



ADAPTATION FUND

Title of Project/Programme:	West and Central Africa Small Island Developing States ADAPT - <i>Building resilience of agricultural systems to climate change</i>
Countries:	<i>Cabo Verde, Guinea Bissau, Sao Tome and Principe (STP)</i>
Thematic Focal Area ¹ :	Food Security
Type of Implementing Entity:	Multilateral Implementing Entity
Implementing Entity:	International Fund for Agricultural Development (IFAD)
Executing Entities:	Ministry of Agriculture and Forests of Guinea Bissau, Ministry of Agriculture, Fisheries and Rural Development of STP, Ministry of Agriculture and Environment of Cabo Verde
Amount of Financing Requested	14,000,000 (in U.S Dollars Equivalent)

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

Table of Contents

PART I: PROJECT/PROGRAMME INFORMATION	5
A. Project / Programme Background and Context	5
1.1 Climate change and agricultural vulnerability	5
1.1.1 From the countries' perspective	5
1.1.2 From the regional perspective	16
1.2. Socioeconomic development and environmental context.....	18
1.3. Target areas and beneficiaries.....	20
B. Project / programme objectives	20
C. Project / programme components and financing	23
D. Projected calendar	24
PART II: PROJECT / PROGRAMME JUSTIFICATION	25
A. Project / programme components.....	25
B. Promotion of new and innovative solutions to climate change adaptation	21
C. Economic, social and environmental benefits.....	32
D. Cost-effectiveness analysis	35
E. Consistency with national or sub-national sustainable development strategies.....	41
F. Relevant national technical standards	43
G. Duplication or synergies with other funding sources	51
H. Learning and knowledge management	53
I. Consultative process	54
J. Justification for funding	57
K. Sustainability of the project / programme outcomes.....	59
L. Overview of the environmental and social impacts and risks	61
PART III: IMPLEMENTATION ARRANGEMENTS.....	69
A. Arrangements at the regional and national level	69
B. Measures for financial and risk management	69
C. Measures for environmental and social risk management	71
D. Monitoring and evaluation arrangements and budgeted M&E plan	71
E. Results framework	71
F. Alignment with the Results Framework of the Adaptation Fund	71
G. Detailed budget with budget notes	72
H. Disbursement schedule with time-bound milestones	72
PART IV: ENDORSEMENT BY GOVERNMENTS AND CERTIFICATION BY THE IMPLEMENTING ENTITY	72

ANNEXES

Annex 1: Desalination options in agriculture (IFAD Mission for RTA Cape Verde)	77
Annex 2: More detailed RO and RED desalination technologies comparison from IFAD Mission for RTA Cape-Verde in 2019.....	81

LIST OF TABLES

Table 1: list of activities under output 1.1	26
Table 2: list of activities under output 1.2.....	26
Table 3: list of activities under output 1.3	27
Table 4: list of activities under output 2.3	29
Table 5: empowerment of key local user associations	37
Table 6: list of relevant national legislations	44
Table 7: child labor policies in Guinea Bissau	51
Table 8: list of stakeholders met to date in the three countries	55
Table 9. Relevant national/local authorities to ensure capacity for sustainability	59
Table 10: environmental impacts and management measures	61
Table 11: environmental risk assessment	56
Table 12: list of the potential financial and other risks	69
Table 13: list of desalination technologies and their comparison in Cape Verde	77
Table 14: Water reuse for irrigation pros and cons	78
Table 15: Results of preliminary modelling (IFAD Mission for RTA Cape Verde)	79
Table 16. Economic and financial parameters used for the modelling (IFAD Mission for RTA Cape Verde)	80
Table 17. List of assumptions for the preliminary modelling (IFAD Mission for RTA Cape Verde)	80

LIST OF FIGURES

Figure 1: Evolution of the average temperature from 1960 to 2016 in STP	5
Figure 2: Evolution of accumulated precipitation (mm) in STP	6
Figure 3: Evolution of the average temperature (° C) in STP	7
Figure 4: Top Annual cycle of temperature for the period 1986-2005 in Cape Verde	10
Figure 5: Regional climate model projections for temperature displayed as 20 year running mean in Cape Verde	11
Figure 6: Relationship between annual maize production and rainfall in Cape Verde	12
Figure 7: Regional climate model projections for temperature displayed as 20 year running mean in Guinea-Bissau	17
Figure 8: Top - Annual cycle of temperature for the period 1986-2005 in Guinea-Bissau	15

PART I: PROJECT/PROGRAMME INFORMATION

A. Project / Programme Background and Context:

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

1.1 THE CLIMATE RELATED PROBLEM TO SOLVE

1.1.1 From the countries' perspective

1.1.1.1. Sao Tome climate change and agricultural vulnerability profile

Climate change trend

1. The annual average temperature trend of the airport weather station (Figure 1), calculated from the linear trend, indicates an increase of 0.6 ° C between 1960 and 2016, an average increase of about 0,01°C per year. The hottest five years have been in the past 20 years

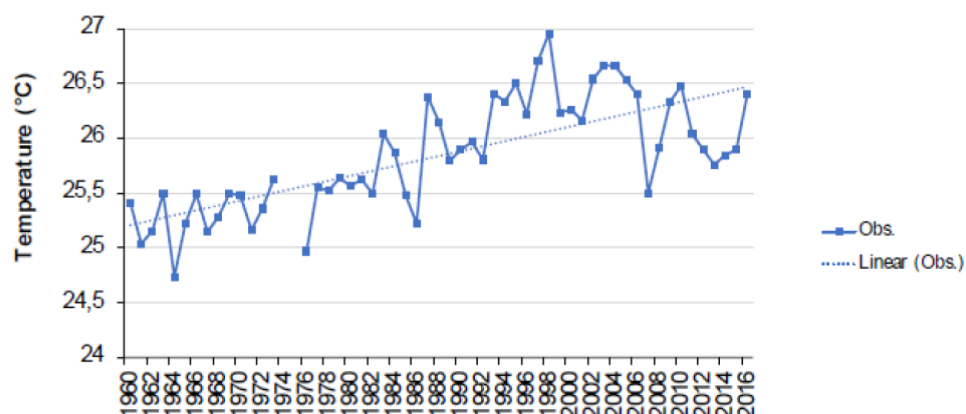


Figure 1: Evolution of the average temperature from 1960 to 2016 (Sao Tome Airport Station).

2. **Observed rainfall data** do not show a clear trend according to the Third National Communication (2019)². However, according to producers, the length of the rainy season has shortened compared to 4-5 years ago when the duration of the dry season (*gravana*) was normal and allowed two seasons. The historic period of heavy rainfall in the rainy season typically lasted for 2 to 3 months and has now shortened considerably. Heavy winds and rains have become more frequent and intense. Hot nights have become more frequent, as observed by coffee producers. The *Gravanita* (a small dry season between January and March) tends to extend into April causing extend dry conditions for agriculture. Previously, stormy events occurred in April, May and in October. Now thunderstorms almost occur continuously throughout the wet seasons, becoming unpredictable and occurring at any time.
3. **Precipitation.** In scenario RCP4.5 (Figure 2), the precipitation evolution projections for the two islands indicate a rainier climate from October to May and slightly drier conditions in the other months of the year. The most significant variations in precipitation (+ 150 mm / month) occur in the south-southwest part of the island of São Tomé, where total precipitation is also the highest. In scenario RCP8.5 (Figure 2), projections indicate that the reduction in precipitation occurs both in rainy and dry periods. However, by analyzing the changes from month to month, December and January show an increase in

² Democratic Republic of São Tomé and Príncipe. Ministry of Public Works, Infrastructures, Natural Resources and the Environment. 2019. Third National Communication, pp 1122.

precipitation on the island of São Tomé in the RCP8.5 scenario. The reduction in precipitation in this emission scenario is very marked in April on the island of São Tomé, reaching the rate of -100 mm / month.

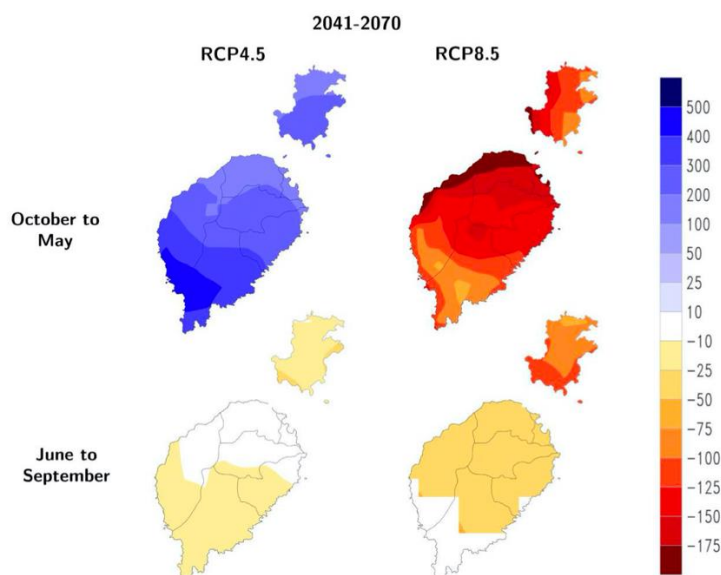


Figure 2: Evolution of accumulated precipitation (mm) from October to March (rainy season) and from June to September (dry season) projected by the Eta³⁻⁴ km model for the period 2041-2070 in the RCP4.5 and RCP8.5

4. **Projected Temperatures:** Projections indicate global warming, most pronounced between October and May. During the "gravana" period, warming is greatest in the central part of the island of São Tomé where the highest altitudes are found (Figure 3). Note that the warming pattern in the two scenarios (RCP4.5 and RCP8.5) is quite similar, with a more intense temperature increase in the RCP8.5 scenario. Temperature changes in the two islands reach values of around 2.5°C in RCP4.5 and 3°C in RCP8.5 both during the rainy season and during the dry season.

³ The Eta model is applied on various climate scales seamlessly, from suseasonal, seasonal to multidecadal from coarse 40 km up to high 5 km resolution; Eta-4 km model has been adapted to run for long-term climate model integrations. The model resolution is approximately 4 km in the horizontal coordinate and the vertical coordinate is more suitable to operate in regions of steep orography than other climate models such as Sao Tome and Principe. Examples of applications are on various socioeconomic sectors, such as for crop yield forecasts, environmental and forest conservation, urban areas management, assessment of natural disaster risks, hydropower management etc...

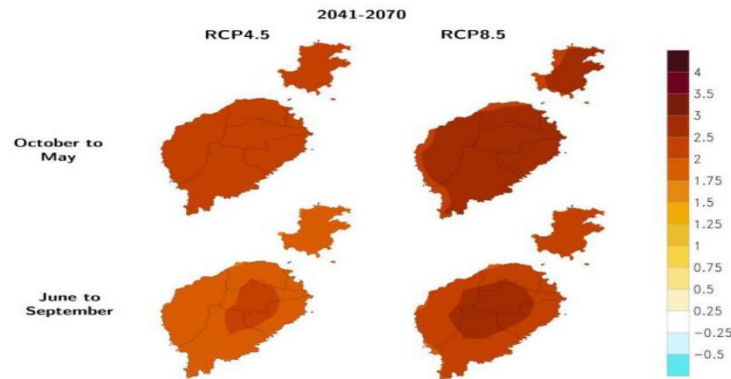


Figure 3: Evolution of the average temperature (° C) from October to March (rainy season) and from June to September (dry season) projected by the Eta-4 km model⁴ for the 2041-2070 period of RCP4 .5 and RCP8.5 relating to the period 1971-2000

5. **Weather extremes are predicted to increase** between 2041 and 2070, and indicate an increase in heavy rains, especially in the southwestern region of Sao Tome Island. This will be complimented by an increase in the observed number of consecutive dry days (days without rain) throughout the Gravana. Further, projections of temperature extremes between 2041 and 2070 in both scenarios indicate warming, with increases in heat waves, hot days, annual maximum temperatures and increasing annual minimum temperatures.

Agricultural sector vulnerability

6. Due to its insular nature, its small size and its low coasts with large human concentration, Sao-Tome and Principe is very vulnerable to climate change. Rising temperatures, rising sea levels and intensifying climatic disturbances are potential risks, some of whose effects have already been observed (case of coastal erosion). Climate change could also have consequences on the specific composition of fishery resources and their distribution. In the agricultural sector, the tendency to lengthen the dry season and intensify torrential rains poses a potential threat to food security and land use. 45. In São Tomé and Príncipe, rising temperatures and coastal erosion are the main apparent manifestations of climate change, although they may have other causes. The variability of rainfall is also a reality; it leads to disruptions in the agricultural calendar and the irregularity of agricultural production. Food insecurity persists despite a climate and soil favorable to agriculture and the variability of agricultural production increases the volatility of food prices. In this context, several trends have already been observed, in particular the increase in temperatures, the decrease in precipitation, the lengthening of the dry season, the decrease in river flows, the rise in the level of the sea and coastal erosion. These trends have negative economic impacts on several sectors, notably agriculture and forestry.
7. **Crop vulnerability.** The erraticity of rainfall distribution, as well as its poor distribution, on the one hand, and the increase in temperature, on the other hand, have negative impacts on crop growth. The significant increase in substantial rainfall results in sheet erosion and top soil loss, leading to the leaching of soil nutrients, which negatively affects crop and pasture development negatively as well as agricultural productivity. Further increases in temperature and moisture levels will result in proliferations of plant pathogens and parasites, such as rust fungus and *spodoptera frugiperda* (American corn moth)

⁴ Eta model has been adapted to run for long-term climate model integrations. The model resolution is approximately 4 km in the horizontal coordinate and the vertical coordinate is more suitable to operate in regions of steep orography than other climate models such as Sao Tome and Principe.

Source: Chou, S.C., et al. (2014) Assessment of Climate Change over South America under RCP 4.5 and 8.5 Downscaling Scenarios. American Journal of Climate Change, 3, 512-527. <http://dx.doi.org/10.4236/ajcc.2014.35043>

that have the potential to reduce crop yields. This could lead to a reduction in the productivity of existing plantations, and consequently to a decrease in farmers' income. Projections in both low (RCP4.5) and high (RCP8.5) emissions scenarios for period from 2041 to 2070 indicate a high or very high risk for taro culture in São Tomé and Príncipe. On the other hand, plots that are located outside the minimum allowable crop precipitation limits (1,500 mm of rain for cocoa) may no longer be viable. If the rainfall decrease trend reaches 1.7 mm per year and the dry season extends beyond the normal period, the export of the country's main product will be reduced, with cocoa contributing about 18% to the country's GDP (INE, 1999) and the proportion in exports about 95%. It is predicted that by 2040-2060, a decrease of almost 75% would lead to important economic losses for agricultural products particularly on the cocoa sector, which contributes significantly to the GDP.

8. For maize crop which has a strategic importance in human and animal feeding in STP, projections in scenario RCP4.5, for the period from 2041 to 2070, considering the first and second maize crops of São Tomé and Príncipe islands, show reduction of areas classified as high risk, possibly due to the increase in air temperature. However, in the coastal region and for a second maize crop, risks range from low or very low to moderate to high risk. The RCP8.5 scenario raises the risk rating of the second corn crop to high because of the low productive potential in São Tomé Island, but maintains the high-risk classification in the central region of São Tomé and Príncipe.
9. Projections in the RCP4.5 scenario maintain the risk associated to low productive potential and moderate water stress. On the other hand, in the scenario RCP8.5, the risks becomes very high due to water stress. These results are in accordance with those presented in the Second National Communication of São Tomé and Príncipe (2010), which already warned of the risk of reduction of cocoa production areas due to the reduction of precipitation in the future (2040-2060), with lower annual totals to 1,500 mm.
10. **Water resources vulnerability.** During the dry season, storage changes of the water balance is of increasing concern in STP. The standardized precipitation evapotranspiration index (SPEI), calculated over 12 month periods, captures the cumulative balance between gain and loss of water across the inter-annual time scale. Data predictions for RCP 8.5 indicate a likelihood for severe drought increase in both frequency and duration over the next 30 years. This is due to the expected increase in mean annual temperature of 1.6 °C (with an upper bounding of 2.6 °C) by 2050³. This average pattern will lead to higher levels of transpiration and evapotranspiration that will lead faster drying soils, (even in wet conditions). This will have a negative impact on agricultural systems, as heat stress combined with reduced water availability in soils (in non-irrigated systems) will decrease agricultural yields.
11. Despite this negative impact, the increased temperatures are also associated with an increase in precipitation, estimated at an annual mean increase of 63.2mm by 2050³. However, although this would indicate a positive trend, this is correlated with an increase in extreme events of heavier rainfall. Under RCP8.5 scenarios, there will be an increase of 5-day precipitation at the 10-year return level of an upper quartile estimate of 238mm and a maximum of 433mm over any 5-day extreme event⁵. Extensive rainfall on to graduated or compacted soils (as seen in agricultural systems) 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 inundate. Although this indicates an increase of water availability, the reality is that with underdeveloped water infrastructure, flooding results in unpotable stagnated water sources (that increase levels of disease) and a lack of retention of water in terrestrial systems. 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.
12. **Fishing vulnerability.** According to the Second National Communication (2010)⁶, the results of FAO/UNDP studies (1999) have shown a close link between deep biomass migration and the increase

⁵ <https://climateknowledgeportal.worldbank.org/country/sao-tome-and-principe/climate-sector-energy>

⁶ The vulnerability of this sector as well as that of the ecosystem and forestry are not included in the Third National Communication.

in the surface temperature of ocean waters. According to these studies, this scenario of increasing of the surface temperature of ocean waters reflects the low level of fish production on the São Toméan coasts. The global temperature increasing projections for Sao Tomé and Príncipe are in the order of 2.25°C by 2040-2060. Given that the temperature at the surface of the ocean in the coastal zone of Sao Tomé and Príncipe will increase by 2.25 °C, the artisanal fishermen would have to go to 60 m in depth to reach the fishing banks located at the depths of the ocean where the water temperature rises to about 24.5°C. This fact in the medium term would have led to the impoverishment of artisanal fishermen and the reduction in the supply of fishery products to the population.

14. **Ecosystems and biodiversity vulnerability.** The extension of the dry season "gravana" and the increase in temperatures combined with a decrease in projected precipitation will have extremely severe consequences on the ecosystems and biodiversity of Sao Tome. Major consequences include a very high: reduction in water flow in the soil; decrease in agricultural and forestry production and; deficit in photosynthesis activity accompanied by a progressive reduction in the current annual growth (m3/ha/year) of linear species; and a high increase in invasive species. The loss of biodiversity can result in the loss of important ecosystem services, such as vector-based pollination, which can have negative impacts on agricultural crops with flowering reproductive systems. This could have major impacts on cash crops such as cacao, a major export of Sao Tome and Principe. Loss of ecosystem services and biodiversity can therefore negatively affect the economy and well-being of local communities.

1.1.1.2. Cape Verde climate change and agricultural vulnerability profile

Climate change trend

15. **Observed temperature trend.** Current scenario temperature shows that the annual average has increased at 0.6°C since 1960, which represents an average rate of 0.14°C per decade. The growth rate was faster in the rainy season, August September October with an average increase in temperature of 0.23°C per decade. As for rainfall, the annual average for Cape Verde has not shown any consistent trend since 1960. The existing climatic weather stations network in Cape Verde indicates that temperatures have warmed up throughout the 20th century with negative impacts on the agricultural sector. The projections of and increase by 0.4°-0.7°C for the 2020 horizon came about, and it is believed that this growth rate will continue, to a 0.5-1.0-°C increase by 2090 (RCP 8.5). The results obtained for scenarios A2 and B1 generally point to the increase of the average temperature between 0.2°C and 0.4°C in the 2020-2039 time horizon for the Cape Verde region, with some negative fluctuations (cooling) in a few years.
16. **Observed rainfall trends.** The annual average for Cape Verde has not shown any consistent trend since 1960. Some abnormally significant rains occurred between November and February, which is unusual for this dry season. Observations on the daily rainfall are also insufficient. For this parameter, from which it would be possible to determine the changes in the extremes of the daily rainfall data⁷. The correlation between temperature and rainfall shown by the assessment and national data, the country will be more humid and subject to heavier rainfall, with drier intermittent periods. The existing weather stations network in Cabo Verde indicates that temperatures have warmed 20th century with periodic droughts occurring in large areas.
17. **Climate Shocks.** The country vulnerability to climate change ranges from sea rise level and ocean acidification, degradation of fish stocks, coastal erosion, floods and droughts. It is increasingly vulnerable to slow and fast-onset events resulting from natural, man-made and climate related hazards such as coastal erosion from sea level rise, tourism activities and industrial development. Extreme events such as devastating floods, droughts, sudden temperature changes have become more frequent and intense.

⁷ Republic of Cape Verde. 2017. Third National Communication

18. **Previous studies** have revealed increasing of the sea level rise and to the associated increases in tidal surges and sea storms. The sea level rose at 1.7 mm per year during the 20th century.

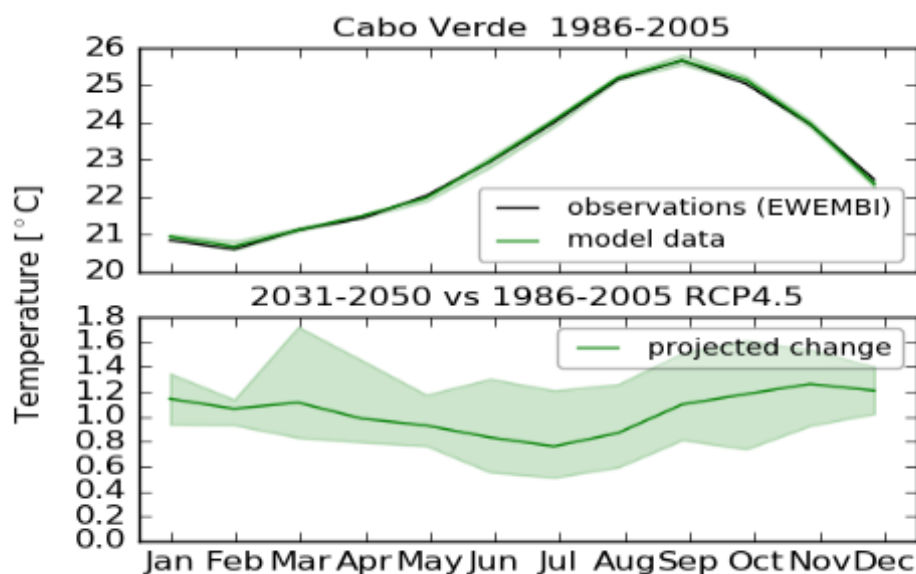


Figure 4: Top Annual cycle of temperature for the period 1986-2005. Bottom: Changes in annual cycle projected for 2031-2050 compared to the reference period 1986-2005. EWEMBI data is shown in black, regional climate model simulations in green. The green line represents the ensemble mean while the shaded area represents the model spread. The projections are based on the emission scenario RCP4.5. (Climate Analytics, 2020)

Projected climate trend.

19. With regard to rainfall, according to the close correlation between temperature and rainfall shown by the assessment and national data, the country will be more humid and subject to heavier rainfall, with drier intermittent periods. Projections suggest an increase of sea level of at least 0.13 m by 2090 and with a maximum of 0.56 m. These projections have a significant impact on poor farmers, who depend on rain fed agriculture and operate with limited resources in fragile environments that are sensitive to shifts in temperature and rainfall patterns. The irregular and deficient rainfall aggravated phenomena related to poor diversity of species and varieties, steep slopes and high water erosion rate, low fertility and organic matter of the soil.

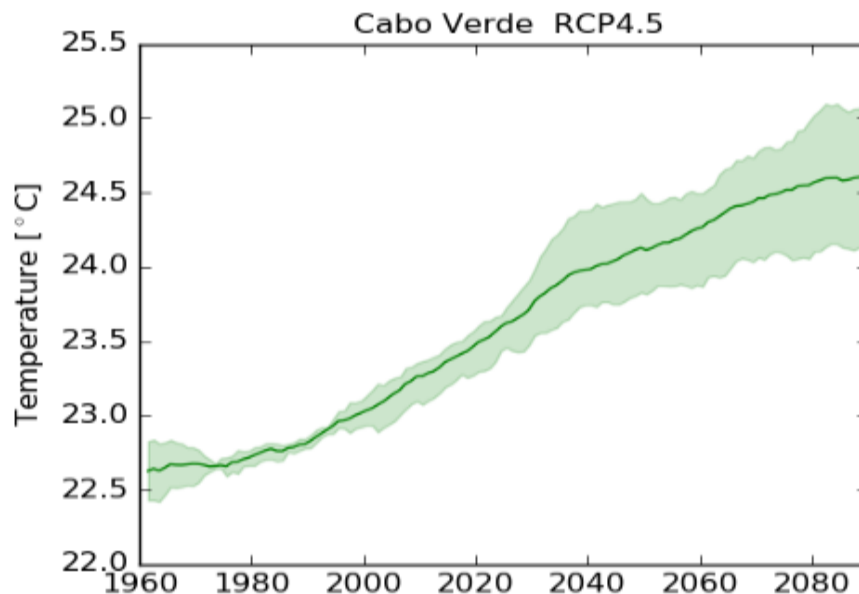


Figure 5: Regional climate model projections for temperature displayed as 20 year running mean. The line represents the ensemble mean while the shaded area represents the model spread. The projections are based on the emission scenario RCP4.5. (Climate Analytics, 2020).

Agricultural sector vulnerability

20. **Current agricultural vulnerability profile.** Cape Verde is one of the most vulnerable Small Island Development States to Climate Change and climate vulnerability with low adaptive capacity in West and Central Africa region. Temperature, torrential rainfall intensity and irregularity increasing, decreasing in rainfall quantity and in water availability and sea level rise have a significant impact on poor farmers who depend on rain fed agriculture, operating with limited resources in fragile environments that are sensitive to shifts in temperature and rainfall patterns. These climate change hazards made species, varieties, and cultural techniques not suitable for the rainy season and increased soil salinization. Droughts and floods associated with climate change will lower household yield negatively affecting food security in Cape Verde.
21. The irregular and deficient rainfall are correlated to a reduction in diversity of species and varieties⁸, which can negatively affect the resilience of crop systems to changing climates. Torrential rainfall in the presence of slopes with steep gradients can result in a high sheet erosion rate and a significant loss of agricultural soils. This results in low organic soil content and a loss of soil fertility. Rising sea levels have led to saline intrusion and salinization of water sources (such as low-lying riverbeds) and agricultural systems in coastal areas. These ecological effects have led to reduced agricultural productivity, incomes, and food insecurity because of the dependency of agriculture on rainfall.
22. In this context, Cape Verde is already implementing innovative ways to adapt to climate change in agriculture. This includes water desalination for agriculture, reclaimed water for irrigation, drip irrigation and greenhouses among others to increase productivity and income of smallholder farmers. Nevertheless, more financing is needed to scale up successful adaptation measures, water and food security interventions while promoting the adoption of modern practices and techniques, addressing information gaps and knowledge, and strengthening institutional capacity to set up mechanisms to leverage innovative climate and environmental finance.

⁸ Republic of Cape Verde. 2017. Third National Communication

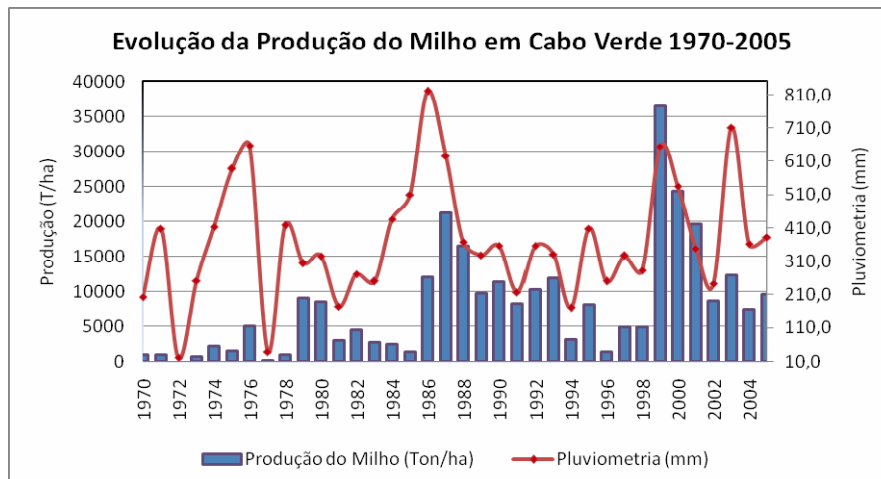


Figure 6: The relationship between annual maize production and rainfall in Cape Verde

23. Extreme events also result in loss of human lives, animals and the destruction of roads and bridges. For some events, economic losses of agricultural soils have been estimated at about 2,000,000 USD⁹.
24. **Projected agricultural vulnerability profile.** Droughts and floods associated with climate change will lower household yield and negatively affect food security in Cape Verde. It will also decrease agricultural production for irrigated and rain-fed crops, and will lead to agricultural land abandonment.
25. **Water sector vulnerability.** In Cape Verde, irregular, high-intensity rainfall is poorly distributed in space and time. This affect, coupled with poor infiltration, make water one of the primary limiting factors for climate change resilience in the agricultural sector and, therefore, for the socio-economic development of the country. Rise in temperature and variation in rainfall pattern will lead to siltation of streams, reduction in surface runoff, weak recharge of aquifers, salt-water intrusion, which is a serious problem due to droughts and excessive pumping of groundwater. The projected sea level rise is expected to increase soil and water salinity, reduction water availability for various uses and degradation of water quality.
26. Increased water salinization and drought resulting from climate change has been identified as the greatest constraint on the future prospects of economic development in Cabo Verde. Climate induced changes have so far resulted in seasonal water shortages over the past decade with more storms, floods, droughts, and generally expected to negatively affect agricultural production which may then translate into impacts on agricultural prices, incomes, and food security and social and economic development.

1.1.1.3. Guinea Bissau climate change and agricultural vulnerability profile

Climate change trend

27. **Observed changes in climate.** Guinea Bissau is considered as one of the most vulnerable countries to climate change in the world. Climate change ranges from greater variability in precipitation and late onset to the rainy season to an increase in temperatures of about 1 degree over the past decades and rising sea levels and rising tides. Climate observations show that rainfall in the country has declined in the last twenty years and this is mainly felt during the months of June and October. According to local climatic pattern, the rain events are increasingly being accompanied by strong winds and intense rainfall bursts, especially during the months of July, August and September. With decreases experienced in the

⁹ NAPA 2008-2012

duration of the rainy season (now limited to 5 months) and the overall volume of rain having led to a decline in production often associated with water shortage, acute droughts are identified as the most significant risk. However, increased winds and intense rainfall may also lead to loss of production (and stored crops) as well as periodic localized floods, either through destruction of dykes and rice fields or salinity intrusion from the sea. A reduction in the duration of cold periods may exacerbate heat stress on plants and animal.

28. There is a shortening of the cool season during the months of December-February. Trends show an increased irregularity of precipitation, as well as a general downward trend in average and seasonal annual precipitation. Changes in rainfall patterns lead to longer and warmer dry seasons, particularly in the northeastern interior of the country, resulting in seasonal water shortages that directly affect access to water for population needs, as well as for agriculture and livestock. Flooding is frequent in inland and coastal areas, with serious implications for infrastructure and agriculture. For example, Guinea-Bissau suffered this year from a wind anomaly (the longest Harmattan period) during the flowering of cashew trees, bringing dust - which can have a negative impact on production. Due to the lack of national data, it is difficult to accurately the level of production of raw cashew nuts, but it is estimated that production in 2018 has dropped by 10 to 20% compared to 2017¹⁰.
29. **Projected trends.** These trends are projected to be exacerbated in the future, as Guinea-Bissau, a low-emission country, is highly vulnerable to the impact of the global crisis on the environment. Climate change, in particular sea-level rise and water salinization. The 2014 Climate Change Vulnerability Index report ranks it second only to Bangladesh. Climate projections to 2100 show a decrease in rainfall of 11.7% and a 2% increase in temperatures. Sea level rise will range from 0.4 m (low emission scenario, RCP2.6) to 0.7 m (high emission scenario, RCP8.5) in 2100. For the 2050 horizon, all models predict an increase in the average temperature of between 1.95°C and 1.77°C, compared to the 1961-1990 average.
30. **The scenarios predict an increase in the mean daily temperature** for the period 2016-2045 of about 1.3°C for the low emissions scenario and 1.5° for the high emissions scenario, compared to the average between 1961 and 1990. The maximum daily temperature rises from 1.2° C in the coastal areas to 1.4° C in the inner regions in the low emission scenario and from 1.3° C in the coastal areas to 1.5° C in the inner regions in the high emission scenario. For the period 2046-2075, the daily maximum temperature increase will be more pronounced. It will be 1.5° C on average (and may reach 1.9° C) compared to 1.3° C on average in 2045 for the low emissions scenario (RCP 4.5), and 2.9° C (up to 3.6° C) compared to 1.4° C on average in 2045 for the high emission scenario (RCP 8.5).

¹⁰ Marie Caroline Paviot, Edward W. Bresnyan, Jr., Alvaro Diaz, Siddika Mishu. 2019. Guinea Bissau: Unlocking diversification to unleash agriculture growth. 118 pages. International Bank for Reconstruction and Development/ International Bank for Reconstruction and Development/ The World Bank.

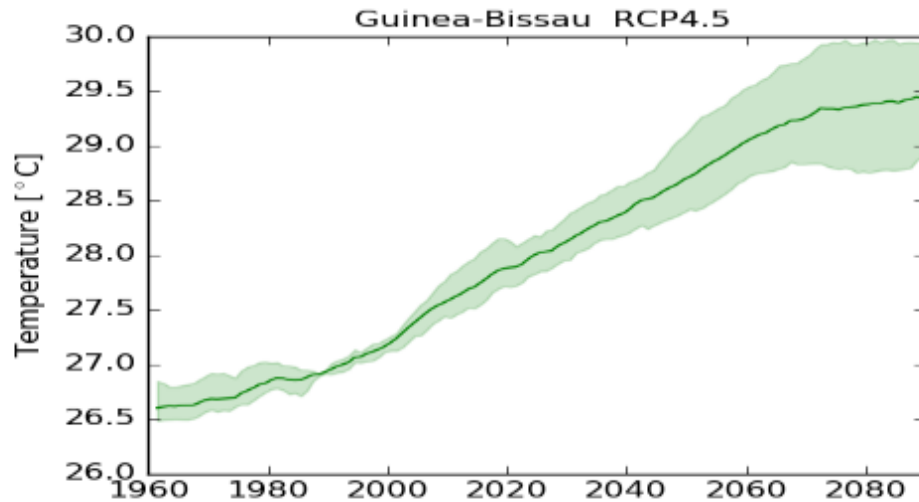


Figure 7: Regional climate model projections for temperature displayed as 20 year running mean. The line represents the ensemble mean while the shaded area represents the model spread. The projections are based on the emission scenario RCP4.5. (Climate Analytics, 2020).

31. **A slight increase in mean daily rainfall** of about +3% is projected under the low emissions scenario over almost the entire national territory, except for the south-western part of the Bijagós archipelago, where an increase of between +5% and +10% is projected. Under the scenario of high emissions, a rainfall regime similar to that observed between 1961 and 1990 (reference period) is projected for the period 2016-2045, except for the south-western part of the Bijagós archipelago and the southern part of the Tombali region (Cacine sector) where a slight increase in rainfall of between + 2% and + 5% is projected. Trends show an increased irregularity of precipitation, as well as a general downward trend in average and seasonal annual precipitation. Changes in rainfall patterns lead to longer and warmer dry seasons, particularly in the northeastern interior of the country, resulting in seasonal water shortages that directly affect access to water for population needs, as well as for agriculture and livestock.
32. For the period 2046-2075, with the scenario of low emissions, the variability of rainfall will increase, and will result in reductions in the order of -2% to -5% in the northern part of the Cacheu region (Canchungo, Caliquesse and Caió sectors) and increases in rainfall in the order of 5% to 10% in the southern regions. For the same period, but under the high emissions scenario, there will be increased variability in rainfall, with a decrease (-2% to -10%) in the northern coastal areas, but with less coverage than in the previous scenario. Even in this scenario of high emissions, an increase in average daily rainfall of about +2% to +5% is projected in the south-western regions of the islands and in the south of the country (Caciné Sector of the Tombali Region). Globally, the scenario of high emissions as well as the more distant horizons results in a drier climate than that of low emissions and for the closer time horizons. Flooding is also frequent in inland and coastal areas, with serious implications for infrastructure and agriculture. For example, Guinea-Bissau suffered this year from a wind anomaly (the longest Harmattan period) during the flowering of cashew trees, bringing dust - which can have a negative impact on production.

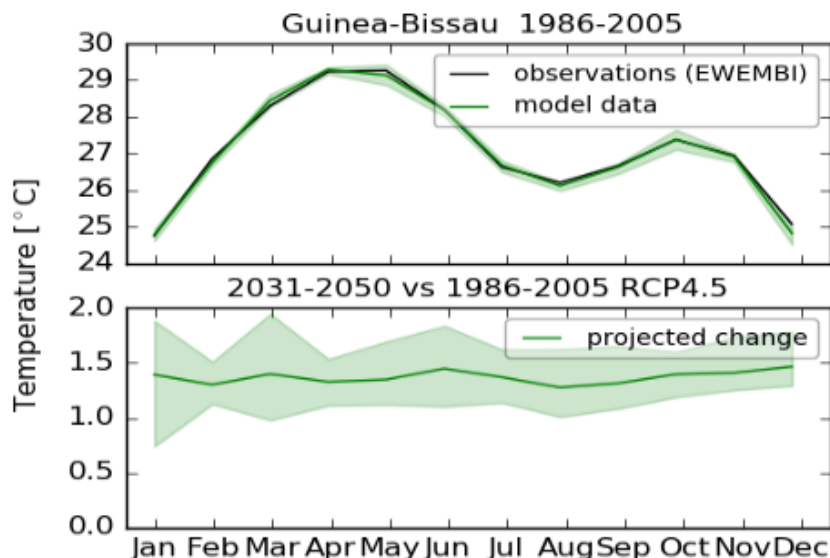


Figure 8: Top - Annual cycle of temperature for the period 1986-2005. Bottom - Changes in annual cycle projected for 2031-2050 compared to the reference period 1986-2005. EWEMBI data is shown in black, regional climate model simulations in green. The green line represents the ensemble mean while the shaded area represents the model spread. The projections are based on the emission scenario RCP4.5. (Climate Analytics, 2020).

Agricultural vulnerability to climate change

33. **Current climate change vulnerability of agriculture.** Decreased rainfall has led to reduced production of rice especially on small upland areas, in the valleys and of other cereals on different lands in Guinea Bissau. Extreme rainfall events accompanied by strong winds lead to floods that affect the productivity of different crops including rice paddies ("bolanhas") and cereals through flooding phenomena that decimate small plants due to root rot and death at the germination stage. Waterlogging (flooded, swampy, saturated soils) affects a number of biological and chemical processes in plants and soils that can affect crop growth in the short and long term. The main result of waterlogging of crop plants is oxygen deprivation or anoxia, because the excess water itself does not diffuse into plant tissues at a sufficient rate, leading to tissue decay and stunting. Additional, long stemmed crops, such as cereals experience higher levels of lodging (tipping) in water-saturated conditions, leading to poor harvest and reduced yields (Rotter et al, 2018¹¹).
34. **On water resources**, the increase of about 0.3°C during the periods 1961-2003 in the temperature in Bafata region and the decrease in rainfall in both Bafata and Gabu during the periods (1961-2007) resulted in a decrease in surface runoff. The construction of water retention infrastructures in the upstream part of the Kaianga-Geba River in Senegal within the framework of the OMVG cross-border project also contributes to the decrease in runoff.
35. **Rising of sea level** has led to frequent coastal flooding, resulting in significant losses of rice production in lowlands (lowlands) and swampy mangrove rice fields. Saltwater dykes built along the banks and parallel to estuaries with sluice gates prevent the intrusion of salt water into the rice fields and retain the freshwater from the rain needed for the rice growing process. With the rise in the average sea level, there has been an excessive invasion of salt water into the mangrove rice fields due to the high and strong tides. As a result, these anti-salt dikes have been destroyed, leading to a substantial loss of

¹¹ Rötter, R. P., Appiah, M., Fichtler, E., Kersebaum, K. C., Trnka, M., & Hoffmann, M. P. (2018). Linking modelling and experimentation to better capture crop impacts of agroclimatic extremes—A review. *Field crops research*, 221, 142-156.

productive capacity of the crops and salinization of the soils. The rise in sea level leading to coastal erosion favoured by the low altitude of the country's coastline could have dramatic consequences for the mainland and small islands, particularly affecting the country's economy, especially the people living in coastal areas who depend on coastal resources for their livelihood. In the low rainfall areas in the north of the country, the rise in the average sea level and the decrease in rainfall are leading to an overabundance of saline soils along the riverbanks, where rice fields are located in associated mangroves. Thus, there is a need to build polders in order to prevent the invasion of saline waters during the growing season. Rice cultivation in these parts of the country is increasingly vulnerable to these climatic events. Rice in the polders is usually planted on ridges. The ridges play an important role in controlling water and leaching salt and acids from the soil. In high rainfall environments, most mangrove rice is grown in tide-flooded areas, where it is not necessary to build polders and dig ridges. However, in wetter areas, salinity downstream along some rivers is high enough to justify stocking during the growing season periods.

36. **In the fishing sector**, declining rainfall, degradation of fisheries ecosystems by polluted run-off from extreme rainfall events, increased prolonged climate-induced drought episodes and sea level rise resulting in increased salinity of fisheries systems are the main climatic factors affecting the fisheries sector. They lead to the migration of wild species from local fishing grounds or submergence to depths unattainable using traditional fishing methods. This has led to a decrease in fish production and therefore a reduction in a primary protein source for the country, effecting nutritional balances in the country.

Projected vulnerability of agriculture to climate change.

37. The country's National Adaptation Programme of Action (NAPA; 2006) identified the agricultural sector as the most vulnerable to climate change for a number of reasons: it is the dominant component of the GDP, the livelihood for a majority of the poor population depends on agriculture, with climatic change potentially causing significant damage to the sector. Projected agricultural vulnerability shows difficulty in plant fecundation (pollen sterilization) and crop growth, low productivity and lower agricultural yields, mainly cereals, which are the staple food of the great majority of the population, food insecurity and episodes of hunger. This contributes to rural exodus, malnutrition, diseases and constant acidity of the mangrove soils making farming difficult in these "bolanhas" for mangrove ecosystems. As for bas-fonds / freshwater ecosystems, the projected climate change effects consist of lack of water that negatively influences the maturation of plants and low productivity and low income in the agricultural sector, malnutrition. Regarding plateaus ecosystems, climate change will lead to lack of water, with crop water deficit developing and negatively impacting productivity. With regard to backyard ecosystems, when rainfall and temperature decrease, water is the limiting factor hindering the normal crop growth translating in crop failure or productivity reduction. The NAPA further estimates that there has been a 20 to 30% fall in agricultural production with one third of the population of Guinea-Bissau being threatened by food insecurity. The shortfall in national cereal production, predominantly rice, is expected to rise to 75,000 tons per year, which would increase the need for imports.

1.1.2 From the regional perspective

38. The socio-economic contexts and climate change vulnerability analysis of the agricultural sector in Sao Tome and Principe, Cape Verde and Guinea Bissau shows a set of challenges and issues that are common to these three Atlantic African island countries, despite national specificities.

IFAD's strategic objectives and themes in these West African SIDS is guided by the progress of and the emerging trends and lessons learned from past and ongoing IFAD's operations since 30 years and to respond to the demands made by these countries reiterated for the Third International Conference on SIDS in 2014 organised by IFAD.

In the three West African SIDS, key common development objectives are:

- To promote sustainable small-scale fisheries, including aquaculture and mariculture of nutrition-rich fish, and strengthen fish value chains;
- To enhance opportunities for smallholder agriculture to become a vibrant business by catering

- to new dynamic markets and providing employment opportunities and financial inclusion, especially for women and youth;
 - To strengthen resilience to environmental and climate change and enhance adaptation capacity, including by facilitating access to relevant data and information and mainstreaming environmental and climate change considerations into development planning
39. The endorsement of this approach for engagement with the West African SIDS provides flexibility and allows IFAD to tailor country-specific solutions; despite their commonalities, SIDS often have very context-specific needs based on IFAD's experience and comparative advantage and a range of options. During the IFAD design missions in 2019-2020, COMPRAN for Sao Tome and Principe, REDE for Guinea Bissau and the Technical Assistance project in Cap Verde, countries expressed the need to leverage additional adaptation finance to close jointly the adaptation gap at country level but also as part of a coalition given their very limited fiscal space and common development challenges. The strategic themes that brings together the three countries is adaptation of smallholder agriculture in the context of a changing climate both the fishery and agricultural sector
40. From a socio-economic point of view, the three countries are characterized by high poverty, food and nutritional insecurity and significant social inequalities. Inequalities can be noticed through access to basic social services such as health, education, sanitation and access to drinking water. Inequalities generally contrast urban areas with rural areas, which are generally the most disadvantaged. Small populations with developing economies often dependent on imports and climate-sensitive industries, also have less financial and human resources to address these looming threats. Countries vulnerability to climate change ranges from sea rise level and ocean acidification, degradation of fish stocks, coastal erosion, floods and droughts. Water, agriculture are the most vulnerable to climate change. This situation is aggravated by the population growth, industrial development, development of the tourism sector, and more and more additional pressures on scarce water resources, and increasing demand for food import on a government limited fiscal space. There is therefore potential for reduced agricultural productivity, increased food insecurity, and adverse impact on livelihoods that could drive poverty and accentuate rural-urban and international migration. In the absence of adaptation, climate change may exacerbate these trends. Finally, lusophone countries are still lagging behind in Monitoring and Evaluation (M&E), as initiatives to establish a shared culture of evaluation practice on climate change adaptation, in particular in Africa. This Programme is thus also driven by the cultural and linguistic similarities in the three island states as well, which can facilitate sharing of lessons and good practices, and mutual learning.
41. **Common environmental and climate challenges.** Sao Tome and Principe, Cape Verde and Guinea Bissau are small island developing states (SIDS), all located in the Western African Atlantic Ocean and one of the most vulnerable regions in the world. These SIDS have following common and specific circumstances related to the limited size of agricultural land, their geographical sea locked, limited natural resources and the particular fragility of their ecosystems. Another particularity, in terms of vulnerability to climate change, which is common to island countries, is that they are vulnerable to climate-related risks associated with the presence of the sea on all sides. While countries partially bordered by seas and oceans are vulnerable to the effects of climate change from only one part of their borders, namely their coastal margin, island countries are vulnerable to the presence of oceans and seas from all their sides. In fact, most of these countries' population lives on the coastal areas and ecosystems. With 29.3% of the population of SIDS living on land that is less than five meters above sea level, the threat of sea level rise, storm surges, salt-water intrusion, and coastal destruction pose critical risks to these countries. These specific natural characteristics make them particularly vulnerable to climate change. For example, the 2014 Climate Change Vulnerability Index report ranked Guinea Bissau second only behind Bangladesh.

42. **A strengthening of climatic hazards:** In summary, all three countries experienced a generalized increase in temperature. Climate projections in the three countries show a worsening of climatic hazards. Temperatures will increase over a range between 0.5°C and 3°C by 2090, with a greater increase in Guinea Bissau. The number of hot nights has increased while the length of cool seasons has shortened. The analysis of rainfall in the three countries shows a shortening of the length of the rainy season and a lengthening of the dry seasons. This has led to a late onset or early cessation of the rainy season and a decrease for rainfall per season. Rainfall variability, intensity, and frequency of droughts and extreme rains and winds have increased. Flooding of low-lying coastal and inland areas increased in all three countries because of extreme rains and resulting torrential runoff. Sea level rise has been observed in the three island countries of the East Atlantic. As for projections, the three countries will experience, depending on climate scenarios, a decrease in rainfall in the scenario of increased fossil emissions and an increase in rainfall in the case of a more low-carbon development. However, this increase in rainfall will generally be accompanied by periods of intermittent drought.
43. **Overview of the common climate challenges of the three countries.** The major climate change impacts across the three SIDS countries are primarily a water deficit and increases in temperatures across an extended dry seasons resulting in late onset and/or early cessation of rainfall. All these effects lead to a lack of water supply for populations and crops. The increasing temperatures result in, decrease in soil moisture and soil fertility as well as increased of pest proliferation, negatively affecting agricultural yields. Agricultural is also affected by flooding and severe storms that have, to date, led to: dissemination of coffee and cocoa plantations in the three SIDS; the destruction of infrastructure; increased soil erosion and loss of soil fertility; siltation and pollution of river waters by solid matter associated with soil erosion; and reduced aquifer recharge. All these impacts lead to lower agricultural yields, fish catch volumes and lower incomes for communities that increase negative trends in food insecurity and accentuation of poverty.

1.2. SOCIOECONOMIC DEVELOPMENT AND ENVIRONMENTAL CONTEXT

44. **Cape Verde socioeconomic context.** While a positive step has been made to graduate from least developed country to middle-income country status, Cape Verde still faces the persistence of deep pockets of poverty particularly in rural areas due to it vulnerably to climate change. This situation is aggravated by the population growth and urbanisation, industrial development, development of the tourism sector, and more and more additional pressures on scarce water resources, and increasing demand for food import on a government limited fiscal space. There is therefore potential for reduced agricultural productivity, increased food insecurity, and adverse impact on livelihoods that could drive poverty and accentuate rural-urban and international migration. In the absence of adaptation, climate change may exacerbate these trends. Freshwater availability is the main constraint to the development of the agricultural sector, limiting available arable land and therefore production. By altering temperature and precipitation patterns, climate change is further worsening the conditions for crops and livestock production. To address this growing challenge, the Ministry of Agriculture and the Environment and the National Water and Sanitation Agency (ANAS) are scaling up their efforts towards the mobilization of desalinated water and improved water management including drip irrigation. The Government estimates in the PEDS that EUR 219 millions would be necessary to address the freshwater access and agricultural challenges. However, following its graduation to LMI in 2008, Cabo Verde started financing its development at higher cost, leading to an increase in the debt to GDP ratio from 60 percent in 2008 to about 123 percent in 2019. Concessional and grant financing also remains limited compared to the country needs, even considering increasing resources allocated to climate finance (GCF, Adaptation Fund, etc.).
45. In this context, Cape Verde is already implementing innovative ways to adapt to climate change in the agriculture. Building of ongoing (POSER-C) and past IFAD projects, this programme focuses on

financing agricultural and rural interventions that promotes water mobilisation and efficient use as well as adoption of innovative climate resilient agricultural practices.

46. This includes wastewater treatment and water desalination for agriculture (see Annex 1 on reclaimed water for irrigation and desalination technologies and opportunities in Cape Verde), drip irrigation, vertical agriculture and green houses, hydroponic agriculture among others to increase productivity and income of smallholder farmers. Nevertheless, more financing are needed to scale up successful adaptation measures, water and food security interventions while promoting the adoption of modern practices and techniques, addressing information gaps and knowledge, and strengthening institutional capacity to set up mechanisms to leverage innovative climate and environmental finance. According to the gender initial assessment, the participation rate of women is still lower compared to that of men, which were 69.4 percent in 2016 and 64.1 percent in 2015. In terms of sectors, women are more represented in sales and services, while men are found in military, agricultural and manual jobs. Paid labour is 56 percent male and 44 percent female. In terms of unpaid work, women spend 62 hours per week on unpaid care work compared to 38 hours for men. While the gender gap is less important than in other SIDS, women faces challenges to access to resources and assets, financing knowledge, and participation to decision making processes.
47. **Guinea Bissau socioeconomic context.** Guinea-Bissau is one of the world's least developed countries and had a GDP per capita of USD 723.34 in 2017. Economic growth is positive, at around 4% in 2018, but not strong enough to significantly poverty. In 2017, growth was mainly driven by food agriculture (up 8% from 5.6% in 2016) and the fishing sector (up 9.5% from 9% in 2016). At the national level, the extreme poverty rate is 69.3%. The rate outside the capital reaches 75.6%. Absolute poverty rates are highest in Gabú (83.5%) and Cacheu (80.5%). Of the 39 districts in the country, 22 have a poverty rate above 80% and are located in rural areas. Socio-economic characteristics of poor households. There is a strong correlation between poverty level and household size. Heads of households living in extreme poverty are generally illiterate. In these households, there is often at least one school-age child who is not in school. Households in extreme poverty have little access to basic services and live in isolated communities a) markets (at least one hour's walk for half of the people in extreme poverty), b) health centers and schools, while c) 95% of them have irregular access to electricity and 50% to drinking water. A proportion of 90% of the people in extreme poverty work in agriculture. There is a strong correlation between extreme poverty and malnutrition, disease incidence and less favorable housing conditions. Unlike Cabo Verde and Sao Tome and Principe, the UNDP's Gender Equality Index and the WEF Global Gender Gap Report do not have data on Guinea Bissau. Nevertheless, IFAD projects reports reveals that the gender gap in agricultures is very high particularly in the rural areas. The country still experiences discrimination against women regarding employment access, opportunities in agriculture particularly land rights, access to finance and knowledge and skills as well as women participation in decision making processes. (Gender initial assesement)
48. **Sao Tome and Principe socio-economic conditions.** STP ranks 143rd out of 189 countries on the Human Development Index (HDI) and faces many challenges including poverty and hunger, social inequalities, youth employment, etc. This situation makes Sao Tome and Principe an island State in search of dynamic impulses to boost its development and achieve the SDGs. In terms of poverty, about 66% of the population lives below the poverty line and 11.5% below the extreme poverty line. However, it is important to note that at the national level, inequalities decreased by 49% in 2000 to 32.9% in 2010, reflecting a better distribution of income in favor of the poor. This improvement is observed in rural areas, where there is a worsening of this phenomenon, particularly in the country's capital. This shift from poverty to urban areas reveals the progress made in rural areas, but also the inability of the sector to generate enough economic activity and employment to settle rural assets. In terms of food security, about 24% of households are food insecure. Given the low productivity, the country is forced to import a large part of its foodstuffs. Efforts to diversify food production for domestic consumption have led to an increase in banana, cassava and maize production by small farmers, but volumes remain below what

is required to meet national needs. However, Sao Tome and Principe has a GII (Gender Inequality Index) value of 0.538 in 2017, and it is ranked 115th in terms of gender inequality. Women play important and varied roles in agriculture and fisheries, but they are constrained by two important types of gender gaps. Despite the recent progress in terms of gender equality, women have unequal rights access and opportunities, relative to men, to productive resources and inputs, and there is insufficient information about the roles and resources of women and men as well as opportunities for participation, and leadership in decision-making particularly in the agricultural sector. The gender gap is higher in rural areas, and data from the latest census found that only 34 percent of rural women are employed compared to 66 percent of rural men¹² (source- gender initial assessment).

1.3. TARGET AREAS AND BENEFICIARIES

49. In **Sao Tome e Principe**. The Programme will have a national scope and its activities will be implemented in the rural areas of the two islands of Sao Tome and Principe by adopting an approach aiming on one hand, the Programme will intensify production in the current basins, which concentrate more than 80% family farms (districts of Me-zochi, Lobata and Cantagalo in Sao Tome), and on the other hand, it will develop the agricultural potential in sparsely exploited areas, which as the districts of Caue and Lemba in Sao Tome and autonomous region of Principe. The Programme will reach 4,350 rural households, corresponding to 17,400 people. The initial targeting categorized as follows:
 - 3,250 small farmers affiliated to associations, unions or producers' cooperatives, of which around 50% will be women (and 30% of women heads of households) and 50% of young people.
 - 750 rural producers not affiliated to associations or cooperatives supported by the project, 60% of which will be headed by women.
 - 350 young promoters of economic initiatives (including 20% in principle), who will benefit from professional training, technical and economic advice and start-up funding with a view to their economic integration (300 young people) or the strengthening of their activities in agricultural, related and non-agricultural sectors (50 young people). It is estimated that 40% of these young people will be women.
50. In **Guinea Bissau**, the area of intervention will cover the four regions of Gabú, Cacheu, Bafatá and Oio which are the poorest, largest and most remote regions as well as the most populated regions of the country with 0.9 million inhabitants out of a total population of 1.77 million (51 per cent). The intervention will target around 13,000 rural households, i.e. 143,000 expected individual beneficiaries (15 per cent of the population of the four-targeted regions), of which at least 50 per cent are women and at least 30 per cent are young people. People with disabilities and returned migrants are present in three per cent of the targeted households.
51. In **Cabo Verde**, the project will cover five sites / watersheds in Brava, Fogo, Santiago and São Nicolau. It will mainly target small family farms and support interventions that affect both crop areas and watersheds in areas of higher vulnerability, as defined above. Within these groups, it will ensure, through well-developed targeting methods, the inclusion of the most vulnerable households, young people and women. The Project will directly reach 600 households, or around 3,000 people of which 50 per cent are women and at least 30 per cent are young people.
52. For both Cape Verde and Sao Tome and Principe, there is a growing need for increased knowledge of design and construction of sustainable and climate resilient hybrid solar/wind power systems for use in desalination plants and reclaimed water. The suitable technology/site will be selected at the design stage after the identification of the final sites based on additional assessment/studies to be conducted at the design stage. A project preparation grant is submitted in this regard.

¹² <http://documents.worldbank.org/curated/en/474701562909890340/pdf/Sao-Tome-and-Principe-Country-Economic-Memorandum-Background-Note-7-What-are-the-bottlenecks-on-land-governance-and-how-to-remove-them-to-support-tourism-and-agriculture-development.pdf>

B. PROJECT / PROGRAMME OBJECTIVES

53. To address these climate related challenges, the main objective of the proposed programme is to build climate-resilient agricultural systems in the three SIDS in West and Central Africa by securing water resources for agricultural and domestic usages and rehabilitating degraded lands to increase the climate resilience of agrarian ecosystems and enhance agricultural productivity. The project will focus both on youth and women and the final targeting will be determined at design stage
54. The specific objectives consist of:
1. Providing permanent access to water for hydro-agricultural works
 2. Increase adoption of climate-resilient varieties tolerant to the major climatic risks
 3. Restoring agricultural soil fertility through climate-smart water and soil conservation and anti-salt control practices and infrastructures
 4. Fostering the sharing of good practices and developing learning and exchange platforms on climate-smart agriculture and climate-resilient fish farming among the three West and Central Africa SIDS sharing Portuguese as official language
55. For both Cape Verde and Sao Tome and Principe, the programme will pilot rural desalination plants using renewable power and membrane technology and wastewater treatment in agriculture (see Annex 1 on reclaimed water for irrigation and desalination technologies and opportunities in Cape Verde and Sao Tome). The specific desalination treatment technology (either brackish water RO desalination; brackish water RED desalination; Seawater RO desalination) will be selected at the design stage based on in-depth studies on water salinity and the amount of energy consumption needed in the final selected sites.
56. The adoption of the regional approach is primarily driven by the similarity in circumstances and challenges in the three island states, which can facilitate sharing of lessons and good practices, and mutual learning. Second, these same challenges and the national languages of Portuguese (in Cabo Verde, Guinea Bissau and STP) are not shared with neighbouring states of the Western Atlantic, hence providing a solid foundation for the establishment of a framework for partnerships and exchanges among these SIDS to overcome the challenges they share. While they share common characteristics of insularity and geographical disparity as well as small populations, their vulnerability to climate change is not uniform and they have varied experience of occurrence of climate related events and capacity to address them. In addition, Guinea Bissau and Saõ Tome and Principe are both LDCs while Cape Verde has higher levels of development as well as policies and mechanisms in place to better address climate change. Strong knowledge management established across the programme will allow for enhanced experience sharing, enabling improved adaptive management beyond what would be observed in the case of single country projects.
57. In addition, the project directly contributes to shaping international agreements such as the Agenda 2030, the Sendai Framework for Disaster Risk Reduction and finally the Paris Agreement. By addressing the three elements above through a regional approach, it is believed that the project would provide benefits that each country taken alone would not be able to achieve through a national single approach.
58. The regional approach will have the effect of triggering or strengthening cooperation and synergies between the three countries on climate change adaptation. In the current scenario, the three countries have weak cooperation on climate action. In addition, by increasing the financial resources mobilized

for climate action and by strengthening cooperation and synergies between the three countries, the regional approach will result in intensified implementation of climate solutions for the three countries with a particular focus on the most vulnerable groups, particularly youth and women.

59. The Programme contains monitoring-evaluation / knowledge-generating and capacity-building regional components that would create a regional platform for communication between the three SIDS based on shared goals, cultural values and norms and that not only would create more linkages and cooperation between different activities and actors but also would help to solve coordination problems and reduce transaction costs. The creation of a regional coordination unit based in Praia, which will coordinate with the national project management units, will allow for more overall supervision, which will have the advantage of harmonizing the pace of project implementation in the three countries. This cooperation and coordination would also benefit other countries of the IFAD West and Central Africa region as well.
60. Lastly, by introducing innovative adaptation measures at farm and landscape levels for the first time in the target countries, the regional project will help test and disseminate technologies, knowledge sharing, lessons learnt and good practices through the establishment of a regional platform for Portuguese-speaking SIDS in West and Central African countries. The regional approach will emphasize the need for Lusophone African countries to map their own needs, building on their own internal resources and on regional initiatives, to strengthen their own national evaluation systems and capacities. This platform will provide opportunities for exchange visits (farmers, private sector, and ministries), development and sharing of case studies, trainings and business opportunities among the three countries.

C. PROJECT / PROGRAMME COMPONENTS AND FINANCING

Project/Programme Components	Expected Outcomes	Expected Outputs	Countries	Amount (US\$)
1. IMPLEMENTATION OF CLIMATE-RESILIENT AGRICULTURAL PRACTICES	1. Climate-smart agricultural systems implemented in the three SIDS (% women beneficiaries / per country to be determined at the stage)	<p>1.1. Climate-smart farming techniques implemented \$1,781,900</p> <p>1.2. Climate-smart landscapes with increased agricultural water supply from watershed restoration practices \$2,363,800</p> <p>Increased sustainable use of available water through infrastructure development (Pilot rural desalination plants using renewable power) \$4,145,700</p>	Sao Tome and Principe, Cape Verde, Guinea Bissau	8,291,400
2. CAPACITY BUILDING TO SUSTAIN PROJECT INTERVENTIONS	2. Improved climate resilient agriculture governance and management with participation of women (% women of women in decision makings/country to be determined at the stage)	<p>2.1. Strengthened capacity of climate risk governance structures</p> <p>2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management</p> <p>2.3. Functional mechanism for coordination and information flow between institutions involved in climate resilient agriculture initiatives in SIDS</p>	Sao Tome and Principe, Cape Verde, Guinea Bissau	2,072,850
3. MONITORING-EVALUATION AND LEARNING (gender specialist in the staffing)	3. Effective project and outreach	<p>3.1. Project results are documented and disseminated for replication with gender disaggregated data</p> <p>3.2. Established knowledge management system to ensure continuous experience sharing across the three SIDS</p>	Sao Tome and Principe, Cabo Verde, Guinea Bissau	1,828,980

4. Programme Execution cost	826,770
5. Total Programme Cost	12,193,230
6. Programme Cycle Management Fee charged by the Implementing Entity (if applicable)	980,000
Amount of Financing Requested	14,000,000

D. PROJECTED CALENDAR

Milestones	Expected Dates
Start of Project/Programme Implementation	January 2021
Mid-term Review (if planned)	June 2023
Project/Programme Closing	December 2026
Terminal Evaluation	January 2027

PART II: PROJECT / PROGRAMME JUSTIFICATION

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

61. The programme will promote climate-resilient system that combines the absorptive, adaptive and transformative capacities of social-ecological systems of Cape Verde, Guinea-Bissau and STP. The programme will support agrarian systems to recover from climatic shocks and stresses, while positively withstanding against the effects of climate change. The following three mutually reinforcing components (i) implementation of climate-resilient agricultural practices; (ii) capacity building to sustain project interventions; (iii) monitoring-evaluation and learning.
62. Throughout the planning and implementation of each activity within the components, there will be regular sharing of information and experiences with the different stakeholders that are involved in climate resilience in agriculture in Cape Verde, Guinea-Bissau and STP. This will ensure that lessons are learned as the programme progresses and that each country builds of the experiences and knowledge of each other.

COMPONENT 1: IMPLEMENTATION OF CLIMATE-RESILIENT AGRICULTURAL PRACTICES

Component 1 of this project consists mainly of agronomic practices and technologies at the household and farm level as well as sustainable water management practices at landscape level. Both sets of techniques are proposed to combat the effects of certain climatic effects on crops, plantations, soil and watersheds. These are water deficit due to rising temperatures, evaporation of water from the soil and reduced soil fertility, evapotranspiration from crops and plantations, reduced rainfall, and extended dry season. It also includes flooding, surface runoff, pest proliferation and changes in upwelling. These climatic hazards have led to a drop in agricultural yields as well as in the volume of catchments for small-scale fisheries. Most of the activities proposed are proven activities implemented by IFAD in the selected countries. IFAD economic and financial analysis of approved or ongoing project combined with economic rentability of these interventions. With regard to the desalination technology, an RTA mission has been organized in Cape Verde and the outcome is in annex 1. Building on the initial gender assessment, a gender-responsive approach to climate-smart agriculture will be promoted while implementing activities under this component. This approach help identify and addresses the various constraints faced by women and men, while recognizing their specific capabilities. Therefore, it aims to reduce the gender inequalities and ensure equal benefit from interventions and practices of climate-smart agriculture, achieving thus more sustainable and equitable results. Adopting such approach for this component will contribute to narrow the gender gap in agriculture by reducing women's work burden through improved technologies, financing services and infrastructure and quotas will be set at the design for women participation to training and access to resources and inputs.

Output 1.1.

63. This output is proposed to build a resilient agricultural system at both the farm and landscape scales. To this end, a technology package to increase the crops, plantations, soils and landscapes resilience to climate change is proposed. At the farm level, this involves the adoption of varieties that are more resilient to heat and water stress, fertilization techniques adapted to the water and heat stress of plants and soil, a climate information service, a sustainable supply financing mechanism and a National Fund for Recovery from Climate Disasters. Further, mulching practices, crop combinations, the use of organic matter/fertilizers produced by biodigesters, tillage perpendicular to the slope, and the adoption of biological control techniques to prevent the proliferation of pests on plantations will be implemented. To cope with the negative effects of the change in the upwelling phenomenon, inland and marine fish habitats will be further managed and protected. Lastly, the project will help establish sustainable partnerships for climate information services in Guinea Bissau and STP.

Table 1 lists activities under output 1.1 with indication of which countries the activities will be implemented in. Sao Tome and Principe (STP), Guinea Bissau (GB) and Cape Verde (CV)

Proposed climate smart agricultural activities under component 1	STP	GB	CV
Adopt more resistant varieties to thermal and water stress and salinization with short growing cycles from seeds to yields	x	x	x
Establish a climate-smart irrigation system	x	x	x
Promote Half-moon techniques and crop rotations techniques		x	
Apply fertilization techniques and mulch cropping, which are organic residues from composting, manure, cold ash or household waste, that covers degraded soil surfaces	x	x	x
Improve the management and protection of inland habitats	x	x	x
Establish partnerships for a climate information services service to protect plantations from the negative effects of unpredictable weather events on plantations	x	x	x
Establish a sustainable mechanism for financing the supply of agricultural inputs (plant material, phytosanitary products, fertilizers) to cooperatives' producers	x	x	x
Mangrove restoration in coastal communities of Cape Verde and Guinea-Bissau to protect inland areas against sea level rise and salt-water intrusion.		x	x

Output 1.2

64. With regard to the landscape scale, this output is aimed at the restoration of watersheds in order to produce intelligent landscapes in the face of climate change. Thus, terraces and dikes will be built to mitigate the eroding effects of surface run-off, particularly in raised areas, and of saline intrusion and flooding. At the same time, the slopes and catchment areas where vegetal cover will fight against landslides associated with intense rainfall and torrential runoff, the reduction of the infiltration rate of runoff water, and the reduction and pollution of river water by eroded materials. Wooden barriers against the effects of violent storms on plantations and against soil erosion by torrents will also be installed. Agricultural systems generally include two main geographical scales, the farm scale and the landscape or watershed scale within which the farm is located. These two geographical levels are interdependent, which means that any change in one scale inexorably affects the other. Thus, to successfully develop climate-resilient agricultural systems, it is necessary to consider these two scales when intervening. In other words, resilient watershed and farm practices must be implemented. Women will be targeted with a set quota defined at the full design stage.

Table 2 lists activities under output 1.2 with indication of which countries the activities will be implemented in. Sao Tome and Principe (STP), Guinea Bissau (GB) and Cape Verde (CV)

Proposed watershed rehabilitation activities	STP	GB	CV
Establishment of green infrastructure to fight against erosion.	x	x	x
Build-up mechanical works for the recovery of degraded land	x	x	x
Creation of nurseries to assist biological rehabilitation	x	x	x
Terracing and contour bunding	x		x
Check damn and gabion construction in degraded rain-washed gullies	x	x	x

Output 1.3

65. To sustain farms through the predicted extended dry seasons and increasing temperature, improved water harvesting and distribution infrastructure will be initiated. This will utilize the greater water availability that is generated by the watershed level land rehabilitation in Output 1.2. Emplacing water harvesting infrastructure in parallel to landscape rehabilitation is key to ensuring immediate benefit of increased water availability from rehabilitation. Additionally, the addition of water infrastructure will provide an immediate and tangible benefit for communities particularly women and will create to visualise, creating greater buy- in and adoption of the mechanisms proposed in output 1.2.

Table 3 lists activities under output 1.3 with indication of which countries the activities will be implemented in. Sao Tome and Principe (STP), Guinea Bissau (GB) and Cape Verde (CV)

Proposed water harvesting and disbursement infrastructure activities	STP	GB	CV
Salt-water intrusion barriers, which are positive well barriers used to inject fresh water into the aquifer through recharge wells to raise the water table	x	x	x
Anti-salt dikes, which are physical barriers positioned perpendicularly to the direction of the water flow that are used for protection against coastal erosion and salinization agricultural lands. This also allow water storage and water supply used for irrigation;	x	x	x
Pilot seawater desalination plants powered by renewable energy , which improves the quality of local groundwater;	x		x
Pilot brackish water RO or RED desalination based on further assessment to be conducted at the design stage and select the right site/ appropriate procurement processes	x	x	x
Pilot wastewater reclamation and reuse systems for irrigation, which conserves freshwater and ensure water supply; based on further assessment to be conducted at the design stage and select the right site/ appropriate procurement processes	x		x
Water harvest basins and retention dikes designed to collect runoff water and allow producers to adapt to the adverse effects of drought;	x	x	x
Storage cisterns and water reservoirs to provide storage capacity and avoid the disruption of activities of the producers in drought seasons;	x	x	x

Boreholes pumped by photovoltaic solar energy to ensure water supply and irrigation;	x	x	x
Solar-powered drip irrigation systems ¹³ , which are micro-irrigation systems that drips water at very low rates to the roots of plants instead of the whole soil surface.	x	x	x

66. While targeted areas are known, the exact site location for each technology are unknown and will be determined at the full concept stage. Further studies environmental Impact Studies/Reviews are planned to determine the level of salinity, orientation with main winds; groundwater , soil , volume of wastewater and sanitation networks and to decide on the most suitable technology according to that exact location bearing in mind the cost benefit analysis presented in annex 1 which will be further detailed at full design stage.

COMPONENT 2: CAPACITY BUILDING TO SUSTAIN PROJECT INTERVENTIONS

67. Component 2 is proposed to complement component 1 and ensure its successful implementation. It is aimed at capacity-building activities for Project Management Unit (PMU) staff and the support of supervisory institutions such as government and civil society structures. A gender specialist will be hired to support the design and the implementation a detailed gender assessment along with a gender action plan (GAP) at the fully developed proposal stage. This component also targets producers, direct users of the infrastructure and beneficiaries of the practices and technologies that the project will implement.

68. **Output 2.1** : Strengthened capacity of climate risk governance structures: Under this output , the project will strengthen the technical capacities of government institution officials on climate risk management and coordination (trainings, events) including women, the development of tools and instrument adapted to local contexts, and integration into of climate risks into planning and programming in the agriculture, fishing and water sectors as well as into the budgeting and investments.

69. **Output 2.2.** Strengthened organizational capacities of communities' including women in irrigation infrastructure and resource conflict management: The programme will support Women Users Associations (UAs) to maintain the infrastructures and to adopt new climate resilient practices and technologies. Activities under this component will also include training on farm and landscape sustainable management and maintenance practices,

70. Trainings sessions for farmers and fishermen at the community level will focus on sustainable management techniques of agricultural practices. In order to consider gender disparities, and the different needs of men and women, it is critical to promote gender-sensitive technologies and practices. Given that women are performing the majority of unpaid work, priority will be given to accessible and affordable technologies and practices that can contribute to reduce significantly the unpaid labor. Furthermore, given that women active in fish processing are large consumers of fuelwood, particularly the one from mangrove, a special attention should be given to women in playing a critical role to adopt sustainable management practices. A gender lens will be applied while developing and implementing training modules in order to raise women's awareness and build their capacities to adopt a more sustainable approach for the management of mangrove forest resources. It is demonstrated that significant engagement of women in local decision-making of natural resources lead to positive outcomes for the environment and household livelihoods. For contributing to women's empowerment, the training sessions at the community level will include leadership capacity-building modules to give women opportunity to share knowledge and develop their skills towards a more sustainable

¹³ <http://www.fao.org/3/s8684e/s8684e07.htm>

management of resources. It is important to facilitate women involved in agriculture and fisheries activities in documenting and sharing their local knowledge. The project will support also women on financial education and access to land and opportunities. Agricultural and fish farming techniques upon which producers will be trained include; management of varieties resilient to water and thermal stress; irrigation systems; increasing soil fertility; coping mechanisms to unpredictable weather events on plantations; and mangrove restoration. Farmers will also be trained on landscapes restoration techniques, which will comprise establishment of green infrastructure to fight against erosion, build-up mechanical works for the recovery of degraded land, creation of nurseries to assist biological rehabilitation, terracing and contour bunding and construction of check dam and gabions in degraded rain-washed gullies. Training will also cover building and management of infrastructure to fight against salt-water intrusion, including anti-salt dikes and water harvesting. A quota will be fixed at design stage in each country to increase women's participation in the decision-making processes for infrastructure management and maintenance, as well as natural resources management to enable these activities.

71. **Output 2.3.** Functional mechanisms for coordination and information flow between institutions involved in climate resilient agriculture initiatives in each country. The programme will set up or strengthen existing coordination mechanism between institutions involved in climate resilient agriculture initiatives in each country. These are ministries such as the ministry of agriculture, water, environment, forestry, economy and finance as well as other stakeholders such as civil society, the private sector and local authorities. Key activities will include conducting assessments on institutional and regulatory frameworks, institutional and capacity needs, setting up or enhancing working mechanisms for enhanced climate resilience agriculture in each country. Women will be included in decision-making processes.

Table 4 lists activities under output 2.3 with indication of which countries the activities will be implemented in. Sao Tome and Principe (STP), Guinea Bissau (GB) and Cape Verde (CV)

Proposed capacity building in the 3 selected countries	STP	GB	CV
Trainings on climate resilient and low emission agriculture Awareness events and sensitization (define the quota for women participation at the design stage) Development of tools and instrument adapted to local contexts, and integration into of climate risks into planning and programming in the agriculture, fishery and water sector as well as into the budgeting and investments	x	x	x
Women Users Associations to maintain the infrastructures and to adopt new climate resilience practices and technologies, support the environment fund in its readiness process to become an instrument for climate and environment resource mobilisation. Trainings on farms and landscape sustainable management and maintenance practices (define the quota for women participation at the design stage)	x	x	x
Conduct assessments on institutional and regulatory frameworks, institutional and capacity needs, setting up or enhancing working mechanisms for enhanced climate resilience agriculture in each country	x	x	x

72. Further analysis at the design stage will help to streamline context specific activities for each country. This combined with increased knowledge platforms, created through the project, and regular exchange visits between the SIDS will enable greater information sharing. This in turn will lead to wider extension

of capacity building of best practice technologies and practices, resulting in greater adoption of strengthened climate adaptation across the SIDS.

COMPONENT 3: MONITORING-EVALUATION AND LEARNING

73. Component 3 aims at collecting, documenting and disseminating through the most appropriate channels the good practices and lessons learned generated from the implementation of the project in each of the participating countries.

Output 3.1

74. Monitoring and evaluation are essential to the smooth running of a programme, ensuring that targets are being met and that interventions are effective. The programme will be monitored and evaluated through the following monitoring and evaluation (M & E) activities. A first step consisting of the project's start up activities, which will comprise a project-launching workshop to be held in the first two months of project start-up with project staff, IFAD, other partners. The kick-off workshop is essential to strengthen ownership of project results and plan the first year's annual work plan. A launch workshop report is a key reference document and should be prepared and shared with the participants to formalize the different agreements and plans decided at the meeting. After the kick-off, a periodic follow-up via site visits of the project sites by IFAD according to the agreed schedule in the project's annual start-up / work plan to assess project progress. The second step in the M&E activities will consist of an independent mid-term review at mid-term of project implementation. Gender disaggregated data will be collected to monitored the performance on gender equality and empowerment in this programme. The mid-term review will identify progress towards the achievement of results and identify corrections where necessary. It will focus on the effectiveness, efficiency and timeliness of the project; highlight issues that require decisions and actions; and present the first lessons learned from project design, implementation and management. The end of the project step will allow carrying out an independent final evaluation, which will take place after closing of the programme activities in accordance with the guidelines of IFAD. The final evaluation will focus on the production of project deliverables as originally planned (and corrected after the mid-term review, if such a correction has occurred). The final evaluation will examine the impact and sustainability of the results, including the contribution to the fund investment criteria.

75. **A regional coordination unit** will be established at the regional level and located in Praia. This **regional coordination unit** will be in charge of the administrative and financial procedures as well as of the M&E of the entire programme in coordination with country specific teams including collecting gender disaggregated data

Output 3.2

76. Under this component, the programme supports the development of learning materials and knowledge products in Portuguese, exchange visits between the three countries for farmers and technical teams in ministries to share experiences, and the establishment of a knowledge platform specific to each country and a regional platform to scale up this initiative to other African SIDS. Beside the country specific knowledge management, the programme will support a knowledge hub on climate change adaptation in the three SIDS in partnership with other donor. Key activities will include: the establishment of a knowledge transfer platform on climate resilient and low emission agriculture, which will serve in connecting virtually various networks at country level. The Knowledge Platform will be a formal collaborative effort coordinated by an existing entity bringing selected countries to build and populate a set of innovative climate resilient agricultural practices at the intersections of food, energy, water and land. A web platform to disseminate these innovations will be established. This component will also document progress, good practices and lessons generated by the country component. A knowledge management system will be developed and implemented. It will then feed the knowledge hub, which will be common to the three SIDS countries. A quota for women participation will be defined at the full design stage by country.
77. The project contributes to the Adaptation Fund Result Framework. This SIDS project supports the AF goal, impact, outcomes, outputs and indicators. The SIDS project will help the three only West and Central African SIDS (Guinea Bissau, Sao Tome and Cape Verde) to meet the financial challenges

they are facing in their climate action. Activities in component 1 will help reduce exposure to climate-related hazards and threat (outcome 1). The capacity building component, more specifically the output 2.3 activities will contribute strengthening countries institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses (outcome 2 of AF result framework). Activities of output 2.3 contribute to outcome 3 as they strengthen awareness and ownership of adaptation and climate risk reduction processes at local level through awareness and sensitization events. They also support achievement of the outcome4 of the result framework of the AF Increased adaptive capacity within relevant development sector services and infrastructure assets. Component 1, more specifically activities of outputs 1.1, 1.2, 1.3 and component 2 activities especially that on strengthening capacities of governance institutions and of communities are meant to directly strengthen livelihoods and sources of income for vulnerable people in targeted areas. In that sense, they are aligned with the Outcome 6 of the result framework of the AF. Activities in output 1.2 contribute to achieve the Outcome 5 of the AF result framework through watershed rehabilitation activities, which help increase the ecosystem resilience in response to climate change and variability induced stress. Component 3 activities are aligned with the outcome 8 as they focus on development and diffusion of innovative adaptation practices, tools and technologies.

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

78. The innovative climate change adaptation practices of this Programme are related to its regional approach. It also deals with the technologies targeted and the financial mechanisms that will be put in place.
79. The regional approach is new for the three West Africa SIDS for addressing climate change in the agricultural and fisheries sectors in coordinated manner. Up to now, the three SIDS climate change initiatives have been undertaken at country level. They did not benefit from the mutual learning opportunity offered by the regional approach. This approach will create conditions for countries to develop partnerships and to exchange good practices and lessons in their fight against negative climate effects. The combination of the farm scale and the landscape scale approaches is an innovative aspect of the project, as usually projects in the three countries used to adopt only one of these two approaches. The innovations that the regional approach is bringing to the three SIDS countries in combating climate change can be apprehended at three levels. Firstly, in the absence of this regional project, recipient countries would only have access to their national allocation from the Adaptation Fund. Therefore, the regional approach increases access to climate finance for the three SIDS countries, as each country will mobilize more financial resources in addition to its national allocation. Secondly, the regional approach will have the effect of leveraging or strengthening cooperation and synergies between the three West African SIDS on climate adaptation. In the current scenario, the three countries have weak cooperation on climate action. The third rationale that justifies the regional approach on innovative climate adaptation practices is by increasing the financial resources mobilized for climate action and by strengthening cooperation and synergies between the three countries, the regional approach will result in intensified implementation of climate solutions for the three countries. The regional approach of this project will enable the establishment of a regional platform for SIDS in West and Central Africa and SIDS with different level of development (Cap Verde lower middle-income country while Guinea Bissau and Sao Tome and Principe are Least Developing Countries). This platform will then be linked to the global SIDS coalition and will promote an intensification of the exchange of experiences, knowledge and good practices. This knowledge sharing will necessarily lead to the strengthening of skills in the beneficiary countries and a better capacity to respond to climate change.
80. The use of some new climate resilient agricultural technologies, infrastructures and practices is another dimension of the innovativeness of the solutions brought by the project. Targeted innovative technologies at landscape scale include among others establishment of green infrastructure through assisted natural regeneration for example to fight against erosion, build-up mechanical works for the recovery of degraded land, creation of nurseries to assist biological rehabilitation, terracing and contour bunding, check damn and gabion construction in degraded rain-washed gullies, half-moon techniques, and crop rotations techniques. At farm scale, this regional project innovative technologies are related

to adoption of more resistant varieties to thermal and water stress and salinization with short growing cycles from seeds to yields, implementation of i) boreholes pumped by photovoltaic solar energy to ensure water supply and irrigation, ii) solar-powered drip irrigation systems, which are micro-irrigation systems that drips water at very low rates to the roots of plants instead of the whole soil surface, iii) salt water intrusion barriers, which are positive well barriers used to inject fresh water into the aquifer through recharge wells to raise the water table, iv) wastewater reclamation and reuse, which potentially saves fertilizer applications as the reclaimed wastewater contains plant nutrients and conserves freshwater (Annex 1); (v) anti-salt dikes, which are physical barriers positioned perpendicularly to the direction of the water flow that are used for protection against coastal erosion and salinization agricultural lands. This also allow water storage and water supply used for irrigation. The innovativeness of these technologies is related to the fact that i) most of these technologies are not being implemented in all of the three countries, thus they are new; ii) they are very effective in tackling climate change adverse effects; (iii) the use of renewable energy for water mobilization is innovative to promote low emission and climate resilient agriculture, which contribute to the country Nationally Determined Contributions and to achieving the Paris Climate Agreement and; (iv) the climate information system as well as the financial mechanisms to ensure sustainable supply of agricultural seeds and to recover from climate hazards, are innovative measures in the agricultural sector of the countries.

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

81. The project will benefit smallholders, as coastal communities that live in poverty and depend on marginal and degraded land with inadequate possibilities to withstand flooding and saltwater encroachment in their lands in the three selected countries.
82. Women and men farmers have very different levels of access to male family labor. A large part of the gender gap can be attributed to differential access to male family labour in the three countries. The project will support in equalizing the access to male family labour would reduce the estimated gender gap in the targeted countries. Other factors including the segregation of tasks, rural women's limited voice and agency, their lack of access to finance to hire male labour and invest in machinery and limited timesaving infrastructure will be also addressed. SIDS Women are also disadvantaged in accessing agricultural machinery and production technologies. Because of cultural beliefs, property rights and control over assets, women have limited access to land and agricultural inputs, houses and other assets in their names to be able to provide guarantees to access to loans and develop viable business. This remains one of the biggest challenges to gender equality and prevents financial institutions from providing loans. Rural women generally lack knowledge on the financial options available to them with the local financial institutions and men control the resources at the household level. This is mainly due to lack of financial education and social and cultural norms. Concerning cultural beliefs and norms, women are expected to perform certain types of work and respect the society rules, which affect their engagement in economic activities, and to close the gender gap. They are mainly confined on unpaid care work and not in activities, which can liberate them economically such as cash crops. Lack of access opportunities of women and high birth rates for most of rural female farmer's results in reduced education compared to men. The Biased perception of the financial sector prevents women to access to finance. In various decision-making positions, women are under-represented due to these barriers, IFAD targeting mechanisms will be used to address to better address the gender gap in the three selected countries.
83. Preliminary target groups in each country are presented under the section on target group and beneficiaries but will be refined during the project design stage. A special attention will be given to men, women, youth and marginalized groups through an inclusive approach. These groups that are more vulnerable to climate change with less capacity to adapt. They are also the most food insecure with high probably to migrate. The most vulnerable populations as determined by the IFAD targeting

strategy¹⁴ will receive significant economic and social benefits from this project. During the design stage, IFAD targeting approach will be applied to define the final targets per country. They will receive capacity building on the implementation of best climate resilience agricultural practices, techniques, climatic good and services. Good and services include climate resilient infrastructures as described above (technologies, equipment's, water equipment and infrastructures).

84. Other socio-economic benefits will come from the all activities related to resilient production systems with a potential side benefit of increasing yields, it is expected to have beneficial impacts on local food security and nutrition including through the creation of reserves in case of climate shocks. Sustainable land and water management techniques, along with water access monitoring, are also expected to have benefits for local health, while the diversification and sustainable management fish farming and gardening will also have benefits on overall nutrition and improved income.

Economic benefit

85. The SIDS regional programme will support development of irrigation systems, improvement productivity to ensure better food security that would allow the generation and diversification of income and employment. With the irrigation system, there is a huge opportunity to ensure appropriate doubling of the number of harvests per year. Diversified production in crops will also add to the economic benefits of the programme. The increase in production will indirectly generate activities and transactions that will have a beneficial effect on employment in the programme areas, particularly for young people and women involved in the production and trade of agricultural products. The improvement of production with soil and water conservation techniques and technologies promoted in the programme in Part II, section A will improve and maintain soil health in Cape Verde, Guinea-Bissau and STP. This will allow the soil to grow both at the surface and at depths and improve water retention. This ultimately will enhance crop production and productivity while generating income for farmers through the sale of surpluses. The restoration of mangrove in coastal communities of Cape Verde and Guinea-Bissau will ensure that the aesthetic value is retained. This is an important component in the tourist industry that will result in job security and economic gain in the communities. The programme will require that 50% of all incomes will be profited to female and youth farmers.

Social Benefit

86. The program will contribute to an enhanced food security and nutrition of the targeted communities. By providing support (technical assistance, infrastructures, technologies and equipments) to smallholder farmers (male, women, youth), It will improve agricultural production and productivity through the adoption of adapted practices against climate change and ensure better rural communities's livelihoods. With improved and diversified production, the project also aims to reduce the risks concerning nutrients and food security by allowing the population to maintain a diversified diet. By supporting climate smart agriculture and providing alternative methods to produce under a changing climate, this project will aim to reduce the percentage of households with a poor food consumption.
87. Targeted groups (male, women and youth) resilience will be improved through income and livelihood diversification and infrastructures, technologies and equipments. The proposed programme suggest alternative activities for women and youth to diversify household food supply but also to ensure several income-generating activities per household by encouraging restoration of mangrove in coastal communities to support all activities linked to the tourist industry that will result in job security and economic gain in the rural communities.
88. Gender equality and women's empowerment: The project will contribute to close the gender gaps while promoting gender equality in the agriculture and fisheries sectors. During the preliminary consultative process, which has led to this concept note, issues related to closing gender in agriculture have been collected. According to the initial gender assessment, the incidence of poverty is higher among female heads of household compared to men. In the formal labour market, women are generally in the majority in the category of "unskilled workers". In the three-targeted countries, women are most often engaged in subsistence farming or sell their labour force as farm labourers. Women play important and varied

¹⁴ <https://www.ifad.org/en/document-detail/asset/41397731>

roles in agriculture and fisheries, but they are constrained by two important types of gender gaps. They have unequal rights access and opportunities, relative to men, to productive resources and inputs, and there is insufficient information about the roles and resources of women and men as well as opportunities for participation, and leadership in decision-making particularly. For example, this gender gap is higher in rural areas, and data from the latest census found that only 34 percent of rural women are employed compared to 66 percent of rural men.

89. The programme will focus on more on women and youth as they are the most vulnerable to climate change. While a sex disaggregated data will be produced at design stage, IFAD baseline investments gender targeting are: 40 per cent women and 50 per cent youth in Sao Tome and Principe, at least 50 per cent women and 30 per cent youth for Guinea Bissau, and 50 per cent women in Cabo Verde. The objective is for this program activity to originate from local ideas and for communities to take ownership of the climate change issue and full mainstreaming of gender into the programme. As such, all needs in the initial gender assessment will be addressed in the full project design. These needs include women's access to resources access and control of productive asset including inputs and technologies;; women's integration into more profitable / remunerative economic activities and income diversification, women's involvement in operational contexts;; women's integration into nutrition education campaigns, and promotion of access to drinking water, hygiene and sanitation. In addition to that, it is worth mentioning the need for strengthening women's leadership skills and promoting their active participation in decision-making bodies in agricultural and fisheries communities. In addition; expressed needs are targeting female and male youth (under thirty years old) engaged in primary production and (mainly) value-addition initiatives; social protection system; employment and jobs women inclusion into decision making processes and in all exchanges visits and experiences sharing (at least 50%).
90. At design stage, a detailed gender action plan will be provided with indicators, targets, timeline, responsibility and cost will be submitted. The gender action plan will inform the full design proposal.
91. The programme will foster rural community empowerment through capacity building in areas related to organizational development, addressing the impacts of climate change on farms and the landscape, managing irrigation infrastructure and reclaiming degraded land. These skills will lead to better decisions and positive changes in the management of natural resources. Training on climate resilience among staff of national institutions, NGOs and producer organizations will result in sustainable agricultural practices at the household and individual levels. Improved household food and nutrition security through practices that enhance agricultural and fisheries productivity will lead to improved health. The gender approach of ensuring that the interests of youth, women and other vulnerable groups are adequately addressed will reduce social inequalities and strengthen the capacity of vulnerable groups to take action. These gains will be reflected in better school attendance by children from marginalized households whose difficulties in coping with poverty will have been reduced. Coastal communities in the programme will benefit from mangrove restoration, which will add an aesthetic value and recreational values in the intervention sites, thus maintain a social well-being.
92. Component 2 of the programme will improve community life through capacity-building activities and participation of all stakeholders in the project activities, including women and vulnerable groups. This will involve multidisciplinary approaches and teams on the programme's technical side, which encourages farmer organisations to be fully involved. This is one of the key elements of the sustainability of actions planned within the programme. This component will require the Project Management Unit (PMU) to pursue the inclusion of qualified women and youth technical personnel into the programme team. This will reinforce that at least 50% female and 50% of youth are direct beneficiaries of the programme. This will ensure their fair and equitable access to the benefits of the programme, strengthen their resilience, improve gender equity and empower women.
93. The knowledge sharing in Component 3 will also improve the decision-making of women and young people who were not involved in the programme but want to adopt the climate-smart agriculture approach. Social cohesion will also be enhanced under Component 3 because communities that work

and share lessons learned together will strengthen mutual trust and collective action of adaptive capacity and resilience.

94. At the design, the program will incorporate the use of participatory approaches that are culture- and context- sensitive throughout all project activities as well IFAD gender targeting approach. The proposed programme will also ensure that civil society is involved in all decision-making along government and private actors so that the programme in each country integrates women's concerns. A detailed gender assessment along with a gender action plan (GAP) will be prepared including gender indicators, targets, timeline, responsibility and cost to inform the full proposal.

Environmental benefits

95. Several environmental benefits are expected from this project, including (i) the improved management and protection of fish natural habitats with a positive effect on biodiversity, (ii) groundwater recharge and protection from salt water infiltration, (iii) protection from sea water intrusion in agricultural lands through the construction of anti-salt dikes, (iv) the rehabilitation of degraded land through improved agricultural practices and building green infrastructure, and (v) increased coastal protection through strengthening of natural barriers.
96. Agricultural practices for conservation agriculture, water and soil management, and agricultural residues are not only increasing fertility of soils and enhancing biomass, but are also expected to sequester approximately 155,523 TeqC. The development of biogas with banana trunks will enable production of organic fertilizer, which will enter in the soil amendment. The use of organic manure will decrease the use of chemical fertilizers, thus lower production costs to the producer and the conservation of soil carbon. The use of solar powered equipment, will also foster access to renewable green energy, and then decrease GHG emissions through reduction of the use of wood fire.
97. Further analysis of economic, social and environmental benefits of the programme will be conducted during the full proposal development. As a result, Part III, section C will propose mitigation and compensation measures that will minimize or eliminate negative impacts and risks of the programme related to salt intrusion, ground water extraction, loss of biodiversity and soil fertility, land cover, coastal protection among others in compliance with the Environmental and Social Policy of the Adaptation Fund.

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

98. The project is viable according to the cost-effectiveness analysis. Nevertheless, a more thorough cost effectiveness analysis, including a quantitative analysis will be carried out at the fully developed proposal stage. The cost-benefit analysis will include estimated costs per beneficiary as well as comparing the project to alternative interventions. This is based on IFAD lessons learnt and ongoing investment as well as recent RTA mission on opportunities for various technologies to be promoted particularly in Cape Verde (See Annex 1) The biomechanical works built, the production of plant material adapted to the new climatic conditions, the biological fertilization techniques, the development of a system of climate services under **component 1** certainly imply important initial financial investments. However, by taking into account climatic hazards during their design and implementation, their sustainability is enhanced. In this way, their costs are amortized. In terms of efficiency in the face of the effects of change, irrigation and landscape restoration works ensure in an appropriate manner high performance in terms of water control in a context of water stress linked to climate change, and the fight against water erosion respectively. The programme will use a climate-smart crop production approach, which is a more cost-effective approach that aims to achieve food security but through the lens of climate change. Climate-smart agriculture will reduce economic losses due to the waste of agricultural inputs during climate changes, by creating agricultural systems in Cape Verde, Guinea-Bissau and STP more efficient and resilient. These climate-resilient agricultural systems will be managed through an ecosystem approach proposed in Part II, section A at landscape, national and regional levels as well as in integrated systems. The programme's adaptation measures will use a

mixture of best options being tested in the three SIDS countries to revitalise agricultural production systems at best costs.

99. On one hand, cost-effectiveness will be assured in water conservation and management infrastructures by: (i) the construction of positive barriers where freshwater is injected at the toe of the saltwater wedge, although the saltwater wedge is never stationary in real world scenarios; (ii) the construction of anti-salt dikes at a height that minimises the costs along with a homogenous clay that resists to the water flow and infiltration; (iii) locally adapted reclaimed water systems for irrigation under certain conditions and requirements to avoid potential risks (see example of Cape Verde in Annex 1); (iv) locally adapted available renewable energy resources for desalination plants (Annex 1), particularly in remote regions of Cape Verde, Guinea-Bissau and STP, with low population density and poor infrastructures for fresh water and electricity transmission and distribution¹⁵; (v) the construction of water harvest basins and retention dikes with the same homogenous clay component than anti-salt dikes while protecting the slopes and ramps of the intervention sites; (vi) locally available materials to build sub-surface cisterns, reduced in size and located so that gravity will be used to collect water with the help of a pipe/tap arrangement; (vii) the implementation of boreholes with solar pumps in small farming activities for cost minimisation while supplying water in remote areas of Cape Verde, Guinea-Bissau and STP and (viii) drip irrigation powered by solar energy that are planted along the soil's contour lines to avoid changes in water drips as a result of changes in land elevation. To increase effectiveness and sustainability, the rates of water drips will be slower on clay soils to avoid surface water ponding and runoff than on sandy soils, which will need higher rates to ensure adequate soil moisture.
100. On the other hand, the programme is cost effective through the soil rehabilitation and sustainable agriculture land management by: (i) Facilitating the development, official release and registration of well-adapted crop varieties in Cape Verde, Guinea-Bissau and STP. This will ensure that farmers have access to quality seeds and planting materials. This will require a community-based seeds' distribution systems for delivering the seeds of the most suitable varieties to farmers; (ii) Placing more emphasis on nutrient management through crop rotations as well as mulching and half-moons, both enriched by compost and organic manure. The use of organic fertilisers reduces the use of synthetic fertilisers, which emit greenhouse gases (GHGs), and the use of compost improves soil water retention, which strengthen the short-term adaptability of crops to water shortages; and (iii) Placing an emphasis on enrichment planting through the mangrove restoration. This will improve biodiversity and maintain soil carbon stocks and its organic matter content.
101. The project is also cost effective in that through the **component 2** on capacity building and **component 3** on M&E and knowledge documenting and dissemination; there will be various additional effect and impacts for the Eastern Atlantic SIDS as a whole. Climate smart agricultural systems also rely on the social, institutional and political support of the beneficiaries of the programme to be cost-effective. Therefore, Component 2 and 3 of the programme proposes local, national and regional partnerships, capacity building and knowledge dissemination of stakeholders, especially farmers and their local expertise, as well as a strong government commitment to jointly develop and/or adapt climate-resilient agricultural policies and network. Additionally, national investments to reinforce cost-effectiveness in the environmental are proposed in the programme for building adaptive capacity, livelihood resilience and reinforce employment for vulnerable groups.
102. Lastly, the regional approach is a major aspect of ensuring the cost-effectiveness of the project, through the sharing of experience, knowledge and lessons learned, but also through economies of scale during the procurement of equipment and services.
103. The SIDS and coastal areas of several countries are facing freshwater scarcity due to their insular

¹⁵ Owing to the costs of desalinating water, it was soon realized that available wastewater should be reclaimed and reused as much as possible. Because wastewater has a high load of suspended and dissolved solids, a further tertiary treatment is required and membrane technologies have become essential. <http://www.fao.org/3/a-a0494e.pdf>

character but also to the effects of frequent severe droughts on their groundwater and surface water resources. The water tables are poorly supplied or are drained very quickly. As a result, water shortages can be chronic. As a result, locally adapted reclaimed water systems are an alternative to conserve the consumption of freshwater in the three SIDS under certain conditions and requirements to avoid potential risks (Annex 1). They require less investment in infrastructure than desalination plants, take less time to bring the supply on line as the source water is already available and technologies for water quality for irrigation exist and have already been implemented in an IFAD's RTA mission in Cape Verde (Annex 1), which could serve as an example for Sao Tome and Principe. This alternative is cost effective because as the reclaimed water is used for toilet flushing, landscaping and crop irrigation, it will therefore reduce the need (thus the cost) of additional water resources. For irrigation, it will save fertilizers as the reclaimed wastewater already contains plant nutrients. Reclaimed water could also be combined with other water sources to increase crop typologies to irrigate. Besides, water reuse systems will reduce the amount of water discharged to the waterbodies, thus prevent the environmental pollution caused by sewage discharge and enhance the local environmental aesthetics of the receiving waterbodies. Therefore, benefits of treated discharge reduction may be quantified as the savings in sewage charge¹⁶.

104. Desalination of seawater is another alternative with a double advantage related to the improvement of water supply of the populations and a better recharge of the aquifers. Indeed, the availability of water of suitable quality for agricultural purpose is the primary limiting factor to development in the three SIDS. The exacerbation of water scarcity due to climate change and the degradation of groundwater quality due to saltwater intrusion have a significant impact on each country's socio-economic development leading to major implications on all other sectors. The low quantities and poor quality of water constitute a barrier to the reconstitution of the underground water table, especially in the Sahelian zone of Cape Verde. In this context, desalination is essential and is the most effective and sustainable long-term technology. Also, the water sector in the three SIDS is also faced with many challenges related to the affordability of water supply, specifically to rural communities. Since water tariffs are directly linked to the cost of supply, the costly approach of pumping water over long distances is not economically viable for supplying rural communities with good quality water for agricultural purposes. Thus, the Programme proposes to establish how to effectively and efficiently improve the quality of local groundwater by means of desalination at the design stage of the Programme (Annex 1). The Programme is following the long-established principle that using local water first is more cost-effective than importing water remains valid, even if the local water needs to be desalinated. However, a comparison of the capital cost of establishing infrastructure to import water to the Programme's areas of interventions to the capital cost of establishing desalination plants at the same areas of interventions will be carried out at the design stage. The installation of desalination plants will also lead to the creation of jobs and a new activity essential for the development of the area in the future. Jobs will be created in the industrial sector for the design, construction and operation of the sites for instance.

105. The long-term cost-effectiveness of water management infrastructures, such as saltwater intrusion dams, saltwater dams, retention basins and dykes, wastewater treatment and seawater desalination to improve water quality for agriculture will be ensured through a management mechanism. This mechanism will include the beneficiary populations and the state technical services pertaining to relevant ministries. A maintenance fund for these infrastructures will be set up and will be financed by the contribution of each beneficiary. The beneficiaries will be organized into user associations, if they do not exist. Training sessions in infrastructure management and maintenance will be organized for these user associations. State technical services personnel will be upgraded in the management and maintenance of the infrastructure. They will coach the beneficiaries in the management of the infrastructures set up.

¹⁶ Yupeng Fan, Weiping Chen, Wentao Jiao & Andrew C. Chang , Desalination and Water Treatment(2013): Cost-benefit analysis of reclaimed wastewater reuses in Beijing, Desalination and Water Treatment, DOI:10.1080/19443994.2013.859102

106. **Table 5** below describes the empowerment of key local user associations in each of the three SIDS by the following Programme's activities:

Key local user associations/ unions/producers' cooperatives	Key barriers	Expected exit profile / Potential needs identified	Alternative with the Programme
Farmers' organizations and water user associations including women	<ul style="list-style-type: none"> - Irregular climatic conditions (including rainfall) - Low security of land tenure - Limited access to irrigated land and water particularly for women - Poor access to finance (credit) - Inequalities in access to factors of production particularly for women - (land, finance and technology) based on the gender of the head of the household particularly for women - Difficult access to remunerative markets particularly for women - difficult transport between the islands - Insufficient access to technologies - modern and efficient transformation - Low entrepreneurial capacity - Insufficient mastery of management tools and - planning 	<ul style="list-style-type: none"> - Improved climate resilient agriculture governance and management - Increase in sustainable productivity / revenues particularly for women - Equitable distribution of workload and income within the associations <p>Potential needs identified:</p> <ul style="list-style-type: none"> - Land security - Sustainable and efficient use of water - Rehabilitation of degraded land - Agricultural income-generating activities - Innovative and climate-resilient techniques and technologies for agricultural practices - Support, advice and training in sustainable agricultural practices and participation of women 	<ul style="list-style-type: none"> - Targeting smallholders particularly women (quota to be set at the design stage) that live in poverty and depend on marginal and degraded land with inadequate possibilities to withstand climate change, flooding and saltwater encroachment so that they can drag other producers of the intervention areas - Sustainable development subject to: food security (through climate smart agricultural activities) and sustainable water management - Watershed rehabilitation arrangements - Involvement of producer organizations in planning, implementation and monitoring processes - Large-scale dissemination of climate-resilient practices and techniques in agriculture allowing

	<ul style="list-style-type: none"> - Low level of organization of producers particularly for women 		<p>the increase of crop yields / income generation</p> <ul style="list-style-type: none"> - Strengthening coordination and sustainable management capacities of user associations on a basis of equitable distribution of workloads and income in agricultural farms and landscapes
Women Users Associations	<ul style="list-style-type: none"> - Informal participation in agricultural activities - Limited knowledge on sustainable agricultural and water use - Difficult access to land and poor land security, especially for irrigated land - Low representation of women in decision-making bodies of grassroots organizations 	<p>Involvement and economic empowerment in agriculture particularly women</p> <p>Potential needs identified:</p> <ul style="list-style-type: none"> - Land security especially for irrigated land - Agricultural income-generating activities - Acquisition of technical and sustainable management skills of agricultural farms and landscapes - Advisory support on climate-resilient practices - Recognition and representation within local decision-making 	<ul style="list-style-type: none"> - Prioritization of women in access to agricultural land and practices, which also improves the nutritional value of locals - Capacity building of women in terms of planning and sustainable management of agricultural activities - Capacity building of women in terms of leadership, negotiation and knowledge of their rights - Support of the environment fund in its readiness process to become an instrument for climate and environment resource mobilization. - Networking of women producers
Rural youth (women and men) Associations	<ul style="list-style-type: none"> - Difficulty in accessing land, seeds, inputs etc. - Knowledge limited to traditional and 	<ul style="list-style-type: none"> - Involvement and economic empowerment in agriculture - Successful young 	<ul style="list-style-type: none"> - Prioritization of youth in access to agricultural land and practices, which also

	sustainable practices in agricultural activities - Lack of opportunity other than agriculture determining exodus / migration - Weak organizational capacity	associations, using climate resilient techniques and technologies Potential needs identified: - Land security especially for irrigated land - Acquisition of skills on sustainable agricultural practices - Access to agronomic information - Acquisition of managerial and sustainable management capacities to ensure the profitability of agricultural activities	improves the nutritional value of locals - Professionalization of young people in agriculture (maintenance and installation of water infrastructures) - Capacity building of youth in terms of planning and sustainable management of agricultural activities - Networking of young rural farmers
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107. Such empowerment will ensure that the greatest value is attached to local natural resources and local commitment in each of the three SIDS, which could result in a business case for production systems and improve their financial and ecological sustainability. For instance, reclaimed water systems for irrigation, access to the drip irrigation system and solar energy for pumping will allow significant savings in terms of energy and water pricing. This will ensure that the agricultural activities are more profitable and sustainable. This reinforces the autonomy and financial independence of the beneficiaries organized into user associations.

108. The support of the Programme will be intensified at the beginning and will be declining in order to strengthen national structures to make them increasingly autonomous and capable of supporting monitoring systems, capacity building for stakeholders and advocacy for the reduction of barriers to sustainable agricultural practices. At the regional level, a study is envisaged for the implementation of internal resource mobilization strategies for agricultural organizations to contribute to the financing of monitoring cross-border flows and agricultural barriers.

109. The long-term cost-effectiveness therefore relies largely on the capacities of the beneficiary populations to understand their agrarian systems and recover from climatic shocks and stresses. The operational arrangement will obey the following major principles:

- Any interventions of the Programme in favor of a beneficiary group will be accompanied by capacity building in terms of management, accounting, monitoring and evaluation, in order to guarantee the sustainability of the results and the impacts produced;
- The participation of target groups, especially the poorest, will be guaranteed by participatory diagnostic / planning processes (at community or municipality level), information and training,

- which will target the most vulnerable population (women, young people, smallholders);
 - The Programme will support the training and activities of resource persons, who will be relays from their community and most likely will remain in their community to be able to disseminate the knowledge and practices acquired with the support of the Programme;
 - The systematic integration of a gender and youth approach in the implementation of the activities will be required. The Programme will ensure that at least 50% of the beneficiaries are women and youth groups;
 - The local know-how will be systematically encouraged and technical innovations will also be developed.
110. With regard to the financing of the maintenance of infrastructure and equipment, an infrastructure and equipment maintenance fund will be set up and housed in a financial institution. At the end of each agricultural year or at the end of a period to be agreed with the users, the users' associations will pay an amount representing the membership fees agreed with them. The amount of each member's contribution will be defined on the basis of two main criteria:
- a. The amount must be sufficient to cover all the membership fees to cover the cost of maintaining the membership.
 - b. The amount must be bearable by the users, i.e. taking into account the profit margins that their activity allows. This profit margin can be obtained from a financial analysis.
111. Overall the sustainability will depend on i) the financial and economic profitability of proposed investments; (ii) strengthened public institutions; (iii) better equipped youth training institutions stressing youth and women leadership; (iv) empowered and autonomous farmers' organizations and water user associations at all levels that build the communities' sense of ownership and their operation and maintenance capacity; (v) sustainable and well-managed infrastructure by communities and Farmers Organizations; (vi) clear operation and maintenance arrangements and responsibilities for large and complex infrastructure and; (vii) the promotion of a more structured approach to value chain support.
112. The regional project will be implemented according to the country-implementing modality. This will increase the financial resources devoted to project activities as compared to the direct implementation modality. Under the direct implementation modality many resources are managed by other partners. This increases transaction costs and thus reduces the volume of resources invested in the field.
113. Although water management infrastructure, renewable energy infrastructure and equipment, land degradation control works and the irrigation system are expensive, their added value will depend on (i) their quality, (ii) the capacity of users to maintain them through training, (iii) the operational management system including user associations and government technical services, (iv) the establishment of a fund dedicated to their maintenance, and (vi) their efficiency. The proposed works are recognized as being efficient in terms of water supply, renewable energy production, restoration of degraded land and water control.
114. A more thorough cost effectiveness analysis will be carried out at the fully developed proposal stage to compare the costs, benefits and effectiveness of the proposed resource allocation with measurable outcomes to other options per location

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

115. The proposed project is fully consistent with the national development policies, plans and strategies of Cabo Verde, Guinea-Bissau and STP as well as with relevant regional strategies and agreements. While Cabo Verde is a lower MIC, Guinea Bissau and STP are UN Least-Developed Countries (LDC) and have developed their National Development Plan. These describe each country's macroeconomic, policies in support of growth and poverty reduction, associated external financing needs and major sources of financing. In this context, the Growth and Poverty Reduction Strategy (GPRS) and the National Development Plans (NDP) integrate the agricultural sector's strategies to fight against poverty. Similarly, the Programme will contribute to poverty reduction and improve food security in the most vulnerable communities of the three SIDS through capacity building of local actors, climate information and practices to help producers and governments make climate smart decisions, reduce the vulnerability of agricultural systems and conflicts between producers as well as through the regional knowledge dissemination related to climate change adaptation in agriculture.
116. The Programme will contribute to progress towards the Third National Communication on Climate Change to the United Nations Framework Convention on Climate Change (UNFCCC) of Cabo Verde, Guinea-Bissau and STP¹⁷. These National Communications predict that both high and low emissions scenarios from climate models at national levels will have significant increase in the average temperature. These reports emphasise the need to strengthen climate risk strategies and integrate development needs into policy and planning, which is one of the objectives of this project.
117. The project will also support the implementation of the National Adaptation Programmes of Action (NAPA) in each country, with an emphasis on preparing for adaptation in line with the recommendations of the UNFCCC and the Kyoto Protocol¹⁸. The NAPA for each country aims at identifying priority adaptation needs in order to better reduce and/or mitigate climate change, implement early warnings and forecast measures to adverse impacts of climate change. The programme will support and respond to these through climate-smart agricultural practices proposed in Component 1, partnerships and capacity-buildings proposed in Component 2 of the programme as well as the knowledge sharing in Component 3.
118. The programme is also consistent with the Intended Nationally Determined Contributions (INDC) of each country, which are reference documents for actions in the field of climate resilience¹⁹. NDCs describe each country's adaptation and investment priorities, analyse knowledge on best practices for climate-smart agriculture and/or co-benefits adaptation and mitigation measures. The implementation of climate-resilient measures in the three SIDS proposed in the programme addresses the NDCs.

Consistency with Sao Tome e Principe, Cabo Verde, Guinea Bissau strategies

119. **With SDGs.** Implementation of SDG's is a huge challenge for many developing countries, especially for SIDS like STP, Guinea Bissau, Cape Verde, because of the number of objectives (17), the number of targets (169), the number of indicators (231) and their overall complexity. This leads these countries Sao Tome and Principe, Cap Verde, Guinea Bissau to prioritize the SDGs to be implemented. This project is aligned with SDG13, which is "*Take urgent action to combat climate change and its impacts*" and the SDG 14 "*Protecting, restoring and promoting the sustainable use of*

¹⁷ STP: https://unfccc.int/sites/default/files/resource/TCN_Vers%C3%A3o_Final_EN_v11.pdf

Cape Verde: https://www4.unfccc.int/sites/SubmissionsStaging/NationalReports/Documents/0136895_Cabo%20Verde-NC3-1-Cabo%20Verde%20-%20Third%20National%20Communication%20on%20Climate%20Change.pdf
Guinea-Bissau: https://unfccc.int/sites/default/files/resource/TCN_Guinea_Bissau.pdf

¹⁸ <https://unfccc.int/topics/resilience/workstreams/national-adaptation-programmes-of-action/napa-background>

¹⁹ Guinea-Bissau:

[https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Guinea%20Bissau%20First/GUINEA-BISSAU_INDC_Version%20to%20the%20UNFCCC%20\(eng\).pdf](https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Guinea%20Bissau%20First/GUINEA-BISSAU_INDC_Version%20to%20the%20UNFCCC%20(eng).pdf)

STP:

https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Sao%20Tome%20and%20Principe%20First/STP_INDC%20_Ingles_30.09.pdf

terrestrial ecosystems, sustainably managing forests, combating desertification, halting and reversing degradation and to prevent loss of biodiversity, but also SDG 1 (no poverty) and SDG 2 (zero hunger) to reduce poverty and food insecurity". Through mastering water and adoption of resilient crops activities, this project will be contributing to STP, GB and CVe efforts to meet targets related to the aforementioned SDGs and assist countries in meeting their nationally determined contributions (NDCs) and the Paris Climate agreement.

120. **With the National Development Plan.** This Program is in line with the priorities of the National Development Plans of Sao Tome and Principe, Cape Verde, and Guinea Bissau. In the selected countries, the diversification of the economy and broadening its productive base is at the center of the national policies to cope with climate shocks. It is planned to increase the productivity of traditional sectors such as agriculture and fisheries with a view to improving food security and reducing imports. In the same framework, two programmes are planned which will be reinforced by the SIDS programme. These are, (i) the "Integrated Rural Development" Programme, which targets capacity building for rural communities most exposed to the effects of climate change, and (ii) the "Sustainable Management of Natural Resources" Programme, which provides for a set of measures to promote the preservation of a healthy environment and the rational use of forest resources, including non-timber resources, the improvement of water management and the fight against soil erosion and deforestation. This presented SIDS Programme will contribute to the objectives of the following programmes: "Promotion of Climate Resilient Agriculture", "Improvement of the Meteorological Monitoring, Prediction and Vigilance Network" and the "Project for Adaptation to the Effects of Climate Change in at the local level
121. The participating countries are parties to the United Nations Framework Convention on Climate Change (UNFCCC), have signed, and ratified the Kyoto Protocol. By ratifying the UNFCCC, these countries have committed to implementing measures to adapt to climate change and reporting on their NDCs.
122. The programme will contribute to the implementation of objectives of the three Rio conventions ratified by all countries, including the UNFCCC, as well as the Paris Climate Agreement, the SDGs and the Sendai Framework for Disaster Risk Reduction.
123. This programme is fully aligned with the countries' national development plans and their national commitments on climate mitigation and adaptation included in their NAPAs, National Climate Change Policies and Strategies, NDCs, National Communications (NCs), Agricultural sector policies, agricultural investment plans, SDGs and National Strategies for Disaster Risk Reduction in the selected countries .

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

124. All IFAD supported donor funded projects are required to follow the mandatory requirements outlined in the IFAD manual of implementation. This includes the requirement that all IFAD development solutions must always reflect local circumstances and aspirations and draw upon national actors and capabilities as mentioned in the COSOPs. The project will comply with the Environmental and Social Policy of the Adaptation Fund as described in Section L, and IFAD's environmental and social safeguards standards that are aligned with international standards. IFAD has an internal Environmental and Social Impact Assessment's (ESIA) quality control procedure, namely its Social, Environmental and Climate Assessment Procedures (SECAP), which is applied to all projects. During preparation of the full proposal, the individual interventions will be assessed and adapted where necessary to ensure full compliance.
125. In addition, all IFAD supported donor funded projects are appraised before approval. During appraisal, appropriate IFAD representatives and stakeholders ensure that the project has been

designed with a clear focus on agreed results. The appraisal is conducted through the formal IFAD review quality process. Appraisal is based on a detailed quality-programming checklist, which ensures, amongst other issues, that necessary safeguards have been addressed and incorporated into the project design.

126. In addition, regional technical standards will be developed for the establishment of the selected activities, and the selection of the locations of these activities will be guided by criteria developed through the project, which will take account of zoning, IFAD targeting strategy regulations and other relevant requirements in each country. Where required, EIAs will be conducted prior to implementation of activities.

127. **Table 6** below lists national legislations that are relevant for implementation of the Programme in each of the three SIDS countries.

São Tomé and Príncipe		
Name	Key Objectives	Potential Synergies with the Programme
Framework Law on the Environment (Law no. 10/99)	The Basic Law on Environment defines the basis for national environment policy, adopting in the internal legal system the principles established in most international instruments such as sustainable development.	Output 1.1. Establishment of a resilient agricultural system at both the farm and landscape scales Output 2.1 : Strengthened capacity of climate risk governance structures Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management Output 2.3. Functional mechanisms for coordination and information flow between institutions involved in climate resilient agriculture initiatives in the country
Law on the Preservation of Fauna, Flora and Protected Areas (Law no.11/99)	This Law provides basic legislation for flora and fauna conservation and protected areas with the aim of protecting biological diversity and promoting, at the same time, its social and economic sustainable use. In particular, the Law allocates areas of national territory to the preservation of habitats and biodiversity (NBSAP). This law disregarded the marine environment in what is concerning the establishment of marine protected areas (MPAs).	Output 1.1. Establishment of a resilient agricultural system at both the farm and landscape scales Output 1.2. Restoration of watersheds in order to produce intelligent landscapes in the face of climate change Output 1.3. Improved water harvesting and distribution infrastructure for sustainable use Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management
Legal regime of environmental impact assessment (Decree Law no. 37/99)	This Law defines the rules and principles establishing the requirements to be satisfied in order to authorize activities which could damage the environment (to be authorized by an EIA licence)	Output 1.1. Establishment of a resilient agricultural system at both the farm and landscape scales Output 1.2. Restoration of watersheds in order to produce intelligent landscapes in the face of climate change Output 1.3. Improved water harvesting and distribution infrastructure for sustainable use

		<p>Output 2.1 : Strengthened capacity of climate risk governance structures</p> <p>Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management</p> <p>Output 2.3. Functional mechanisms for coordination and information flow between institutions involved in climate resilient agriculture initiatives in the country</p>
Regulation of the distribution of State agricultural lands (Decree-Law No. 51/91)	This Decree-Law establishes land concession requirements in order to develop and to improve the agricultural sector	<p>Output 1.1. Establishment of a resilient agricultural system at both the farm and landscape scales</p> <p>Output 1.2. Restoration of watersheds in order to produce intelligent landscapes in the face of climate change</p> <p>Output 1.3. Improved water harvesting and distribution infrastructure for sustainable use</p> <p>Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management</p> <p>Output 2.3. Functional mechanisms for coordination and information flow between institutions involved in climate resilient agriculture initiatives in the country</p>
Land Management Act - Law on the Management of State Land Property (Law no. 3/91)	This Law defines the framework regime for government owned law ownership, identifying public and private property of the state. Besides, it defines basis for private use lands under public regime, especially for distribution for investment purposes.	<p>Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management</p> <p>Output 2.3. Functional mechanisms for coordination and information flow between institutions involved in climate resilient agriculture initiatives in the country</p>
Requirements for coastal sand extraction (Decree No. 35/99)	This Decree establishes the conditions in order to perform the aforementioned activity within coastal and inland river areas. It concerns licensing, beach selection, environmental impact assessment, sanctions to be paid for illegal activity, etc.	<p>Output 1.1. Establishment of a resilient agricultural system at both the farm and landscape scales</p> <p>Output 1.2. Restoration of watersheds in order to produce intelligent landscapes in the face of climate change</p> <p>Output 1.3. Improved water harvesting and distribution infrastructure for sustainable use</p> <p>Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management</p>
Water Resources Legal Framework (Law No. 07/2018)	This Law aims at managing and protecting inland water resources of public domain, whether	Output 1.2. Restoration of watersheds in order to produce intelligent landscapes in the face of climate change

	superficial, transitional, coastal, or groundwater waters	Output 1.3. Improved water harvesting and distribution infrastructure for sustainable use Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management
Forestry Law (Law No. 5/2001)	This Law provides a classification of forest according to protection requirements, production and forest uses. Moreover, it institutes a national Forestry plan and a special fund. Finally, it regulates control measures and defines applicable penalties	Output 1.1. Establishment of a resilient agricultural system at both the farm and landscape scales Output 2.1 : Strengthened capacity of climate risk governance structures Output 2.3. Functional mechanisms for coordination and information flow between institutions involved in climate resilient agriculture initiatives in the country
Legal System for Individual Employment Terms (Law no. 6/92)	This law defines the legal regime of individual working conditions, which is adapted to the new economic and social order of the country	Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management Output 2.3. Functional mechanisms for coordination and information flow between institutions involved in climate resilient agriculture initiatives in the country
Guinea-Bissau		
Name	Key Objectives	Potential Synergies with the Programme
Framework Law on the Environment (Law no. 1/2011)	This law defines the basic concepts and specifies the norms, and the basic principles related to policies and activities of protection, preservation and conservation of the environment of the country. It also promote the improvement of the quality of life through a correct management of the National environment and a rational use of natural resources, in order to optimize and to guarantee the sustainability and continuity of the use of such resources. In addition, it creates the Environmental Fund	Output 1.1. Establishment of a resilient agricultural system at both the farm and landscape scales Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management Output 2.3. Functional mechanisms for coordination and information flow between institutions involved in climate resilient agriculture initiatives in the country
Legal framework of protected areas (Decree-Law No. 5-A/2011)	This law establishes in particular classification and declassification of protected areas and lays down competencies and composition of the responsible authorities in order to protect the natural ecosystems, fauna and flora, and	Output 1.1. Establishment of a resilient agricultural system at both the farm and landscape scales Output 1.2. Restoration of watersheds in order to produce intelligent landscapes in the face of climate change

	promote its sustainable development	<p>Output 1.3. Improved water harvesting and distribution infrastructure for sustainable use</p> <p>Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management</p>
Legal framework and region on Environmental Impact Assessment (Law No. 10/2010)	It specifies the legal framework and regime to be satisfied by research, environmental and social impact assessment, as well as the requirements to be satisfied for obtaining natural resources use licensing through controls to be carried out on projects, programmes, public or private policies, which may impact on the natural environment and human health	<p>Output 1.1. Establishment of a resilient agricultural system at both the farm and landscape scales</p> <p>Output 1.2. Restoration of watersheds in order to produce intelligent landscapes in the face of climate change</p> <p>Output 1.3. Improved water harvesting and distribution infrastructure for sustainable use</p> <p>Output 2.1 : Strengthened capacity of climate risk governance structures</p> <p>Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management</p> <p>Output 2.3. Functional mechanisms for coordination and information flow between institutions involved in climate resilient agriculture initiatives in the country</p>
Land Management Act (Act No. 5/98)	This law regulates land-use planning and rational exploitation of land. Agricultural land exploitation areas shall not exceed 300 ha, but the Council of Ministers may authorize land-use concessions to cooperatives and national or foreign companies for areas not exceeding 1500 ha. This Law lays down the requirements to be satisfied in order to obtain a land concession (including entities benefiting from a free concession and different types of authorization)	<p>Output 2.1 : Strengthened capacity of climate risk governance structures</p> <p>Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management</p> <p>Output 2.3. Functional mechanisms for coordination and information flow between institutions involved in climate resilient agriculture initiatives in the country</p>
Statute of Overseas Services for Agriculture and Forests (Decree No. 48.198)	This Decree specifies the composition, duties, and competencies of the aforementioned services, entitled to manage and control natural resources. Their aim being forestry and agricultural exploitation	<p>Output 1.1. Establishment of a resilient agricultural system at both the farm and landscape scales</p> <p>Output 1.2. Restoration of watersheds in order to produce intelligent landscapes in the face of climate change</p> <p>Output 1.3. Improved water harvesting and distribution infrastructure for sustainable use</p> <p>Output 2.2. Strengthened organizational capacities of communities in irrigation</p>

		<p>infrastructure and resource conflict management</p> <p>Output 2.3. Functional mechanisms for coordination and information flow between institutions involved in climate resilient agriculture initiatives in the country</p>
New Forestry Law (Decree-Law No. 5/2011)	<p>It aims at: (i) the promotion of the sustainable exploitation of forestry resources; (ii) the optimization for the socio-economic and cultural development in line with the protection and preservation of the natural environment and; (iii) the improvement of the quality of life of the population, through the promotion and rational exploitation of forestry resources within the territory</p>	<p>Output 1.1. Establishment of a resilient agricultural system at both the farm and landscape scales</p> <p>Output 2.1 : Strengthened capacity of climate risk governance structures</p> <p>Output 2.3. Functional mechanisms for coordination and information flow between institutions involved in climate resilient agriculture initiatives in the country</p>
Water Code (Decree-Law No. 5-A/1992)	<p>This Law defines the legal regime of all activities relevant with water management and the institutional framework in order to: (i) implement the national policy on water rights; (ii) guarantee the control and management on water resources; (iii) regulate water uses for domestic, rural, agricultural, industrial, hydropower or other purposes (including navigation, aquaculture) and; (iv) guarantee the protection of the water quality in order to avoid freshwater pollution or its waste</p>	<p>Output 1.2. Restoration of watersheds in order to produce intelligent landscapes in the face of climate change</p> <p>Output 1.3. Improved water harvesting and distribution infrastructure for sustainable use</p> <p>Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management</p>
Worst Forms of Child Labour Convention, 1999 (No. 182) (Ratification: 2008)	<p>Through this law, the country should take immediate and effective measures to secure the prohibition and elimination of the worst forms of child labor as a matter of urgency. The term child labor applies to all persons under the age of 18</p>	<p>Output 1.1. Establishment of a resilient agricultural system at both the farm and landscape scales</p> <p>Output 1.2. Restoration of watersheds in order to produce intelligent landscapes in the face of climate change</p> <p>Output 1.3. Improved water harvesting and distribution infrastructure for sustainable use</p> <p>Output 2.1 : Strengthened capacity of climate risk governance structures</p> <p>Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management</p> <p>Output 2.3. Functional mechanisms for coordination and information flow between institutions involved in climate resilient agriculture initiatives in the country</p>

Cape Verde		
Name	Key Objectives	Potential Synergies with the Programme
Environmental Policy (Law No. 86/IV/93)	This Law establishes the Environmental Policy aiming at improving and guaranteeing the continuous use of natural resources for an autonomous development	<p>Output 1.1. Establishment of a resilient agricultural system at both the farm and landscape scales</p> <p>Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management</p> <p>Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management</p> <p>Output 2.3. Functional mechanisms for coordination and information flow between institutions involved in climate resilient agriculture initiatives in the country</p>
Legal regime for the management of protected areas (Decree-Law No. 3/2003)	This Decree-Law establishes the legal regime in order to manage and control protected areas, according to the importance of their biodiversity, natural resources, ecological function, socio-economic and touristic interest.	<p>Output 1.1. Establishment of a resilient agricultural system at both the farm and landscape scales</p> <p>Output 1.2. Restoration of watersheds in order to produce intelligent landscapes in the face of climate change</p> <p>Output 1.3. Improved water harvesting and distribution infrastructure for sustainable use</p> <p>Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management</p>
Regulation of the Environmental Impact Assessment (Decree-Law No. 29/2006)	This Law regulates the Environmental Impact Assessment (EIA) required for those public and private projects potentially harmful for the environment. The Decree-Law individuates all concerned institutions and characterizes their related competences; moreover, it defines EIA components and procedures; finally, it regulates monitoring and audit requirements, as well as applicable sanctions.	<p>Output 1.1. Establishment of a resilient agricultural system at both the farm and landscape scales</p> <p>Output 1.2. Restoration of watersheds in order to produce intelligent landscapes in the face of climate change</p> <p>Output 1.3. Improved water harvesting and distribution infrastructure for sustainable use</p> <p>Output 2.1 : Strengthened capacity of climate risk governance structures</p> <p>Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management</p> <p>Output 2.3. Functional mechanisms for coordination and information flow between institutions involved in climate resilient agriculture initiatives in the country</p>

Law on land use (Legislative Decree No. 2/2007)	This Legislative Decree defines principles and rules related to land use of both public and private bodies. Particular attention is paid to regulate land sale, rent and concession. The Decree establishes sanctions to any activity undermining the sustainable use of land. In addition, the Legislative Decree provides for a land registration.	Output 2.1 : Strengthened capacity of climate risk governance structures Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management Output 2.3. Functional mechanisms for coordination and information flow between institutions involved in climate resilient agriculture initiatives in the country
Law on land tenure (Law No. 05/VII/2007)	This Law authorizes the Government to rule on land legal order and to review the basic legislation on public expropriation provided by Law No. 2030 of 1948. To this end, the Law lists the fields of application of the above-mentioned authorization.	Output 2.1 : Strengthened capacity of climate risk governance structures Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management Output 2.3. Functional mechanisms for coordination and information flow between institutions involved in climate resilient agriculture initiatives in the country
Forestry Activity Law (Law No. 48/V/98)	This Law authorizes activities to be performed by public and private entities in order to protect national forests. It applies to trees and forests which are not cultivated for agricultural purposes, to the exercise of forestry activity and to land subject to the forestry regime or likely to be afforested within Cape Verde and provided that it is not intended for predominantly agricultural activities. It also establishes national administration competencies and actions to be carried out by the Government of Cape Verde for managing forestry resources.	Output 1.1. Establishment of a resilient agricultural system at both the farm and landscape scales Output 2.1 : Strengthened capacity of climate risk governance structures Output 2.3. Functional mechanisms for coordination and information flow between institutions involved in climate resilient agriculture initiatives in the country
Law on Water and Sanitation Code (CAS) (Legislative Decree No. 3/2015)	This CAS defines the fundamental principles for water resources, setting standards that guarantee their preservation, quality, sustainability and rational use. In addition, it establishes the definition of public systems of water supply and sanitation as well as the mechanisms of economic and financial sustainability and the establishment of enforcement mechanisms of water resources and is applicable to all existing water resources in the soil,	Output 1.2. Restoration of watersheds in order to produce intelligent landscapes in the face of climate change Output 1.3. Improved water harvesting and distribution infrastructure for sustainable use Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management

	subsurface and atmosphere of the Cape-Verdean territory	
Legal regime of license and concession for water resources use (Decree-Law No. 75/99)	This Decree-Law applies for all activities related to: potable and treated water production, including transport, processing, storage and desalination. Water supply, including distribution and selling re-used waters for public uses, in particular for industry and agriculture. Collecting services, effluent treatment and re-use, including rainwater. It specifies that Basic Water Sanitation Services must satisfy specific objectives and principles.	<p>Output 1.2. Restoration of watersheds in order to produce intelligent landscapes in the face of climate change</p> <p>Output 1.3. Improved water harvesting and distribution infrastructure for sustainable use</p> <p>Output 2.2. Strengthened organizational capacities of communities in irrigation infrastructure and resource conflict management</p>

128. During the full proposal development, assessment against the national standards for each country will be further developed. For each standard, requirements in the Programme and how these standards will be met will be further developed at the project development phase.

129. As for child labor potential risk in Guinea Bissau, Table 7 below summarizes policies established by the Government in Guinea Bissau, with regards to child labour and at design stage key mitigation measures will be implemented under the ESMP and in line the fund safeguards :

Policy	Description
National Policy for the Protection of Children and Adolescents (2018–2030)	Guides the government's policies for combating violence towards children, including child labor. Research was unable to determine whether activities were undertaken to implement this policy during the reporting period.
National Action Plan on Human Trafficking (2015–2018)	Guided the government's efforts to prevent and combat trafficking in persons. In 2018, policy was not implemented due to a lack of funding.
Code of Conduct Against Sexual Exploitation in Tourism	Seeks to raise awareness on commercial sexual exploitation of children and child trafficking in Guinea-Bissau, particularly in the Bijagós Archipelago. In December 2018, IMC conducted an awareness session with hotel and night club owners on the Code. Awareness campaigns also took place in Bissau and in the Bijagós Archipelago, where girls are known to be engaged in commercial sexual exploitation.
UN Country Partnership Framework (2016–2020)	Aims to assist in promoting free and universal birth registration, and enforcing human trafficking and child labor provisions. Since 2016, helped IMC reintegrate 132 talibés with their families; and provided access to shelter, schools, and psychological and medical assistance. In 2018, conducted awareness raising activities on talibés to more than 1,500 people throughout Gabú and Bafatá. In addition, held capacity-building trainings on enhancing criminal justice response to trafficking in persons and strengthening the protection of victims to over 40 stakeholders, including Judicial police, National Guard and NGOs working with human trafficking victims.

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

130. The project will build on the experience of completed and ongoing projects. More specifically, it will

be implemented in synergy and complementarity with existing IFAD projects such as the REDE in Guinea Bissau and the COMPRAN in Sao Tome and Principe. It will also build on the experience from the POSER Climat project in Cape Verde.

131. There is no duplication of the project compared with other funding sources. However, opportunities for mutual exchanges or synergies exist with respect to initiatives already existing or under implementation including PAPAC project to support agricultural development in
132. **Sao Tome and Principe** co-financed by AFD and ILO. The project will work in synergy with the AfDB/GEF project “Strengthening Resilience and Adaptive Capacity to Climate Change in São Tomé and Príncipe’s Agricultural and Fisheries Sectors”, especially in the areas of Rural infrastructure development, building capacities of fishermen. It will also learn from the FAO/GEF project “Landscape Restoration for Ecosystem Functionality and Climate Change Mitigation in the Republic of Sao Tome e Principe” on issues related to climate change adaptation and land degradation. Other experience from previous projects funded by the GEF/LDCF will be also collected. This SIDS project will take into account lessons learnt and achievements from the World Bank WACA project whose objective is to strengthen the resilience of targeted communities and areas in the coastal regions of West Africa. Areas of synergy exist between this SIDS project and the WACA component 3 focusing on implementation of medium-scale coastal adaptation infrastructures, maintenance of drainage and revegetation.
133. Collaboration will be established with the project of “Integrated ecosystem approach for the management and conservation of biodiversity in the buffer zones of the Obô Natural Parks of São Tomé and Príncipe” funded by a Global Environment Facility (GEF) grant of USD 2.418 million, the project was formulated among others to promote the development of traditional (coffee and cocoa) and non-traditional (livestock, food crops) value chains.
134. UNDP has developed a project on “Strengthening climate information and early warning systems in Western and Central Africa for climate resilient development and adaptation to climate change – São Tomé and Príncipe”. In its component 2, it plans to implement “Efficient and effective use of hydro-meteorological and environmental information for making early warnings and long-term development plans”. Achievements related to these specific plans will be used by the SIDS project in Sao Tome as it is anticipated to convey climate information to farmers on due time.
135. In **Guinea Bissau**, the project will capitalize on the experiences of other technical and financial partners as well as the knowledge acquired from IFAD in similar projects (e.g. ProDAF and PASADEM in Niger as well as the experiences of the farmer organization MVIWATA in Tanzania with funding from AFD and the European Union). The project will seek to develop synergies with national and international partners present in the four regions of intervention which are Gabú, Cacheu, Bafatá and Oio to ensure the relevance and consistency of the targeting strategy and interventions with beneficiaries.
136. Because of the common interest in coastal areas, more specifically in mangrove ecosystem, the project will develop synergies with the current **LDCF/UNDP project** whose objective is “To strengthen the adaptive capacity and climate resilience of vulnerable coastal communities to climate risks in Guinea-Bissau”. This SIDS programme will build on current activities undertaken within the LDCF/UNDP project especially on mangrove areas, especially climate-proofing, rehabilitation and/or protection of essential fisheries and infrastructures against sea-level rise and coastal degradation, cultivation of lowland rice is protected from climate risks.
137. Complementarity will be sought with the Restoration Initiative (TRI) – Fostering innovation and integration in support of the Bonn Challenge project whose objective is to “To contribute to the restoration and maintenance of critical landscapes to provide global environmental benefits and enhanced resilient economic development and livelihoods, in support of the Bonn Challenge.”. This

GEF/IUCN project plans to implement integrated landscape management practices and restoration plans with a gender approach has similarities with the SIDS project in Guinea Bissau.

138. Further synergy is identified with a GEF/UNDP project which is seeking to increase resilience and enhance key adaptive capacity to address the additional risks posed by climate change to the agrarian and water sectors in Guinea-Bissau will be sought as duplication risks exists between the two project. This GEF/UNDP project seeks to implement among others water conservation, drought and flood management techniques at Pitche and Pirada in North and agriculture and livestock-related management techniques. The SIDS project will build on the experience of this GEF/UNDP project to yield lessons and develop synergies.
139. Some consultations with farmers' organizations have already taken place and this close collaboration will continue during the project development phase. Coordination meetings were held with the World Bank, the Food and Agriculture Organization of the United Nations (FAO), WFP, UNICEF, the African Development Bank and BOAD (which is implementing the "Scaling up climate-smart agriculture in East Guinea Bissau" project funded by the Adaptation Fund and covering the Gabu region, among others, which itself is building from the UNDP/GEF "Strengthening adaptive capacity and resilience to Climate Change in the Agrarian and Water Resources Sectors in Guinea-Bissau" project).
140. In **Cape Verde**, the project will build on the experience of the POSER-Climat project implemented by IFAD and completed POSER project in 2019. It will also learn from the lessons of the UNDP/GEF project "Building Adaptive Capacity and Resilience to Climate Change in the Water Sector in Cabo Verde". This project will also collaborate with the UNIDO project funded by GEF to build on its achievements in the field of seawater desalination and renewable energy. The UNIDO project includes solar-powered seawater desalination units. More specifically, it supports the financing of pilot projects using renewable energy and energy efficiency technologies to mobilize groundwater or seawater resources through desalination.
141. Further analysis of existing and completed initiatives relevant to the project in the three countries will be undertaken during the preparation of the full proposal.

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

142. The project component 3 focuses on knowledge management in the project. This component will consist of i) designing a knowledge management plan (KMP), and ii) implementing the KMP. Concretely, this will consist of capturing, documenting and disseminating lessons learnt from the projects activities both at the local and institutional levels, to target and improve adaptive capacities for resilience in the farming systems in the project area. Monitoring and evaluation activities will also be implemented under Component 3 in order to inform long-term policies and strategies for climate adaptation practices for on-going resilience in the farming systems. The knowledge acquired in the project will be shared on the IFAD's website.
143. The project will carry out an assessment of what existing projects have done on development of knowledge products in the field of adaptation of the agricultural sector to climate change but also more generally in the field of the environment. Thus, the work done by stakeholders, in particular development agencies and NGOs, which will be identified and analyzed, will serve as a basis for the knowledge management activities that this project will implement. Thus, targets for knowledge management, the most appropriate knowledge products for these targets and the most relevant events

will be defined. On the events side, regular regional workshops will be organized to enable the three countries to exchange experiences and learn from each other. These events will be organized in the framework of the activities of the regional platform bringing together the three countries. Beyond this platform, the experiences and lessons learned from this project will also be shared in other wider networks. The project will also participate in international events such as the Conferences of the Parties, and other conferences and fora. The lessons generated by the project will be disseminated through the relevant websites of the different key parties as well as the website of the regional platform that will be created and those of other platforms in which the project will take part. The project will assess the relevance and feasibility of creating a WhatsApp group bringing together key stakeholders from the three countries for the circulation of information and lessons learned from the project activities.

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

144. Addressing adequately the climate change risks in Sao Tome, Cap Verde, and Guinea Bissau requires action both at local and national levels. This is why at this concept note stage, stakeholders have been consulted during field missions which were carried out during the IFAD new design phase in 2019 and gaps in IFAD investments have been identified and aligned with National Action Plans. Following the consultations held with all three National Focal Points, government authorities between in 2019 during the designs of IFAD new investments, supervisions and the scoping mission for the Reimbursable Technical Assistance (RTA) for Cap Verde, and design mission in STP, the concept for this regional programme was endorsed by all Adaptation Fund focal points from participating countries.

145. More elaborated stakeholders' consultations will be carried out during the project full proposal development. Consultations with local stakeholders consisted of meetings with leaders of farmers' organizations. At the national level, consultations included institutions of the Ministry of Agriculture, Fishery and rural development, Ministry of Environment, Ministry of Livestock, Ministry of Economy and finance, NGOs working in the agricultural, sector as well as in the environment sector. The list of set stakeholders met in the selected countries is as follows:

146. At National level

- The services of the Ministries of Agriculture with their relevant Directorates and Departments
- The services of the Ministries of Environment, Forestry with their relevant Directorates and Departments
- The services of the Ministries of Water with their relevant Directorates and Departments
- The Regional Services for Agriculture and local authorities.
- Extension, training and research institutions under the Ministries of Agriculture
- Producers organized in formal groups including
- Civil society through several NGOs.
- Donors (UNDP, World Bank, FAO, AFD, AfDB, IsDB)
- All expressed the importance to support these vulnerable SIDS to address the challenges related to climate change in the agricultural in line with the national climate change plans and policies.

147. At local level

Direct beneficiaries particularly smallholder farmers, youth and women living in the most vulnerable areas to climate change were met around focus groups and direct interactions, the total number of male farmers met was more than the number of females. Key issues were raised and related to their need to better understand climate change specific impacts and associated adaptation options, water access and management, soil degradation (loss of fertility, erosion and salinization), resilience building against floods and violent rainfall and winds among others.

148. The preliminary consultations have provided an opportunity to gather views of stakeholders at the central and local levels on major climate change challenges and responses. Most of the expressed needs in the three countries were around improving agricultural production through climate resilient agricultural practices, Climate-smart landscapes with increased agricultural water supply from watershed restoration practices. Additionally, stakeholders expressed also needs to test and adopt most the suitable technologies/ infrastructures which will lead to increased sustainable use of available water; organizational ,technical and coordination for climate risk governance; knowledge management and sharing experiences between countries. Based on information collected, the components, outputs and activities of this Programme have been proposed.
149. In addition to the participatory analysis of the vulnerability of the agricultural sector to climate change, a certain number of lessons emerged from the preliminary stakeholder consultations. The preliminary consultations took place during IFAD projects designs and adaptation gaps were identified. For Sao Tome, consultations happened during the COMPRAN project design, Guinea Bissau during REDE project design and for Cap Verde during a technical assistance mission in 2019 Thanks to the previous interventions of IFAD and its partners, and new investments, producer associations and cooperatives are well constituted and their roles are well understood and needs well identified. These organizations function quite well, but need further technical and financial capacity building to make them more dynamic. While IFAD projects support development objectives, preliminary consultations shows the lack of understanding of the climate challenges and the appropriate actions required on the part of the staff of national and sub-national government structures, NGOs and producers.
150. The bottom up approach promoted during the consultations processes promoted ownership and led to initial expression of needs with regard to closing the gender gap in agriculture. These needs are women's access to resources access and control of productive asset including inputs and technologies; women's integration into more profitable / remunerative economic activities and income diversification, women's involvement in operational contexts; women integration into nutrition education campaigns, promotion of access to drinking water, hygiene and sanitation. In addition; expressed needs are targeting female and male youth (under thirty years old) engaged in primary production and (mainly) value-addition initiatives; social protection system; employment and jobs , women inclusion into decision making processes and in all exchanges visits and experiences sharing (at least 50%). These concerns have been used to define the project outcomes. More details on specific concerns related to gender issues have been captured in the gender initial assessment. To mention a few, these are: targeting strategy will focus on women and gender sensitivity, facilitating women's access to resources, control over resources, facilitate women's access to inputs (quality seeds, livestock feed, etc.) and to modern irrigation equipment to increase productivity and reduce the drudgery of tasks (dewatering system / modern irrigation), support for women's integration into more profitable, participation of women in all exchanges visits and experiences sharing, contribute to the consolidation of the jobs of women and young producers and related trades in the value chains into the links of processing and marketing by strengthening their capacity and staffing of small equipment

Table 8. List of stakeholders met to date in the three countries.

Sao Tome and Principe

Types of stakeholders	Names
MOPIRNA (Ministry of Public Works, Infrastructures, Natural Resources and Environment)	Environmental technical unit
DGA (Directorate-General for Agriculture)	Technical unit
Ministry of Agriculture, Rural Development and Fisheries	Livestock technical unit

GEF (Global Environment Facility)	Lourenco Monteiro de Jesus, Operational Focal Point
GCF (Green Climate Fund)	Fausto Policarpo Abreu das Neves, National Designated Authority
Adaptation Fund	Victor Manuel Bofim
CEPIBA (Pepper and Vanilla Export Cooperative)	Focus group
CECAFEB (Organic Coffee Export Cooperative)	Focus group
CIAT (Agronomic and Technological Research Centre)	Focus group
CECAB (Organic Cacao Export Cooperative)	Antonio Dias, Director
CECAQ -11 (Quality Cacao Export Cooperative)	Adalberto Ferreira Luís, Executive Director
MARAPA NGO (Sea, Environment and Small-scale Fishing)	Manuel Jorge de Carvalho do Rio, President
NGO Oikos– Cooperação e Desenvolvimento (Cooperation and Development)	Bastien Loloum, Representative
BirdLife International NGO	Jean Baptiste Deffontaines, Head of Project Office
Alisei NGO	Focus group on gender
IFAD	IFAD project team

Guinea-Bissau

Types of stakeholders	Names
GEF (Global Environment Facility)	Joao Raimundo Lopes, Operational Focal Point
GCF (Green Climate Fund) and Adaptation Fund	Viriato Cassamá, National Designated Authority
ENAS (National Agency for Water and Sanitation)	Inacio Pereira, Executive Administrator
Instituto Nacional de Meteorologia da Guiné-Bissau	Cherno Luis Mendes, Director do Serviço da Rede de Observação Meteorologica e Apoio Técnico
Secretariat d'Etat à l'Environnement et à la Biodiversité	Quitè Djata, Secrétaire
Network of farmers organizations in Biombo	Representatives and members
Network of farmers organizations in Bolama-Bijagos	Representatives and members
Network of farmers organizations in Cacheu	Representatives and members
Network of farmers organizations in Gabu	Representatives and members
Network of farmers organizations in Tombali	Representatives and members
IFAD	IFAD project team

Cape-verde

Types of stakeholders	Names
Minister of Agriculture and Environment	Gilberto Correia Carvalho Silva, Minister
CERMI (Center of Renewable Energies and Industrial Maintenance)	Gilson Correia, Administrator

INDP (National Institute for Fisheries Development)	Maria Ivonne Lopes, Representative
INIDA (National Agricultural Research Development Institute)	Nora Silva, Focal Point UCP POSER in INIDA
INMG (National Institute of Meteorology and Geophysics)	Maria da Cruz Soares, President
GCF (Green Climate Fund)	Gilson Gomes Pina, National Designated Authority
Adaptation Fund	Maria Da Cruz Gomez Suarez
World Bank	Fatou Fall, Liaison Officer/Resident Representative
Ministry of Finance	Representatives
Ministry of foreign affaires	Representatives
Cooperatives in Praia	Technical unit
UNDP (United Nations Development Programme)	Boubou Camara, Deputy Representative
Alisei NGO	Focus group on gender
Cooperatives	Members
IFAD	IFAD projects team POSER C
Praia IFAD supported POSER funded beneficiaries	Focus groups with 5 communities and farmers organizations in 6 valleys

151. Stakeholders' consultations went beyond the content of National Communications and NSCs and NAPAs to gather information on farmers' perceptions of climate risks in their activities. Once climate risks were identified, adaptation measures were proposed. The concrete adaptation actions proposed in this project took into account the measures proposed by farmers during the consultations.

152. In order to complete and validate the identified preliminary set of activities, additional consultation workshops will be organized in the three countries during the design process, including one regional workshop targeting participants from the three countries. This includes consultation of farmers, open dialogues with, smallholder farmers, fishermen, local and national governments, private sector and CSOs, youth and women on possibilities of adaptation to the effects of climate change, the fight against food insecurity, capacity building and knowledge exchanges.

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

153. Without the programme, lasting periods of drought and floods especially in arid and semi-arid agricultural regions in Cape Verde, Guinea-Bissau and STP are going to be more severe due to climate change. On top of that, saline water intrusion is going to amplify due to sea level rise resulting from climate change as well. This will significantly affect existing crops and cause loses or declines in production and productivity. Poor soil health can lead to abandonment of agriculture areas, displacement of producers and non-resilient farming techniques such as mangrove destruction to create new paddies. Thus, climate variability is one of the drivers for unsustainable land uses, which reduce the quantity and quality of water, degrade soils, pollute, and reduce forest cover and other ecosystem services. This increases poverty and hunger, in particular in vulnerable communities whose livelihoods depend on crop, livestock, fish, trees and other natural resources. This also creates diseases and conflicts among different beneficiaries of such natural resources. The continue practice of unsustainable land uses is going to reinforce the adverse effects of climate change and emit more GHGs.

154. In this context, there is a need to find an approach that promotes a sustainable combination of techniques and technologies that better controls and manages water as well as rehabilitates and

manages soil in order to enhance the beneficiaries' resilience, improve their productions and incomes, and contributes to the mitigation of GHGs. The programme proposes to build climate-resilient agricultural systems in the three SIDS by securing water resources for agricultural and domestic usages and rehabilitating degraded lands. This alternative offers opportunities to provide permanent access to water and climate-resilient plant material for farmers through implementation of hydro-agricultural works and massive adoption of varieties tolerant to the major climatic hazards observed in SIDS as well as to restore agricultural soil fertility through water and soil conservation and anti-salt control practices and infrastructures. The programme will help beneficiaries to better plan agricultural crops through the strengthening of agro-meteorological information, a community early warning system and local, national and regional learning through capacity building, partnerships, knowledge exchange and lessons learned. The programme will improve yields and production and reduce food insecurity, malnutrition and poverty.

155. The requested funding is based on a full cost of adaptation reasoning as all the Programme activities contribute to achieve its objective, which is “to build climate-resilient agricultural systems in the three SIDS in West and Central Africa by securing water resources for agricultural and domestic usages and rehabilitating degraded lands to increase the climate resilience of agrarian ecosystems and enhance agricultural productivity. For example, **Component 1** will provide water security, build agricultural and fishery resilient systems to increase productivity and reliability through innovative technologies for higher levels of efficiency, mainstreaming of renewable energy in agriculture and plant material tolerant to thermal and water stress. This component will also provide land management practices at landscape scale by the end of year two, with longer-term benefits from built resilience in ecosystem services, and improved adaptive capacities within the farming population in order to respond to climate change and climate variability. This is expected to increase productivity in the local food supply chain, and to generate productive value chains in agro processing. **Component 2** is strongly focused on building adaptive capacities for climate change and climate variability based on established baselines in the project area. The Component will assess climate change adaptation and resilience capacities of major stakeholders at local and national institutions. It will then improve their adaptive capacities for resilience in farming and fishing systems in the programme areas. **Component 3** will implement a monitoring and evaluation (M&E) system as well as a knowledge management (KM) plan. The M&E and KM plans will benefit policies and strategies but also on farm and traditional fishing practices of other regions in the three SIDS. These benefits will lead to upscaling and sustainability of climate adaptation and resilience practices, of income generation and employment for the farming households including those most vulnerable.

156. Analysis of the ongoing scenario in the countries covered by this SIDS project has revealed that there are several ongoing or recently completed projects addressing roughly the same challenges in all three countries. While this project will seek to establish strong synergies with these existing initiatives, it should be stressed that without these ongoing projects, this SIDS project will achieve its objectives, as the implementation of any of its activities does not depend on existing projects.

157. During the full proposal development, the full cost of adaptation reasoning will be deepened through: i) assessing the baseline of adaptive capacities of farming and fishing systems, ii) appraising residual or net benefits from the proposed programme activities, and iii) funding requested from the Adaptation Fund. This analysis will be carried out for each country of the regional programme components.

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

158. The sustainability of the Regional Programme's outcomes in the Eastern Atlantic Ocean SIDS has been addressed in the design of the programme through various activities. By enhancing crop production and productivity while generating income for farmers through the sale of surpluses, the project will ensure that beneficiaries in the target sites sustain their livelihoods. The restoration of

mangrove in coastal communities of Cape Verde and Guinea-Bissau, which will also benefit the tourism industry, will also ensure job security and economic gain in the communities. The environmental smartness of some technologies such as the use of renewable energy equipment as well as the use of reclaimed water to mobilize water resources, the drip irrigation method and the anti-erosive works contributes to sustain the programme outcomes.

159. Training sessions for farmers on farm-level techniques for agricultural, fisheries productivity enhancement and landscape-level land restoration practices will contribute to ownership by farmers and fishermen. In fact, producers will be trained in the design and implementation of agricultural and fish farming productivity techniques. They will be also trained in the design, construction and maintenance of water, irrigation, energy and anti-erosive infrastructure, equipment and works. To this end, the project will build on existing producers' associations and cooperatives or create them where need be. The project will ensure involvement of women and youth in these associations of users to make that opinions of all social groups are taken into account in the maintenance of infrastructures, installations and works. These will be users associations of water, irrigation, energy and anti-erosive infrastructures and equipment services. They will be trained in management, and maintenance of these infrastructures, equipment and works. For this maintenance to be sustainable, each farmer, through its association will contribute financially to constitute an amount dedicated for paying the operations and management costs. For bigger infrastructures like dams, solar power equipment and boreholes, associations of users and cooperatives will be supported in this maintenance by the government relevant technical services, especially those based at the subnational level.

160. Capacity in the responsible national and local government sectors will be raised during the implementation of the project, especially through the training component. This will ensure institutional capacity in supporting the sustainability of the Programme, particularly in the operation and maintenance (O&M) of key structures, equipment and facilities. The institutions that will be directly responsible the identification, selection, maintaining the infrastructures and their functionalities are the Ministries of Water and Rural Development in each of the three SIDS with their relevant Directorates and Departments. To facilitate continuous and problem-free operation of infrastructures, regular inspections and maintenance by local authorities on-site will be carried out. This arrangement will be important for the sustainability of the Programme, so that there will be a physical presence of responsible staff to respond to any problems that arise. The following national and local authorities that are expected to play important roles in the O&M of key structures, equipment and facilities, are outlined below:

Table 9. Relevant national/local authorities with identified roles in supporting the project infrastructures/equipment maintenance and sustainability. Additional consultations will be conducted at the full design stage to identify further national/local authorities to support infrastructures/equipment maintenance and sustainability.

Types of key structures, equipment and facilities	Country	Relevant national and local government authorities	Roles to sustain project gain such as infrastructures and equipments
Water (including storage and reservoirs) and irrigation	Sao Tome and Principe	Ministry of Public Works, Infrastructure, Natural Resources and the Environment; Empresa da Agua e Electricidade (EMAE – Water and Electricity Company); Ministry of Agriculture,	Definition and selection of infrastructures, oversight-inspection and maintenance; co-management of infrastructures

		Fisheries and Rural Development	
	Guinea-Bissau	Ministry of Natural Resources and the Environment; Ministry of Energy and Water; Ministry of Rural Development and Agriculture; Ministry of Fisheries	
	Cape Verde	Ministry of Environment, Agriculture and Fisheries; National Institute of Management and Water Resources; Ministry of Rural Development	
Renewable Energy (solar- wind)	Sao Tome and Principe	Ministry of Natural Resources, Energy, and Environment; EMAE	
	Guinea-Bissau	Ministry for Trade, Energy, Industry and Environment	
	Cape Verde	Ministry of Tourism, Industry and Energy; Ministry of Natural Resources and the Environment	
Anti-erosion	Sao Tome and Principe	Ministry of Agriculture, Fisheries and Rural Development	
	Guinea-Bissau	Ministry of Rural Development and Agriculture;	
	Cape Verde	Ministry of Rural Development	
	All countries	Community based associations such as Water Users Associations Women and Youth Groups, Local NGOs and private entities	

161. The documentation and dissemination of the good practices and lessons generated by the programme will help sustaining the programme's outcomes. The fact that opinions and needs of

stakeholders in the fishery and crops subsectors are fully taken into account during the design of activities will ensure appropriate ownership by actors, enhanced capacity, then sustainability.

162. Maintenance of infrastructure and equipment will be financed through an infrastructure and equipment maintenance fund, which will be housed in a financial institution. At the end of each agricultural year or at the end of a period to be agreed with the users, the users' associations will pay an amount representing the membership fees agreed with them. The amount of each member's contribution will be defined on the basis of two main criteria:

- a. The amount must be sufficient to cover all the membership fees to cover the cost of maintaining the membership.
- b. The amount must be bearable by the users, i.e. taking into account the profit margins that their activity allows. This profit margin can be obtained from a financial analysis.

163. This sustainability analysis will be furthered during the full proposal development.

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

164. The programme geographic target areas in the three SIDS countries are located in the most vulnerable regions to climate change impacts. Those areas are among the most affected by poverty as households have weak incomes, high sensitivity and low adaptive capacities to climate shocks. Small farming and fishing systems in these areas are exposed to climate hazards and impacts from intense rainfall and extended drought conditions, upwelling modification, soil erosion, low fertility and salinization. The project is proposed to build resilience of farming systems through interventions for water security coupled with solar energy, soil fertility conservation, land restoration, capacity building on climate resilience and knowledge management activities. While the geographic target areas are known, the exact site location for the USPs are unknown and will be determined at the full design stage. Further studies and environmental Impact Studies/Reviews are planned to determine the level of salinity, orientation with main winds; groundwater, soil, volume of wastewater and sanitation networks and to decide on the most suitable technology according to that exact location. A revised ESP risk screening will be conducted at the full design stage taking into account the identified activities, and an environmental and social management plan (ESMP), which includes management measures that are commensurate to risk findings as per the AF ESP Policy.

165. The social and environmental impacts and risks of the regional programme have been identified and analyzed according to the AF's Environmental and Social Policy (ESP), as well as the IFAD Social, Environmental and Climatic Assessment Principles (SECAP).

Table 10. Preliminary Environmental impacts and management measures at concept stage

Impact	Management measure / commitment
General	
• Noise, traffic, etc. disturbance to residents	• Develop, communicate and implement a conflict management procedure
• Local capacity building	• Ensure that contractors hire local staff whenever possible (e.g., for unskilled positions).
• Health and safety at work	• Developing an HSE policy and health, safety and environmental rules for construction sites • Ensuring the use of PPE by construction workers

Impact	Management measure / commitment
<ul style="list-style-type: none"> Impacts on biodiversity 	<ul style="list-style-type: none"> Incorporate a reforestation program into the project, in consultation with the Ministry of the Environment. Species must include endangered species and species with habitat/nesting value/food for animals.
Use of agricultural inputs	
<ul style="list-style-type: none"> Risk of water and soil pollution 	<ul style="list-style-type: none"> Provide training on the rational use of agrochemicals (dosage, etc.), the use of organic compost and manure, crop rotation/ crop combination techniques and other techniques to minimize the use of agricultural inputs. A quota for women will be considered
<ul style="list-style-type: none"> Risks to the health and safety of the community 	<ul style="list-style-type: none"> Provide training in application methods and appropriate personal protective equipment (gloves, mask, etc.) including for women
General Agricultural Activities	
<ul style="list-style-type: none"> Loss of biodiversity through the introduction of cash crops 	<ul style="list-style-type: none"> Promote mixed / intercropping crops, including planting subsistence species / crops alongside species of ecological value
<ul style="list-style-type: none"> Soil erosion and leaching due to rainfed agriculture developments 	<ul style="list-style-type: none"> Identify areas at risk of erosion and erect physical and / or biological structures to minimize the risk of soil erosion in the target area Identify and mapping of areas of risks and install physical infrastructures to reduce soil erosion
<ul style="list-style-type: none"> Low productivity upstream of production chains due to climate change and variability 	<ul style="list-style-type: none"> Extension of climate-intelligent farming techniques. Information, education and environmental communication. Ecological monitoring and climate change adaptation measure.
Irrigated areas	
<ul style="list-style-type: none"> Land deforestation for hydro-agricultural development and soil erosion risk. 	<ul style="list-style-type: none"> Restrict the development of irrigated perimeters to land that is already under food and seasonal crops. Train beneficiaries on erosion control
<ul style="list-style-type: none"> Lowering of the water table 	<ul style="list-style-type: none"> Train the beneficiaries in water use and saving management. Develop water management plan
<ul style="list-style-type: none"> Conflicting competition for access to developed areas and water 	<ul style="list-style-type: none"> Raise awareness of the programme's objectives and explain the selection criteria and procedures, which will be transparent. Intervene only in areas where land status is clarified and use is consensual and in accordance with the principle of free, prior and informed consent of all stakeholders. Train the beneficiaries on water distribution techniques and the efficient application of water to the plot as well as on conflict management techniques.
<ul style="list-style-type: none"> Environmental Imbalance in downstream streambeds at water intake works 	<ul style="list-style-type: none"> Implement measures to ensure the maintenance of aquatic ecosystems downstream of water intake structures.

Impact	Management measure / commitment
Preparation / Land clearing	
<ul style="list-style-type: none"> Loss of trees 	<ul style="list-style-type: none"> Clearly demarcate work sites prior to work; ensure that disturbance occurs only within marked boundaries Preserve trees as much as possible Integrate tree planting into store design, prioritizing endangered species and/or trees with nutritional value
<ul style="list-style-type: none"> Risk of soil erosion 	<ul style="list-style-type: none"> Planning work in the dry season Install silt fences down from the bare soil to catch any runoff, if any
<ul style="list-style-type: none"> Risk of physical/economic displacement 	<ul style="list-style-type: none"> Select uninhabited and unused sites
<ul style="list-style-type: none"> Disturbance of watercourses and borrow pits 	<ul style="list-style-type: none"> Collecting aggregate material from existing borrow sites Rehabilitate borrowed areas
Heavy machinery and equipment used for construction purposes	
<ul style="list-style-type: none"> Risk of soil contamination (hazardous material spill) 	<ul style="list-style-type: none"> All hazardous materials will be stored appropriately (covered, etc.) with secondary containment of sufficient capacity (> 110% of volume). Use spill prevention equipment such as bundles, sorbent booms, etc..
<ul style="list-style-type: none"> Dust generation 	<ul style="list-style-type: none"> Cover all loads during transport Cover all stocks (of sand, etc.) during storage
Waste generation	
<ul style="list-style-type: none"> Generation of construction waste, including hazardous waste 	<ul style="list-style-type: none"> Designate a suitable disposal site at least 200 m from drainage lines and residences, preferably in a previously disturbed area

166. The environmental and social assessment carried out classifies this program in Category B as its activities are not expected to result in significant negative environmental and social impacts. The irrigated areas will not exceed 100 contiguous hectares, in one block. The sustainable land management works at landscape scale as well as the productivity enhancement techniques at farm scale will not bring major modification on soil, water and forest resources as well as in biodiversity. The programme is environmentally sustainable positive, given the many positive effects in terms of strengthening the resilience of production systems, improving the economy of rural households, the strategy of inclusion of young people, women and people with reduced mobility and special needs. All the planned productive investments (hydro-agricultural developments; construction of antierosive works; solar pumping; dissemination of improved varieties) are based on simple and proven technologies that have already demonstrated positive impacts for households and the environment with minimal risk to the climate. The regional programme's scaling up strategy is based on the ownership and empowerment of local actors and the strengthening of their capacities for effective ownership of project activities during and after its implementation. The results of the assessment against each of the AF Environmental and social principles are summarized in the table below.

Table 11. Environmental risk assessment

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
<i>Compliance with the Law</i>		<p>The regional programme activities will comply with the three SIDS national laws and with international agreements on environment when national standards are lacking.</p> <p>However, a comprehensive update of the existing ESIA as well as a complete analysis of compliance with relevant laws will be carried out at the full proposal stage and this will ensure relevant national permit requirements and international laws are respected</p>
<i>Access and Equity</i>		<p>Some of the regional project activities like renewable energy infrastructures and equipment, anti-land degradation works, irrigation system as well as capacity building activities may exacerbate social inequities.</p> <p>Conflict Management in Sao Tome: Although there are no major risks of conflict that may arise from this project, weak land tenure system and lack of legislation on grievance, require that particular attention is given to grievance mechanism.</p> <p>In Cabo Verde, access to land for farming is a challenge for women in the project area. The creation of a national cadastre is aiming at addressing this inequity. There is also a risk of conflict for water resources due to the increase in irrigated areas when the water resources are really scarce in some islands of the archipelago.</p> <p>IFAD will deepen the analysis of marginalized and vulnerable groups and conduct a deep assessment of impacts of this SIDS programme activities on marginalized and vulnerable groups in the full design. Mitigation measures will be proposed. The outcome will guide the programme managements units to ensure a fair and equitable access to the project benefits. Particular attention will be given during the designing and implementation of the project on the management of potential conflicts.</p>
<i>Marginalized and Vulnerable Groups</i>		<p>Sexual Exploitation and Abuse in Sao Tome: Particular attention will be paid to adolescent girls to prevent early pregnancies and the likely intergenerational cycle of malnutrition and poverty. It is to be noted that in Sao Tome e Principe, the Lifetime Physical and/or Sexual Intimate Partner Violence rate is 28 %. IFAD's applies no tolerance for Sexual Exploitation and Abuse (SEA) in its supported operations, requiring that precautionary and remedial measures to safeguard against SH/SEA risks affect.</p> <p>In Guinea Bissau, the project area concentrates, outside</p>

		<p>Bissau, the main regions where population living with disabilities (53%) are distributed.</p> <p>Guinea Bissau is one of the few countries where the presence of the two HIV viruses (1 and 2) is present with fairly large proportions, 4.4% for HIV-1, 1% for HIV-2 and 0.3% for double profile, with the highest proportion (72%) being women.</p> <p>During the project development phase, further analysis of risks associated to impacts on marginalized and vulnerable groups will be carried out. The outcome of this analysis will guide the regional programme units to ensure that poor people, women, young, old people have the opportunity to improve their income and living conditions.</p>
<i>Human Rights</i>		<p>There is a potential risk of child labour in Guinea Bissau Children in Guinea-Bissau engage in the worst forms of child labor in agriculture, including in forced begging. According to a national child labor survey, more than 169,200 children aged 5 to 17 work, and 85 per cent of this children work in agriculture²⁰. The prevalence of child labor is more important in rural areas than urban areas, 61.5 per cent and 37.1 per cent respectively, with a high prevalence in the Cacheu region. ;. Moreover, girls are more exposed than boys (52.5 per cent vs. 49.8 per cent respectively) and children aged 5 to 11 years old, which represent 55.5 per cent of those children at work.</p> <p>The project will not engage in any forms of child labor activities. At the CN stage, key mitigation measures include awareness raising about the issue of child labour through trainings conducted to build capacity of relevant stakeholders, including project beneficiaries and implementing partners, on child labour's issues and respect for labour legislation and ILO international conventions. To ensure ownership by all project beneficiaries and partners, efforts will be undertaken to customize such trainings by delivering them in local languages. Moreover, to have more impacts with the awareness raising, local leaders, women association, farmers groups and other key local organizations will be convened to participate to focus group discussions on the negative impacts of child labour. Among these stakeholders, it could be useful to design a team whose responsibility is to ensure that project beneficiaries are strictly following that no of their children are working in project activities, as well as enterprises to not employ any children. In line with the government efforts to eliminate the worst forms of child labor, other mitigation measures will be developed during the design stage and an ESMP that covers the USPs potential risk will be prepared.</p>

²⁰ https://www.dol.gov/sites/dolgov/files/ILAB/child_labor_reports/tda2018/Guinea-Bissau.pdf

<i>Gender Equity and Women's Empowerment</i>		<p>The project activities may increase exclusion of some social groups like women, youth and other groups if any mitigation measure is implemented. Women and youth may not have equal participation level and receive proportional social and economic benefits than men and adults.</p> <p>IFAD will carry out an in-depth analysis of gender and develop a gender action plan during the project development phase. A further assessment of the AF GP will also be carried out in the full design phase</p>
<i>Core Labor Rights</i>		In Guinea Bissau, the prevalence of child labour is very high, with more than half of children aged 5 to 17 (51%) involved in working activities. This risk will be carefully monitored during project implementation.
<i>Indigenous Peoples</i>	X	No indigenous peoples' presence in the project implementation areas in the three countries has been reported to us to date.
<i>Involuntary Resettlement</i>	X	No resettlement is foreseen in the undertaking of any of the project activities.
<i>Protection of Natural Habitats</i>		<p>The regional programme is not planned to be implemented in legally protected or in areas proposed for protection. However, in Guinea Bissau, the project may intervene in the mangrove area to develop rice. Due to their high conservation value, the project infrastructures like dikes, the irrigation system may bring adverse modifications in the mangrove ecosystems in Guinea Bissau.</p> <p>However, during the full programme development phase, an in-depth ESIA will be conducted to identify and assess potential environmental and social impacts of the programme on natural habitat and biodiversity, especially the fragile ecosystems in the target areas. Mitigation measures of these environmental and social potential impacts will be proposed as well as the possible contribution of the programme to local GHG offset.</p>
<i>Conservation of Biological Diversity</i>		<p>As an integrated agricultural project, the regional initiative may lead to reduction or loss of biological diversity. It may also foster introduction of known invasive species, although the programme will ensure all measures are taken to prevent this.</p> <p>However, during the project development phase, an in-depth ESIA will be conducted to identify and assess potential environmental and social impacts of the programme on natural habitat and biodiversity in the target areas. Mitigation measures of these environmental and social potential impacts will be proposed.</p>
<i>Climate Change</i>		The objective of the project is to build resilience of farming and fishing systems to climate change in Sao Tome e Principe, Guinea Bissau and Cape Verde. The practices will include i) integration of renewable energy water mobilization,

		<p>thus contributing to reduce GHG emissions, ii) increase farms soil fertility and productivity, iii) restore degraded lands. Those planned activities, especially reforestation will capture CO2 and capture surplus of greenhouse gases.</p> <p>A further study to assess the quantity of GHG avoided or reduced will be carried out during the full proposal stage and this will provide full insights into any risks that may increase impacts of climate change.</p>
<i>Pollution Prevention and Resource Efficiency</i>		<p>Although, the programme will contribute to reduce pollution in soil and water, through practices that reduce sedimentation and soil erosion, and the expected shift from agrichemicals to biological inputs, especially with the use of reclaimed water and biodigestors, through the irrigation system that will minimize the use of water, the use of inorganic amendments may trigger pollution of soils and water resources.</p> <p>In Guinea Bissau, there is a potential risk for pollution linked to the development of rice and market gardening in the low-lying areas. In Cabo Verde, the risk for pollution is with regards to potential groundwater infiltration of fertilizers and pesticides used in irrigated lands, which could affect the quality of groundwater.</p> <p>Thus, a study to develop a pesticide management plan will be developed to better manage pollution risks. Building local capacity to use organic manure and microdose of inorganic products will limit the use of chemical products and reduce pollution risks.</p>
<i>Public Health</i>		<p>The regional programme will contribute to a healthier environment and safer food through organic practices for soil building and landscape restoration techniques.</p> <p>However, irrigation schemes serve as suitable habitats for mosquitoes/snails and may exacerbate the existing malaria/schistosomiasis situation. In this regard, if these schemes are not adequately managed, it may result in negative public health impacts.</p> <p>Thus, an additional study will be performed to identify all potential health impacts of the programme activities, mainly during the construction phase.</p>
<i>Physical and Cultural Heritage</i>		<p>As no physical and cultural heritage areas has been reported to us up to now, the regional programme activities are not expected to alter, damage or remove any of these categories of sites.</p> <p>The analysis during the full proposal development will ensure that any physical and cultural sites is involved in the programme areas of intervention.</p>

<i>Lands and Soil Conservation</i>		The SIDS regional programme is proposed to conserve land and soil through implementation of measures to combat lands degradation and soil fertility loss. However, some infrastructures and anti-land degradation works construction like boreholes, dikes, retention basins, and land management works may affect lands and soils. Thus, further analysis of impacts of these activities on soils and lands will be carried out during the project development phase.
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167. Risks associated with the regional programme activities in all phases and in all the three countries include:

- Work-related accidents (use of vehicles and trucks);
- Contamination of water and soil by waste from the construction site during the construction phase and;
- Transmission of stis, hiv-aids and other communicable diseases, due to the arrival of workers.

168. Precise locations where some activities, infrastructures and equipment will be implemented have not yet been provided at this concept note stage. At this stage, they are considered as unidentified sub-projects (USP). This is because the identification of these locations requires in-depth field studies on soils, water resources and vegetation, which could not be exhaustively conducted during the concept note development. Thus, the identification of exact locations of activities needs extensive consultations with the population and other stakeholders. These studies will be carried out at the design stage of the Programme in order to precisely define these locations and enable the ESIA to identify and assess risks and impacts associated to these unidentified. Potential studies would be : the environmental impact of infrastructures/equipments on soil, vegetation/ biodiversity and groundwater; impact of salinity on infrastructures and agricultural land, impact of technologies disposals and management ...

169. The USP will be monitored and evaluated in accordance to the AF's ESP, which will be applied to the USPs. For each USP, an ESIA that covers the risks will be prepared and will provide the following key information:

- A brief description of the fully formulated USP, with details on (i) the characteristics of the USP and (ii) the specific environmental and social setting in which the USP will be implemented in order to evaluate the effectiveness of the risks identification that was carried out;
- A description of the outcome of the ESP risks identification process, using the same structure of Part II. K and Part II. L for regional projects/programmes, identifying risks according to each of the 15 ESP principles, justifying the risk findings, and showing that this is the outcome of an evidence-based and comprehensive effort;
- For each of the identified risks, a description of the subsequent impact assessment that was undertaken and the findings thereof, showing that the assessment was commensurate with the risks identified;
- The findings of the ESIA, and the safeguard measures that have been formulated to avoid, mitigate or manage undesirable impacts;
- The updated detailed safeguard arrangements in the implementation component of the ESIA, identifying and allocating roles and responsibilities to implementation partners for the application of the ESIA. This will include an assessment or a confirmation of the required capacity and skills with the relevant implementation partners;
- Information on the consultations that were held on the risks identification and impact assessments outcome as well as on any proposed management measures, and how any feedback was responded to;

- Gender-disaggregation of the information used in the risks identification and subsequent safeguards actions;
- Information on disseminating information to stakeholders on the grievance mechanism.

170. The updated ESIA will to be attached to the annual IFAD's performance evaluation report.

PART III: IMPLEMENTATION ARRANGEMENTS

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

At the regional level,

171. A Regional Steering Committee of the project (RSC), which will provide general guidance for the implementation of the project, will be established. The RSC will also be responsible for validating the Annual Work Program (AWP) of the project. The RSC management structure and functioning will be further define during the design stage.

At the national level

172. The programme will be supervised in each country by the Ministry of Agriculture (Ministry of Agriculture and Forests of Guinea Bissau, Ministry of Agriculture, Fisheries and Rural Development of STP, Ministry of Agriculture and Environment of Cape Verde), which will chair the National Steering Committee (NSC) with participation of women. This Committee will include the ministries of strategic interest within which focal points will be designated, the Producers organizations and the banks. The NSC will define the orientations for the operational steering of the regional programme, ensuring its alignment with sectoral strategies and priorities. It will integrate the programme's activities in complementarity and synergy with development partners in the agricultural sector in order to optimize its interventions and maximize its impact on the beneficiaries. In addition to approving work programmes and activity reports, the NSC will monitor implementation and make any recommendations it may make during its monitoring missions in the field. This will be further developed in the full proposal document.

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

173. The governments of Guinea Bissau, Sao Tome e Principe and of Cape Verde have well-established procedures for reporting on funds. Those procedures, as well as that of the Adaptation Fund and that of IFAD will govern the financial and procurement operations of the executing entities of this Programme. Moreover, financial and project risk management measures will be assessed throughout the implementation of the project. A comprehensive and detailed risk management framework will be developed in the full proposal document. This framework will take into account the fiduciary procedures of IFAD and the Adaptation Fund.

Table 12 below lists the potential financial and other risks of the Programme.

Risk Class/Category	Level	Mitigation measures/comments
Financial: Inflation leading to increased costs of goods and services	Weak	<ul style="list-style-type: none"> • Hiring Finance and Procurement officers in the Programme Management Units in each of the three countries. They will ensure appropriate management of funds and make timely alerts to Project Managers to make adjustments

Concentration of the Programme activities on traditional intervention areas to the detriment of other vulnerable segments facing food deficits and nutritional problems.	Weak	<ul style="list-style-type: none"> Optimize and intensify production in traditional areas where IFAD has supported the promotion of export value chains. Diversify production areas that are poorly developed, areas suitable for mixed farming, production areas that can be extended by means of development, etc. Characterization of areas allowing geographical targeting taking into account development potential. Criteria-based targeting approach taking into account the socio-economic profiles of the beneficiaries
Marginalization of women, young people and people with disabilities	Weak	<ul style="list-style-type: none"> Discriminatory targeting strategy in favor of women and young people in the promotion of income-generating activities (micro projects) on the one hand and in the process of economic integration of young people on the other hand. A positive approach to the integration of people with disabilities
Traditional farming methods and techniques not adapted to the context of climate change and affecting yield, self-sufficiency and farm incomes	Weak	<ul style="list-style-type: none"> Farmer Field Schools (FFS) approach for learning and adoption of improved practices Promotion of high-performance and resilient varieties in partnership with Research (CIAT) Financing (on demand) of micro-projects of income-generating activities in the production of food crops. Deployment of Operations Advisors Strengthening biological control
Pressure on fisheries resources	Moderate	<ul style="list-style-type: none"> Strategic support for the implementation of precautionary measures regulating fish catches Support for activities to mitigate the risks of overfishing Actions to reduce post-harvest losses and increase the value of catches Institutional strengthening of the Fisheries Directorate
Adverse effects related to irrigation development schemes	Moderate to low	<ul style="list-style-type: none"> Raising community awareness of the objectives of COMPRAN and the need to ensure ecosystem integrity Development restricted to land under food and seasonal crops Training of users on erosion control, water saving management, water distribution techniques and efficient application of water to the plot, conflict management techniques and management of organic fertilizers to minimize their impact on water resources Measures will be established to ensure an ecological flow equal to at least one-third of the low-water flow of the watercourses in order to

		ensure the maintenance of aquatic ecosystems downstream of the water intake structures. <ul style="list-style-type: none"> • Promotion of organic production systems • Strengthening of the Irrigation Department
Severity of climate change and variability	Weak	<ul style="list-style-type: none"> • Climate change adaptation measures • Sustainable water and soil management • Environmental and Social Management Plan • Extension of climate-intelligent farming techniques • Environmental information, education and communication • Ecological monitoring and climate change adaptation measures
Lack of institutional capacity to take ownership of the achievements of the programme and their sustainability	Weak	<ul style="list-style-type: none"> • Institutional strengthening of technical services with the aim of making them capable of performing their regalian functions. • Partnerships in the form of an agreement with the technical departments concerned • Support to the Regional Delegations (Districts) of Agriculture and Rural Development Support Offices (CADR)
Weak consultation with stakeholders	Moderate	<ul style="list-style-type: none"> • Develop and implement a stakeholders' engagement plan
Environmental: Natural hazards (high winds and floods, droughts, and storm	Moderate	<ul style="list-style-type: none"> • Implementation of techniques to reduce impacts of heavy rainfall on soil, crops and plantations
Weak buy-in from the population	Weak	<ul style="list-style-type: none"> • Capacity building for a understanding and awareness of climate change and the potential benefits of climate resilience for income generation and food security • Practices with short-term psotive effects such as improved water security • Youth and women participation
Lack of collaboration of the technical institutions	Weak	<ul style="list-style-type: none"> • Collaboration and cooperation of the technical institutions involved

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

This part will be developed in the full proposal document, especially during the development environmental ans social management plan.

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

This part will be developed in the full proposal document.

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

This part will be developed in the full proposal document.

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

This part will be developed in the full proposal document.

Project Objective(s) ²¹	Project Indicator(s)	Objec	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Project Outcome(s)	Project Outcome Indicator(s)		Fund Output	Fund Output Indicator	Grant Amount (USD)

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

This part will be developed in the full proposal document.

H. Include a disbursement schedule with time-bound milestones.

This part will be developed in the full proposal document.

²¹ The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

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

- A. Record of endorsement on behalf of the government²²** *Provide the name and position of the government official and indicate date of endorsement for each country participating in the proposed project / programme. Add more lines as necessary. The endorsement letters should be attached as an annex to the project/programme proposal. Please attach the endorsement letters with this template; add as many participating governments if a regional project/programme:*

República Democrática  de S. Tomé e Príncipe

(Unidade – Disciplina – Trabalho)

Ministério das Obras Públicas, Infraestruturas, Recursos Naturais e Ambiente

Letter of Endorsement by Government

Sao Tome, November 11, 2019

Ref. :Nº. 01/2019

To: The Adaptation Fund Board

c/o Adaption Fund Board Secretariat

Email: Secretariat @Adaptation- Fund.org

Fax: 202 522 3240/5

Subject: Endorsement for “West and Central Africa Small Island Developing States (SIDS) ADAPT”

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

Accordingly, I'm pleased to endorse the above programme proposal with support from the Adaptation Fund. If approved, the programme will be implemented by the International Fund for Agricultural (IFAD) and executed by Ministry of Agriculture, Fisheries and Rural Development (MAPDR). The amount requested for São Tomé and Príncipe is USD 3 500 000.

Sincerely,

Victor Manuel do Sacramento Bonfim

Director of Nature Conservation, Sanitation and the Quality of Environment

AF National Designated Authority,

Largo das Alfândegas – VC.P-nº 1030 – São Tomé

Phone number: + 239 990 74 70

Email address: victorbonfim2@hotmail.com

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



GOVERNO DA
GUINÉ-BISSAU

SECRETARIA DE ESTADO DO AMBIENTE E BIODIVERSIDADE

Direcção Geral do Ambiente

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5
G-Tower, 24-4 Songdo-dong, Yeonsu-gu
Incheon City, Republic of Korea

Bissau, October 25th 2019

Subject: Endorsement for the "West and Central Africa Small Islands Developing States
ADAPT" proposal

In my capacity as Designated Authority for the Adaptation Fund in Guinea-Bissau, I confirm that the above national «West and Central Africa Small Islands Developing States ADAPT» proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the Guinea-Bissau (Gabú, Bafatá, Oio and Cacheu regions).

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project/programme will be implemented by International Fund for Agricultural and Development (IFAD) and executed by the Ministry of Agriculture and Forestry (MAF).

Kind regards,

Mr. Viriato Luis Soares Cassamá

GCF Focal Point



Ministério da Agricultura
e Ambiente

INSTITUTO NACIONAL DE METEOROLOGIA
E GEOFÍSICA

República de Cabo Verde



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

N.Rep 002/GP.INMG/2020

Ilha do Sal, January 9, 2020

Subject: Endorsement for West and Central Africa Small Island Developing States (SIDS) ADAPT proposal*

In my capacity as designated authority for the Adaptation Fund in Cabo Verde, I confirm that the above West and Central Africa Small Island Developing States (SIDS) ADAPT* proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Cabo Verde.

Accordingly, I am pleased to endorse the above programme proposal with support from the Adaptation Fund. If approved, the programme will be implemented by International Fund for Agricultural and Development (IFAD) and executed by the Ministry of Agriculture and Environment.

Sincerely,

Maria da Cruz Gomes Soares



President of the National Institute of Meteorology and Geophysics

<i>Victor Manuel Sacramento Bonfim, Director of Nature Conservation and the Quality of Environment, Ministry of Public Works, Infrastructure, natural Resources and the Environment, Sao Tome and Principe</i>	<i>Date: November 11 2019</i>
<i>Viriato Luis Soares Cassama, General Director of the Environment, Ministry of Environment and Sustainable Development, Guinea Bissau</i>	<i>Date: October 25 2019</i>
<i>Maria da Cruz Gomes Soares, President of the National Institute of Meteorology and Geophysics, National Institute of Meteorology and Geophysics, Cape Verde</i>	<i>Date: January 9 2020</i>

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

I certify that this Concept Note has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans and subject to the approval by the Adaptation Fund Board, <u>commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund</u> and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.	
<i>Margarita Astralaga, Director Environment, Climate and Social Inclusion Division, IFAD</i>	
Date: (Month, Day, Year)	Tel. and email: a.astralaga@ifad.org
Project Contact Person: Liza Leclerc , Environment and Climate Coordinator, IFAD HQ Amath Pathe SENE, Lead Environment and Climate Specialist, West and Central Africa	
Tel. And Email: l.leclerc@ifad.org; amath.sene@ifad.org +393346629228 +22509190249	

Annex 1: Desalination options in agriculture from IFAD Mission for RTA Cape-Verde in 2019. A throughout cost effectiveness analysis building in this initial assessment developed by IFAD during this consultation process will be developed at the full design stage to better inform the selection of the most suitable technologies per sites.

Reverse Osmosis (RO) has positioned itself as the reference technology for SW desalination, since it presents reduced energy consumption (less than 3.0 kWh/m³ in the desalination process) and production costs compared to the rest of the robust desalination technologies. Reversal Electrodialysis (RED) presents lower energy consumption than RO in the case of low salinity water (BW) to treat.

Table 13. RO and RED desalination technologies comparison.

Type of water resource	Benefits	Risks	Associated costs
Brackish water RO desalination	<ul style="list-style-type: none"> • Lower operating pressure • Low energy consumption • High recovery rate • Lower investment 	<ul style="list-style-type: none"> • Feed flow to the system is conditioned by variations in flow rate (due to rain or drought episodes), and in quality. • Problematic brine management- inland conditions. • High costs of raw water pre-treatment and in the desalinated water post-treatment 	<ul style="list-style-type: none"> • Investment costs (small scale plants) from 400 to 600 €/m³ installed. • Operational cost around 0.5 €/m³ (0.09 €/kWh).
Brackish water RED desalination	<ul style="list-style-type: none"> • RED does not require pressure • Lower energy consumption than RO with raw water salinity from 2.5 to 10 g/l. • Higher recovery rate (up to 95%) • Similar investment and amortization costs than RO • Lower costs in the feed water pre-treatment 	<ul style="list-style-type: none"> • Higher energy consumption than RO with a raw water salinity > 10 g/l. • Investment is very conditioned if the feed flow salinity increases as time passes. • Post-treatment must be adapted to the final water use. 	<ul style="list-style-type: none"> • Investment costs (small scale plants) from 500 to 700 €/m³ installed. • Operational cost around 0.35-0.5 €/m³ (0.09 €/kWh).
Seawater RO desalination	<ul style="list-style-type: none"> • Feed flow to the system constant in quantity and quality • Easier brine discharge than BW plants • SW desalination is more developed • Difference in SW and BW implied by the amortization and the energy consumption. 	<ul style="list-style-type: none"> • Higher operating pressure which means higher energy consumption and higher operational cost. • Higher investment costs, due to high pressure materials, salinity and the use of energy recovery devices 	<ul style="list-style-type: none"> • Investment costs (from high to small scale plants): from 600 to 1000 €/m³ installed. • Energy cost represents 25-40% of the total exploitation cost.

Source: ITC background.

Reclaimed water for irrigation

Water reuse can be considered as a non-conventional water source for irrigation, particularly in water-scarce regions. In Cabo Verde, water reuse can contribute to meet irrigation water needs under certain conditions and requirements. Tchom d'Holanda, Ribeira da Vinha (Sao Vicente); Santa Cruz and Santa Catarina (Santiago) have already implemented reclaimed water systems for irrigation.

Water reuse planning for agricultural purpose necessitates considering different key requirements such as:

- 1) Minimum quality standards;
- 2) Wastewater and tertiary treatment specifications;
- 3) Wastewater and water reuse systems responsible operation;
- 4) Specific safe water reuse and irrigation practices guidelines (farmers and end-users);
- 5) Specific regulation;
- 6) Procedures in relation with environmental protection.

Depending on the type of usage of water, the associated regulations would require different levels of options; for example: exploitation, chemicals and energy requirements, possible externalities, post-treatment required depending of the crops defined.

Table 14. Water reuse for irrigation pros and cons.

Type of water resource	Benefits	Risks	Associated costs
Reclaimed water	<ul style="list-style-type: none">• Conservation of freshwater• Reduction in GHG• Net sanitary benefits compared to discharge of treated water (or not) to the sea or underground• Reduce the need for chemical fertilizers providing nutrients for irrigated crops.• Public control of the treatment and distribution.• Reclaimed water could be combined with other water sources to increase crop typologies to irrigate.• Wastewater is always present next to the end-users.• Investment costs are lower than desalination.	<ul style="list-style-type: none">• Potential risk for the human health and the environment.• Issues with the social and environmental acceptability.• Water reuse is a local solution.• Treated water with high salinity could require desalination	<ul style="list-style-type: none">• The scale, local requirements, quality standards and regulation significantly affect the final investment.• Exploitation cost is separated in two costs: 1) sanitation and wastewater treatment (paid by households, industry and tourist sectors); 2) tertiary treatment and water reuse distribution (paid by farmers).

Source: ITC background and European Guidelines on Integrating Water Reuse into Water Planning and Management.

Maximizing impacts: resilience and profitability

In the simulations conducted for this preliminary assessment during IFAD field missions in 2019, several parameters were considered. The assessment first considers the fixed and variable costs of water saving (improved drip irrigation, net shading, shaded drip irrigation and hydroponics) technologies as well as their effects of the water requirements. Therefore, a given water saving technology contributes to reduce the needed water volume for irrigation. The simulations then takes into account several water production technologies (boreholes for underground water, BW and SW desalination, and reclaimed water) for the required amount of water per day as calculated taking into account the reduction in water requirement

following the installation of the saving technology. The expected revenue from the production also integrates the effects of climate-related disasters using a recent study conducted in the aftermath of the 2017 droughts (Sanoussi *et al.*, 2017). Since the supply of desalinized water and to some degree of reclaimed water is independent from precipitation patterns, crop systems relying on these sources are assumed to be less affected by the impacts of climate change. The farmer's net revenue is calculated as the difference between the climate-affected gross revenues minus the cost of production (labour, inputs, water, etc.) and the 10-year constant annuity reimbursement of the water saving and production investments at a 5-percent interest rate.

Table 15. Results of the preliminary modelling: in dark green net revenue per hectare above 1 million CVE; in light green net revenue between 0 and 1 million CVE; in orange net revenue around 0 (net revenue and loss); and in red net loss. In grey, non-applicable or available.

	Simple drip irrigation				Net Shading				Improved drip irrigation				Shaded drip irrigation				Hydroponics			
	Borehole	Desal. seawater	Desal. brackish water	Reclaimed water	Borehole	Desal. seawater	Desal. brackish water	Reclaimed water	Borehole	Desal. seawater	Desal. brackish water	Reclaimed water	Borehole	Desal. seawater	Desal. brackish water	Reclaimed water	Borehole	Desal. seawater	Desal. brackish water	Reclaimed water
Banana																				
Cabbage																				
Carrot																				
Cassava																				
Onion																				
Papaya																				
Pepper																				
Potato																				
Sweet potato																				
Tomato																				
Water melon																				

Source: modelling by the authors based on INIDA data.

The results of the simulations show that for the cabbage, carrot and pepper value chains, independently from the technologies, the results are positive. For the other value chains, there is a systematic pattern showing that in the absence of water saving technologies the benefits remain limited if not uncertain. The optimal technological mix appears to be shaded drip irrigation combined with any type of water production technology (desalination or reclaimed water). However, it is worth noting that even though BW has much lower fixed and variable costs than SW desalination, it bears the risk of significantly increasing the salinity of groundwater tables – later leading to a forced movement and reliance on SW desalination as a sole source of freshwater and agricultural water. This risk would need to be considered in the assessment of the technologies. In line with the improved selection of the water technologies and value chains, the proposed technical assistance will also suggest a specific segmentation of the potential beneficiaries. Considering the increased use of technologies and the new types of agricultural practices, the success of this project will largely rely on the adequate identification of the beneficiaries. Without pre-empting the results of the following phases of this TA, a preliminary segmentation would – most likely – focus on young people, who are at least professionally educated in a field related to agriculture and agronomy, for example from the

agricultural university of Cabo Verde (ECAA) and are interested and motivated in starting an economic activity in relation with agricultural production.

Table 16. Economic and financial parameters used for the modelling. Water costs are for a price per cubic meter of CVE 15.

Crops	Yield (in ton per ha)	Price (per kg)	Labour (in CVE)	Seeds (in CVE)	Pesticide (in CVE)	Fertilizer (in CVE)	Manure (in CVE)	Water cost (in CVE)
Sweet potato	19.99	103.00	206,439	62,281	28,873	8,535	49,879	120,474
Water melon	34.38	55.00	131,471	5,892	12,291	6,536	17,430	79,465
Potato	24.36	73.30	171,918	300,853	-	12,105	44,877	114,308
Cassava	20.46	91.00	265,062	57,194	-	2,222	57,953	113,403
Onion	21.07	80.00	384,309	26,080	35,034	41,863	18,814	88,566
Tomato	24.78	76.40	245,627	12,512	29,414	24,499	30,572	66,229
Pepper	32.41	123.00	424,658	57,976	65,984	38,831	26,864	63,500
Banana	62.25	38.70	345,545	690,687	-	37,407	59,829	113,682
Carrot	20.00	100.00	39,870	31,500	9,600	15,557	-	17,579
Cabbage	32.00	70.00	24,390	7,500	15,810	17,080	-	11,496
Papaya	40.00	80.00	10,200	18,000	1,200	18,050	-	8,132

Source: INIDA, based on March 2019 market data.

Table 17. List of assumptions for the preliminary modelling

Category	Technology	Unit	Fixed cost (mean)	Variable cost (mean)
Saving	None	per ha	- CVE	- CVE
Saving	Net shading	per ha	8,333,333 CVE	- CVE
Saving	Drip irrigation	per ha	550,000 CVE	- CVE
Saving	Shaded drip irrigation	per ha	8,883,333 CVE	- CVE
Saving	Hydroponics	per ha	12,000,000 CVE	- CVE
Production	Borehole	per m3	30,313 CVE	50 CVE
Production	Desalination seawater	per m3	88,000 CVE	593 CVE
Production	Desalination brackish water	per m3	55,000 CVE	90 CVE
Production	Reclaimed water	per m3	55,000 CVE	44 CVE

Annex 1. More detailed RO and RED desalination technologies comparison from IFAD Mission for RTA Cape-Verde in 2019

Type of water resource	Benefits	Risks	Associated costs
Brackish water RO desalination	<p>Lower operating pressure (from 10 to 25 bar) depending on BW salinity (from 4 to 15 g/l).</p> <p>Low energy consumption due to the low pressure required (1.5 - 2.5 kWh/m³ including intake pumping).</p> <p>High recovery rate (up to 75% or more), which means less feed water needed and less brine produced.</p> <p>Lower investment and amortization costs in comparison with SWRO.</p>	<p>Feed flow to the system is conditioned by variations in flow rate (due to rain or drought episodes), and in quality (possible salinity increase due to marine intrusion, natural pollution and/or discharges near the brackish water source).</p> <p>Problematic brine management- inland conditions.</p> <p>High costs in the feed water pre-treatment and in the post-treatment of desalinated water in order to re-mineralize it and adapt its use for irrigation.</p>	<p>Investment costs (small-scale plants) from 400 to 600 €/m³ installed.</p> <p>Operational cost around 0.5 €/m³ (0.09 €/kWh).</p>
Brackish water RED desalination	<p>RED does not require pressure. It operates using electricity.</p> <p>Lower energy consumption than RO with raw water salinity from 2.5 to 10 g/l. (0.7 – 1.8 kWh/m³ including intake pumping).</p> <p>Higher recovery rate (up to 95%), which means less feed water needed and less brine produced.</p> <p>Similar investment and amortization costs than RO, but it will depend of local market, suppliers and business implementation of RED in Cabo Verde.</p> <p>Lower costs in the feed water pre-treatment.</p>	<p>Higher energy consumption than RO with a raw water salinity > 10 g/l.</p> <p>Investment is very conditioned if the feed flow salinity increases as time passes (marine intrusion, natural pollution and/or discharges near the brackish water source).</p> <p>The desalted water post-treatment must be adapted depending of the use for irrigation.</p>	<p>Investment costs (small-scale plants) from 500 to 700 €/m³ installed.</p> <p>Operational cost around 0.35-0.5 €/m³ (0.09 €/kWh).</p>
Seawater RO desalination	<p>Feed flow to the system constant in quantity and quality (beach wells is the recommended catchment system).</p> <p>Easier brine discharge (devices to sea discharge with low impact).</p> <p>In market terms, as seawater desalination is more developed, economies of scale allow the disparity on investment costs</p>	<p>Higher operating pressure (from 40 to 57 bar) depending on SW salinity (from 35 to 38 g/l).</p> <p>Higher energy consumption due to the higher pressure required (2.5 - 3.5 kWh/m³ including intake pumping). It means higher operational cost.</p> <p>In terms of investment costs, they are higher in SW desalination due to the</p>	<p>Investment costs (from high to small-scale plants): from 600 to 1000 €/m³ installed.</p> <p>Energy cost represents 25-40% of the total exploitation cost (depends of the scale).</p>

	<p>not to be as significant for some scales.</p> <p>Operating costs do not show significant divergences between BW and SW, except for the difference implied by the amortization and the energy consumption.</p>	<p>materials used for high pressure, salinity and the use of energy recovery devices (which are not installed in BW plants).</p>	
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