REQUEST FOR CEO ENDORSEMENT

PROJECT TYPE: FULL SIZED PROJECT
TYPE OF TRUST FUND: LDCF

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PART I: PROJECT INFORMATION

Project Title: Strengthening land & ecosystem management under conditions of climate change in the Niayes and Casamance ecoregions- Republic of Senegal (PRGTE)			
Country(ies):	Senegal	GEF Project ID:[1]	5566
GEF Agency(ies):	UNDP	GEF Agency Project ID:	4964
Other Executing Partner(s):	Directorate of Water, Forests, Hunting and Soil Conservation	Submission Date: Resubmission Date:	16 April 2015 4 June 2015
GEF Focal Area (s):	Climate Change	Project Duration(Months)	60
Name of Parent Program (if applicable): ➢ For SFM/REDD+ ☐ ➢ For SGP ☐ ➢ For PPP ☐		Project Agency Fee ($):	389,500

A. FOCAL AREA STRATEGY FRAMEWORK[2]

Focal Area Objectives	Expected FA Outcomes	Trust Fund	Grant Amount ($)	Cofinancing ($)
CCA-1	**Outcome 1.1:** Vulnerability of physical assets and natural systems reduced	LDCF	300,000	1,000,000
	Outcome 1.2: Livelihoods and sources of income of vulnerable populations diversified	LDCF	1,000,000	2,000,000
	Outcome 1.3: Climate-resilient technologies and practices adopted and scaled up	LDCF	565,000	1,000,000
CCA-2	**Outcome 2.1:** Increased awareness of climate change impacts, vulnerability and adaptation	LDCF	163,000	1,000,000
	Outcome 2.2: Access to improved climate information and early-warning systems enhanced at regional, national, sub-national and local levels	LDCF	1,400,000	5,000,000
	Outcome 2.3: Institutional and technical capacities and human skills strengthened to identify, prioritize, implement, monitor and evaluate adaptation strategies and measures	LDCF	475,000	2,500,000
	Project management	LDCF	197,000	700,000
	Total project costs		4,100,000	13,200,000

B. PROJECT FRAMEWORK

Project Objective: To strengthen the enabling environment for the implementation of appropriate adaptation measures based on ecosystem management in Niayes and Casamance Regions.

Project Component	Grant Type	Expected Outcomes	Expected Outputs	Trust Fund	Grant Amount ($)	Confirmed Cofinancing ($)
Component 1: Climate and socio-environmental information platform	TA	Effective forecasting, preparedness and decision making information	Output 1.1: The climate, meteorological and hydrological network for the target areas and the	LDCF	1,400,000	5,000,000

[1] Project ID number will be assigned by GEFSEC.
[2] Refer to the Focal Area Results Framework and LDCF/SCCF Framework when completing Table A.

for determining climate-driven vulnerabilities and cost effective adaptation options in Niayes and Casamance		management systems for determining and tracking climate impacts on ecosystem systems established	capacities strengthened in order to produce reliable data needed to monitor and analyze hydro-climatic phenomena Output 1.2: Develop an integrated information system producing climate information and generating the products needed to identify risks related to climate change (e.g., maps for risk, vulnerability, etc.) Output 1.3: A platform for sharing information established to support the management of climate risks and long-term planning for adaptation.			
Component 2. Reducing climate driven risks in target ecosystem and land through adaptive restoration measures	INV	Ecosystem based adaptation options including the adoption of climate resilient land and ecosystem management practices in two target area (Niayes and Casamance) reduce exposure to climate induced risks	Output 2.1: At least 100 hectares of mangrove plantations restored to reduce the impact of swell and coastal erosion; Output 2.2: Multi-purpose community forests resilient to climate change tested in the vegetable gardens of Niayes to protect crops from wind erosion and prevent encroachment by sand dunes. Output 2.3: At least 10 community groups, particularly women's groups, supported in Casamance to improve climate resilience through agro-pastoral and agro-forestry activities and sustainable water management practices in rice paddies.	LDCF	1,828,000	4,000,000
Component 3. Knowledge and information support mechanisms	TA	Individual, household and community capacities will be strengthened in order to increase awareness about responses to climate change and effective support for	Output 3.1: Local governments and decentralized technical services have the necessary capacities to support communities in implementing adaptation activities;	LDCF	675,000	3,500,000

		adaptation efforts.	Output 3.2: The benefits from implemented adaptation solutions are monitored and shared with government officials, target communities and partners to inform them about project results replication opportunities.			
				Subtotal	3,903,000	12,500,000
				Project management Cost (PMC)[3]	LDCF	197,000	700,000
				Total project costs		4,100,000	13,200,000

C. SOURCES OF CONFIRMED COFINANCING FOR THE PROJECT BY SOURCE AND BY NAME ($)

Please include letters confirming cofinancing for the projeSct with this form

Sources of Co-financing	Name of Co-financier	Type of Cofinancing	Cofinancing Amount ($)
Recipient Government	Ministere de l'Environnement et du Developpement Durable	Grant	3,000,000
Recipient Government	Ministere de l'Environnement et du Developpement Durable	In-kind	200,000
Recipient Government	ANACIM	Grant	3,500,000
Bilateral aid agency (MAECD)	Ministere de l'Environnement et du Developpement Durable	Grant	4,000,000
GEF Agency	UNDP	Grant	2,500,000
Total Co-financing			13,200,000

D. TRUST FUND RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY[1]

GEF Agency	Type of Trust Fund	Focal Area	Country Name/ Global	(in $)		
				Grant Amount (a)	Agency Fee (b)[2]	Total c=a+b
UNDP	GEF LDCF	CCA	Senegal	4,100,000	389,500	4,489,500
Total Grant Resources				4,100,000	389,500	4,489,500

[1] In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table. PMC amount from Table B should be included proportionately to the focal area amount in this table.

[2] Indicate fees related to this project.

F. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:

Component	Grant Amount ($)	Cofinancing ($)	Project Total ($)
International Consultants	15,000	45,000	60,000
National/Local Consultants	103,500	3,500,000	3,603,500

G. DOES THE PROJECT INCLUDE A "NON-GRANT" INSTRUMENT? NO

[3] PMC should be charged proportionately to focal areas based on focal area project grant amount in Table D below.

(If non-grant instruments are used, provide in Annex D an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF/NPIF Trust Fund).

PART II: PROJECT JUSTIFICATION

A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN OF THE ORIGINAL PIF[4]

A summary of what changed since the PIF is provided below

Original project design in PIF	Adjustment/improvement made at CEO Endorsement	
Allocation of LDCF resources per component		
Comp. 1) $2,000k Comp. 2) $1,100k Comp. 3) $804k Project Management: $195k	Component 1: 1.400 million Component 2: 1.828 million Component 3: 0.675 million Project Management:0.197 million	The analyze of the baseline situation during the preparatory phase and detailed budgeting carried out in connection with the PRODOC development resulted in adjustments in the allocation of LDCF resources per component, but total LDCF request is unchanged. - Component 1: the LDCF allocation decreased of 0.6 million after the inventory of existing climate information by ANACIM. - Component 2: an increased of 0.728 million based on demand from stakeholders to allocate more resources on communities activities - Component 3: decreased of 0.129 million after the evaluation of capacity needs
Co-financing resources and source		
Indicative total: $43.7 million Comp. 1) $4 million (from ANACIM and MEDD) Comp. 2) $38 million (from bilateral aid agency and UNDP) Comp. 3) $1 million (from bilateral aid agency and MEDD) Project Management: $0.7	Total co-financing: $13,2 millions Component 1: $5 million (from ANACIM and MEDD technical department) Component 2: 4 million (from bilateral aid agency) Component 3: 3.5 million (from bilateral agency, UNDP and MEDD) Project Management: $0.7 million	The total leveraged co-financing has decreased by approx. 70% from what had been foreseen at PIF stage, totaling of $13.2 million in mobilized co-financing at CEO Endorsement stage. During the Project development phase a screening of ongoing initiatives was realized to determine the more suitable baseline in target areas. This leaded to several changes in the co-financing figures presented in the PIF. Component 1: increase of 1 million due to more engagement of ANACIM

[4] For questions A.1 –A.7 in Part II, if there are no changes since PIF and if not specifically requested in the review sheet at PIF stage, then no need to respond, please enter "NA" after the respective question.

Original project design in PIF	Adjustment/improvement made at CEO Endorsement	
million (from UNDP and MEDD)	(from UNDP and MEDD)	Component 2: decrease of 34 millions. Changes on co-financing amount from the "**Economic Development of Casamance Programme**" (PADEC) and the **Economic Development and Management Program of Niayes (**PADEN) are made due to the advanced stage in the implementation of the programs (about 4 years execution out of 8 years) and the level of interventions in the project target areas. By the way some co-financing figure from UNDP and PADEN are moved to component 3 (capacity development) Component 3: increase of 3 millions due to the move of co-financing from UNDP (2 millions) and from PADEN (1 million). Finally, a change is made on the name of co-financing from bilateral agency (Programmes PADEN and PADEC) as the Ministry of Environment is executing the activities in the fields (see letter of co-financing).

A.1 National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAS, N NBSAPs, national communications, TNAs, NCSA, NIPs, PRSPs, NPFE, Biennial Update Reports, etc.

1.1 Intervention areas

The project "Strengthening land and ecosystem management under conditions of climate change" (PRGTE) will be implemented in two geographic areas: Niayes and Casamance.

The Niayes eco-geographic area is located along the northern coast from Dakar to Saint Louis. With a total area of 2754 km^2, it covers the administrative regions of Dakar, Louga and Thiès. The project will be implemented in the rural councils of Léona and Kab Gaye (Louga), in the Mboro commune (Thiès) and, by extension, in its area of influence (Darou Khoudoss and Taïba Ndiaye). A short rainy season and an overall rainfall of 200 mm/year characterize Léona and Kab Gaye. By contrast, Mboro, located in the south, reports an overall rainfall of 300 mm/year.

- The rural council of Léona covers approximately 415 km^2 with 30,335 population and numbers 106 villages. The socio-economic activities are market gardening, agro-forestry, logging, livestock raising, fishing and trade. It is an outstanding onion production area but marked by lack of rain.
- The rural council of Kab Gaye covers 302.55 km^2 with 12,235 population and numbers 54 villages. The main activities are market gardening, rain-fed crops, livestock raising and small trade. The majority of the land (55.2%) is cultivated in rain-fed crops, market gardening in the basins (1.5%) and a minute portion occupied by residents (0.3%). The remaining land is divided between savannah shrub lands, forest plantations, grassy savanna and grassy steppe.

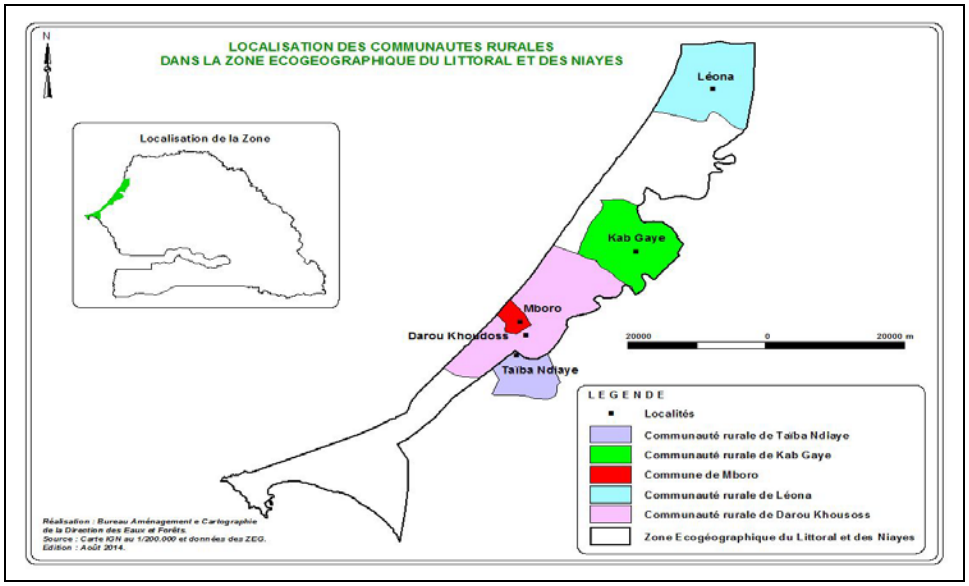


FIG 1: Target sites in Niayes ecoregion

- The Mboro commune covers 3.1 km^2 with 25,982 populations. It is an important industrial and commercial hub. Agricultural and fishery products play a key role for Mboro, which through its area of influence (Darou Khoudoss, Méouane and Taïba Ndiaye) is a large market gardening area. It provides 30% of the domestic production of potatoes and onions. Promoters come from Mauritania, The Gambia and Guinea Bissau for their supply. Women are the fastest growing marginalized group and are investing in all sectors of activities. The area of influence of Mboro encompasses the rural council of Darou Khoudoss (520 km²; 64,576 population), the rural council of Taïba Ndiaye (140 km²; 27,994) and the rural council of Méouane (334.3 km^2; 38,170 population).

The eco-geographic area of Casamance corresponds to the natural region of the Casamance and combines the administrative regions of Ziguinchor, Sédhiou and Kolda, covering a total area of 28,350 km^2.

- For the Ziguinchor region, activities will target the Tobor land (Niamone CR) and in the Kalounayes forest focusing on four rural councils (Niamone, Coubalan, Ouonck and Tenghory). In Kolda, the sites are the Soukou valley (Saré Bidji CR) and Saré Oumar (Dioulacolon CR).
- The Tobor land falls within the Niamone rural council, and the project will support the Tobor village development committee's activities to strengthen capacities to involve women in mangrove management (oyster farming and mangrove restoration through reforestation).
- The Kalounayes area lies in the Tenghory arrondissement, which covers 1073 km² and numbers 81 villages with a population of 48,235. The Tenghory arrondissement has four rural councils (Coubalan: 11,002 population; Niamone: 7,643 population; Ouonck: 10,385 population; and Tenghory: 19,205 population). The main socio-economic activities of Kalounayes interfering with forest resources management are agriculture, livestock raising, logging, fishing, trade, handcrafts, tourism and industries drawing their raw materials from the forest. The Kalounayes forest encompasses 33 villages.
- The Diendé rural council covers a total area of 164 km^2 with and estimated population of 20,655. The plateaus, made up of leached ferruginous and ferallitic tropical soils, are adapted to rain-fed crops (grains, groundnut and cotton). The hydromorphic soils suitable for rice production, arboriculture and market gardening are found in the basins and lowlands. The fairly good rainfall with peaks over 1300 mm is, however, quite irregular. Agriculture is the main source of income for over 80% of the workforce. Livestock raising, fishing, logging, trade, handcrafts and micro-industries are also conducted here.

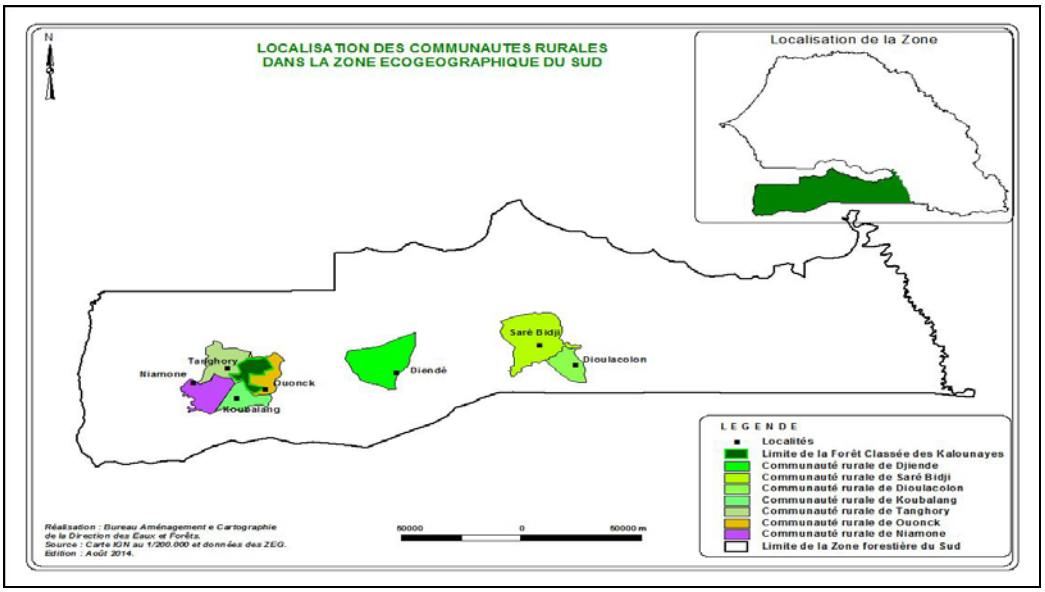


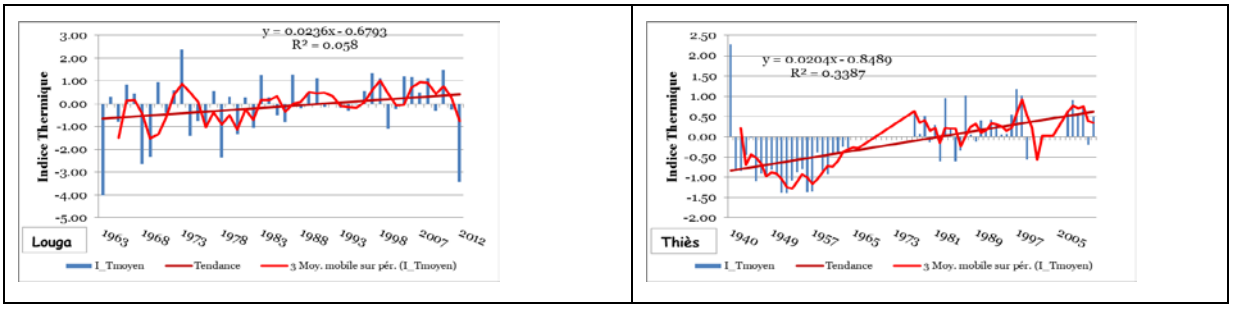
FIG 2: Target sites in Casamance ecoregion

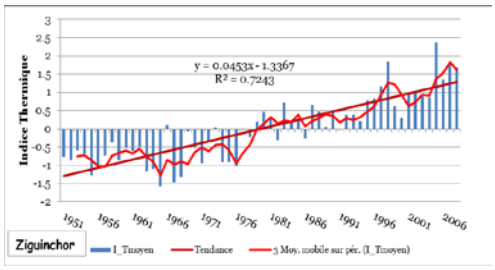
- The rural council of Saré Bidji covers 375 km^2 with 16,982 population and numbers 93 villages. The main activities are agriculture, livestock raising, fishing, trade, handcrafts and logging. Recorded rainfall is approximately 1000 mm/year. The sandy-clay soil suitable for growing millet, sorghum, maize, rice and fonio covers over 90% of the land, followed by sandy soil (groundnut and millet) and then the pebbly soil of the plateaus. Excessive land use and the gradual abandonment of leaving plots to fallow are contributing factors to soil degradation. Added to these are bush fires and wind and water erosion.
- The rural council of Dioulacolon covers approximately 179.57 km^2 with 14,980 population and numbers 56 villages and borders the Saré Bidji CR to the north. Agriculture is the main activity, followed by livestock raising with real potential for poultry farming and fish farming. Logging, handcrafts and trade are also significant. The average annual rainfall ranges between 900 and 1200 mm. It borders the Saré Bidji CR, and the same types of soils can be found there.

1.2. Climate change - induced problem

A detail report on Climate changes in project target sites is presented under the PPG Report 1.

In summary, temperature trends in the Niayes and Casamance, between 1940 and 2012, are rising (Fig 3). The upward trend is more pronounced in the Ziguinchor region with about 2.6 ° C increase. The analysis also shows that the last decade was the warmest on record since 1950, especially in Casamance. These results were confirmed by several studies conducted in the Sahel (Ly, M., 2013)





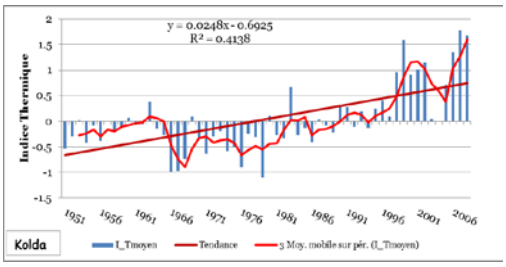


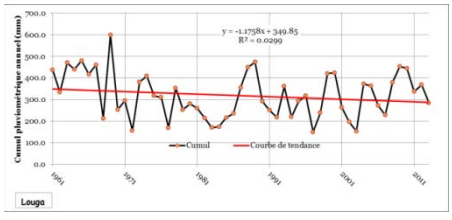
Figure 3: Change in average temperature in the Niayes and Casamance

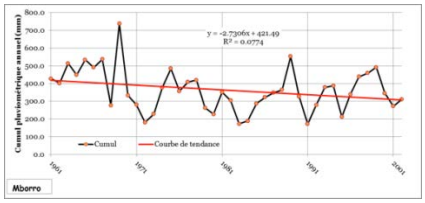
The comparison of average rainfall between the two periods of 1950-1970 and 1970-1990 shows a shift in isohyets throughout the country. Indeed, the 400 mm isohyet which was around 16 ° North during the 1950-1970 period moved south over 100 km at around 15 ° north for the period 1970-1990. A decrease in rainfall of about 200 mm was observed over most of the country with the exception of Casamance where it is more pronounced, with about 400 mm. As for the period 1990-2010, it is marked by a "recovery" of rainfall resulting in a slight move towards the North of isohyets compared with the period 1970-1990. This recovery is much more pronounced in the eastern half of the country compared to the coastal areas. An analysis of changes in rainfall between 1961 and 2013 in the Niayes and Casamance shows strong within-year variability of rainfall and declining trend of total rainfall (Figure 4).

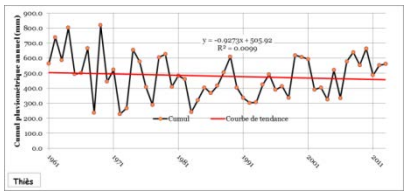
This decrease in rainfall is much greater in the Mboro district of the Niayes and in Sédhiou for the Casamance. In these areas, the occurrences of pauses in rainfall are quite high and often compromise the chances of success of rain fed crops.

Scenarios of climate change in Senegal prepared under the second National Communication on Climate Change in Senegal shows temperature increases of about 3 ° C in the period 2031-2050, and of 8.5 °C for 2100. The rains are usually decreasing for all scenarios for the period 2006-2040.

Niayes







Casamance

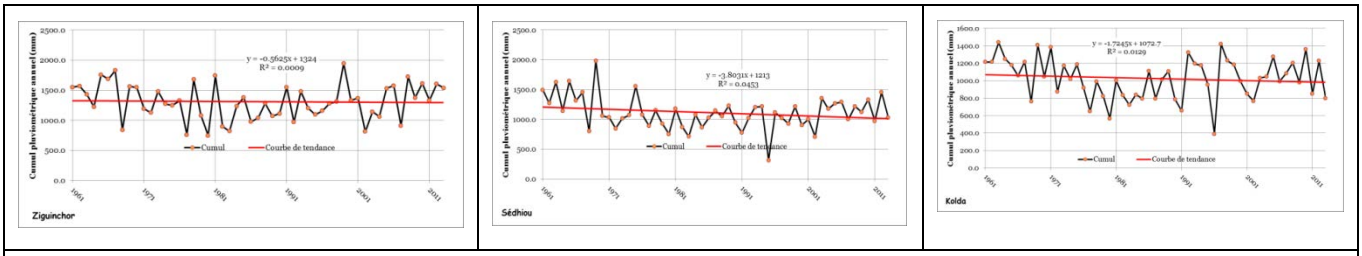


Figure 4: Changes in annual rainfall and trends in the Niayes and Casamance in 1961-2013

Rural communities depend heavily on ecosystems which products and services are often the only means for their livelihoods. The degradation of these ecosystems has increased dramatically as a result of human activities, but also due to climate change. The main potential and expected impacts of climate variability and change in the medium and long term are following:

In the eco-geographic area of the Niayes, climate change has caused the early depletion of water ponds and the deepening of the water table. This situation is also accompanied with salt water intrusion and thus the salinization of the water table, the main source of water for farms (vegetable, tree, forestry, poultry ...etc.). Key economic activities and ecosystems most affected are:

- **Horticulture**: The split of the seasons (dry, cold, rainy) is no longer neat and has resulted in the disruption of agricultural calendars. Therefore, farming techniques are no longer appropriate, and physical and chemical degradation of the soils led to reduce the effectiveness of agriculture inputs. The limited availability of agricultural inputs (seeds, fertilizer, water ...etc.), the resurgence of pest attacks, and limited agricultural technologies will continue to affect yields of horticultural enterprises, especially those undertaken by women who remain highly vulnerable, as long as effective adaptation measures are not implemented. In addition, sea spray conveyed by sea breezes that flow in the area during unexpected periods, and the harmattan winds cause significant damages to crops. Given the low level or absence of close protection (windbreak) the negative impacts on vegetable production, especially for onion, are alarming. The lack of effective adaptation strategies for the short, medium and long term results in the persistence of this situation that is a real threat to the horticultural industry in the Niayes and to food security for the entire country because this area accounts for 60% of the national production of vegetables.
- **Vegetation band**: The protection functions (fixation of sand dunes, protection of vegetable farms, house, etc.) and production (fuel wood, lumber, seeds…etc.) of the band of vegetation are well appreciated by local communities along the northern coastline of Senegal. The plantations of casuarinas were established between 1948 and 2004. The casuarinas specie is well adapted to high sunny conditions and is tolerant to salinity, but the increasing levels of temperatures and salinity are contributing to high mortality rates of the plantations.
- The **groundwater** resources: Declining rainfall and higher temperatures result, on one hand, in salinization and degradation of the groundwater, particularly in areas covered by sand dunes with the lowering of the water table, and on the other hand, in early depletion of surface waters due to high evaporation. Rising temperatures associated with the effect of the harmattan increases water requirements of plants because of high evapotranspiration. This trend combined with high demands for water and wasteful watering techniques does not favor the sustainability of water resources in the Niayes.
- Impacts on **health**: The Chemical Industries of Senegal (ICS) releases ammonia into the atmosphere. The pollutant gets blocked in lower layers by thermal inversion and is transported directly to homes and crop fields in the east or west directions. This toxic pollutant causes burning of the leaves of vegetable crops and fruit trees, diseases in humans and animals, pollution of the water table in some areas as evidenced by the case of abandonment of wells in some towns in the area etc. In this area, the risk of acid rain can be expected if the amount of ammonia reaches certain proportions during the rainy season. If the morning fog contains this pollutant has the same effects on crops and fruit trees in the area are observed.

In the eco-geographic area of Casamance, modifications induced by climatic change include salt-water intrusion in the continent, salinization of mangrove mudflats and rice fields, degradation of mangroves, loss soil fertility in the plateau areas due to erosions and related siltation of rice field, and forest degradation. This has led to changes in production systems practiced before. Between 1985 and 2006 changes are observed in the land cover. With respect to natural vegetation, there is a decrease in the area occupied by woodland and forest. This explains the increase in areas covered by savanna landscapes and tree species. The same downward trend is observed for the mangroves resulting in an increase in area of degraded mangroves. The mapping conducted by CSE shows a mangrove surface area coverage of 102,303 ha in 1985, 89.999 ha in 1993, and 90,381 ha in 2006. With regard to surface areas covered by crop fields, the mapping shows a total of 357,776 ha (73,655 ha of rain fed rice fields, and 28.4121 ha of rain fed crops) in 1985, and a slight decrease in 2006. Key sectors of economic activities most sensitive and most affected by climate change, and thus requiring adaptation measures, include, rice cultivation, mangrove forest, and highlands. The main sectors with current and expected impacts of climate change and variability in the medium and long term are:

- **Rice fields**: The increasing salinization of rice filed has caused many women to abandon their rice fields. A main consequence of rice fields becoming unusable due to excessive salinity is the massive deforestation in the highlands for new farmland, and bushfires, combined with uncontrolled logging. This deforestation leads in turn to soil and water erosion that causes the progressive siltation of rice fields, provoking a further decline in rice fields. It is estimated that rice fields abandoned due to acidity and salinity totaled 130,000 ha between 1970 and 1986. In the early 1970s, the share of Casamance represented 70% of the national production of rice. Now it represents only about 32%, about half of what is was [5]Furthermore, the reduction in the duration of the rainy season and more frequent pockets of drought, and un-adapted rice varieties aggravate problems the rain fed rice cultivation is faced with. This situation exposes Casamance to more food insecurity because rice is the main food staple in rural and urban communities in Casamance. The regression of rice cultivation is partly offset by the development of new economic activities (cultivation of peanuts and millet, vegetable gardening, salt production, forest fruits harvesting...etc.). Efforts to rehabilitate the valleys by reducing the salinization and acidification have experienced very limited success due in part to increasing water deficits.
- **Mangroves**: The mangrove ecosystem of the Casamance estuary and lower river basin is remarkable because of its important biodiversity, and its ecological, economic and socio-cultural functions. It acts also as a buffer between the sea and the mainland, reduces coastal erosion, and protects against the effects of winds, and waves. Mangroves provide important forestry and fishery resources to communities. The economic products and services provided by mangroves include firewood, fishing, harvesting of oysters, medicinal plants, rice fields…etc. The mangrove areas play also very important cultural functions such being used as sacred forests for traditional customs and practices (totem, funerals, and various ceremonies). The mangrove ecosystem is also affected by the decrease in rainfall and continental runoff favoured the development of salt flats and the reduction of their extent and productions that are attached (ex. oysters, arches, shrimp). Climate change impacts include significant increases in salinity accelerating the degradation of mangrove ecosystems. Reforestation activities undertaken by NGOs and community based organizations show that it is possible to carry out successful activities of mangrove restoration with a focus on community participation, especially the involvement of women.
- **Forests**: In addition to the negative impacts of climate change on forests massive fraudulent exploitation of forests in Casamance causes serious threats to forests in this region. Areas classified as protected area suffer from various forms of degradation, as well, affecting diversity and plant density. It appears from the land mapping done by CSE in 2008 on a total area estimated at 1,468,506 ha of different forest formations, there are dramatic changes on forests and woodlands due to natural stress on about 13% for the area studied, and conversions due to encroachment on forest reserves estimated at 6% of the same area. These modifications and conversions are largely due to the impacts of climate change (reduced rainfall, higher temperatures) that led to the salinization of streams and wetlands, degradation of forests and farmland, and decline crop yields. This situation has resulted in lower incomes. To make up for these losses local populations rely more and more on forest resources leading to further forest degradation and being trapped in a vicious circle.

[5] DAPS: WFP Study on Food Aid Impact and Role in Casamance, June 2007

In conclusion, almost all social, economic, and environmental aspects in the two project areas are already seriously affected by the observed impacts of climate change. It is also certain that these impacts will be exacerbated in the short and most likely long term as well. The Intergovernmental Panel of Experts on Climate Change (IPCC) mentions in its 2007 report that LDCs, because of their low level of development will have technical and financial difficulties to deal with climatic changes and their impacts, and are considered among the most vulnerable countries to Climate Change. The report also indicates that for West Africa in particular impacts due to the increase in temperature and decrease in rainfall will cause significant levels of agricultural and GDP losses. Existing risks that could be exacerbated by climate change include greater erosion and low yields for rain fed agriculture, among others. Small farmers, who are the majority in rural areas, would be hardest hit with the decline in agricultural production, loss of income and population displacement, i.e. a deterioration of living conditions if appropriate measures are not taken.

The impact of climate change on populations' health is real. For example, in the two target areas, morbidity due to malaria is particularly high during the rainy season. In the same vein, rising temperatures are affecting the elderly and infants. Moreover, when soils in dry lands are loose, easterly trade winds cause an increase in dust that can provoke respiratory diseases. The wind regime acts as a transport agent of disease vectors and harmful pollutants.

1.3. Preferred Situation and Barriers to Overcome

Despite various strategies, policies and measures that were undertaken, the current socio-economic situation in the Niayes and in Casamance is characterized by low resilience to climate change and variability. The weakness of the physical environment (low and erratic rainfall, low groundwater levels, salinization and soil degradation, loss of biodiversity, regression of mangrove and forest) under high human pressure and degradation of systems and production tools have led to falling incomes of local people. The sources of income for local communities mainly based on the services and products from these ecosystems will be increasingly affected by the impacts of climate change and variability. Unless appropriate solutions are implemented, these effects will have negative impacts on productivity in all sectors, resulting in difficult socio-economic conditions, including increased poverty and an impediment to national development efforts.

The long term solution, would be to promote the adoption of integrated agro-sylvo-pastoral systems and practices that are resilient to climate change and variability, that will improve horticulture and rice production, strengthen the protective and production function of the band of casuarinas and ensure sound management of water resources, forests and mangroves for the benefit of local communities in the project target areas of Niayes and Casamance.

The long-term solution for local communities' sustainable resilience to climate change will necessarily involve an understanding of climate information with the implementation of adequate financial, institutional and technical measures for a better adaptation of the socio-economic activities to climate change. Therefore, these challenges, sources of population vulnerability must be overcome by the producers to adapt to climate change in order to increase the resilience of the production systems in the intervention sites identified in the Niayes and Casamance. The stakeholders (institutions, producers, producer organizations, local governments, NGOs, etc.) in the project areas have identified the barriers presented below. Although these barriers are presented separately, they are linked.

Barrier #1: Inadequate production systems challenged by climate change and variability:

As stated previously, climate variability within seasons is a serious problem in the project target areas. This reality has a decisive impact on the agro-sylvo-pastoral production level in these areas. Climate change has resulted in the shortening of the rainy season, the disruption of the seasonal cycle (dry, cold and rainy) and the disruption of the cultivating and sowing calendar. All these disruptions are not without impact on the market garden cycle and rain-fed agriculture (rice production and food crop) and the low productivity of livestock and forestry systems. Agro-forestry and cattle ranching management systems are no longer adapted to climate variability. This affects farmers' yields, especially women who remain highly vulnerable as long as, effective and sustainable adaptation measures are not carried out.

The contribution from support and research institutions and decision-makers at all levels to help producers remove this barrier by developing appropriate production systems to climate change is low, including a very limited development of agro-forestry and livestock species adapted to climate change and variability. This situation is similar regarding the development of technical packages that take into account climate variability. In addition, there

is a lack of ecosystem approach such as the watershed approach in the management of agro-forestry and cattle ranching areas.

Barrier #2: Weak institutional capacity for climate information production and dissemination

The challenges due to climate change adaptation in the Niayes and Casamance, including those connected to barrier 1 above, require equipment and operating institutions capable of reducing the deficit on the production and access to climate information. In the project's two target areas, the meteorological and rainfall stations are far from meeting required standards. There are several shortcomings including the lack of well-functioning measurement instruments, human resources in needed quantity, logistics for data collection and adequate equipment for data processing (software, computers, etc.). In addition, there is a need for human and material resources for communicating climate information in a language that is accessible to different users (research and extension services, administration and decision makers at various levels and local people).

Barrier#3: Insufficient capacities of local communities, technical services and decentralized administrations to develop and implement adaptation practices to climate change.

Local communities and technical and administrative services at different levels (national, regional and local) are hampered by their legal, regulatory, financial and technical constraints. Here are some examples:

- The governance of natural resources, a critical aspect for adaptation based on land and ecosystem management, a major theme of this project, has serious flaws because of the coexistence of customary law with that of the national land management legal framework;
- Funding local activities is a major handicap because of low local government budgets (less than US$ 20,000 per year on average) and non-decentralized trend to finance development;
- Illiteracy and lack of training of most local officials are an exacerbating factor;
- Availability of managerial services in quality and quantity is a serious handicap;
- Finally, the lack of coordination between government and non-government stakeholders is a problem at different levels.

These various weaknesses and challenges lead to the following problems.

- Limited experiences in the consideration of scientific information including climate: To cope with climate change and variability including the lifting of barrier 1, producers and institutions (research & development) initiated adaptation strategies that are still inadequate. Indeed, these strategies are applied at very small scales and developed without the benefit of appropriate scientific knowledge. These strategies are mainly based on traditional knowledge that is far from being adequate due mainly to the rapid changes. For example, for the livestock sector, the measures consist of reducing herd size and migration to richer pasture. In agriculture, for instance, the emergence of agricultural areas around boreholes for market gardening is noticeable; initiatives towards the use of early maturation seed varieties developed by research institutions (sorghum, millet, peanuts, rice, etc.); crop monitoring and advice to producers on critical planting dates and useful rain required for sowing, etc. This support by the research and extension services to producers is well intentioned but produces very limited effects because of a lack of relevant climate information.
- Local Governments limited ability and insufficient awareness: Regional and local political and administrative authorities lack the capacity and a sufficient awareness to manage the effects of climate change and variability. Local development plans level of implementation is low and it is necessary to channel available resources towards activities and resilient investments by incorporating climate risk in municipal budgets. In this regard, the general knowledge on climate change and its consideration in the strategies and development programs are generally low at all levels (national, regional, county and municipal).
- Government technical services with limited capacity: National technical services at different administrative levels are responsible for the technical support to local communities for the implementation of various activities of economic and social nature and the protection of the environment upon which most of these activities depend on. However, the technical staff has very limited resources to fulfill these responsibilities. In general, public services at national and local level suffer from inadequate physical presence both in

quality and quantity. Decentralized departments of agriculture on which the majority of rural people rely, as well as the weather forecasting support system, whose role for increased resilience is critical, are no exception. This situation leads to low institutional capacity of decentralized government and the support provided by the decentralized technical services at the local level is far from covering the needs. Therefore, decentralized technical services should be strengthened and farmers need more information and demonstrations of options for adaptation.

- Weaknesses linked to social rules and policies including gender and birthright: Gender issues and birthright constitute major constraints that can be summarized as follows. Women in the project target areas and the rest of Senegal are seldom sufficiently involved in identifying problems and solutions and in the decision making process. In addition, women are faced with problems that are unique to them: (i) unfair access to production resources including land, training, funding, etc.; and (ii) an unfavorable distribution of roles and responsibilities between men and women in the production and social life. Considering the percentage of the population they represent, the important role they play in all fields and their remarkable capacity of mobilization, women's involvement is essential to improve the resilience of local communities. Moreover, concrete examples demonstrate the importance of specific adaptation strategies implemented by women's organizations that can be powerful agents of change.

The Senegalese youth, including those in the project target areas, present the following important characteristics: (i) this most educated group has become increasingly the largest section of the population; (ii) young people are more open to new ideas and technologies, which are essential to adapt to climate change and variability, which present new challenges that require new knowledge and attitudes. These essential assets for resilient living conditions are often seriously impaired by some traditional customs, including the birthright, which means that the oldest always lead. Young people are also restricted on many issues related to land and ecosystems management.

Barrier #4: Producers and households with low technical and financial capacities: The vast majority of people in the project target areas are victims of extreme poverty causing extreme limited technical and financial capacity to adapt to climate change.

The project areas are characterized by low productivity of agro-sylvo-pastoral activities linked to underuse of agricultural inputs and appropriate equipment, in addition to a strong dependence on rainfall and fragile ecosystems. Producers (growers, ranchers, loggers, oyster harvesters, rice farmers, farmers, etc.) have very limited financial resources. This results in limited equipment and access to inputs and technical guidance needed to overcome the precarious living conditions.

Due to the population's low income levels and limited access to credit, farmers and households do not have the financial resources to make required investments to adapt to climate change: such resources include new technologies to make agro-sylvo-pastoral activities more resilient; and diversification of activities for better risk management.

Combined with high population growth, this situation causes an increase in areas used for agro-sylvo-pastoral activities and its corollary alarming degradation of ecosystems that in turn exacerbate the impacts of climate change.

1.4. National and local benefits

This project supports national development goals and plans to achieve Millennium Development Goals (MDGs) 1, 3 and 7.

- *MDG 1: Eradicate extreme poverty and hunger* – at least 5000 direct and 30,000 indirects beneficiaries will be supported to use climate information, understand climate risks and develop climate resilient livelihoods activities to improve household's livelihood. Key adaptation measures will be promoted in order to enhance agricultural and generate income for vulnerable households, specifically women. Means and skills will be to help them to be prepared and act appropriately and effectively in a timely manner, in case of climate chocks. Seasonal forecasts can enable the rural population to take adaptive farming measures to protect productivity;
- *MDG 3: Promote gender equality and empower women* – Adaptation measures and relevant associated training will be tailored to end-user needs, in particular the needs of women who have little access to

climate information.

- *MDG 7: Ensure environmental sustainability* – The foundation of this project is to ensure environmental sustainability by promoting mangrove restoration, water management and soil Protection and Restoration / Soil and Water Conservation measures. This approach can assist in the sustainable use of natural resources through good land- and watershed-management practices.

In term of socio-economic and environmental benefits, the project will help to decrease the exodus of rural population to urban centers and migration with the restoration of land and ecosystem (youth and women can now develop economic activities related to the wise use of mangroves resources and exploitation of Niayes). This will improve income-generating opportunities and therefore limit the migration process toward big cities. Furthermore, national and local institutions will strengthen databases, access to climate information to better manage risks on ecosystems. Investment will contribute to the preservation and restoration of natural habitats and ecosystem integrity. Co-benefits are expected with the increased carbon sequestration and biodiversity conservation.

1.5. Innovation, sustainability and potential for scaling up

In terms of innovation, the project will support local stakeholders (actors) to implement consistent monitoring and an information and data system to strengthen decision making for ecosystem management. This will be developed to facilitate the process to disseminate climate and environment information to interested actors within the project areas where information is currently limited. Innovation has also been integrated into the project's solution-based approach. The project will take into account gender concerns because the issue of degradation of natural resources and natural disasters (drought, salinity) affects men and women and vulnerable groups (children, young people and seniors) differently.

The fact that this project reflects priorities of local populations was confirmed during the project formulation phase. It has strong support from the people, the Senegalese Government and development partners both at the central and local levels. Through the implementation of adaptation initiatives at the community level, the project aims to ensure that local communities have effective ownership of the adaptation solutions and, thus, sustainability and replication of the promoted solutions.

Another guarantee of project sustainability and replicability is its anchoring in the Directorate of Water, Forests, Hunting and Soil Conservation (DEFCCS) of the Ministry of Environment and Sustainable Development (MEDD), as well as the involvement of several branches of the State at various levels including ANACIM, which will be crucial, particularly for Components 1 and 3 of the project and the Ministries of Agriculture, Livestock, Water, etc. The project will provide support to the entities to strengthen their capacities in line with their role in the project. The project team will be based in close proximity to the communities and a number of civil servants will be identified, equipped and trained in order to work with the project team and closely monitor project activities and results. Along the same line of ensuring the project's sustainability, a strategy for replicating site-level interventions will be developed.

The various planned capacity building activities will also help ensure the sustainability of project activities but will also multiply the effects and replicate the results achieved by other stakeholders. The long-term project viability and sustainability will depend greatly on its 'institutionalization' of capacity built by the project. All capacity building activities foreseen in the project have been planned so as to have a lasting impact, both at the local and national levels, e.g. training components will be planned based on needs assessments. The project will equally build on the 'multiplier-effect' of training trainers. The envisaged training of the population and extension services will build their capacities and will create the conditions for sustainable resilience and local development, by fostering the emergence of community groups capable to act appropriately and in sufficient time to reduce the possibility of harm or loss. The developments, which will be carried out at the request of beneficiaries, will use simple techniques that are adapted and easily grasped by the populations.

Activities for Component 3, designed especially for the scaling-up of project experiences, will be used to ensure sustainability and replicability of project activities and results. Therefore, through the various communication and dissemination methods to share project experiences, including visits between the different communities for sharing, planned in Component 3, it is envisaged that the promoted adaptation solutions will be replicated in other

communities. This component will help the project results to influence local and regional policies, strategies, plans and programs in the target areas, especially ensuring intervention sustainability and replicability. Lessons learned from this project will be compiled and disseminated to a broad range of stakeholders. The project will also make frequent contributions to the adaptation learning mechanism (ALM) to ensure that lessons learned will benefit other stakeholders within the entire portfolio of LDCF projects, in particular, and of the GEF as a whole.

A.2. GEF focal area and/or fund(s) strategies, eligibility criteria and priorities.

This project is consistent with LDCF strategy, eligibility criteria and financing strategy.

Consistency with LDCF/SCCF strategy: the proposal is aligned with the focal area objective 2 "Increase adaptive capacity to respond to the impacts of climate change, including variability, at local, national, regional and global level" and objective 3: Promote transfer and adoption of adaptation technology. It is specifically aligned with outcomes linked to these objectives including increased knowledge and understanding of climate variability and change-induced risks at country level and in targeted vulnerable areas, strengthened adaptive capacity to reduce risks to climate-induced economic losses, successful demonstration, deployment, and transfer of relevant adaptation technology in targeted areas and enhanced enabling environment to support adaptation related technology transfer.

Ownership: Senegal is a Party to the UNFCCC, having ratified it on December 1994. The country is also a signatory of the Kyoto Protocol since 2001. As required by the UN Framework Convention on Climate Change, Senegal prepared the first National Communication in 2000 and completed the National Adaptation Plan of Action (NAPA) in December 2006. These reports are prepared with the support of the National Committee on climate changes (COMNACC) and through a participatory approach involving all national stakeholders involving diverse stakeholders. The country is also hosting the Interim Secretariat of NEPAD.

Compliance with programme and LDC Fund policies: Senegal is among the least developed countries (LDCs), thus making it eligible for funding from the Least Developed Countries (LDC). The proposed project is consistent with the strategic objective of the LDCF fund to promote the LDCs' "climate compatible" development options and support the achievement of the MDGs under conditions of climate change. The project complies with the NAPA rules and procedures and represents the response of Government of Senegal to urgent and immediate adaptation needs.

Financing: The project is designed to reflect the additional adaptation costs of priority actions identified in the NAPA and builds on several other projects and programmes. The co-funding for this project is also within the stated guidelines with more than $ 10 m in prospective funding. These amounts will be clarified during the project preparation phase. It should be noted that the among likely co-financing is twice the amount required by the LDCF guidelines for the amount of LDCF resources being requested by the Government of Senegal for this project.

Institutional Synergy and Coordination: The implementing partner is the Ministry of Ecology and Nature Protection (MENP). MEPN will delegate specific project activities to appropriate ministries, including the Ministry of Decentralisation, the Ministry of Livestock, the Ministry of Agricultural, the Ministry of Water, etc. Sub national authorities, civil society (women and youth associations, NGOs, media, Community Based Organizations) and the private sector will be important partners of the project and will be provided with adequate space to contribute. The COMNACC and its break-up at regional level (COMRECC-established through UNDP support) will also play a great role in identifying, disseminating and supporting adoption of relevant adaptation options. Details of the institutional arrangements will be spelt out during the PPG phase.

Monitoring and Evaluation: The implementation of the project's activities will reflect GEF monitoring and evaluation standards and procedures as well as UNDP guidelines on monitoring and evaluation of projects on adaptation policy. As the project will be on NIM modality, the national Cellule of Project Coordination (CAP) will ensure the compliance of the Project monitoring and evaluation with Senegalese Procedures. Details for monitoring and evaluation will be articulated during the project development phase.

A.3 The GEF Agency's comparative advantage:

Present in Senegal since 1975, UNDP is supporting the efforts of the Senegalese Government in improving the living conditions of communities in line with the priorities identified by the Government through its planning frameworks (DSRP, SNDES, PSE) and sectorial policy letters. Strategically, this support has contributed to: (i) integrate adaptation into national, sectorial and local planning; (ii) strengthen institutional capacity for adaptation; and, (iii) remove the political barriers and promote community management of natural resources. At an operational level, this assistance has contributed to: (a) the introduction of reliable and replicable methods of rehabilitation of degraded lands through integrated soil fertility management, agro-forestry and water and soil conservation, as well as the development of participatory management plans; (b) improve the participatory management of pastoral units and communal natural reserves, resulting in the reduction of bush fires and a fair legal access to farmland for farmers; (c) the establishment of savings and green credit institutions which funding is aimed at a sustainable use of natural resources; (d) the diversification of sources of income for the fight against poverty; and (e) the introduction of the eco-village model. These accomplishments have been achieved through partnerships including with the GEF.

Based on areas of cooperation identified in the Country Program Action Plan (CPAP) 2012–2016 jointly signed between UNDP and the Government, "the support for adaptation to climate change" is one of three priority areas of the program cycle. The UNDP assistance has two components: (i) supporting the formulation of national policies resilient to climate change; and (ii) developing pilot sites resilient to climate change. UNDP supported the government efforts in the implementation of the Senegalese component of the Africa Adaptation Project. Support was provided to integrate adaptation to climate change in key development sectors and processes. With the "boots on the ground" Program, UNDP has placed national officers in 24 country offices (including Senegal) to provide policy support to governments on climate change.

At the local level, UNDP supports the effective implementation of the Climate Change Territorial Approach (TACC). This project is part of a partnership between the UN and decentralized government bodies, to promote climate friendly development at the subnational level. The TACC project supports the integration of climate change adaptation and mitigation measures in development plans thru: (i) the development of partnerships with the United Nations and its specialized agencies, national governments, sub-national centers of excellence, regional technical institutions and the private sector; (ii) the provision of methodologies and tools, and best practices sharing for participatory long term planning of climate change related development in the regions and cities,; (iii) provision of information on the challenges and opportunities of climate change and the technical and financial solutions for the regions; (iv) Provision of technical support for the preparation of integrated territorial climate plans, including the identification of mitigation and adaptation priority measures; and (v) Provision of technical support to identify policies and financing instruments to implement priority climate change adaptation options. The TACC project in Senegal is implemented in six regions (Fatick, Louga, Kaffrine, Tambacounda, Matam and Saint Louis).

Finally, at the institutional level, UNDP has supported the Government of Senegal to improve its capacity to absorb resources, including the introduction of mechanisms through support units for projects and programs within the Ministry of Economy and Finance. Currently, several technical and financial partners of Senegal use these mechanisms. This reflects the recognition of UNDP's effectiveness in improving the country planning capacity for project monitoring and control, transparency and tracking of external resources spending.

A.4. The baseline project and the problem that it seeks to address:

Baseline for Component 1

LDCF financed project will take advantage of the Senegalese National Agency of Civil Aviation and Meteorology (ANACIM) exiting capacities to coordination of all operations for meteorology and climatology research in the country

and to collect, analyze and disseminate weather forecast services. The project will benefit from ANACIM's existing network of meteorological stations spread throughout the country. In the project target areas, ANACIM manages two synoptic stations in Cap Skirring and Ziguinchor and three agro-meteorological and climatological stations in Thiès, Kolda and Louga. ANACIM is also providing regular agro-meteorological and weather information on a daily, weekly, monthly, yearly and 10-year basis (http://www.meteo-senegal.net/html/prdmto.htm). Furthermore, the LDCF funded project will benefit experiences of ANACIM on community early warning system. Within the framework of the "Climate Change, Agriculture and Food Security" project, ANACIM implemented a pilot project in Kaffrine to demonstrate to farmers the added value of climate information in agricultural production. For this purpose, the following model was implemented: (i) identification of producers' needs in terms of climate information and advisory services, ranging from seasonal forecasting to 10-day and daily forecasting; (ii) combining scientific and endogenous climate forecasting methods; (iii) creation of a local multi-disciplinary working group (GTP) bringing together technical services for agriculture, livestock farming, weather, research, fishing and local communes; (iv) capacity building for producers, government officials, community radio announcers and NGOs to gain understanding of forecasts; (v) setting up test fields to assess the added value of climate forecasting; (vi) collection of rainfall data with the goal of assessing forecasts (seasonal and intra-seasonal); and (vi) assessment by producers of the communications system and products. The expected co-financing associated with **ANACIM activities is US $ 3.5 Million** during the 5 years cycle of the project, taking into account all investments related to meteorological observation network, maintenance, and functional operations (see attached co-financing letter from the General Director of ANACIM). Despite this government's investment, the coverage of meteorological stations remains insufficient to effectively identify risks and predict potential impacts associated with climate change on land and ecosystems. In addition, the use of global and regional climate models (such as GCM, PRECIS) does not generate sufficient information to effectively predict the impacts of weather patterns at a local level. There is a need to refine strategies at the local level, in terms of adaptation, downscaling, refining prediction, to make it more informative for a much localized adaptation option related to decision-making.

With a co-financing estimated to be **US $ 1.5 Million**, the Ministry of Environment and Sustainable Development (MEDD) established ecological data and monitoring systems across its technical departments to make availability information on the condition of natural resources and the environment, and strengthening operational, technical, and institutional capacities of the State and local communities.

- A national monitoring framework is developed by MEDD with operational environmental and socioeconomic indicators to quantitatively assess the state of the environment and pressure on natural resources. This framework is articulated around nine strategic priorities: (i) management of forest and wildlife potential; (ii) promotion of good citizen behaviour for the environment; (iii) preservation of the marine and coastal environment; (iv) promotion of popular participation and involvement of the private sector and local communities in managing natural resources and the environment; (v) improving the knowledge base of natural resources and the environment; (vi) strengthening the technical and institutional capacities of the State and local communities; (vii) contributing to conserving the global environment; (viii) controlling surface waters to improve agriculture-forestry-pastoralism and fish production; and (ix) control and operation of the multi-year expenditure.
- The Directorate of Water, Forests, Hunting and Soil Conservation has a long history — since 1973 — in the management of natural resources and the environment. It plays a key role for forest resources and has a vast network of Regional Inspections (IREF) that is well established in all regions under its authority. It operates mainly in the management of forests, wildlife, and soil conservation.
- Since 1987, the Ecological Monitoring Center (CSE) regularly monitors parameters related to vegetation (pasture), brushfires, rainfall, agriculture and livestock productivity, with the use of advanced technology such as satellite data. CSE use Geographic Information Systems (GIS) as management tools and for interpreting environmental and land use information. CSE publishes a yearbook on the environment and natural resources, as well as a report on the state of the environment in Senegal, making it easy for various national institutions to access information.

The collaboration needed between institutions involved in the production of climate information, on one hand, and its use at a national or local level, in the other hand, is very limited in the Niayes and Casamance. Relevant ecological, hydrological and socio-economic data remain scattered and managed by several institutions. Without collaboration for

access to socio-economic and environmental information, the meteorological department has trouble estimating risks in areas such as agriculture, fisheries, water resources, and forest ecosystems, including mangroves. Although some limited information on climate (based on weather monitoring and some short-term forecasts) are available, information on specific risks for different sectors is also missing due to the lack of appropriate vulnerability analysis. The information provided by the current system is also not useful for sustainable land management and ecosystems. Moreover, the non-translation of climate information into formats that are easily understood by technical extension services (agriculture, forests, livestock, etc.), makes it of limited use.

Other relevant initiatives (non part to the co-financing). The General Directorate for Water Resources Management (DGPRE) monitors a network of close to one hundred (100) hydrometric stations located between the basins of the Senegal River, the Gambia, the Casamance River, the Kayanga Sine Saloum and small coastal basins. The data collected are used to develop hydrological weekly bulletins during floods and monthly during low flow periods, edit hydrological directories and to conduct studies on the behavior of rivers. DGPRE also established the integrated information system on water (SIIE) to improve the data management of water resources and their uses. As a tool for decision support, and for quality and sustainability of data assurance, this unifying IT platform is improving the accessibility of water data and information for professional users and the public. In the framework of the proposed LDCF funded project key linkages will be established with DGPRE database.

Baseline for Component 2

With a **co-financing of US$ 2 millions**, the Directorate of Water, Forests, Hunting and Soil Conservation (DEFCCS) is coordinating the "**Economic Development of Casamance Programme**" (PADEC) that operates in the regions of Kolda, Sédhiou and Ziguinchor for the enhancement of small farmer agricultural production in Casamance. This baseline is supporting the emergence of economic sectors with high added value. It targets domestic fruits (mango, banana etc.) and non-timber forest products (cashews, honey etc.). Through a structural approach for value chains, beneficiary producers draw their income from the production, processing and marketing of agricultural and non-timber forest products. The project also strengthens local capacities of extension services for greater supply of services to operators. This project should also include climate change aspects, particularly when supporting the implementation of agro-forestry plantations (plant materials used, adopted technology, etc.) for promising sectors (cashew, mango, etc.) to secure investments.

DEFCCS is also implementing agro-forestry development activities under the **Economic Development and Management Program of Niayes (**PADEN) in support of strengthening the capacities and skills of extension services and market garden producers. With a **co-financing of US$ 2 million,** this baseline is enhancing entrepreneurship capacity of about 17,000 producers (women and men). The project provided farmers with access to agricultural inputs and land to grow onions, cabbages, tomatoes, potatoes, peppers and parsley. However, the project has not included adaptation of socio-economic activities to climate change. This climate change and variability aspect increasingly exposes people to instability and food insecurity due to their vulnerability to climate change and variability impacts on market garden crops (decreased rainfall, shallow draft and salinization of groundwater, sea spray and harmattan, unsuitable technical agricultural package, etc.).

Other relevant initiatives (non part to the co-financing)

DEFCCS is also implementing the Programme to promote rural electrification and a sustainable supply of domestic fuel (PERACOD-Ziguinchor and Kolda regions) to strengthen the technical and financial capacities of local communes and the forest service for large-scale implementation of a strategy aimed at ensuring sustainable provision of household fuel. With this investment, the management plan of Kalounayes forest is realized and forest inventories in the region of Kolda are on-going. Given the high pressures on forest resources in a context of climate change with negative forecasts for the rainfall regime in the area, key actions are needed to reinforce the natural stands, while taking into account the severe erosion of these plant genetic resources due to climate change and human pressure.

Baseline for Component 3

Several efforts are undertaken to strengthen capacity for extension services, producers and local deciders on participative and sustainable environmental governance. The Senegalese Government has made substantial efforts in improving the quality of extension services by expanding the knowledge base on natural resources and the environment,

by the availability of information on the condition of natural resources and the environment, and strengthening operational, technical, and institutional capacities of the State and local communities to improve working conditions at the Ministry. In this framework, the Forest Training Center in Thiès is playing a central role in training or upgrading skills. Since 1991, the Centre has strengthened the technical and operational capacity of over 5230 staffs in the following areas: environment & natural resource management, wetlands management, coaching of women association on organisation and training local deciders on decentralization of resources natural (knowledge on policies). The competencies of the Forest training centers will be used to support development of local capacities on climate changes. The co-financing from the MEDD will be **US$ 0,5 million**.

Training activities are also undertaken under projects implemented by DEFCCS in target regions. With PADEN, producers are improving their skills in planning and coordination of socio-economic development; and extension services on programme and project management. In addition, 9000 producers are trained on marketing and finance. With PADEC, about 150 stakeholders are trained on gender issues and 540 stakeholders trained in product marketing. However, the institutional and technical capacity to properly manage and protect natural resources against the negative impacts of climate change must be reinforced by a mechanism, in order to share and transfer information and knowledge more effectively. Co-financing from ongoing capacity building activities is **US$ 1 million**. Despite the recognition of the critical role of local institutions in the management of natural resources, a systematic analysis has never been done to identify factors for successful performance to strengthen climate resilience and the support needed by these services to strengthen their role in facilitating adaptation to climate change.

Finally, the UNDP's baseline "*Programme on Coastal and marine resources Governance in the West African"* is developing capacities of communities and technical management of the coastal zone. With a co-financing of **2 millions**, community organisations using mangrove ecosystems and marine protected areas managers are improving their technical competencies and also on the use of suitable technologies for the rehabilitation of coastal ecosystems.

A. 5. Incremental /Additional cost reasoning: describe the incremental (GEF Trust Fund/NPIF) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF/NPIF financing and the associated global environmental benefits (GEF Trust Fund) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project:

The purpose of this project is to contribute to this goal through its objective of strengthening an enabling environment for adaptation measures based on ecosystem management in the eco-geographic areas of Niayes and Casamance. Specifically, this includes improving or strengthening land and ecosystem management in the face of climate uncertainties that prevail in these two areas, particularly through: (i) good climatic forecasting and effective diffusion/use of climate information; (ii) strengthening the capacities of decentralized technical services, local leaders/decision makers, grassroots communities and individuals; (iii) better assessment of the vulnerability to climate change and the effects of adaptation; and lastly, (iv) demonstration, autonomous adoption and promotion of adaptation solutions or technologies able to reduce risks related to climate change in the Niayes and Casamance regions. The project will be developed around the three main components.

Component 1: Information platform on climate change and socio-environmental aspects to identify vulnerabilities caused by climate change and propose effective adaptation options in the Niayes and Casamance regions.

Outcome 1: Information management systems to determine and monitor the impacts of climate change on ecosystems are implemented for effective forecasting, preparation and decision-making.

Without project intervention, communities, and particularly women groups and small farmers, are simply lacking of access to information that would facilitate climate risk management. The current mix of seeds/crop production is not associated with regular consideration of seasonal forecasts, an important input in the face of increasing temperatures and a greater frequency of variation in rainfall. In alternative scenario that is enabled by the LDCF funding, the delivery of climate/ecological information & projections will be improved for land and ecosystem sensibility, adaptation and vulnerability assessment, monitoring and planning. In order to cope with the noted and forecasted harmful impacts of climate change, it is necessary to implement medium- and long-term strategies based on climate and meteorological information products and services in the project target areas. For this, it is imperative to install well functioning system for generating climate and meteorological information; and an efficient communications system for this information.

Consequently, it is necessary to: (i) on the one hand, renovate some meteorological stations and, on the other hand, set up new stations in the two project areas; (ii) implement an effective system to collect and transmit meteorological data; (iii) strengthen the capacities of monitors and producers of climate and meteorological data in order to provide producers, decision makers and local communities with localized meteorological information; (iv) implement an information system on climate services in the project area; (v) strengthen the capacities of various actors (final and intermediate users) on the understanding and use of climate and meteorological information; (vi) strengthen the capacities of local decision makers on the integration of climate information in the various development programs and projects; (vii) strengthen the capacities of local media outlets in order to provide better diffusion of climate information, especially community radio stations; and (viii) set up an early warning system to monitor and manage natural disasters due to weather or climate.

Outputs & Activities

Output 1.1*: The climate, meteorological and hydrological network for the target areas and the capacities are strengthened in order to produce reliable data needed to monitor and analyze hydro-climatic phenomena*

Activity 1.1.1: Participatory identification of climate-information needs of potential users and a diagnosis of the network of climate, meteorological, hydrological and hydrodynamic observations.

The implementation of the hydro-climatic information platform will first require conducting a diagnosis of the system to collect meteorological and hydrological data, and then, to assess the needs in climate information for targeted populations in the context of this project (local population, technical services, locally-elected officials, local administration, etc.). Thus, an evaluation study of the hydro-climatic data collection system and a needs assessment among the various actors (policy decision makers, technical organizations, local populations, etc.) for hydro-climatic information will be conducted in the five administrative regions. A consultant should conduct this study. The results will be shared with all final users during a workshop to ensure they are consistent with the actual needs expressed in the field. Specific actions include:

Mapping of the system for meteorological and hydrological data collection in Niayes and Casamance;

Identification of local actors' specific needs in terms of agro-hydro-meteorological advice and climate information (ranging from seasonal forecasting to 10-day and daily forecasting);

Sharing results of these two studies with local policy decision makers, institutional actors and final users.

Activity 1.1.2: Acquisition and installation of hydro meteorological instruments

This will involve rehabilitating and/or strengthening the network for meteorological and hydrological observations in the five-targeted administrative regions to better monitor changes in the climate and hydrology of the various waterways. Specifically, five automated meteorological stations (automatic collection and transmission via GPRS) will be installed in the regions of Louga, Thiès, Ziguinchor, Sédhiou and Kolda to collect data on temperature, rainfall, sunshine, wind, humidity, evaporation, etc. In addition, in each of these regions, the network of rainfall stations will be made denser. Therefore, 40 rainfall stations will be set up in each region. In an effort to monitor the impact of the swell on the mangrove, a marine station will be installed in Tobor for measuring wave height (swell) and conventional parameters. For this, ANACIM will be responsible for: (i) identifying sites to set up the different measuring points in accordance with WMO standards; (ii) participating in the selection process for meteorological equipment vendors; and (iii) installing all the equipment (automated meteorological stations, automated rainfall stations and the marine station). In addition, for monitoring in real time and forecasting of the various hydrological phenomena, four automated hydrological stations will be installed in the regions of Sédhiou, Kolda, Ziguinchor and Louga, in partnership with DGPRE. These stations will make it possible to measure the flow and height of various waterways. In close coordination with ANACIM, the DGPRE will be responsible for: (i) identifying the sites to set up the different hydrological stations; (ii) participating in the vendor selection process; and (iii) installing the equipment.

The management and use of hydro-climate data will require, on the one hand, implementing a database management system at ANACIM and DGPRE, and, on the other hand, a system to analyze these data. For this, two servers, three workstations (high-capacity computers), one climate model, one atmospheric model and one hydrological model will be procured. Specific actions include:

- Signing of protocols among DEFCCS, ANACIM and DGPRE;

- Identification of installation sites for measuring points by ANACIM and DGPRE;
- Development of technical specifications related to ANACIM and DGPRE; and
- Procurement and installation of equipment.

Activity 1.1.3: Training of technical staff (weather, hydro, agricultural, etc.) and producers on data collection, processing and analysis

Within the framework of implementing this information system, capacity-building training sessions for the management of equipment and use of data will be organized for staff from ANACIM, DGPRE and the Directorate of Agriculture (DA) as well as for producers. Thus, the following staff will be trained:

- Three meteorological forecasters on the forecasting models (meteorological and climate) to develop forecasts related to natural-disasters management and food security;
- Three hydrologists on the hydrological model that will be acquired for improved water-resources management in the target areas and especially for the development of warning products on flooding risks of the Casamance River;
- Two agro-meteorological technicians for the development of agro-meteorological information products for food security and resources management;
- Five monitors to collect meteorological data and manage different stations that will be upgraded; and
- Two maintenance technicians for the monitoring and management of meteorological equipment.
- In addition, training sessions for both the farmer-monitors and staff from the DA will be held on the collection, diffusion and interpretation of rainfall data in local languages.

Data collected at the meteorological and hydrological stations and at the rainfall stations will be analyzed by ANACIM and DGPRE, with support from DA, the Directorate of Livestock Breeding and other institutional actors, for the publication of agro-hydro-meteorological bulletins adapted to the needs of various users (producers and local decision makers). Specific actions include:

- Identification of actors (participants and trainers), training modules and training tools;
- Organization of at least one workshop on forecasting models for technicians from ANACIM and DGPRE;
- Organization of at least one workshop on meteorological data collection and equipment maintenance for technicians from ANACIM and DGPRE, DA and local producers;
- Organization of at least one workshop on agro-meteorological information products and the meteorological data interpretation for technicians from ANACIM and DGPRE, the Directorate of Agriculture, the Directorate of Livestock Breeding, media outlets and local producers; and
- Monitoring and evaluation of training.

Output 1.2: An integrated information system producing climate information and generating the products needed to identify risks related to climate change (e.g., maps for risk, vulnerability, etc.) is developed to help identify efficient adaptation options and develop actors' capacities in adaptation

Activity 1.2.1: Implement a climate database (correlated with socio-economic and environmental data) and assessment tools to measure vulnerability due to climate change.

The management and use of hydro-climatic data will require the implementation of data management systems. For this, a management system for data collected from the various meteorological and hydrological stations will be implemented both at ANACIM and DGPRE. Transmission between the two databases will be done automatically using a GPRS network of one of the existing mobile telephone operators. This system will allow producers to have near real-time climatic information to better manage risks through an effective early warning system. This system will be combined with various socio-economic and environment data for the publication of a bulletin for each region with complete

information on food security that will be disseminated to various users and shared with the National Council on Food Security (CNSA). Specific actions include:

- Signing of partnership protocols between ANACIM technical services, DGPRE and the technical services of Agriculture, Livestock Breeding and the mobile operator;
- Development and production of the database;
- Preparation of the model for the information bulletin that will be published regularly and shared within the framework of establishing the platform (see output 1.3).

Activity 1.2.2: Using a participatory approach, analyze the sensitivity and exposure of targeted ecosystems (Niayes, mangrove, Kalounayes forest, etc.) as well as the means of subsistence in the face of climate change, both past and future (in 2030, 2050 or 2100) and estimate their impacts.

An evaluation study will be conducted in the context of this project to: measure the degree of vulnerability in the project targeted ecosystems as well as the means of subsistence for local communities in the face of harmful impacts of climate change already observed; and measure the expected risks due to warming predicted for the near (2030), medium (2050) and distant (2100) future. The goal of this study will be to estimate the observed and future impacts due to climate change in the various targeted ecosystems and on the people's livelihoods in the target areas. These time periods were selected by taking into account the time horizons included in the medium- and long-term planning documents for the national (Plan Sénégal Émergent, Sénégal Prospective 2035) and local level. Specific actions include:

- An assessment of ecosystem and socio-economic vulnerability in the Niayes and Casamance regions;
- An assessment of current and expected climate risks for the various productive sectors in the short-, medium- and long-term; and
- Sharing study results with local policy decision makers, institutional actors and final users.

Activity 1.2.3: Identify the adaptation options for local communities and the resilience of ecosystems and analyze the cost-benefits of various options.

A study will be conducted with the following objectives: (i) identify the climate forecasting methods that have been endogenously developed by communities; (ii) identify the various adaptation options implemented by local communities in the face of observed climate change; and (iii) analyze the advantages and costs associated with these various adaptation strategies for each of this project's target regions, as well as the options for improvements in light of the opportunities offered by meteorological and climate forecasting. A consultant will conduct this activity.

Output 1.3: A platform for sharing information is established to support the management of climate risks and long-term planning for adaptation.

Activity 1.3.1: Identify the existing sharing platforms (e.g., GTP, Infoclim, Siena, etc.), and evaluate their effectiveness and sustainability and models for collaboration.

A study aimed at conducting an inventory of the various existing platforms on climate information in the various target regions across the country and at the sub-regional level will be conducted. This will involve identifying them; describing how they function and the roles of the various stakeholders; assessing their strengths and weaknesses, indicators of their sustainability; and the means for collaboration and sharing information that can be implemented. A consultant will conduct this study.

Activity 1.3.2: Establish a functional and sustainable system for sharing climate information and vulnerability assessments for local actors (local governments, technical services, producers and households).

This will involve improving and replicating the early warning system (EWS) model developed by ANACIM within the framework of the CCAFS program in Kaffrine. Each council will undertake:

- Identifying producers' needs in terms of climate information and advisory services, ranging from seasonal forecasting to 10-day and daily forecasting (see activity 1.1.1);
- Combining scientific and endogenous climate forecasting methods;

- Creating a regional platform in the form of a local Multi-disciplinary Working Group (GTP) whose mission is to provide ongoing monitoring of the meteorological/climate, hydrological and agricultural situation and to warn communities in time through the intermediary of the technical services of the agricultural and rural council present in all rural communities to avoid the disasters that rural households might face. This working group brings together the technical services in agriculture, plant protection, livestock breeding, meteorology, research and fishing; the administrative authority coordinates it. Each technical service, for its respective domain and in accordance with its mission, collects, analyzes and presents the current situation and 10-day prospects for its sector. In addition to the technical services, this working group will also include members who represent local media outlets and local NGOs. Thus, every 10 days, all GTP members will meet to evaluate the evolution of the growing season. Following each meeting, an information bulletin will be published and disseminated;
- Capacity building of producers, State actors, community radio announcers and NGOs on understanding climate forecasting, and especially their integration into their production system;
- Implementation of a test field to assess the added value of forecasting on production systems. Each year, demonstration fields will be installed to meet the extension needs for each site. Therefore, based on the seasonal pattern, inputs (seeds and fertilizer) and a mobile phone will be distributed in each site to target farmers (among those who will undertake the management of rain gauges and have at least a one-hectare plot);
- Collection of rainfall data to use for the evaluation and demonstration of forecasting (seasonal and intra-seasonal); and
- Evaluation of the communications system and the products included in the system

Activity 1.3.3: Create a network between the sharing system discussed in the project activity above with other existing information systems on food security and the environment.

Based on the results of the study on "Identification of existing sharing platforms – Activity 1.3.1" and to make the various implemented platforms more sustainable, these will be directly linked to the national GTP, CNSA, and CSE, which plays the same role with a broader vision in terms of information. At the sub-regional level, the existing platforms will be leveraged (AGHRYMET, ACMAD, RPCA, etc.). In addition, this system will serve as a technical arm for the various existing platforms in the various target areas (e.g., COMRECC set up in the various regions). Therefore, representatives of these platforms will have access to the various training activities offered in the context of this system. Specific actions include:

- Implementation of an electronic platform for sharing information linked to the existing platforms at the national and sub-national level; and
- Organization of at least one sub-regional workshop for sharing, bringing together the existing platforms in CILSS space.

Component 2: Reducing climate change risks in target ecosystems and land with adaptive restoration measures

Outcome 2: Adaptation options based on ecosystem management in the two target areas (Niayes and Casamance), including the adoption of ecosystem and land management practices resilient to climate change, reduce the risks caused by climate change in these areas.

In the absence of the proposed initiative, farming production capacities in the targeted sites will remain low due to the fragility of the natural resource base, the weak use and low availability of farm inputs and water, high dependence on rainfall. The agricultural productivity will continue to be threatening by drought and desertification impacts with sand encroachment of the soil due to dune advancement, diminishing of water table levels and salinization of ground water. Market gardening production is the main source of income and means of support in the local communities of the Niayes area, which provides nearly 60% of the national vegetable production. Despite the appropriateness of the implemented strategies and resources mobilized, including the climate change aspect in current and future interventions is more than necessary, given the vulnerability of local communities who primarily depend on market garden crops. The abandon of rice-growing valleys in the Casamance will continue due to the lack of means to rehabilitate them Local capacity to

adopt resilient practices and techniques in the face of climate change will remain weak. In the alternative scenario made possible by the LDCF funding, the exposures to climate risks will be reduced through the adoption of climate resilient management practices in land and ecosystem management.

The alternative is to promote proven agro-forestry technologies that are resilient to climate change to better protect market garden basins from silting up from sand dunes and also provide close protection for crops from winds (trade winds and harmattan) and heat. Faced with the downward trend in rainfall, special emphasis will be placed on saving water through the promotion of micro-irrigation. Support will be provided for research-development activities to adapt the technical agricultural package for horticulture and agro-forestry production systems to a changing biophysical context based on agro-meteorological and climate forecasts developed within the framework of this project.

As for the Niayes area, it will be necessary to fill the gap with respect to integrating the climate change and variability aspects in ongoing (baseline) projects and programs in the eco-geographic area of Casamance. The PRGTE interventions will include support to local communities in mangrove management and restoration in Casamance. In the forest, PERACOD achievements must be strengthened in Kalounayes and Kolda through the development and implementation of management plans in extensive forests inventoried in a climate change context. This will also involve including the climate information aspect in the agro-forestry projects and programs that are underway or planned for the next five years (e.g. PADEC) in Kolda, Sédhiou and Ziguinchor in addition to recommending adaptation strategies and solutions. The interventions will also involve promoting the development of palm and borassus groves around the agricultural areas, income generating activities (IGAs) for women, adapted agro-forestry and agro-pastoral practices, and the watershed approach for soil restoration, and water and soil conservation, all adapted to the new climate conditions.

Outputs and Activities

Output 2.1: At least 100 hectares of mangrove plantations are restored to reduce the impact of swell and coastal erosion**.**

Activity 2.1.1: Regeneration/restoration of 100 ha of mangrove in Tobor (Ziguinchor) and Diendé (Sédhiou)

In Tobor and Diendé, soil and water salinization due to decreased rainfall is accompanied by degradation of the mangrove ecosystem in the estuaries, which are replaced by acid sulphate soils that compromise the availability of fishery resources. To deal with this, a management plan integrating meteorological and climate forecasting will be developed based on a contract with a service provider under the supervision of the forest service. It will be followed by the regeneration/restoration of 100 ha of mangrove in partnership with the NGO Oceanium, on the Tobor site, based on a Memorandum of Understanding backed by a technical program under the supervision of the water and forest services. The same approach will be selected with the NGO Enfance et Paix in Diendé. Specific actions include:

- Development of mangrove restoration plan taking in account medium and long term climate changes;
- Memoranda of Understanding with the NGOs Oceanium and Enfance et Paix to undertake restoration activities;
- Regeneration/restoration of 100 ha of mangroves in Tobor and Diendé;
- Evaluation and adjustment of the application of the mangrove restoration plan and sharing experiences for potential scaling up.

Activity 2.1.2: Develop and apply techniques for sustainable farming of mangroves in the forest reserves of Ziguinchor and Sédhiou to prevent cutting and degradation of these forests.

This will involve supporting IGAs (oyster farming, fish farming, etc.) related to sustainable management of mangrove resources to support women's groups from villages located in the intervention areas of Tobor and Diendé. The IGAs will be rolled out in partnership with the National Aquaculture Agency (ANA) based on a Memorandum of Understanding under the supervision of the regional fishing service. Specific actions include:

- Participatory identification of IGAs, targeted Women's Advancement Groups (GPFs) and partnering mutual schemes;
- Supporting at least 20 women groups in implementing IGAs (oyster farming, fish farming, etc.)
- Socio economic and environmental assessment of the impacts of IGA in livelihood and the mangrove ecosystems

- Advisory and supervision by ANA and the regional fishing service.

Output 2.2: Multi-purpose community forests resilient to climate change tested in the vegetable gardens of Niayes to protect crops from wind erosion and prevent encroachment by sand dunes.

Activity 2.2.1: Identify the best-adapted forest species and suitable technologies for better protection of market garden basins from silting up as well as market gardening technology packages adapted to the biophysical context. The research-action will be realized on the most adapted forest species and the most effective agro-forestry technologies to protect market garden basins and plots. The specific activities are:

- Identify climate resilient forest species adapted to the Niayes area and effective agro-forestry technologies for the protection of basins and market garden plots;
- Update the technical sheets for market garden crops regarding climate changes impacts;
- Dissemination of research results

Activity 2.2.2: Planting of 110 ha of windbreaks around individual market garden basins to protect them from silting up and provide close protection of crop plots from the harmful impacts of winds (harmattan and trade winds).

Adapted agro-forest species will be planted to ensure close protection of market garden basins on vulnerable sites in the communes of Léona (35 ha), Kab Gaye (35 ha) and Mboro (40ha). The direct costs for planting are estimated at US$ 600/ha. The forestry service will submit an annual work plan for the planting operations for each site. It will provide supervision of the work to be done with local communities organized into groups who are also in charge of surveillance and maintenance until completion. Specific actions include:

- Identification and mapping of market garden basins to be protected by site;
- Production of plants with adapted agro-forestry species;
- Planting windbreaks close to market garden basins and crop plots, totaling 35 ha in Léona, 35 ha in Kab Gaye and 40 ha in Mboro by the end of the project.
- Supervision and advisory support from the forest service to producers groups for the roll-out of activities: plant production, planting and plantation maintenance and surveillance;

Activity 2.2.3: Set up 60 ha of micro-irrigation systems to save water in pilot market gardens

The micro-irrigation devices will be installed by a service provider based on a contract for the provision of services under the technical supervision of the agricultural service. The agricultural service will be in charge of verifying the quality and technical certification of the work. The average cost is estimated at US$ 1000/ha. Specific actions include:

- Participatory identification of pilot gardens;
- Realization of micro-irrigation in Léona (20 ha), Kab Gaye (20 ha) and Mboro (20 ha) and training producers on the use of systems.
- Advisory support and supervision from the agricultural services.
- Dissemination of results during regional fora for potential scaling-up.

Output 2.3: At least 10 community groups, particularly women's groups, will be supported in Casamance to improve climate resilience through agro-pastoral and agro-forestry activities and sustainable water management practices in rice paddies.

Activity 2.3.1: Reforest and apply natural regeneration techniques to 100 ha of palm grove with adapted varieties to reinforce the natural stands, while taking into account the severe erosion of these plant genetic resources due to climate change and human pressure.

Enrichment operations will be carried out in the valleys of Madina Findifé (Diendé CR in Sédhiou), Soukou (Saré Bidji CR in Kolda) in Tobor and Coubalan. Planting will be done based on an operation plan that will be executed under the

supervision of the water and forest service. The plants produced or procured by the forest service will be provided to the planters at a rate of 100 plants/ha. Specific actions include:

- Participatory identification of palm grove sites in the targeted valleys;
- Identification and training of pilot/planter community groups;
- Participatory completion of enrichment operations in the targeted valleys at a rate of 100 plants/ha with a goal of 100 ha at the end.
- Advisory and supervision support from the forest service;

Activity 2.3.2: Support at least 10 women's groups in conducting income-generating activities (market gardening, poultry farming, small livestock husbandry, forest product marketing, salt production, etc.).

Support will be provided through microcredit. The diversification of production activities will enable local communities to reduce the risks of insecurity and to cope with the dangers of climate change and variability. Specific actions include:

- Participatory identification of target Women's Advancement Groups (GPFs) and IGAs to develop;
- Realization income-generating activities (market gardening, poultry farming, small livestock husbandry, forest product marketing, salt production, etc.);
- Partnership with existing microfinance services to support women in their IGA (establishment of saving system, credit lines, training on entrepreneurship)
- Develop protocol with the relevant technical services (DRDR, livestock, fishing) to advice and supervise women groups.

Activity 2.3.3: Adoption of resilient agricultural technology packages (drought-resistant varieties, agro-forestry practices, etc.).

At least 200 producers will be supported to improve the resilience of the agricultural system in the Madina Findifé, Bakoum and Diendé valleys in Sédhiou and the Soukou (Saré Bidji) and Saré Oumar (Dioulacolon) valleys in Kolda. . Specific actions include:

- Participatory selection of producers and identification of needs;
- Organization of awareness raising sessions for producers on the use of improved seeds to enable producers' adhesion and adoption of the new technology;
- Organization and training of rural seed producers– At least 200 farmers, among them 50% women, in each site will be trained in seed production techniques. For each farmer, it will be provided seeds of drought-resilient crops to enable him to plant at least half a hectare of such crops
- Production of resilient seeds by 200 seed multipliers;
- Conservation & distribution of resilient seeds to at least 2000 producers
- Supervision and advisory by ISRA.

Activity 2.3.4. Restoration of 100 ha community forest in the Soukou valley watershed (Saré Bidji CR in Kolda) to protect riverbanks from soil erosion.

This will involve reforestation activities and the application of Soil Protection and Restoration / Soil and Water Conservation (SPR/SWC) measures to protect the watershed. A partnership agreement will be established between the project and the various decentralized technical services (DRDR, Water and Forests) to carry out the demonstration work in the Soukou valley. Specific actions include:

- Development of nurseries and production of local plant species. Women groups will be trained in nursery practices and production of local plant species;

- Reforestation of 100 ha community forest, carried out by the local population, in areas that have been classified as degraded;
- Realisation of banquettes (barriers) and half-moon (demi-lunes) and planting woody species to protect soil from splash erosion;
- Train communities in assisted natural regeneration techniques;
- Where necessary, local committees will be establish to manage forest restored;
- Supervision and advisory by forest services

Activity 2.3.5: Combat bushfires in the Kalounayes forest to support regeneration effort of valuable forest species adapted to the biophysical context. A partnership agreement will be established with the forest service responsible for supervision of activities to benefit local communes and communities. Specific actions include:

- Identification of sites to treat and communities needs
- Acquisition of equipment and supplies to support 33 village committees to combat bush fires;
- Planting to enrich the forest with valuable forest species that are adapted to the biophysical context; and
- Advisory and supervision by forest services

Component 3: Support mechanisms for knowledge and information

Outcome 3: Individual, household and community capacities will be strengthened in order to increase awareness about responses to climate change and effective support for adaptation efforts.

Without LDCF intervention, experiences in knowledge management and transfer of technologies related to needs for adaptation to climate change in the target areas, are in their earliest stages, and inexistent in most parts of the project target areas. In the baseline, current cross-cutting efforts to identify, codify and disseminate climate risks management tools and adaptation best practices and lessons learned are limited and insufficient, and knowledge-sharing among vulnerable communities on how to address a changing climate is poor.

With LDCF support, the individual and collective capacities of the various stakeholders—local and departmental advisors, CBOs and ministry staff at the national and decentralized level—will be strengthened by increasing their access to information on climate change adaptation technologies. The individual and collective capacities will be strengthened through training programs in the following areas: (i) planning that supports commune and departmental advisors to better integrate climate change in local development plans with the goal of improved governance of land and ecosystems in a context of climate change; (ii) consideration of climate information when planning and programming activities of coordinating bodies, such as the COMNACC and COMRECC; (iii) integration of climate information into technology packages disseminated by the technical staff of ministries in charge of extension services; (iv) inclusion of climate change related issues in school curriculum to develop a genuine culture built on climate risk management; and (v) training and capacity building for CBOs for better use of information and adaptation technologies in their various socio-economic activities.

Results drawn from the project experience will be widely disseminated to help scale up the project outcomes to various local, regional and national levels using various strategies and mass communication tools, but also: systems for sensitization and awareness-raising, such as intra- and inter-community exchanges; community networks, such as school teachers and their students; institutional systems, including national and international meetings and seminars; and scientific and technical publications in particular.

Outputs and activities

Output 3.1: Local governments and decentralized technical services have the necessary capacities to support communities in implementing adaptation activities.

Activity 3.1.1: Train community advisors (60 members) from eight municipalities on the integration of risks and opportunities related to climate change and options for adaptation.

This involves mainstreaming the issue of CC, which often manifests in negative events that have a considerable impact on socio-economic activities and the sustainable development of land and ecosystems in the local and departmental plans for the project intervention areas. The commune and departmental advisors and officials who set local policies and strategies will be trained in the areas of: (i) risk management and (ii) governance in land and ecosystem management in a context of CC. This involves ensuring greater consideration of risks related to CC and the adoption of suitable adaptation mechanisms, both in the formulation and implementation of local development plans. A training session over a two-year period will be provided in each commune and department by COMRECC technicians with support from two national consultants, who specialize in decentralization and climate change, respectively. The training will be given on site in each commune to reach all advisors. The local development plans (PLD) and regional plans for integrated development (PRDI), as well as tools developed by the TACC and INTACC on CC, along with materials developed by the project, will be included in the training materials.

Activity 3.1.2: Train 200 staff from the extension services of the ministries (of water resources, agriculture, environment, livestock, etc.) on the management of climate risks and on using results from climate risk assessments and vulnerability to adjust regulations, policies and plans that govern land and ecosystem management.

Staffs from technical services are responsible for advising communes and local communities in the management of local development. They will be trained both to upgrade their skills and in the management of climate risks as trainers to train commune and departmental advisors in applying CC knowledge in their respective technical areas. The categories of staff and the types of training are defined as follows:

- Technical staff from national extension services (MAER, MEDD, MEPA, fishing, water, etc.) will be trained on taking CC into account in project and program planning and the preparation of development plans and policies. (50 staff)
- Technical staff from devolved and decentralized services and NGOs will be trained on including climate risks in the management and planning of socio-economic activities. (50 staff)
- The capacities of members of coordination bodies at the national (COMNACC, GTP), regional (COMRECC, GTP, CRD & CDD and ARD) and local level will be strengthened in planning and coordinating activities related to climate risk management and the implementation of suitable adaptation options. (100 staff)
- Training will be provided by experts from the relevant technical ministries who will have been trained in advance by a national consultant specialized in CC. Specifically this will provide ongoing training, available on demand, through regular sessions and through cascade training from the national level to the regional and local level. Two training sessions will be held annually, based on the two in country seasons (dry and rainy).

The training will emphasize risk prevention, agro-sylvo-pastoral and fishing adaptation mechanisms and the standards and regulations for land and ecosystem management in a context of CC. The specific topics will include: (i) assessment tools for socio-economic and ecosystem vulnerability; (ii) awareness-raising methods for local communities and their advisors; (iii) production techniques using climate information integrated into technical packages and technologies for each type of production; (iv) methods for climate risk prevention and management; (v) tools to monitor the application of extended technologies and to measure their performance and adaptability; and (vi) methods for scaling-up and replication of project results.

Activity 3.1.3: Train members of 100 CBOs, including 50 women's organizations, to use climate information and adaptation technologies in their socio-economic activities.

Producers' organizations (farmers, herders, foresters, fishermen, women oyster farmers, rice growers, market gardening producers, etc.) are very active in production and ecosystem conservation. They will improve their performances through training on the use of climate information and adaptation technologies. The main topics will deal with: (i) identification of the impacts of climate on the various means of production; (ii) defining needs for climate information; and (iii) adaptation technologies for various means of production and land and ecosystem conservation.

The training will focus on practical issues by integrating traditional technologies with modern methods for forecasting and climate risk management. This is to develop the interest of local communities to technological innovations related to CC, which remains an area that is still most unknown to even technicians, and more so to local communities. The

gender and youth approach will be given priority to ensure equal access for young men and women who are most disadvantaged in terms of access to technical information and production inputs, but are yet the best candidates for innovation and most vulnerable to CC.

Two training sessions will be held in each commune at the start and end of the cultivation cycle to ensure that the main stages for crop production and land management are fully taken into account. They will be provided by staff from the advisory organizations (government extension services, and NGOs) who will have already received the necessary training. The training sessions will be conducted with support of a national consultant.

Output 3.2: The benefits from implemented adaptation solutions are monitored and shared with government officials, target communities and partners to inform them about project results replication opportunities.

Activity 3.2.1: Capitalize on project achievements and experiences and develop relevant strategies and communication materials adapted to local communities.

The communities' use of climate information and adaptation technologies developed by the project is subject to the development of strategies and adapted communication tools. Effective communication strategies (institutional, social and educational) will be developed and integrate following subcomponents:

- Institutional communication will be based on existing or soon-to-be-created institutional sharing mechanisms between extension services, based primarily on various frameworks for dialogue and action (COMNACC, COMRECC, Harmonization Conference, CRD, CDD, CLD, etc.); (ii) the project's institutional system (Project Steering Committee, Project Implementation Unit etc.); (iii) partners (co-financing partners, in particular); and (iv) the monitoring and evaluation system to support regular sharing between the various institutional stakeholders. It will use various tools such as written correspondence, regular meetings and workshops, technical and scientific reports, telephone calls, emails, etc.
- Educational communication will emphasize environmental education geared towards local communities aimed at behavior change based on greater understanding of risks related to CC and the most suitable adaptation strategies.
- Social communication will emphasize broad diffusion of climate information thru mass medias, traditional mechanisms of information diffusion at the village-community, inter-village and commune levels. Such a system will capitalize on local knowledge and know-how by highlighting and disseminating traditional knowledge and best practices.

Various communication tools and media will build on one another to support one- and two-way transmission of climate information through: (i) the national network of Community Radio Stations relayed through local radio stations; (ii) a show entitled "Environment - Climate Change and Food Security" sponsored by organizations working in environmental and natural resources management; (iii) an agro-hydro-meteorological bulletin will be published at least every 10 days; (iv) a hotline will be set up in partnership with telecommunications operators to promote the transmission of meteorological information; (v) a project Web site will be set up to facilitate dissemination of information; (vi) opinion leaders and resource persons will be sensitized and mobilized to support the dissemination of climate information and to develop best practices for adaptation; (vii) mass communications methods such as radio, television, newspapers and internet will be used; (viii) traditional communication channels will be used: places of worship, markets, traditional communicators, palaver tree, storytelling, etc.; and (ix) toolkits (audiovisual, pictures, etc.). Communications tools will also include materials, such as posters, films, slide shows, theater, village bulletins, maps, text messages, etc. To do this, service provision protocols will be signed with various stakeholders, such as communication organizations.

Activity 3.2.2: Share project experiences with communities by organizing exchange visits or intra- or inter-community forums; information shows on radio and local, regional and national television; and through sensitization and information sessions.

To promote the scaling-up of the project's positive experiences at the local, regional and national level, local communities in the project intervention area will help extend the approach and results with project support into other communities; from one village to another in the same commune (intra-community) and from one commune to another (inter-community).

To do this, departmental and regional umbrella organizations that often focus on several communes will be mobilized to act as intermediaries between the project areas and other areas, thereby facilitating the rapid replication of project results. Thus each year, based on the forthcoming results and at the opportune time, an intra-community visit for experience sharing will be organized in each commune, followed by forums at the intra- and inter-community level to better demonstrate and disseminate the results. In addition, in order to scale up from the local to the regional, and even national, level, mass diffusion methods will be used, such as: (i) community-based radio stations with a monthly or bi-weekly show on the project activities and results; (ii) spots and an annual televised documentary; and (iii) traditional systems for sharing information (word of mouth, palaver trees, weekly market, pilot farmers, etc.

Activity 3.2.3: Produce 1000 school manuals on climate risk management and training for teachers and other school personnel to support the integration of CC in the school curriculum and build a culture of CC resilience.

Public primary schools will be chosen as pilot test sites to disseminate information and best practices in climate risk management aimed at households. Selection of these schools is based on the fact that the teachers in rural settings often assert genuine intellectual leadership that they also transmit through students, especially those in the fourth and fifth grades who in turn serve as intermediary educators in their families. Climate change will be included in the school curriculum through development and diffusion by the project, in accordance with the Ministry of National Education, of: (i) 100 guides for inspectors; (ii) 200 teaching manuals for teachers; (iii) 700 school exercise books. Two schools located far from each other will be chosen in each commune, both to receive the training and to put it into practice in the school gardens and woods that already exist in some locations and which could serve as demonstration and extension sites.

Activity 3.2.4: Make project results visible during regional and international meetings and through written reports and technical and scientific publications.

The products produced and the impacts generated by the project activities will be disseminated during regular meetings of the project bodies, notably the PSC, but also during meetings held at the coordination structures at various national (COMNACC, GTP, etc.), regional (CRD, COMRECC, GTP local, etc.) and local (CLD) levels. Also, regional and international seminars will provide an opportunity for sharing lessons learned from the project with other countries in the sub-region and worldwide in the context of the country's contribution to CC management on a global scale.

The two experts in charge of monitoring and evaluation will have primary responsibility for this activity. They will receive support from a national consultant specialized in communications. They will be assisted in their activities by other actors involved in project implementation, namely: (i) commune advisors who will be able to disseminate project results among colleagues in areas not covered by the project; and (ii) staff from extension services responsible for disseminating technical innovations to local communities.

A.6 Risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and measures that address these risks:

#	Description	Date Identified	Type	Impact & Probability (1-5)	Mitigation / Management response	Owner
1	Low commitment and capacity of governing/technical institutions at different levels notably local (commune) to develop practices and mainstream climate change adaptation	PIF	Organizational and operational	I=3 P=3	The project will build the capacity of relevant governing/technical entities, and communities at different levels to raise awareness about climate change, and the need to develop plans and practices to adapt to these changes.	Governmental entities, and partners at regional, and communal level

#	Description	Date Identified	Type	Impact & Probability (1-5)	Mitigation / Management response	Owner
2	Social and political conflicts (e.g. land management, gender …etc.). This includes security related issues due to the ongoing conflict in parts of the Casamance.	PIF	Social, Political	I=3 P=3	The project will fully involve elected leaders of the communes, and different stakeholders at the local level. This will help prevent and manage conflicts of different types. The Board of the commune in charge of affairs within the commune will be used in the decision making related to project activities in their areas including issues such as land management, gender and youth involvement.	Local stakeholders, namely local leaders and communities.
3	Heavy administrative procedures slow down project implementation	June 2014	Organizational and operational	I=3 P=3	The project will use a formalized and systematized partnership approach thru the signing of written agreements that spell out clearly the roles and responsibilities with a description of actions to be taken by who, when, where, and with what means and approach. Wherever possible and appropriate partnership with most decentralized institutions (communes, CBOs, NGOs, local extension services) will be favored.	Governmental entities (MEDD…etc.) UNDP
4	Limited financial and technical capacity of project stakeholders including local communities and their institutions, and extension services	June 2014	Financial, technical, and organizational	I=3 P=3	The project is designed to build needed capacities of project stakeholders for its successful implementation (see description of project activities for more information on the type of support that will be provided).	Project stakeholders at different levels (government, local communities, extension services)
5	Occurrence of extreme climate events far greater than ever experienced and anticipated.	PIF	Environmental	I=4 P=2	Extreme climate events can significantly impact project activities. The project will develop mitigations measures and strengthen communication on potential climate risks based on improved climate information (appropriate adaptation technologies, etc.)	DEFCCS, UNDP, project partners and stakeholders
6	Political reforms and changes in personnel at different levels.	June 2014	Political	I=4 P=3	The project is designed with an adaptive management approach to allow taking into account major political changes that may have negative impacts on its achievements. With regard to the change of personnel, the project will mitigate potential impacts by establishing formal partnerships with institutions and not individuals. In addition, capacity-building activities, such as training,	DEFCCS, UNDP, project partners and stakeholders

#	Description	Date Identified	Type	Impact & Probability (1-5)	Mitigation / Management response	Owner
					will target several individuals (instead of one) to ensure that in the event of personnel change there will be some remaining persons for continuous involvement project activities.	
7	Villagers do not see the benefit of new practices or social pressures hinder adoption of new practices	June 2014	Strategic	I=4 P=2	The project has been designed with a participative approach that involved wide consultations with all project stakeholders at different levels and on numerous occasions. This approach was selected, even though it is time consuming and expensive, to ensure a maximum buy in from project stakeholders. In addition, the project is designed to use a similar approach during its implementation to put project beneficiaries in the driving seat as much as possible.	DEFCCS, UNDP, project partners and stakeholders
8	Risks of potential exclusion of women from project activities.	June 2014	Social	I = 2 P =2	Gender mainstreaming, stakeholder engagement and participatory approaches to designing activities will aim to avoid adverse impacts on gender equality	DEFCCS, UNDP, project partners and stakeholders
9	Anticipated negative environmental impacts from activities associated with the restoration of mangrove ecosystem, establishment of windbreaks around individual market garden, and reforestation activities.	June 2014	Environmental	I = 2 P =3	Coordination and implementation of the Project‘s environmental and social safeguards will be carried out by the PCU, which will oversee Project compliance with standard best practice, mitigation measures and stakeholder engagement during Project implementation	DEFCCS, UNDP

A.7. Coordination with other relevant GEF financed initiatives

Coordination under stakeholder’s platform established by the Senegalese government

The Ministry of Finance established the Projects and Programmes Support Unit under the Investment Direction as mechanisms for projects review and information exchanges. Currently, technical and financial partners of Senegal as the World Bank, the Spanish Cooperation, and the Luxembourg Cooperation and to some extent, the Belgian Technical Cooperation and the African Development Bank made use of this mechanism. The Ministry of Environment and Sustainable Development also established the National Climate changes Committee (COMNACC) as an exchanges platform for stakeholders intervening in climate changes. In 2011, a presidential decree was issued to strengthen the institutional character of COMNACC. It is now a body of coordination, consultation, training, information, management and monitoring of various activities identified as part of the implementation of the Convention and additional legal instruments. It now includes representatives from the presidency of the republic, the senate, national assembly, the Prime Minister, the Economic and Social Council, ministries, civil society, local politicians, academics, youth associations and women etc.

Coordination with national Initiatives

- GEF/IFAD: *Climate Change adaptation project in the areas of watershed management and water retention*

The project will increase the resilience of agriculture production system and value chains to climate changes. The project expect to: (i) build national capacity, awareness and knowledge on climate change and agriculture production; (ii) to promote water harvesting and watershed management; (iii) promote water conservation and efficient conservation. While the two projects are intervening in different sites, it is expected exchanges of experiences and adaptation practices in the framework of Ministry of Environment.

- Adaptation Fund project -*Adaptation to Coastal Erosion in Vulnerable Areas*

The two projects are targeting the impacts of sea level rise impacts in the Coastal zone. The AF project is supporting the implementation of actions to protect the coastal areas of Rufisque, Saly, and Joal against erosion, actions to fight the salinization of agricultural lands used to grow rice in Joal with the construction of anti-salt dikes; assisting local communities of the coastal area of Joal, especially women, in handling fish processing areas of the districts located along the littoral and to conduct awareness programme and training related to adaptation and its adverse effects; communicating on the adaptation, sensitize and train local people on climate change adaptation techniques in coastal areas and on good practices, to avoid an aggravation of the various situations encountered; and developing and implementing the appropriate regulations for the management of coastal areas. The project ended on June 2015. As the Ministry of environment is implementation partner of the AF project, GEF project will benefit experiences and tools developed to implement efficient adaptation measures in the coastal zone.

Regional Projects

World Bank -*Senegal River Basin Climate Change Resilient Development Project*

The GEF project will increase the sustainability of and the resilience of the Basin's agriculture-dependent population in the face of climate change and improve environmental management practices in the SRB. In term of Institutional Strengthening, the project is seeking the inclusion of Guinea as a signatory to the SRB Water Charter; and (ii) the development and delivery of a capacity development and training program on climate change adaptation for OMVS National Cellules and pre-identified National Agencies. It will strengthen the regional and national data knowledge base for Basin management with an emphasis on developing and integrating climate variability and change. Finally the project will implement climate change adaptation measures and integrate water resource management practices in the SRB.

B. ADDITIONAL INFORMATION NOT ADDRESSED AT PIF STAGE:

B.1 Describe how the stakeholders will be engaged in project implementation.

The success of project intervention requires the active involvement and participation of the different stakeholders. Key stakeholders for the project include (i) national institutions involved in environmental monitoring and climate information (e.g. ANA, ANACIM, DEFCCS, CSE, DEEC, DGPRE, etc.); (ii) Regional and Local authorities and technical staffs from Louga, Thiès, Ziguinchor, Kolda, Sédhiou and target villages leaders; (iii) community based organisations (women and young associations) that are living in the targeted rural areas, including the participation of potentially vulnerable groups such as women; (iv) and NGO supporting communities on their activities (e.g. OCEANIUM, Action pour la Paix). The present Plan was designed based on the series of meetings organised with stakeholders during the project inception, for agreeing on project content and operationalization (situation analysis, priority sites for intervention, priority criteria, management arrangements).

Outputs	**Responsible institution and role**	**Stakeholders and role**
Output 1.1: The climate,	ANACIM & DGPRE:	Local leaders, technical staffs,

meteorological and hydrological network for the target areas and the capacities are strengthened in order to produce reliable data needed to monitor and analyse hydro-climatic phenomena	identification of needs, procurement and installation of hydro-Meteo stations, and organise training of staffs on the use of material and tools	target communities organisation: contribution to the identification of climate /hydro information needs
Output 1.2: Develop an integrated information system producing climate information and generating the products needed to identify risks related to climate change (e.g., maps for risk, vulnerability, etc.)	ANACIM& CSE: development of the database	DGPRE, DEFCCS, MEED, etc.: contribution to establish socio-economic & environmental database; Target communities: participation in analysing socio-economic and ecosystem sensitivity to CC & identifying adaptation options
Output 1.3: A platform for sharing information is established to support the management of climate risks and long-term planning for adaptation.	ANACIM: establishment of the sharing platform	CSE, DGPRE, DEEC, DEFCCS, COMNACC: contribution in identifying relevant existing sharing system/participation in the designing and operationalization of the sharing information platform; Local government: mobilisation of communities Communities: participation in the sharing information platform.
Output 2.1: At least 100 hectares of mangrove plantations are managed sustainably to restore this important ecosystem as a means of support (oyster farming, for example) and reduce the impact of swell and coastal erosion	ANA & DEFCCS: Advisory and supervision	NGO Oceanium and Enfance et Paix: conduct restoration activities; Local government: mobilisation of communities Target communities (women organizations): participation in restoration and IGA's activities;
Output 2.2: Multi-purpose community forests resilient to climate change tested in the vegetable gardens of Niayes to protect crops from wind erosion and prevent encroachment by sand dunes	ISRA: Conduct research on best-adapted forest species and suitable technologies for market gardens DEFCCS: Advisory and supervision reforestation activities Local Agriculture Services: Advisory and supervision on	Local government: mobilisation of communities Target communities (farmers): participation in reforestation & micro-irrigation activities

	micro-irrigation activities	
Output 2.3: At least 10 community groups, particularly women's groups, will be supported in Casamance to improve climate resilience through agro-pastoral and agro-forestry activities and sustainable water management practices in rice paddies	DEFCCS: Advisory and supervision reforestation activities Extension services: Advisory and supervision women IGA activities activities	Local government: mobilisation of communities Microfinance services: supporting women in their IGA (establishment of saving system, credit lines, training on entrepreneurship); Women organization: involved in identifying and undertaking IGA, and establishing plant nursery; Farmers organization: involved in farming systems (beneficiaries) Other communities: involved in reforestation activities and bushfire combat.
Output 3.1: Local governments and decentralized technical services have the necessary capacities to support communities in implementing adaptation activities	ANACIM & COMNACC: development of training packages	Staffs from municipalities, extension services & community organisations: identification of training needs, participation to training sessions
Output 3.2: The benefits from implemented adaptation solutions are monitored and shared with government officials, target communities and partners to inform them about project results replication opportunities.	Ministry of Environment: management of project communication component	Ministry of Education (regional inspections & schools in target sites): contribute to the development of school booklets on climate changes Target communities: involved in projects communication (regional forums, exchanges visits, etc.)

B.2 Describe the socioeconomic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund/NPIF) or adaptation benefits (LDCF/SCCF):

The project objective is to create an enabling environment for the implementation of adaptation solutions based on ecosystem management in the Niayes and Casamance regions with major consideration placed on maximizing the project's cost-efficiency ratio. This consideration will consist of leading activities on the geographic themes and areas where their added value is substantial, or even crucial. Thus, the proposed components, outputs, activities and approaches have been identified and selected so the project objectives and expected impacts can be achieved based on a cost-efficiency approach.

As indicated above, this project document meets the immediate and urgent adaptation priorities identified in the NAPA for Senegal. These priorities were measured based on their cost-efficiency and their sustainability, before the project components had been identified and developed. This project aims to achieve results that will be a first in the target areas

through three components commensurate with the project's resources. These components and their expected results reinforce each other. Hence, Component 1 will consist of providing climate information and relevant tools for managing climate risks to communal authorities, technical services and communities to promote practices for sustainable land use and ecosystems resilient to CC (Component 2) and to bring all this to scale through Component 3 on knowledge sharing and management.

Improving resilience to the impacts of climate change for the ecosystems of the Niayes and Casamance regions as well as communities from these regions who are among Senegal's and the world's most vulnerable is an undertaking with incalculable benefits, justifying by far the modest envisaged costs. With or without this project, local populations will have to develop more resilient options and economies for their survival. In effect, this is less about improving living conditions than safeguarding life, and even survival, which is priceless.

In the context of the project areas, developing socio-economic activities in alternative and more lucrative activities in the traditional sectors of agriculture, livestock breeding and forestry that are becoming increasingly unstable due in large part to CC. However, the vast majority (over 90%) of people in the project areas still depend on these types of activities and are facing food insecurity and various other manifestations of poverty that are becoming chronic for an increasingly substantial proportion of people. Increasing the resilience of agricultural and livestock practices is therefore crucial to improving the resilience of communities themselves. Promoting alternative economic activities with a view to increase people's incomes through IGAs would be a way to increase their resilience.

As indicated in the various studies conducted in the country, including the NAPA, and worldwide, Senegal as a whole (economic sectors, geographic areas taken together) and as an LCD is severely threatened by the impacts of CC. Thus, to strengthen resilience to the impacts of climate change, it is tempting to cover the entire country and therefore only scratch the surface. Instead, it was decided to only implement the project in two of the six eco-geographic areas of Senegal and on a limited number of communes, and by emphasizing the demonstration sites and sharing of successful experiences outside the sites and project areas. The idea is to reach a critical sample of people (by region and by type of production) who will adopt and extend community-based adaptation solutions that have been previously tested in demonstration projects.

Adapting to the impacts of climate change requires relevant climate information. This project will implement an effective system for climate data collection, analysis and extension to rural communities, technical services and local decision makers. It is expected that 3000 direct beneficiaries including producers, State actors, community radio announcers and NGOs are targeted to benefit capacity building on the use /maintenance of hydro meteorological instruments and on understanding climate forecasting. It is expected that the total population in project target sites (estimated to be 168,555 indirect beneficiaries) will access to relevant climate information trough the information-sharing platform established and diffusion of information by community radios.A large part of the costs associated with this component will help finance meteorological equipment and strengthen ANACIM capacities and its existing network, all while ensuring a good cost-efficiency ratio for these investments. A possible, though not viable, alternative for the country could be to only use climate forecasts from the WMO or other international organizations. However, these organizations (i) can only work if the data are provided by a large number of countries worldwide, and (ii) generally do not provide forecasting on the local level and cannot do it without available data. Therefore, strengthening the climate data collection and processing system that the project will support will benefit all of Senegal, the sub-region and the rest of the world because these data can be entered into climate information systems on a national, regional and global levels. The type of expected results for Components 1 and 3 of the project is a prerequisite for: (i) conducting forecasting at the local, national and sub-regional levels; and (ii) sharing data with international organizations that in turn will help improve their climate forecasts and scenarios throughout the world.

Through the second component, this initiative will support the implementation of technologies and agro-sylvo-pastoral and IGA practices that will be resilient to climate threats that are becoming more frequent and intense. These local investments will be made through Component-2 activities. These activities have been identified through a literature

review and field visits during the project design stage through a participatory approach involving the various stakeholders (local communities and their locally-elected officials; decentralized government advisory services, CBOs and NGOs active in the project areas; and administrative and policy officials at the commune, departmental and regional levels.

Gender considerations were part of the process of project formulation. During the preparatory phase, efforts were made to involve women's groups and youth, as well as civil society and institutional leaders in the group discussions. Key issues were identified during the process, including the need for information on gender. Field missions were also organised at project target regions with consultants, meetings with regional, departmental and council's authorities and target communities to select key activities and target sites. Following community groups, including women association, are consulted during the PPG and the outcomes of discussions presented in PPG report 3.

Niayes

- Market gardener groups of Potou (Louga);
- Producers Associations Federation of Louga;
- Producer groups of Lompoul

Casamance

- Tobor Women Association
- Diende Women Association
- Women Association exploiting Bakoum valley
- Sare village women association

Women's group and association will become partners in the implementation of climate resilient adaptation and awareness activities. As highlighted in section II.2, the project aims at implementing adaptation measures in a very participative fashion, through the inclusion of all social groups, also the marginalised, to guarantee maximum coverage of impact and structural consideration of the most vulnerable (and exposed to the impact of climate change) in planning adaptation interventions and early warning in the areas receiving beneficial effects. Thus there is provided in component 2 to implement adaptation initiatives, community-based small-scale activities with youth associations and women from target councils, focused on the development of alternative livelihoods resilient activities to climate change. At least 10 community groups, particularly women's groups, will be supported in Casamance to improve climate resilience through agro-pastoral and agro-forestry activities and sustainable water management practices in rice paddies. Under Component 3, at least 50 women's organizations will be capacitated to use climate information and adaptation technologies in their socio-economic activities. Women's group and association will become partners in the implementation of climate resilient adaptation and awareness activities. As highlighted in section II.2, the project aims at implementing adaptation measures in a very participative fashion, through the inclusion of all social groups, also the marginalised, to guarantee maximum coverage of impact and structural consideration of the most vulnerable (and exposed to the impact of climate change) in planning adaptation interventions and early warning in the areas receiving beneficial effects.

Proposed outputs are considered cost-effective relative to the alternative approaches considered to address project barriers, as shown in the Table in below

Outputs	**Barriers addressed**	**Alternatives considered**
Output 1.1: The climate, meteorological and hydrological network for the target areas and the capacities are strengthened in order to	**Barrier #2:** Weak institutional capacity for climate information	**Alternative 1:** If nothing is done, the current climate information targeting less that 5% of target communities will continue to work

Outputs	Barriers addressed	Alternatives considered
produce reliable data needed to monitor and analyse hydro-climatic phenomena	production and dissemination	independently and little regional capacity will be built. **Alternative 2:** Acquiring more equipment to improve regional and local coverage; this option was considered as per the feasibility studies, which demanded more monitoring equipment. **Alternative 3:** Only use climate forecasts from the WMO or other international organizations. However, these organizations (i) can only work if the data are provided by a large number of countries worldwide, and (ii) generally do not provide forecasting on the local level and cannot do it without available data.
Output 1.2: Develop an integrated information system producing climate information and generating the products needed to identify risks related to climate change (e.g., maps for risk, vulnerability, etc.)	**Barrier #2:** Weak institutional capacity for climate information production and dissemination	**Alternative 1**: Have separate data portals for each agency to ensure security: however, this would prohibit the easy use of data across agencies and a potential means to share data.
Output 1.3: A platform for sharing information is established to support the management of climate risks and long-term planning for adaptation.	**Barrier #2:** Weak institutional capacity for climate information production and dissemination	**Alternative 1:** Do nothing; if the locals are not informed on the utility of climate information and farmers will continue to plan agriculture season without climate information.
Output 2.1: At least 100 hectares of mangrove plantations are restored to reduce the impact of swell and coastal erosion	**Barrier #1**: Inadequate production systems challenged by climate change and variability	**Alternative 1:** If nothing is done, at least 150,000 ha of mangrove will be lost with ecological impacts (loss of biodiversity) and reduction of sources of revenues for women associations (oyster production estimated at 10,000t/year)[6]. **Alternative 2**: Undertake reforestation activities. However, communities are not well capacitated to monitor of plantation. Therefore the project will engage DEFCCS to train communities on plantation maintenance.
Output 2.2: Multi-purpose community forests resilient to climate change tested in the vegetable gardens of Niayes to protect crops from wind erosion and prevent encroachment by sand dunes	**Barrier #1**: Inadequate production systems challenged by climate change and variability	**Alternative 1**: Doing nothing: encroachment of vegetable garden with expected loss of production at least 200,000t of vegetable/year (loss of revenue/household/agriculture campaign=400USD). **Alternative 2:** Ensure protection of vegetable

[6] Cornier-Salem : 1986

Outputs	Barriers addressed	Alternatives considered
		garden through reforestation. The project will support forest activities in areas most vulnerable. However mitigation measures need to be undertaken ahead with the maintenance of filao forest to fix the sand dunes.
Output 2.3: At least 10 community groups, particularly women's groups, will be supported in Casamance to improve climate resilience through agro-pastoral and agro-forestry activities and sustainable water management practices in rice paddies	**Barrier #4:** Producers and households with low technical and financial capacities	**Alternative 1:** Do nothing. At least 185,000 people (45% women) will continue to be vulnerable to face the impacts of climate variability with no safety net mechanisms for managing risks associated with climate variability impacts on foods resources and livelihoods. Therefore, the project will support the development of small-scale adaptation initiatives. **Alternative 2:** Support the establishment of small-scale adaptation initiatives. However, the daily running and sustainability of these initiatives requires capacitance of recipient communities. Therefore, the project will promote partnership with technical services at local level to advice and monitor all activities.
Output 3.1: Local governments and decentralized technical services have the necessary capacities to support communities in implementing adaptation activities	**Barrier#3**: Insufficient capacities of local communities, technical services and decentralized administrations to develop and implement adaptation practices to climate change.	**Alternative 1:** Business as usual. Local government and technical services will continue to support communities on traditional issues. However, they will not have access to relevant technical skills to support communities and climate disaster risks reduction. The project will provide relevant capacities to at least 200 staffs from the extension services of the ministries (of water resources, agriculture, environment, livestock, etc.) on climate risks and on using results from climate risk assessments and vulnerability to adjust regulations, policies and plans that govern land and ecosystem management.
Output 3.2: The benefits from implemented adaptation solutions are monitored and shared with government officials, target communities and partners to inform them about project results replication opportunities.	**Barrier#3**: Insufficient capacities of local communities, technical services and decentralized administrations to develop and implement adaptation practices to climate change	**Alternative 1:** Do nothing, best practices and lessons learned from project are limited and insufficient, and knowledge sharing among vulnerable communities on how to address a changing climate is poor. The project will develop training and a public awareness campaign to inform critical mass of communities local populations about the potential of climate information to assist them in building resilience to climate/weather extremes

B.3. Explain how cost-effectiveness is reflected in the project design:

The project objective is to create an enabling environment for the implementation of adaptation solutions based on ecosystem management in the Niayes and Casamance regions with major consideration placed on maximizing the project's cost-efficiency ratio. This consideration will consist of leading activities on the geographic themes and areas where their added value is substantial, or even crucial. Thus, the proposed components, outputs, activities and approaches have been identified and selected so the project objectives and expected impacts can be achieved based on a cost-efficiency approach.

As indicated above, this project document meets the immediate and urgent adaptation priorities identified in the NAPA for Senegal. These priorities were measured based on their cost-efficiency and their sustainability, before the project components had been identified and developed. This project aims to achieve results that will be a first in the target areas through three components commensurate with the project's resources. These components and their expected results reinforce each other. Hence, Component 1 will consist of providing climate information and relevant tools for managing climate risks to communal authorities, technical services and communities to promote practices for sustainable land use and ecosystems resilient to CC (Component 2) and to bring all this to scale through Component 3 on knowledge sharing and management.

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capacities and its existing network, all while ensuring a good cost-efficiency ratio for these investments. A possible, though not viable, alternative for the country could be to only use climate forecasts from the WMO or other international organizations. However, these organizations (i) can only work if the data are provided by a large number of countries worldwide, and (ii) generally do not provide forecasting on the local level and cannot do it without available data. Therefore, strengthening the climate data collection and processing system that the project will support will benefit all of Senegal, the sub-region and the rest of the world because these data can be entered into climate information systems on a national, regional and global levels. The type of expected results for Components 1 and 3 of the project is a prerequisite for: (i) conducting forecasting at the local, national and sub-regional levels; and (ii) sharing data with international organizations that in turn will help improve their climate forecasts and scenarios throughout the world.

Through the second component, this initiative will support the implementation of technologies and agro-sylvo-pastoral and IGA practices that will be resilient to climate threats that are becoming more frequent and intense. These local investments will be made through Component-2 activities. These activities have been identified through a literature review and field visits during the project design stage through a participatory approach involving the various stakeholders (local communities and their locally-elected officials; decentralized government advisory services, CBOs and NGOs active in the project areas; and administrative and policy officials at the commune, departmental and regional levels.

C. DESCRIBE THE BUDGETED M &E PLAN:

The project will be monitored through the following M& E activities. The M& E budget is provided in the table below.

Project start:

A Project Inception Workshop will be held within the first 2 months of project start with those with assigned roles in the project organization structure, UNDP country office and where appropriate/feasible regional technical policy and programme advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan. The Inception Workshop should address a number of key issues including:

- Assist all partners to fully understand and take ownership of the project. Detail the roles; support services and complementary responsibilities of UNDP CO and RCU staff vis à vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.
- Based on the project results framework and the relevant SOF (e.g. GEF) Tracking Tool if appropriate, finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.
- Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.
- Discuss financial reporting procedures and obligations, and arrangements for annual audit.

- Plan and schedule Project Board meetings. Roles and responsibilities of all project organisation structures should be clarified and meetings planned. The first Project Board meeting should be held within the first 12 months following the inception workshop.

An Inception Workshop report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

Quarterly:

- Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform.
- Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high. Note that for UNDP GEF projects, all financial risks associated with financial instruments such as revolving funds, microfinance schemes, or capitalization of ESCOs are automatically classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical).
- Based on the information recorded in Atlas, a Project Progress Reports (PPR) can be generated in the Executive Snapshot.
- Other ATLAS logs can be used to monitor issues, lessons learned etc. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

Annually:

- Annual Project Review/Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period (30 June to 1 July). The APR/PIR combines both UNDP and SOF (e.g. GEF) reporting requirements.
  - The APR/PIR includes, but is not limited to, reporting on the following:
  - Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative)
  - Project outputs delivered per project outcome (annual).
  - Lesson learned/good practice.
  - AWP and other expenditure reports
  - Risk and adaptive management
  - ATLAS QPR
  - Portfolio level indicators (i.e. GEF focal area tracking tools) are used by most focal areas on an annual basis as well.
  - Describe M&E framework for specific outputs that are based on RCT principles, including who is to be involved, budget, survey instrument etc.

Periodic Monitoring through site visits:

UNDP CO and the UNDP RCU will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the Project Board may also join these visits. A Field Visit Report/BTOR will be prepared by the CO and UNDP RCU and will be circulated no less than one month after the visit to the project team and Project Board members.

Mid-term of project cycle:

The project will undergo an independent Mid-Term Evaluation at the mid-point of project implementation (insert date). The Mid-Term Evaluation will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-EEG. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the UNDP Evaluation Office Evaluation Resource Center (ERC). The relevant SOF (GEF) Focal Area Tracking Tools will also be completed during the mid-term evaluation cycle.

End of Project:

An independent Final Terminal Evaluation will take place three months prior to the final Project Board meeting and will be undertaken in accordance with UNDP and SOF (e.g. GEF) guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF M&E.

The Final Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response that should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Center (ERC). The relevant SOF (e.g. GEF) Focal Area Tracking Tools will also be completed during the final evaluation.

During the last three months, the project team will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

Learning and knowledge sharing:

Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums including IW: LEARN.

The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyse, and share lessons learned that might be beneficial in the design and implementation of similar future projects.

Finally, there will be a two-way flow of information between this project and other projects of a similar focus.

Communications and visibility requirements:

Full compliance is required with UNDP's Branding Guidelines. These can be accessed at http://intra.undp.org/coa/branding.shtml, and specific guidelines on UNDP logo use can be accessed at: http://intra.undp.org/branding/useOfLogo.html. Amongst other things, these guidelines describe when and how the UNDP logo needs to be used, as well as how the logos of donors to UNDP projects need to be used. For the avoidance

of any doubt, when logo use is required, the UNDP logo needs to be used alongside the GEF logo. The GEF logo can be accessed at: http://www.thegef.org/gef/GEF_logo. The UNDP logo can be accessed at http://intra.undp.org/coa/branding.shtml.

Full compliance is also required with the GEF's Communication and Visibility Guidelines (the "GEF Guidelines"). The GEF Guidelines can be accessed at: http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.08_Branding_the_GEF%20final_0.pdf. Amongst other things, the GEF Guidelines describe when and how the GEF logo needs to be used in project publications, vehicles, supplies and other project equipment. The GEF Guidelines also describe other GEF promotional requirements regarding press releases, press conferences, press visits, visits by Government officials, productions and other promotional items.

Where other agencies and project partners have provided support through co-financing, their branding policies and requirements should be similarly applied.

Table: M& E work plan and budget

Type of M&E activity	**Responsible Parties**	**Budget US$** *Excluding project team staff time*	**Time frame**
Inception Workshop and Report	Project Manager UNDP CO, UNDP W&O RTA	Indicative cost: 10,000	Within first two months of project start up
Measurement of Means of Verification of project results.	UNDP W&O RTA/Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members.	50,000	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on *output and implementation*	Oversight by Project Manager Project team	100,000	Annually prior to ARR/PIR and to the definition of annual work plans
APR/PIR	Project manager and team UNDP CO UNDP RTA UNDP GEF M&E	None	Annually
Periodic status/ progress reports	Project manager and team	None	Quarterly
Mid-term Evaluation	Project manager and team UNDP CO UNDP RCU External Consultants (i.e. evaluation team)	Indicative cost: 40,000	At the mid-point of project implementation.
Final Evaluation	Project manager and team, UNDP CO UNDP RCU External Consultants (i.e. evaluation team)	Indicative cost : 40,000	At least three months before the end of project implementation
Project Terminal Report	Project manager and team UNDP CO Local consultant	0	At least three months before the end of the project
Audit	UNDP CO Project manager and team	Indicative cost per year: 3,000	Yearly
Visits to field sites	UNDP CO	For GEF supported	Yearly

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project team staff time*	Time frame
	UNDP RCU (as appropriate) Government representatives	projects, paid from IA fees and operational budget	
TOTAL indicative COST Excluding project team staff time and UNDP staff and travel expenses		US$ 255,000 (+/- 5% of total budget)	

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT(S) ON BEHALF OF THE GOVERNMENT(S):): (Please attach the Operational Focal Point endorsement letter(s) with this form. For SGP, use this OFP endorsement letter).

NAME	POSITION	MINISTRY	DATE *(MM/dd/yyyy)*
Mrs. Mariline DIARA	Director, Department of Environment and Classified Establishments (DEEC)	MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT	01/14/2013

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for CEO endorsement/approval of project.

Agency Coordinator, Agency Name	Signature	Date *(Month, day, year)*	Project Contact Person	Telephone	Email Address
Adriana Dinu, Executive Coordinator, UNDP/GEF		06/04/2015	Ms. Mame Dagou DIOP	+221 77 635 9185	mame.diop@undp.org

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

The project will contribute to reaching the Country Program Results as defined in the UNDP and UNDAF Country Program: **UNDAF 2012-2016 Outcome(s):** Outcome 1: "By 2016, farmers in targeted areas increase their income by using new knowledge, technologies, and investments with high added value." Outcome 7: "By 2016, efforts to adapt to climate change facilitate adequate access of people affected to basic social services and the development of sustainable livelihoods."
Expected outputs of the Country Programme Action Plan (CPAP) 2014-2018: Output 1: "Resilient climate change policies formulated and access to financial mechanisms enhanced " Output 2: "Pilot sites developed and resilient to climate change
UNDP Strategic Plan 2014-2017 Outputs Output 1.4. Scale up action on climate change adaptation and mitigation across sectors which is funded and implemented
Pertinent GEF Strategic Objectives: Objective 1: Reduce the vulnerability of people, livelihoods, physical assets and natural systems to the adverse effects of climate change Objective 2: Strengthen institutional and technical capacities for effective climate change adaptation
Pertinent GEF Expected Outcomes: **Outcome 1.1:** Vulnerability of physical assets and natural systems reduced **Outcome 1.2:** Livelihoods and sources of income of vulnerable populations diversified **Outcome 1.3:** Climate-resilient technologies and practices adopted and scaled up **Outcome 2.1:** Increased awareness of climate change impacts, vulnerability and adaptation **Outcome 2.3:** Access to improved climate information and early-warning systems enhanced at regional, national, sub-national and local levels **Outcome 2.4:** Institutional and technical capacities and human skills strengthened to identify, prioritize, implement, monitor and evaluate adaptation strategies and measures
Relevant GEF Outcome Indicators (Following the AMAT tool): **Indicator 2:** Type and extent (and value, where applicable) of assets strengthened and/or better managed to withstand the effects of climate change (measured e.g. in ha of cropland/ rangeland/ catchments; km of coastline) **Indicator 3:** Number of people benefiting from the adoption of diversified, climate-resilient livelihood options (percentage of whom are female) **Indicator 4:** Extent of adoption of climate-resilient technology/ practice (measured in number of users [percentage of whom are female]; or geographical area)

Indicator 5: Number of people (percentage of whom are female) with increased awareness of climate change impacts, vulnerability and adaptation **Indicator 7:** Number of people (percentage of whom are female)/ geographical area with access to improved climate information services **Indicator 9:** (a) Number of people (percentage of whom are female) trained to identify, prioritize, implement, monitor and evaluate adaptation strategies and measures					
Objectives/Outcomes	**Indicator**	**Baseline**	**Target for End of Project**	**Means of Verification**	**Risks and Hypotheses**
Project Objective	**Indicator 1** Number of people affected by the impacts of climate changes that adopted climate resilient technologies/practices (disaggregated by gender) *(AMAT indicator 4)*	The production in eco-geographical areas of Niayes and Casamance are seriously threatened by the impacts of climate change, include: water shortage, land degradation, salinization, siltation of valleys linked to soil erosion in highlands, and degradation of habitats among the most productive and sensitive such as mangroves and coastal areas. It is estimated that 168,555 people in target sites are affected. Significant efforts have been made to address environmental issues and natural resources management with the implementation of various international agreements including the Rio Conventions. However, due to the population's low income levels and limited access to climate resilient technologies, farmers and households have limited capacity to adapt to climate change: this include new technologies to make agro-sylvo-pastoral activities more resilient; and diversification of activities for better risk management.	At least 3500 people from Dakar, Louga, Thiès, Ziguinchor, Sédhiou and Kolda (50% women) covered by risks management measures such as resilient ecosystem and land management practices (e.g. mangrove/forest restoration); resilient agro-pastoral and agro-forestry activities and sustainable water management	Survey and M&E Reports 18.	Assumption ➢ Existence of scientific and technical capacities to support the development of risks management measures; ➢ Participation and commitment of target communities Risks ➢ Political instability and conflict resurgence in Casamance; ➢ Existence of unresolved land disputes ➢ Low capacity and involvement of national institutions to support communities in their adaptation activities ➢ Impacts of climate change far greater than predicted

Outcome 1: Information management systems to determine and monitor the impacts of climate change on ecosystems are implemented for effective forecasting, preparation and decision-making	**Indicator 2:** Number of people (50% female) in Niayes and Casamance regions with access to improved climate information *(AMAT indicator 7)*	With limited coverage on meteorological network, communities have limited access to climate information. Moreover, the non-translation of existing climate information into formats that are easily understood by technical extension services (agriculture, forests, livestock, etc.), ecosystems managers and producers, makes it of limited use.	At least 3000 people (50%) women will access to relevant climate information through the sharing platform established to provide ongoing monitoring of the meteorological/climate, hydrological and agricultural situation and to warn communities in time.	Activity and M&E Reports Survey 31.	Assumption ➢ Availability of relevant information to support information & awareness process Risks ➢ Low mobilisation and lack of interest of target groups
Outcome 2. Adaptation options based on ecosystem management in the two target areas (Niayes and Casamance), including the adoption of ecosystem and land management practices resilient to climate change, reduce the risks caused by climate change in these areas.	**Indicator 3:** Ha of natural system better managed to withstand the effects of climate change *(AMAT indicator 2)*	At present, natural resource management is advanced largely through the improvement of productivity, capacity building of producers or ecosystem management/land & forest restoration. What is lacking, under conditions of climate change, is climate adaptive interventions to address climate-driven factors such as securing mangrove from the impacts of storm surges, coastal erosion; protecting Niayes from wind erosion and the advancing of dunes, etc. This, in turn, will help local communities and producers to ensure continued availability and access to natural resources that support livelihoods and reduce heir vulnerability to chocks and ultimately to adapt to changing conditions.	➢ 100 ha of mangrove restored to reduce the impacts of storm surges, and coastal erosion; ➢ 110 ha of windbreaks planted in the Niayes vegetable gardens to protect production from wind erosion and prevent the encroachment of sand dunes; ➢ 100 ha reforestation in the Soukou valley to protect the watershed from erosion	Activity and M&E Reports Survey	Assumptions ➢ Involvement of communities Risks ➢ Low capacity and involvement of national institutions to support communities in their adaptation activities

	Indicator 4: Number of people benefiting from the adoption of diversified, climate-resilient livelihood options (percentage of whom are female) *(AMAT indicator 3)*	Due to the population's low income levels and limited access to credit, farmers and households do not have the financial resources to make required investments to adapt to climate change. This situation is particularly difficult for women facing to multiple socio-economic problems, including: (i) unfair access to production resources including land, training, funding, etc.; and (ii) an unfavorable distribution of roles and responsibilities between men and women in the production and social life.	At least 30 community groups (1500 people approx. among them 80% women) supported in Casamance to undertake agro-pastoral, agro-forestry activities and sustainable water management practices in rice paddies	Activity and M&E Reports Survey	
Outcome 3: Individual, household and community capacities will be strengthened in order to increase awareness about responses to climate change and effective support for adaptation efforts**.**	**Indicator 5** Type and number of people with increased awareness of climate change impacts, vulnerabilities and adaptation (gender disaggregated) *(AMAT indicator 5)*	Even with the existing sources of weather data, the national meteorological Agency has insufficient information to effectively predict the impacts of weather patterns leading to low capacity of mangers and households to effectively management natural resources and biodiversity in ignorance of fundamental climate-ecosystem dynamics. Adaptation solutions need to be framed by a basic understanding of how climate interacts with ecosystems and species – the Eco physiological, evolutionary, and ecological processes and responses that determine ecological system productivity and resilience; along with the	At least 200 staffs from local technical services, 1000 people from CBO's, among them 50% women, and 100 teachers have relevant knowledge on climate risks to better response to climate changes and to provide effective support for adaptation efforts**.**	Activity and M&E Reports Survey	Assumption Availability of relevant physical and socio-economic data allowing the assessment of key vulnerability and cost effectiveness adaptation options Risks Low capacity and involvement of national institutions to support development of knowledge products

		productivity and resilience of the dependent social systems.			

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

Response to Germany

Comments	Response
Germany suggests considering more strongly connectivity and transferability of the project results to other regions and/ or to the national level establishing the foundation for up-scaling in the medium-/long-term. Potential for up-scaling also exists for climate resilient land and ecosystem management practices implemented under component 2 as mentioned in component 3. Germany suggests addressing up-scaling of best practices more systematically in the final project proposal	Activities for Component 3, designed especially for the scaling-up of project experiences, will be used to ensure sustainability and replicability of project activities and results. Therefore, through the various communication and dissemination methods to share project experiences, including visits between the different communities for sharing, planned in Component 3, it is envisaged that the promoted adaptation solutions will be replicated in other communities. This component will help the project results to influence local and regional policies, strategies, plans and programs in the target areas, especially ensuring intervention sustainability and replicability.
For instance, regarding the establishment of an integrated region-specific information system (component 1) it should be considered to facilitate inter-regional data and knowledge sharing. Further, the suggested platform should be designed in a way that it allows for an integration of further data from other regions for establishing a national information platform in the long-term. Such an approach would contribute to the sustainability of the project.	Regarding the information system, a national monitoring framework is developed by MEDD with operational environmental and socioeconomic indicators to quantitatively assess the state of the environment and pressure on natural resources. Under component 1, a study aimed at conducting an inventory of the various existing platforms on climate information in the various target regions across the country and at the sub-regional level will be conducted. This will involve identifying them; describing how they function and the roles of the various stakeholders; assessing their strengths and weaknesses, indicators of their sustainability; and the means for collaboration and sharing information that can be implemented.

Responses to <u>US</u>

Comments	Response
How the various project components are linked, especially Components 1 and 2. For example, how will the information collected from the weather, climate and hydrological observation network in Component 1 inform the design of activities in Component 2, such as the planting of mangroves and windbreaks? Building in linkages between project components from the beginning will ensure that the various lessons learned and best practices from each Component's activities will inform implementation across all project areas;	The research-development activities undertaken under Component 2 will adapt the technical agricultural package for horticulture and agro-forestry production systems to a changing biophysical context based on agro-meteorological and climate forecasts developed under Component 1.
What observations/data will be collected, and how UNDP will help ensure that observations/data are used correctly and feed into product, decision-support and hydro-met systems accurately	The project will rehabilitate and/or strengthen the network for meteorological and hydrological observations in the five-targeted administrative regions to better monitor changes in the climate and hydrology of the various waterways. Specifically, five

Comments	Response
	automated meteorological stations (automatic collection and transmission via GPRS) will be installed in the regions of Louga, Thiès, Ziguinchor, Sédhiou and Kolda to collect data on temperature, rainfall, sunshine, wind, humidity, evaporation, etc. In addition, in each of these regions, the network of rainfall stations will be made denser. Therefore, 40 rainfall stations will be set up in each region. In an effort to monitor the impact of the swell on the mangrove, a marine station will be installed in Tobor for measuring wave height (swell) and conventional parameters. The implementation of the hydro-climatic information platform will first require conducting a diagnosis of the system to collect meteorological and hydrological data, and then, to assess the needs in climate information for targeted populations in the context of this project (local population, technical services, locally-elected officials, local administration, etc.).
Provide more information on how the climate and hydrological observation network could contribute to the Global Climate Observing System (GCOS) and the Global Framework of Climate Services (GFCS);	Linkages will be created with other existing information systems on food security and the environment. At the sub-regional level, the existing platforms working with GCOS and GFCS will be leveraged (AGHRYMET, ACMAD, RPCA, etc.).
Provide more information on how beneficiaries, including women and indigenous groups, have been involved in the development of the project proposal.	This project is elaborated through a participative process. Key stakeholders and a selection of direct beneficiaries have been involved in priority settings and project design. The Directorate of Water, Forests, Hunting and Soil Conservation has led project formulation. Various stakeholders participated to the PPG inception meeting such as staffs from Ministry of Environment (including all ministerial department and their representatives in project target regions), Ministry of Finances, ANACIM, and research institutes, NGO, Consultants and UNDP. It was organised series of meetings at national and local level (with regional, departmental authorities and representatives from communities and consultants, NGOs and other stakeholders) to analyse the situation and agree on the content and the operationally of the project. Field missions were also organised at project target regions with consultants, meetings with regional, departmental and council's authorities and target communities to select key activities and target sites. Following community groups, including women association, are consulted during the PPG and the outcomes of discussions presented in PPG report 3. <u>Niayes</u> - Market gardener groups of Potou (Louga); - Producers Associations Federation of Louga; - Producer groups of Lompoul <u>Casamance</u> - Tobor Women Association - Diende Women Association - Women Association exploiting Bakoum valley - Sare village women association

ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS[7]

A. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES FINANCING STATUS IN THE TABLE BELOW:

PPG Grant Approved at PIF: **150,000**			
Project Preparation Activities Implemented	***GEF/LDCF/SCCF Amount ($)***		
	Budgeted Amount	***Amount Spent Todate***	***Amount Committed***
Component 1: Needs assessment and technical feasibility of adaptation options and measures	60,100	37,613	22,487
Component 2: Project development	20,000	13,169	6,831
Component 3: Consultation with key stakeholders	49,900	24,711	25,189
Component 4: Development of financial plan and co-funding scheme	20,000	0	20,000
Total	**150,000**	**75,493**	**74,507**

[7] If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities.

ANNEX D: CALENDAR OF EXPECTED REFLOWS (if non-grant instrument is used**)**

Provide a calendar of expected reflows to the GEF/LDCF/SCCF/NPIF Trust Fund or to your Agency (and/or revolving fund that will be set up)