities will deliver adaptation benefits into the future, as climate continues to change. (b) Please confirm that the hydrological models (groundwater, catchment hydrology and river hydraulic) discussed in the Component 2 description will use climate data that takes climate change into account. (c) The description for Component 1 mentions that the AfDB baseline project will be supporting dams. Please confirm that these will be small dams. (d) Please confirm that any climate risks that may be flagged in a climate risk screening of the baseline project will be managed independently of the LDCF funding. (e) We understand that the project will be focusing on resilient water management and irrigation to help farmers cope with droughts and oods. Will these measures be complemented by efforts to enhance farmer access to drought-tolerant or flood-tolerant crop varieties, as well as guidance on resilient farming practices? Will the project focus directly on other aspects of (climate-resilient) cropping besides irrigation? (f) Please explain what is encompassed in the term "Underground Taming of Floods for Irrigation (UTFI)". (g) Please discuss how the solar PV technologies and solar pumps	The design and location of the interventions will be informed by hydrological modelling which will integrate climate change projections based on the most recent scientific publication from the IPCC. At present climate scenarios for Sao Tome and Principe show likely increased trend in the number of hot days during the ?gravana? period and the continuous trend of rainfall variability with increase intensity. These climate projections have already been taken into consideration for the design of the project and will be further refined with comprehensive hydrological ? climate modelling. (b) Yes, correct. The hydrological models in Component 2 will use climate projections for RCP 4.5 for a timeframe between 2030 ? 2070. (c) Yes, correct. AfDB confirms that PRIASA III project will support small-scale dams. d) Yes, correct. AfDB confirms that any climate risks identified for the baseline project PRIASA III will be managed with AfDB funds and not LDCF funding. (e) Yes, the project design of the project is holistic and thus it considers in Component 1 to promote soil moisture storage promoting soil and water conservation practices. The project design however is not considering the introduction of drought-tolerant or flood-tolerant seeds. f) The Underground Taming of Floods for Irrigation (UTFI) recharges depleted aquifers with wet-season high flows, adding to local groundwater storage and mitigating flooding in downstream areas. The stored recharge water may later be recovered via existing local wells for domestic supplies and irrigation. Capture and storage of high wet season flows that potentially pose a flood risk take place through groundwater recharge structures (interventions) installed in upstream areas for the protection of highly valued assets (urban, industrial, cultural, etc.) locally and in downstream areas. This would then enable the recovery of water stored underground for productive use and livelihood enhancement. Therefore, in a sense, the impacts that would be felt across one part of the system could be offset to create opportunities in another part. You	Please see 3- Project outcomes and components and 6- Adaptation benefits in Part II- Project justification.

will be supporting climate change adaptation. Cleared.	may see more information in the following study: Pavelic, P.; Brindha, K.; Amarnath, G.; Eriyagama, N.; Muthuwatta, L.; Smakhtin, V.; Gangopadhyay, P. K.; Malik, R. P. S.; Mishra, A.; Sharma, B. R.; Hanjra, M. A.; Reddy, R. V.; Mishra, V. K.; Verma, C. L.; Kant, L. 2015. Controlling floods and droughts through underground storage: from concept topilot implementation in the Ganges River Basin. Colombo, Sri Lanka: International Water Management Institute (IWMI). 33p. (IWMI Research Report 165). doi: 10.5337/2016.200 (g) While adopting UTFI approach secures the access of water at community level, some individual farmers in more remote areas still require some technical support to deliver water to their farms. Solar PV pumps can provide a reliable source of energy in remote areas, contribute to rural access to water and reduce energy costs for irrigation. The key adaptation benefits include secure access to energy in order to use the available water in a cost-efficient manner. The saved time and money from the Solar PV pumps can be then invested in further building the resilience of the agriculture system via soil -water conservation practices or the availability of savings as a financial asset/safety in the face of potential impacts from extreme events.	

Core indicators 6. Are the identified core indicators in Table F calculated using the methodology included in the corresponding Guidelines? (GEF/C.54/11/Rev.01) Adjustments are requested: (a) Core Indicator 2: This project has a strong agricultural and water management focus. For Core Indicator 2, please enter the number of hectares of land that will be managed in a more climate-resilient manner as a result of this project. (b) Core Indicator 1 (direct beneficiaries): As a $10 million project that will use the entire STP LDCF amount for GEF-7, we would like to see this project provide impact, delivering adaptation benefits to a large number of direct beneficiaries in the country. The values for Core Indicator 1 appear very low relative to the grant request. Please consider how this project can provide direct adaptation benefits to a significantly larger number of direct beneficiaries and adjust the Core Indicator 1 values accordingly. (c) Core Indicator 3: Please discuss (if known at this stage) which policies or plans will be targeted for adaptation mainstreaming. (d) In the project meta-information section (above Core Indicators, in the Portal), the agency has entered "False" for the statement "This Project involves at least one small island developing State (SIDS)". Please correct this. (e) The Core Indicators table shows that some 60% of the direct beneficiaries will be women. The PIF states that 40% of the direct beneficiaries will be women. Please correct the discrepancy.	The Core indicators targeted by the project have been adjusted as follows: Core Indicator 3: Areas of land restored At least 520ha will be restored. The project will build on the Restoration Initiative (TRI) financed by the GEF and implemented by UNED, FAO and IUCN in which an evaluation of forest and landscape restoration options has been conducted for the different regions of STP. With the communities, areas to be restored and species to use in each community will be assessed during the project inception phase (under Component 2). Here, will be employed the restoration option of planting native species and fast-growing naturalized species in degraded areas of plots. Core Indicator 4: Area of landscapes under improved practices (excluding protected areas) (Hectares) At least 16,369 ha (representing 35% of productive areas in the target districts) will be targeted for the implementation of climate resilient agriculture practices. Here will be employed agroforestry systems to improve productivity and diversification of crops in agro-forestry areas. This area includes 520ha under improved irrigation practices. Core Indicator 6: Greenhouse Gas Emissions Mitigated (metric tons of CO2e) The target for this core indicator was calculated using the EXACT tool. S?o Tom? & Principe primarily consists of forest land, offering significant carbon sequestration potential. To boost this capacity, the proposed 520-hectare irrigation schemes to be developed should focus on converting degraded land and promoting agroforestry. This approach could result in an annual reduction of 2,143.2 tons of CO2 (10,716 tons over 5 years). Implementing climate-smart irrigation, such as solar-powered technology, and supporting sustainable land management practices like no-tillage and organic fertilizers, will enhance the project's carbon-saving potential.	Please see section E.

	Core Indicator 11: Number of direct beneficiaries disaggregated by gender It is expected that the project will benefit 7,334 people, considering 7,280 people benefiting from the implementation of climate resilient agriculture practices (including water storage, irrigation, agroforestry systems, restoration and capacity building related to the implemented technologies) and, 54 technicians and extension officers directly benefiting from capacity building. 40% of the direct beneficiaries will be women.	
Part II- Project Justification		
1. Has the project/program described the global environmental/adaptation problems, including the root causes and barriers that need to be addressed? Further information is requested. Please specify the time period for the climate change projections discussed in the PIF. Are the projections to 2050, 2100 or another year? Please try to use projections to 2030 or thereabouts as projections to 2100 may not provide a realistic picture for the nearer term. Cleared.	The comment is well noted. The available and scientifically rigorous climate projections for Sao Tome and Principe are for the period 20 41 ? 2070. The following clarification was included in the PIF: ?Climate projections. The climate projection dataset is a 4-km resolution down- scaling of the global climate model CanESM2 with baseline 1971 and 2000, and climate projections for the period 2041 and 2 070, under the RCP8.5 and the RCP4.5 greenhouse gas concentration scenarios.? (Arora et al. 2011. Arora VK, Scinocca JF, Boer GJ, Christian JR, Denman KL et al (2011) Carbon emission limits required to satisfy future representative con- centration pathways of greenhouse gases. Geophys Res Lett 38(5). https://doi.org/10.1029/2010GL046270).	See Part II- Project Justification.
3. Does the proposed alternative scenario describe the expected outcomes and components of the project/program? Further information is requested. Please include a theory of change for the project. Cleared.	Well noted. A Theory of Change diagram and narrative are included in the PIF.	Please see Figure 21.

7. Is there potential for innovation, sustainability and scaling up in this project? Further information is requested. The PIF states that the water management technologies that will be supported by the project will be innovative, and that some have not been used in the country before. Please discuss which some of these potential technologies are, and why they are innovative. Cleared.	The technique called Underground Taming of Floods for Irrigation (UTFI) is innovative for Sao Tome and Principe. UTFI provides an opportunity to utilize water harvesting and groundwater storage for agricultural development. It serves to overcome the spatial and temporal mismatch in water availability that is characteristic of recurrent flood/drought cycles. This new technology involves diverting high water flows from rivers or canals when prone to flood risk and recharging the groundwater via village ponds or small dams that are modified for this purpose. By design the technology is gender neutral and is expected to benefit both men and women by offering them greater convenience, better health and enhanced socio-economic opportunities through improved water facilities. Whilst the technical components of UTFI are not necessarily new, the integrated approach and the proposed mode of operation is. The technology has been used in Asia, in particular Thailand, India, Sri Lanka.	See Annex 4- Adaptation measures proposed.

Stakeholders Does the PIF/PFD include indicative information on Stakeholders engagement to date? If not, is the justification provided appropriate? Does the PIF/PFD include information about the proposed means of future engagement? Further information is requested. (a) Please identify the Civil Society Organizations that were consulted. (b) Please discuss whether CSOs and/or local NGOs will be engaged in project design and implementation, and if so, how. (c) Please discuss how this project will aid in post-COVID-19 recovery and efforts to build back better. (d) Please provide further information on the planned consultations to be conducted with stakeholders at local and international level during the different stages of the project proposal preparation, including a list of stakeholders and their potential respective roles in in the project. Cleared.	a) The civil society engaged in the initial consultation process include: (1) FONG - Federation of ONGs and (2) OIKOS. (b) CSOs and local NGOs (in particular women associations) will be engaged in the project design by (i) consulting about the specific needs and challenges of the farmers (including women farmers) with regards to access to water for irrigation, (ii) identification of key locations for the installation of water storage technologies and solutions (e.g. solar PV pumps, drip irrigation systems), (iii) assessment of capacity needs to better inform the capacity building activities at local level. (c) The following clarification is included in the PIF: ?Project components are inherently aligned with the overall objective of stimulating a ?green recovery? following the COVID-19 crisis. The project interventions will build resilience in the livelihoods of smallholder farmers and ecosystems via (1) promotion of ecosystem approach to water and soil resource management, thus increasing the productivity of farmlands and thus avoiding farmland expansions in areas of high natural and biodiversity value and (2) improving the quality and productivity of agricultural systems thus creating surplus of agricultural production which can be sold in markets and generate additional income to vulnerable farmers which can be used for long-term planning and anticipatory action. In combination, those results will enhance the resilience of farmers and their preparedness in the case of future socio-economic, climatic and health- related shocks. ? d) At the project preparation stage, AfDB will engage the stakeholders at two stages (1) Consultation stage: consultation with local communities/CSOs and local government; national level government stakeholders to define needs and refine the project design (2) Validation stage: Validation workshop with representatives from different governance levels and local communities to ensure that the final project design is approved and supported from all stakeholders. An initial list with stakeholders and their roles in included in the PIF. For the Ceo endorsement request development, a consultation workshop has	Please see Section 2- Stakeholders consultations and Annex 6- Stakeholder Engagement Plan.

	been conducted at STP in November 2022 as well as bilateral interviews with relevant stakeholders at national, district and community levels. Once the comments of the GEF Secretariat are received on the Ceo endorsement documents re-submitted, a final workshop will be conducted to validate the project with the local stakeholders.	
Gender Equality and Women?s Empowerment Is the articulation of gender context and indicative information on the importance and need to promote gender equality and the empowerment of women, adequate? Further information is requested. (a) The PIF states that the technologies and solutions for water storage and irrigation deployed by the project will be targeted specifically at women farmers. This is welcomed; please discuss how this is envisaged. (b) Please submit a Gender Action Plan by CEO Endorsement. Please ensure the focus is on how the project activities can enhance women's climate resilience. (c) It is unclear how this project will contribute to closing gender gaps in access to and control over natural resources. Please clarify further and/or revise the ticked box. Cleared.	a) The preparation of the project design was informed by the gender analysis developed for PRIASA I and for PRIASA II. The project envisions the following to strengthen its gender components: improved access of women farmers to irrigation water and innovative technologies (solar PV pumps and drip irrigation); improved representation and participation of women in decision-making bodies; strengthene d technical capacity for intervention and organisation of women in the activities supported by the project; and, appointment of a gender focal point. Project target to promote and enhance women place in decision making and will seek to strengthen women leadership in the Community Associations created / strengthened by the project. b) This is well noted. A Gender Action Plan will be submitted by CEO Endorsement focusing on the expected impacts of the project interventions to enhance women?s climate resilience and gender equality. (c) The project will seek to engage with women farmers and enhance their access to water for irrigation. After a careful analysis it was defined that the project will not have such a prominent impact on closing the gender gap in access and control to water resources. Therefore, this box is revised.	Please see Section 3 and Annex 7- Gender Assessment and Action Plan..

Risks to Achieving Project Objectives Further information is requested: A climate risk screening of the project should be undertaken at PIF stage. Please submit the screening report, with any pertinent risks flagged, and, if flagged, proposed risk mitigation measures. (For any climate risks identified at PIF stage, a climate risk assessment is needed by CEO Endorsement stage, with risk mitigation measures discussed). Cleared.	The climate risk screening for the project was performed using the World Bank?s tool - ThinkHazard! (This is a web-based tool which supports the decision making for project design providing information on impacts of disasters on new development projects. The results are summarised below and a detailed description with proposed mitigation actions is included as a separate Annex 1. At CEO endorsement stage, a more detailed climate risk screening will be performed: Risk matrix have been added for i) Risk to results, ii) Climate risks and iii) Environmental and social safeguards screening (please see Section 4). Annex 8a- Environmental and Social Management Plan and Annex 8b- Full Environmental and Social Impact Assessment conducted by the Government of STP and the GEF Agency, including co-financed activities, have been completed.	Please see Section 4 and Annexes 8a and 8b.
Coordination Is the institutional arrangement for project/program coordination including management, monitoring and evaluation outlined? Is there a description of possible coordination with relevant GEF-financed projects/programs and other bilateral/multilateral initiatives in the project/program area? Further information is requested. Please also discuss coordination with GEF LDCF ID 9364 (World Bank), as well as with any GEF Land Degradation projects in the country. Please also discuss coordination with other relevant non-GEF initiatives (e.g., GCF/Adaptation Fund or bilateral donors). Cleared.	The following clarification is included in the PIF: ?Under the implementation arrangement, the project proposes to establish a Technical Advisory Group (TAG), which will consist of technical experts from the GEF LDCF ID 9364 (World Bank) and GEF ID 9517 (FAO) and other relevant non-GEF initiatives. The TAG will be responsible for the technical guidance, transfer of knowledge and best practices within different initiatives in Sao Tome and Principe. It will seek to ensure project?s strategic approach, coordination among the partners.? Section 6 on the implementation arrangements has been completed in the Ceo Endorsement Document.	Please see Section 6

Knowledge Management the proposed ?knowledge management (KM) approach? in line with GEF requirements to foster learning and sharing from relevant projects/programs, initiatives and evaluations; and contribute to the project?s/program?s overall impact and sustainability? Further information is requested. (a) Please include in the knowledge management plan (and in the PIF) that the project will capture lessons and best practice on the local adoption and use with the water technologies. What were successes and/or impediments to their uptake, use and durability? How were they innovative? Which ones proved more successful in times of drought or other climate stress? Which ones did women favor, and why? What ancillary measures could have made this even more successful? (b) Please also specify the range of audiences for the various knowledge products, ensuring that the lessons can be fed back to extension workers and farming communities, among others. (c) Please provide information on proposed tools and methods for knowledge exchange, learning and collaboration; proposed knowledge outputs to be produced and shared with stakeholders; and a discussion on how knowledge and learning will contribute to overall project impact and sustainability, following the KM approach.	1. A knowledge management (KM) plan has been considered as an integral part of Component 3 of the project. Therefore, at project preparation phase, a draft of KM plan will be prepared and submitted, which will then be revised and tailored during the implementation of Component 3. In order to have a structured approach, the project considers adopting the following three KM steps, which will ensure the coherence of KM, including: ? Knowledge Management Registry (KMR): The KMR will define the areas of knowledge needed by the projects such a "key knowledge inputs? from ongoing projects and "knowledge outputs? from lessoned learned. ? KM Protocol: The KM will develop a process of creating the KM which defines the roles and accountabilities of each partner and d entails on how the knowledge shall be collected, stored, organized and distributed throughout the project lifetime. ? Implementation Plan of the Project: The KM will make sure the KM protocol is ready to be applied throughout the implementation of the project. b) Please see the responses for a) and c). In order to identify the audiences for the products, the project will rst identify what are th e knowledge gaps and needs for the different stakeholders and will then develop a KM plan to effectively address those knowledge and information gaps and share lessons learned. c) The following clarification is included in the PIF: ?Tools and methods for knowledge sharing: The project will generate various knowledge products (e.g. Farmer Field Schools curriculum on water infrastructure, solar energy equipment, climate smart agroecological approaches and techniques, sustainable practices on soil, water and biodiversity conservation), conduct studies (success stories, surveys, e tc.), organize study visits/peer-learning events, different meetings/workshops/exhibitions for one to one communication with actual an d potential beneficiaries, thereby establishing diligent internal and external information circulation ow available for	The knowledge management plan isincluded in the project. Please see Project Description Summary in Section B and Section 8.

	not only for project st akeholders but for also wider audience. The Project will package and disseminate information to the respective stakeholders including beneficiaries in the appropriate formats (e.g. brochures, studies, articles, newsletter, social media and web). This knowledge-sharing process will be supported by a well-focused series of workshops and joint learning events. A communication strategy will be established and implemented to disseminate in the project results within and beyond the project intervention zone through a number of existing information sharing networks and forums.?	

Environmental and Social Safeguard (ESS) Are environmental and social risks, impacts and management measures adequately documented at this stage and consistent with requirements set out in SD/PL/03? It is expected that prior to CEO Endorsement the project applies environmental and social standards and procedures to identify risks and potential impacts and submits for the GEF?s review, in line with GEF Policy and Guidelines on Environmental and Social Safeguards 1. Screening/assessment report(s) such as any nal screening reports and or Environmental and Social Risk and Impact Assessment report(s). 2. Environmental and Social Management Plans, if applicable, to address identified types and levels of risks. 3. Revise and update the overall project risk rating if needed. Cleared for PIF. Further information is needed on the Environmental and Social Safeguards: The Agency response related to ESS is that ?The risk matrix is reviewed and reflects the preliminary results of the environmental and social screening with identified mitigation measures.? However, the information provided in the ESS section includes only climate risks. Please also discuss the broader environmental and social safeguard (ESS) context for the project, and/or provide any ESS screenings that may be have been undertaken. Not yet cleared. Further information is requested. (a) The project risk matrix does not include information on potential environmental and/or social risks that the project could	(a) The risk matrix is reviewed and reflects the preliminary results of the environmental and social screening with identified mitigation measures. (b) The risk screening analysis will be presented at later stage as they it is still in a process of nalisation. Please refer to response a) for preliminary results. (c) ESS risks will be more fully considered during project preparation phase. In the Ceo Endorsement phase, Risk matrix have been added for i) Risk to results, ii) Climate risks and iii) Environmental and social safeguards screening (please see Section 4). Annex 8a- Environmental and Social Management Plan and Annex 8b- Full Environmental and Social Impact Assessment conducted by the Government of STP and the GEF Agency, including co-financed activities, have been completed.	See Section 4 and Annexes 8a and 8b.

pose. Please conduct an environmental and social safeguard screening, and submit the results or emerging ndings to GEF Sec. If risks are identified, please discuss potential risk mitigation measures. (b) Pease provide, if available, the preliminary screening document following the AfDB Integrated Safeguards System (ISS). We note that the project overall ESS risk is classified as low. The PIF said that preliminary information on the types and levels of risks has been provided in the PIF, and a more in-depth analysis of risks is being undertaken as part of the development of the PRIASA III project and will help complement this section. However, there is no information about types of ESS risk related to this project.		

Additional comments (a) Please submit a Stakeholder Engagement Plan by CEO Endorsement that identifies stakeholders consulted and their envisioned roles, including CSOs and NGOs. (b) In addition to the social and gender analysis that will be conducted as part of project preparation, please submit a Gender Action Plan by CEO Endorsement. Please ensure the focus is on how the project activities can enhance women's climate resilience. (c) Please submit a Knowledge Management Plan. See PIF-stage comments on Knowledge Management for some aspects GEF Sec would like to see included. (d) It is expected that prior to CEO Endorsement the project applies environmental and social standards and procedures to identify risks and potential impacts and submits for the GEF?s review, in line with GEF Policy and Guidelines on Environmental and Social Safeguards Screening/assessment report(s) such as any final screening reports and or Environmental and Social Risk and Impact Assessment report(s). 2. Environmental and Social Management Plans, if applicable, to address identified types and levels of risks. 3. Revise and update the overall project risk rating if needed. (e) If significant climate risks were flagged in the PIF-stage climate risk screening, please submit a climate risk assessment by CEO Endorsement, with risk mitigation measures proposed for the identified risks.	a) A Stakeholder Engagement Plan has been developed. Please see Annex 6. b) A Gender Assessment and Action Plan has been developed. See Annex 7. c) Further information has been added on the knowledge Action Plan in order to respond to the GEF Secretariat comments. Please see Part II; Project Description. d) Risk matrix have been added for i) Risk to results, ii) Climate risks and iii) Environmental and social safeguards screening (please see Section 4). Annex 8a- Environmental and Social Management Plan and Annex 8b- Full Environmental and Social Impact Assessment conducted by the Government of STP and the GEF Agency, including co-financed activities, have been included in the Project documents. e) A climate risk assessment with risk mitigation measures proposed for the identified risks was added in Section 4 of the CEO Endorsement document.	See Annex 6- Stakeholder Engagement Plan, Annex 7- Gender Assessment and Action Plan; Knowledge Management in Part II- Project Description, Section 4 and Annexes 8a and 8b for ESS.

ANNEX C: Status of Utilization of Project Preparation Grant (PPG). (Provide detailed funding amount of the PPG activities financing status in the table below:

PPG Grant Approved at PIF:			$200,000
Project Preparation Activities Implemented	GETF/LDCF Amount ($)		
	Budgeted Amount	Amount Spent To date	Amount Committed
Reimbursables (Local Transport and Accommodation Field Mission)	3,300	3,300	0
Stakeholder Workshops (Inception & Validation)	11,883	11,883	0
Consultancy Preparation Contract (drafting of Project Design Report, drafted PRIASA III preparation report (PPR/PAR), finalised the draft of the Ceo Endorsement Request package, consultation with key stakeholders, organisation of the workshops)	163,757	163,757	0
Total	**178,940**	**178,940**	**0**

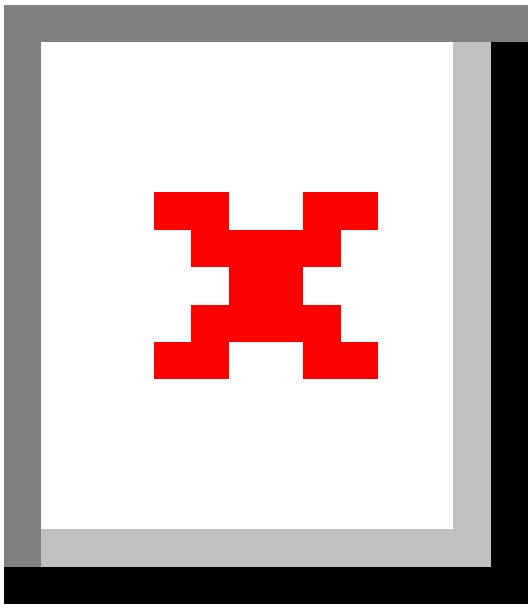
ANNEX D: Project Map(s) and Coordinates

Please attach the geographical location of the project area, if possible.

1. **Targeted Communities**

The project?s targeted communities were selected based first on a climate vulnerability analysis at the district level in S?o Tom? and Principe. Scientific data related to the baseline and future projections under RCP4.5 and 8.5 for temperature, precipitation and agriculture, as well as inputs from stakeholders during the consultations were taken into consideration to define the level of climate vulnerability of the districts in both islands. Based on this analysis, two districts were chosen for the project area: Cantagalo and Lobata. Although both districts have great potential for the agriculture production, they have been experiencing problems related to water availability and have higher exposure to droughts.

Following the definition of districts, a second step was taken to establish the project area at the community level. Based on inputs from the stakeholder consultations and desk research, the communities were analysed based on what is already being implemented in each of them by other projects and what are the main gaps and needs. This process aimed at ensuring the project?s complementarity with other initiatives and the efficiency in allocating project?s resources to meet community needs. The complete list of communities defined during this process is available in the table below.



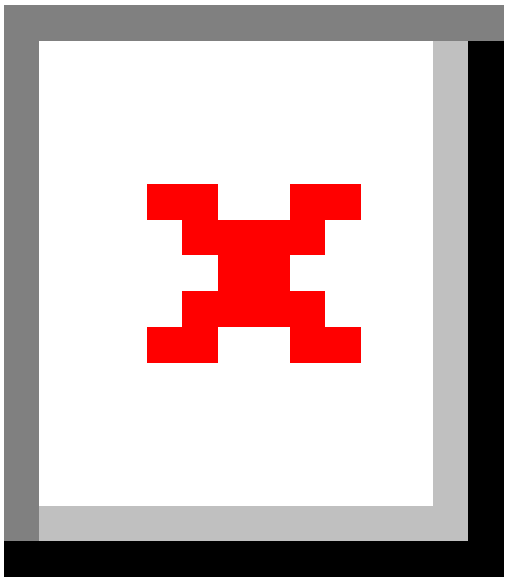
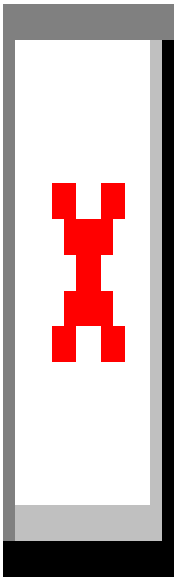


Table 1. List of targeted communities

Community	District
Canavial	Lobata
Ob? Moro/Morro Peixe	Lobata
S?o Bernardo	Lobata
Fern?o Dias	Lobata
Pinheira	Cantagalo
Agostinho Neto	Lobata
Pedroma	Cantagalo

Uba Budo	Cantagalo
Santa Clara	Lobata
Agua Casada	Lobata
Oqu? M?quina	Lobata
Reta de Micol?	Lobata
Praia Nazar?	Lobata
Caldeiras	Lobata
S?o Domingo (entre Caldeiras e Agostinho Neto)	Lobata
Boa Esperan?a	Lobata
Santa Luzia	Lobata
Plancas 1	Lobata
Plancas 2	Lobata
?gua Sampaio	Lobata
Praia das Conchas	Lobata

Mutamba	Lobata 

GEO LOCATION INFORMATION

The Location Name, Latitude and Longitude are required fields insofar as an Agency chooses to enter a project location under the set format. The Geo Name ID is required in instances where the location is not exact, such as in the case of a city, as opposed to the exact site of a physical infrastructure. These IDs are available on the GeoNames? geographical database containing millions of placenames and allowing to freely record new ones. The Location & Activity Description fields are optional. Project longitude and latitude must follow the Decimal Degrees WGS84 format and Agencies are encouraged to use at least four decimal points for greater accuracy. Users may add as many locations as appropriate. Web mapping applications such as OpenStreetMap or GeoNames use this format. Consider using a

conversion tool as needed, such as:https://coordinates-converter.com Please see the Geocoding User Guide by clicking here.

Location Name	Latitude	Longitude	Geo Name ID	Location & Activity Description

ANNEX E: Project Budget Table

Please attach a project budget table.

Appendix A: Indicative Project Budget Template

Expenditure Category	Detailed Description	Component (USDeq.)								Total (USDeq.)	Responsible Entity
		Component 1	*Component 2*	*Component 3*	*Component 4*	*Knowledge Management*	*Sub-Total*	*M&E*	*PMC*		_ftn1
		Outcome 1.1	*Outcome 2.1*	*Outcome 3.1*	*Outcome 4.1*	*KM*					
Works	Works for 1.1.1 and 1.1.2 water storage measures	2350000					2350000			2350000	MAPDR
	Works for 1.1.4 installation of solar pumps and irrigation kits	100000					100000			100000	MAPDR
	Works for 3.1.2 construction or rehabilitation of transformation units and storage facilities			507500			507500			507500	MAPDR
Goods	Equipment for 1.1.4 solar pumps and irrigation kits	400000					400000			400000	MAPDR
	Inputs for 1.1.3 climate resilient agriculture practices	437500					437500			437500	MAPDR
	Equipment for 3.1.2 construction or rehabilitation of transformation units and storage facilities			1200000			1200000			1200000	MAPDR
	Communication equipment for 2.1.1 for reporting extreme events at the community level		9347				9347			9347	MAPDR
	Equipment for 2.1.1 for 3 rainfall stations		200000				200000			200000	MAPDR
Local Consultants	Consultant for the Knowledge management products					50000	50000			50000	MAPDR
	Consultancy for 2.1.1 for diagnostic and first measures report		150000				150000			150000	MAPDR
	Consultancy for 2.1.1 for study on the techniques for soil management, crop selection, diversification, improvement and scheduling, and irrigation management		100000				100000			100000	MAPDR
	Consultancy for 2.1.1 for supporting the development of the meteorological database		100000				100000			100000	MAPDR
	Consultancy for 2.1.2 to support the cross-sectoral dialogues		40000				40000			40000	MAPDR
	Consultancy for 2.1.3 to support										

ANNEX F: (For NGI only) Termsheet

Instructions. Please submit an finalized termsheet in this section. The NGI Program Call for Proposals provided a template in Annex A of the Call for Proposals that can be used by the Agency. Agencies can use their own termsheets but must add sections on Currency Risk, Co-financing Ratio and Financial Additionality as defined in the template provided in Annex A of the Call for proposals. Termsheets submitted at CEO endorsement stage should include final terms and conditions of the financing.

ANNEX G: (For NGI only) Reflows

Instructions. Please submit a reflows table as provided in Annex B of the NGI Program Call for Proposals and the Trustee excel sheet for reflows (as provided by the Secretariat or the Trustee) in the Document Section of the CEO endorsement. The Agencys is required to quantify any expected financial return/gains/interests earned on non-grant instruments that will be transferred to the GEF Trust Fund as noted in the Guidelines on the Project and Program Cycle Policy. Partner Agencies will be required to comply with the reflows procedures established in their respective Financial Procedures Agreement with the GEF Trustee. Agencies are welcomed to provide assumptions that explain expected financial reflow schedules.

ANNEX H: (For NGI only) Agency Capacity to generate reflows

Instructions. The GEF Agency submitting the CEO endorsement request is required to respond to any questions raised as part of the PIF review process that required clarifications on the Agency Capacity to manage reflows. This Annex seeks to demonstrate Agencies? capacity and eligibility to administer NGI resources as established in the Guidelines on the Project and Program Cycle Policy, GEF/C.52/Inf.06/Rev.01, June 9, 2017 (Annex 5).