



PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: Full-sized project

TYPE OF TRUST FUND: LDCF

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PART I: PROJECT INFORMATION

Project Title:	Enhancing the adaptation capacities and resilience to climate change in rural communities in Analamanga, Atsinanana, Androy, Anosy, and Atsimo Andrefana		
Country(ies):	Madagascar	GEF Project ID: ¹	5632
GEF Agency(ies):	UNDP (select) (select)	GEF Agency Project ID:	5228
Other Executing Partner(s):	Directorate of Climate Change	Submission Date:	Oct. 30, 2013
		Re-submission Date:	Nov. 29, 2013
GEF Focal Area (s):	Climate Change	Project Duration (Months)	60 months
Name of parent program (if applicable):	n/a	Agency Fee (\$):	558,353
<ul style="list-style-type: none"> • For SFM/REDD+ <input type="checkbox"/> • For SGP <input type="checkbox"/> 			

A. INDICATIVE FOCAL AREA STRATEGY FRAMEWORK²:

Focal Area Objectives	Trust Fund	Indicative Grant Amount (\$)	Indicative Co-financing (\$)
CCA-2	LDCF	1,600,000	6,300,000
CCA-3	LDCF	4,277,397	28,000,000
(select) (select)	(select)		
Total Project Cost		5,877,397	34,300,000

B. INDICATIVE PROJECT FRAMEWORK

Project Objective: Strengthen the capacities of vulnerable communities of Androy, Anosy, Atsinanana, Analamanga and Atsimo Andrefana to cope with the additional risks posed by climate change and variability on livelihood opportunities						
Project Component	Grant Type ³	Expected Outcomes	Expected Outputs	Trust Fund	Indicative Grant Amount (\$)	Indicative Joint Financing (\$)
Building adaptation capacities among rural development institutions	TA	1. The institutional and technical adaptation capacities of ministries in charge of agriculture, livestock, water and sanitation of local governments of the regions of Androy, Anosy, Atsimo Andrefana, Analamanga, and Atsinanana are strengthened	<p>1.1. A training program for management of climate risk for vulnerable communities livelihoods and living conditions is designed and implemented for policy decision makers, senior executives and technicians of ministries in charge of agriculture, livestock, water, and sanitation and of local governments, NGOs and community based organizations (CBOs) supporting the rural development of the regions of Androy, Anosy, Atsimo Andrefana</p> <p>1.2. The local development plans for the regions of Androy, Anosy, Atsimo Andrefana, Atsinanana, and Analamanga and related budgeting frameworks are revised</p>	LDCF	552,397	6,000,000

¹ Project ID number will be assigned by GEFSEC.

² Refer to the reference attached on the [Focal Area Results Framework](#) when completing Table A.

³ TA includes capacity building, and research and development.

			<p>to integrate climate risks and incentives to advance adaptation</p> <p>1.3. The water and sanitation development plans for the Watersheds of the South, Center and East, as well as the municipal plans for developing access to sanitation and water (PCDEA) of the communes of Androy, Anosy, Atsimo Andrefana, Atsinanana, and Anamalanga and their budgets as well as the National Program for Access to Drinking Water and Sanitation (PNAEPA), are revised so as to integrate climate risks and relevant adaptation options</p> <p>1.4. Key public policy frameworks including the National Seed Strategy (DSNS) and the National Strategy for Agricultural and Rural Training (SNFAR) and the National Reforestation Strategy are revised to integrate climate change</p>			
<p>Production and diffusion of information on agriculture and weather conditions for informed decision making in the agricultural sector</p>	INV	<p>2. Meteorological, climate and socio economic information are packaged into decision support information and disseminated to relevant stakeholders of the line ministries and communities</p>	<p>2.1. Installation of 2 agrometeorological stations in Ampanihy and Amboasary-Sud, 2 synoptic stations in Betroka and Faux-Cap and 3 climatological stations in Betroka, Beroroaha, and Sakaraha. and creation of a network of 5 hydrometric stations in the watershed of Menarandra, and of 12 in the watershed of Mandrare, of two synoptic stations in Betroka and Faux Cap and of three auxiliary climate stations in Betroka, Beroroaha, and Sakaraha</p> <p>2.2. A training program is designed and implemented for the technicians of the Meteorology Directorate, the Ministry of Agriculture, Agencies for watersheds for the South, Center, and East and the Directorate of Disaster Management to enable them to analyze climate and weather data in an integrated manner with key socio-economic and biophysical data and generate policy relevant for key sector based planning and management</p> <p>2.3. A system for producing and disseminating decision making</p>	LDCF	1,000,000	7,500,000

			support information to manage disasters and climate risks, combining data on weather condition (including satellite surveillance data), climate projections, natural resources development, social and economic conditions (livelihood, living conditions, vulnerability, etc... climate change impact and adaptation) is designed, institutionalized, and is put into operation			
Introduction of strategies for strengthening resilience among the most vulnerable communities	INV	3. Adaptation measures including technologies are implemented by communities in Androy, Anosy, Atsimo Andrefana, Analamanga, and Atsinanana	<p>3.1. Climate resilient Agrosylvopastoral technologies, including, but not limited to, the use of crop calendar and other climate and weather condition information, drought tolerant/ shorter cycle seeds, zebus species and other input and methods for managing soil fertility and humidity are demonstrated with 3,000 farmers from the 30 most vulnerable communities</p> <p>3.2. Dredging sewage and rainwater canals, high intensity of labor force works, and other low-cost measures to fight against the silting of canals, the raising of contours and/or the strengthening of vulnerable points of the water and sanitation infrastructures to strengthen the vulnerable community based water supply and sanitation systems in the regions of Androy, Anosy, Atsimo, Andrefana, Analamanga, and Atsinanana is strengthened in response to climate change and variability</p> <p>3.3. Climate resilient agricultural advisory support groups made up of extension workers from agriculture support centers (CSAs) and members of communities are established and operationalized to provide climate resilient agriculture advisory support to the vulnerable communities of the regions of Androy, Anosy, Atsimo, Andrefana, Analamanga, and Atsinanana</p> <p>3.4. A sustainable climate resilient</p>	LDCF	4,046,000	19,170,000

		agricultural input supply chain, laying on seed growers groups, NGOs and CBOs is established.			
		3.5. A public private partnership aiming at fostering and enabling the combination of public and private sector contribution in the provision of institutional, financial and technical support for the integration of climate risks and adaptation options in the agricultural, water and sanitation sectors in Madagascar			
		3.6. Adapted financial credits products , to finance communities to make climate change adaptation and resilient alternatives incomes generating activities (IGAs) are developed by Microfinance Institutions (MFIs) networks			
Subtotal				5,598,397	32,670,000
Project Management Cost (PMC) ⁴			(select)	279,000	1,630,000
Total Project Cost				5,877,397	34,300,000

C. INDICATIVE CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME IF AVAILABLE, (\$)

Sources of Cofinancing	Name of cofinancier	Type of cofinancing	Amount (\$)
GEF Agency	UNDP	Grant	4,300,000
Bilateral Aid Agency	European Union	Grant	4,000,000
National Government	Ministry of Livestock from Government budget and Ministry of Agriculture from IFAD funding	Grant	16,000,000
Private Sector	Sherritt International Corporation, Sumitomo Corporation, Korea Resources Corporation, and SNC-Lavalin Incorporated	Grant	10,000,000
		(select)	
(select)		(select)	
Total Joint Financing			34,300,000

D. INDICATIVE TRUST FUND RESOURCES (\$) REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY¹

GEF Agency	Type of Trust Fund	Focal Area	Country Name/Global	Grant Amount (\$ (a)	Agency Fee (\$ (b) ²	Total (\$) c=a+b
(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0

⁴ To be calculated as percent of subtotal.

(select)	(select)	(select)				0
Total Grant Resources				0	0	0

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.

E. PROJECT PREPARATION GRANT (PPG)⁵

Please check on the appropriate box for PPG as needed for the project according to the GEF Project Grant:

	<u>Amount Requested (\$)</u>	<u>Agency Fee for PPG (\$)⁶</u>
• No PPG required.	-- 0--	--0--
• (up to) \$50k for projects up to & including \$1 million	_____	_____
• (up to)\$100k for projects up to & including \$3 million	_____	_____
• (up to)\$150k for projects up to & including \$6 million	150,000	14,250
• (up to)\$200k for projects up to & including \$10 million	_____	_____
• (up to)\$300k for projects above \$10 million	_____	_____

PPG AMOUNT REQUESTED BY AGENCY(IES), FOCAL AREA(S) AND COUNTRY(IES) FOR MFA AND/OR MTF ROJECT ONLY

Trust Fund	GEF Agency	Focal Area	Country Name/ Global	(in \$)		
				PPG (a)	Agency Fee (b)	Total c = a + b
(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
Total PPG Amount				0	0	0

MFA: Multi-focal area projects; MTF: Multi-Trust Fund projects.

PART II: PROJECT JUSTIFICATION⁷

Project Overview

A.1. Project Description. Briefly describe the project, including ; 1) the global environmental problems, root causes and barriers that need to be addressed; 2) the baseline scenario and any associated baseline projects, 3) the proposed alternative scenario, with a brief description of expected outcomes and components of the project, 4) incremental cost reasoning and expected contributions from the baseline , the GEFTF, LDCF/SCCF and co-financing; 5) global environmental benefits (GEFTF, NPIF) and adaptation benefits (LDCF/SCCF); 6) innovativeness, sustainability and potential for scaling up

1) The climate change related problem

1. The Southern, Eastern and Central regions of Madagascar is characterized by, amongst others: i) food insecurity and deficits in both quantitative and qualitative terms: about 68% of the households in the southern region and 42,6 % in the eastern region are considered as food insecure, and 50,9% in the central highlands are considered vulnerable to food security⁸); ii) the most alarming morbidity indicators in the country: infant-youthful and infant mortality rate in Anosy is 112 % and 75% , in Androy, 77 ‰ and 53 ‰in Atsimo Andrefana, 76 ‰ and 47‰, respectively.⁹; iii) Low access to drinking water and sanitation :

⁵ On an exceptional basis, PPG amount may differ upon detailed discussion and justification with the GEFSEC.

⁶ PPG fee percentage follows the percentage of the GEF Project Grant amount requested.

⁷ Part II should not be longer than 5 pages.

⁸ WFP /UNICEF (2011) Rural Madagascar Comprehensive Food and Nutrition Security and Vulnerability Analysis. November

⁹ L'Etat de l'Insécurité Alimentaire dans le Monde, FAO, 2010.

according to latest JMP data (JMP, 2013)¹⁰; Madagascar has 34% of improved access to water in the rural areas, and a coverage of only 12% of access to improved sanitation, which represent the lowest water and sanitation coverage rates in Southern Africa. The access to improved sanitation is 5.1% in Atsimo Atsinana, 5.2% in Androy, 8.6% in Anosy and 10.3% in Atsimo Andrefana. The access to drinkable water is also less than 40% in most of these regions with an access rate of 11.9% for Atsimo Atsinana, and 21.1% for Atsinana. Moreover, community access to potable water is increasingly more challenging. Without taking climate factors into account, Madagascar is already experiencing incidences of contaminated water sources. For example, more than 65% of the Malagasy population (of 21.3 million) is exposed to contaminated water sources from several sources including agricultural inputs and sewage systems. The poor quality of existing latrines, together with the very high prevalence of open defecation (45% of rural population) constitute one of the main sources of the pollution of water sources. The obvious health related issues are aggravated by increased incidences of flooding and cyclones. The existing water supply and sanitation infrastructure has not been designed and constructed taking climate extreme events into consideration. As a matter of fact, in the area of public health, other expected risks include a higher prevalence rates of malaria and other vector borne illnesses. This explains why diarrhea, with a high prevalence of 13.3 %, 12%, 10% in Androy, Atsinana and Anamalanga respectively is one of the main causes of children death in these regions¹¹.

2. The root causes of this situation above are mainly related to the weak and vulnerable basis of the rural economic development and natural hazards (cyclones, droughts, locust invasions). The main source of incomes and livelihoods in the rural communities of Madagascar is an archaic and unproductive agriculture. Indeed, if primary sector, including agriculture, livestock and fishing, is the foundation of the Malagasy economy, involving more than 80 percent of the active population and contributing to about 26 percent of GDP¹² most farmers practice subsistence agriculture, growing rice, cassava, bananas, maize, and sweet potatoes, in small plots (family average plot is 1.3 ha) with low yield barely enough to feed their families and get necessary incomes to meet the other households needs including water and sanitation. For example, per capita rice production declined from 1.2 tons in 1975 to 0.9 tons in 2006, despite a 15 percent growth in rice area. Slash-and-burn (shifting) agriculture is a common practice, resulting in agricultural land degradation and loss of forest area¹³. According to the Madagascar Institute of Statistique, the average annual agricultural income (including the auto consumption) per farmer household in Atsinanana, Analamanga, Androy, Anosy, Atsimo Andrefana are \$484; \$402; \$223; \$314; and \$318 respectively¹⁴. Thus, with a poverty line of 2\$/day, these incomes don't allow the farmers households to meet their foods and other basic needs including those related to drinking water and sanitation. This explains the high poverty rates and gaps in Atsinanana, Analamanga, Androy, Anosy, Atsimo Andrefana as shown in the table below.

Table 1: Poverty rates and gaps

Region	Poverty rate			Poverty gap		
	Urban	Rural	Region	Urban	Rural	Region
Analamanga	44.2	61.7	54.5	14.2	21.0	18.2
Atsinanana	60.2	88.7	82.1	25.7	46.0	41.2
Atsimo Andrefana	63.1	97.5	94.5	25.7	53.7	51.2
Androy	94.4	94.3	94.4	63.8	60.3	60.9
Anosy	55.1	87.6	83.5	24.2	46.5	43.7

Source: INSTAT/DSM/EPM 2010

¹⁰ WHO/UNICEF Joint Monitoring Program for estimates on the use of water sources and sanitation facilities in Madagascar: (1980 - 2011) WHO/UNICEF 2013

¹¹ République de Madagascar (2010): Enquête démographique et de sante, Avril

¹² Idem.

¹³ IFPRI (2012) : East African Agriculture and Climate Change: a comprehensive analysis – Madagascar. Mireille Rahaingo Vololona, Miriam Kyotalimye, Timothy S. Thomas, and Michael Waithaka. December

¹⁴ Repoblikan'I Madagasikara –Institut National de la Statistique (2011) : Enquête périodique auprès des ménages 2010. Aout

3. Climate induced hazards experienced in Madagascar worsen this already challenging baseline situation, and is fast eroding previous efforts by the government and its partners to advance sustainable development. For several years, the South of Madagascar has experienced the most pronounced effects of global temperature increase, including knock on effects such as evapotranspiration, and prevalence of longer dry seasons. Indeed, according to the Directorate General of Meteorology (DGM), the average temperatures in the Southern half of Madagascar have increased in the order of about 1°C going from 21.5 to 22.4°C (SNC, 2010) over the period of 1960-2010. Furthermore, while, the frequency of rains has tended to increase since the 1930s, they remain always low in the Far South and do not manage to make up water losses due to evapotranspiration and the demand in water of agricultural land. These factors make this region the most arid area of the country and the most subject to degradation of soils. In the area of Tuléar in the South-West, annual average rainfall is below 400 mm per year. In the Central and Eastern regions, rainfalls have characteristically remained scarce despite a longer monsoon period. With longer dry seasons, an increasing and intensification of droughts (for example, the Southern region has lived through 4 large droughts between 1980 and 1992 according to Kiomba-Madio, 1997), and the adverse temporal and spatial variation of rainfall that is leading to changes in the moisture content of soils, compounded by high levels of water extraction from lakes and streams, agricultural production and output is declining. Together with declining forest cover and species change, the adverse impacts on livelihoods are therefore likely to become increasingly pronounced.

4. In addition, Madagascar is also affected by increasingly recurring tropical cyclones. The DGM affirms that the number of intense cyclone crossing the country increased from 18 for the 1975-1989 period to 34 for the 1990 to 2004 period. For example, in early 2000, a series of three particularly devastating cyclones affected more than a million people and caused nearly \$85 million in damage to agricultural infrastructure¹⁵. Furthermore, the Far South Madagascar (Androy and Atsimo Andrefana regions) has been recently hit by a cyclone named Haruna the 22 and 23 February 2013. The greatest damage was recorded on maize and cassava crops and annual cash crops (peanuts, lima beans and cowpeas), with losses of up to 50-75%. The agricultural areas (mainland and Morombe Tuléar II) were the most affected. In total, it is estimated that 7,500 ha of rice, 17,000 acres of corn and 15,000 ha of cassava fields were damaged and / or lost. Finally, nearly 44,000 agricultural households were affected by the cyclone HARUNA. If 40% of households are planning to proceed to the recovery of their agricultural activity (replanting or purchase seedlings to transplant), 60% have declared unable to do so (behind the cropping calendar, financial problems, no seeds, etc. .). Concerning the livestock sector, significant damages have been reported in the coast (goats, cattle and sheep for about 20% of households), in agricultural areas (mainly poultry and goats) and in the hinterland (cattle for about 20% of households)¹⁶.

5. The above impacts are likely to worsen. Indeed, according to the Second National Communication (Submitted in December 2010), the use of downscaled global climate models (HadCM2, CSIRO-TR, ECHAM4), from the IPCC A2 scenario has projected that average temperatures in the Southern part of the country (including the regions of Anosy, Androy, Atsimo Andrefana) is expected to increase during the months of December- January- February (DJF) by 0.2°C, 2°C, and 3°C respectively by 2025, 2050 and 2100. In the Eastern part (including Atsinana) and Central regions (including Analamanga), the projections for the DJF show an increase between 0.8 and 1°C for 2025 and 3°C for 2100. For the months of June, July, and August, expected increments are between 0.8 and 1°C for 2025, 1.5 and 2.5°C for 2050, and between 4 and 5°C for 2100 for the Southern regions. For the Eastern and Central regions, the temperature increases are between 0.1 and 0.8 °C for 2025 and less than 1.5 °C for 2050. The increase of temperature will mean an accentuation of evapotranspiration which coupled with the projected decrease of rainfalls will accentuate the risk of water deficits for agricultural lands. DJF rainfalls may undergo a 20% increase in the central (Including Analamanga), eastern (Atsinana) and southern (Androy, Anosy, Atsimo Andrefana), . in

15 IFPRI (2012) : East African Agriculture and Climate Change: a comprehensive analysis – Madagascar. Mireille Rahaingo Vololona, Miriam Kyotalimye, Timothy S. Thomas, and Michael Waithaka. December

17 Madagascar, Cluster sécurité alimentaire et moyens de subsistance (2013) : Evaluation des impacts du cyclone Haruna sur les moyens de subsistance, et sur la sécurité alimentaire et la vulnérabilité des populations affectées (Avril)

2025 and in 2050, whereas in 2100, rainfalls in South-West and South would have increases from 30 to 50% compared to the 1961-1990 average. As for rainfalls for the months of JJA they will decrease from -1 to -25% in 2025, from -10 to -50 % in 2050 compared to the 1961-1990 average.

6. According to the General Directorate of Meteorology (DGM), a simulation using the ECHAM model has found that while cyclones hitting Madagascar will have the same frequency than the current climate (1994-2005), the frequency of intense cyclones (with a wind speed of more than 200km/h), per year will increase in 2100¹⁷.

7. The increase of precipitation for DJF, while being an opportunity for the agricultural sector in whole could disturb the irrigated rice production which is the most frequent rice growing system (more than 98% of irrigated lands are for rice growing). Indeed this coupled with the cyclone of January-April could lead to the flooding of the rice growing lands. Less rainfall in JJA coupled with higher temperature would mean more pest and disease as in the case of cassava mosaic disease, which will reduce the yields of cassava which is the second staple food and source of income after rice in the southern, eastern and central regions¹⁸. The risks of reduction of rainfalls in JJA also threaten the rice cultivation in these regions and particularly in the South which receives fewer rains. The reduction of rainfalls could thus lead to increased needs of irrigation and risks of food insecurity in these regions. Besides, stress on water coupled with the increase of temperature will be accentuated, aggravating the aridity condition of soils in southern regions such as Androy, Anosy and Atsimo Andrefana making any agricultural activity difficult. For example, the sugarcane industry in Morondava (Atsimo Andrefana) would experience an increase of about 2 to 3% in demand in water in 2100. Such increase would require 200m³ water per ha in the year 2025 to over 1,000m³/ha in the year 2100. An output decrease in the order of 4% (4 Tons/ha of sugarcane) would be probable in 2025 and 8% (6 to 7 tons) per ha in 2100. The increase of the frequency and intensity of cyclones will also probably negatively impact the household and community water and sanitation systems. Indeed the cyclones could lead to the flooding of rivers and sewage canals resulting in an increasing in number of days in which the outlet channels will have to be pumped out, a more frequent outflowing in toilet pits, which increase the exposure of populations to pathogenic agents and in contamination of non-protected water sources, increase of sediments in water intakes because of runoff, destruction of water and sanitations infrastructures and decrease in water available for the populations and unplanned and unbearable costs for sanitation and drinking water supply.

8. With climate change, vulnerable populations in the southern, central and eastern regions who are currently severely suffering from absolute poverty and difficult climate conditions will have to deploy more effort than now to efficiently and sustainably make use of the natural resources and to manage inevitable effects of long-term temperature increase, changes in historical rainfall regime and the increase in the frequency and intensity of cyclones in the country. . In short, without adaptation or technological improvements, food security, livelihood options and living conditions will be challenged.

Causes of climate vulnerability

9. The causes of climate vulnerability of livelihoods and water and sanitation systems of the communities in the Southern, Eastern and Central regions of Madagascar are multiple:

- *A high anthropic pressure on natural resources due to maladapted agricultural practices* destructive farming practices, which cause soil to erode and soil quality to decline, limit crop production. Slash-and-burn agriculture - *tavy* or *hatsake* - is the most common response to falling harvests and to secure non declining cash incomes¹⁹ but is one of the primary threats to Madagascar's forests which leads to a vicious circle of deepening poverty and shrinking forest area.²⁰ Estimates by WWF suggest that as much as

¹⁷ République de Madagascar. Direction Générale de la Météorologie (2008). Le changement climatique a Madagascar. Mars

¹⁸ Repoblikan'I Madagasikara –Institut National de la Statistique (2011) : Enquête périodique auprès des ménages 2010. Aout

¹⁹ ¹⁹ http://www.erikastyger.com/Publications_files/EStyger%20S%26B%20Madagascar.pdf

²⁰ <http://www.new-ag.info/en/country/profile.php?a=2888>

90 per cent of the country's primary forest has already been lost²¹. Tavy is mostly used for converting tropical rainforests in Madagascar into rice fields. Typically, an acre or two of forest is cut, burned, and then planted with rice. After a year or two of production the field is left fallow for four to six years before the process is repeated. After two or three such cycles, the soil is exhausted of nutrients and the land is likely colonized by scrub vegetation or alien grasses²². Tavy was recognized as the principal cause of deforestation and subsequent upland degradation (Humbert, 1927; Kiener, 1963; Oxby and Boerboom, 1985; Gade, 1996; Marcus, 2001). For instance, in the region of Atsimo Andrefana, 31,000 ha of forest have been burned down due to the practice of Tavy²³. The absence of the support from state including the absence of advisory services, illustrated by implementation of few development projects and insufficient legislation, work in favor of an increasing degree of deforestation and other agricultural bad practices contributing to the depletion of natural resources and the worsening of vulnerability of agricultural landscapes. While deforestation is illegal, the lack of law enforcement translates in free access of forest resources²⁴. Thus, faced with poverty and lack of alternatives, information and technical advisory support, farmers hold on to their traditional practices in order to produce enough food and incomes to survive. Styger and al (2006) foresee that tavy will prevail and forests and biodiversity will continue to disappear, unless feasible, affordable and sustainable upland farming techniques that depart from the local farming practices and priorities are developed and diffused to farmers.

- ***Farmers' weak financial capacity and limited access to credit do not favor mechanization and substantial investment in the agriculture activities:*** in the Southern, Central and Eastern areas, the income from agricultural activities (agriculture and animal husbandry) are very low. This is attributed to low agricultural productivity, inefficient storage, transportation and commercialization systems for agricultural products and a high home consumption. In addition, access to credit is limited. In part, this is because of the low density of decentralized financial institutions. Consequently, farmers and livestock breeders in these regions have difficulty to secure the financial resources necessary for developing effective and economically viable agricultural practices. A high-return and climate resilient agriculture would require good quality inputs, the availability of affordable financial products for financing the acquisition of efficient agricultural equipment, good landscaping, including measures for preventing soils erosion and slopes, and efficient irrigation and drainage systems. The absence of public investment in key agricultural infrastructures and including roads, market places, storage and processing structures, and technical support for water management, to sustain agriculture productivity and dependent livelihoods in the context of current development challenges as well as in the context of climate variability and change is also very pronounced.

- ***Absence of effective agricultural input supply system in rural areas.*** The input supply system is not always able to provide agriculture and livestock farmers with inputs in quantity and quality needed and at a competitive price that can enable them to ensure productive agriculture. In addition, the private sector is not encouraged to invest in this sector due to low financial capacity of the producers, difficult access to production areas, and the lack of incentive policies (such as exemption from taxes and duties, for example).

- ***Low and precarious access to water and sanitation infrastructure.*** Most of the rural population (65%) rely on raw water sources for their daily usage, which is heavily prone to contamination. In addition, the few existing infrastructures have not been designed and constructed taking climate extreme events into consideration. As regards sanitation, the poor quality of existing latrines, together with the very high prevalence of open defecation (45% of rural population) creates an unhealthy rural environment, aggravated in case of heavy rains and flooding. Furthermore, systems for preventing diseases sensitive to climate phenomena are still not in place. Moreover, the low level of awareness and knowledge among rural populations and health ministry staff about methods for preventing the climate induced, parasitic, diarrheic, and acute respiratory diseases outbreaks, compounds the problems already created by the limited coverage of infrastructure for sanitation and drinking water supply;

²¹ *Idem.*

²² <http://www.wildmadagascar.org/conservation/threats.html>

²³ <http://wwf.panda.org/?206007/Le-hatsake-menace-la-population-de-lAtsimo-Andrefana>

²⁴ http://www.erikastyger.com/Publications_files/EStyger%20S%26B%20Madagascar.pdf

- **Limited information is available for planning climate resilient agricultural activities and early warnings for severe weather events.** Climate forecasts, where they are available, are not used to efficiently plan ahead for expected cropping seasons, or to warn of expected heavy rains, dry spells or cyclones that will affect population living conditions and farm management decisions, e.g. when to plant and what crop/cultivar to plant, the need for additional investments to better protect crops, food stocks, irrigation systems and other agricultural infrastructure against cyclone damages. Relevant information for improved decision-making is further not packaged into advisories suitable for decision and policy makers as well as the technical staff in charge for the implementation of development policies and strategies in the sectors of agriculture, water and sanitation. In terms of future climate change, there are currently no scenarios for Madagascar that can be used to effectively plan for future adaptation to expected risks. Neither downscaled or sensitivity based analyses of climate from scenarios produced by different climate models, nor economic valuation of the net-benefits of alternative adaptation options are used in the decision-making process

Ideal solution and obstacles to the implementation of the solution

10. In the context of climate change and variability, an ideal solution would be that the decision makers involved in rural development at the national, regional and local levels understand the impacts of current and future climate risks in relation with agricultural systems, livelihoods options and water and sanitation services in rural areas. They should have the technical and functional capacities and required climate monitoring equipment to foresee and respond to such risks. In particular, the local and decentralized authorities of regions in the Southern, Eastern and Central regions of Madagascar : Androy, Anosy, Atsimo Andrefana, Atsinanana, and Anamalanga should also have the knowledge and skills necessary to identify, develop, and apply measures that would effectively reduce the vulnerability of rural communities, and to help them to face to the negative impacts of climate change. Communities that depend on agricultural and other economic activities relying on the natural resources should also have the adequate information and technical capacities to apply climate resilient agricultural technologies, and undertake alternative livelihoods option necessary to strengthen their resilience in face of climate risks and to benefit from incentive measures to use them.

11. Therefore, any solution requires the following to be in available:

- Strengthen the climate change awareness and adaptive capacity of line public and private institutions and local authorities in charge of supporting rural development livelihoods and communities access to water and sanitation services in order for them to understand, foresee the impacts of climate change, including the available climate risk management options and include them in the support they are providing to vulnerable communities;
- Making available and easy access and usage of to up to date information on climate, short term forecasts, seasonal forecasts, long-term climate scenarios, environmental monitoring, early warnings of severe meteorological and climatic events, and other relevant data, all at a suitable spatial scale and packaged in a manner suitable for making on-farm and sector management decisions. This includes adding the necessary infrastructure and building the required core capacity of human resources;
- Implement diverse technologies, and strategies to strengthen communities livelihood and water and sanitation systems resilience face to climate risks. This may include the diversification of agricultural activities the promotion of climate resilient alternative livelihood options and the promotion of improved community and household water supply and sanitation systems.

However, Madagascar is currently facing several obstacles that could prevent the country from achieving such ideal solution. Among these barriers, we can consider the following:

- Low awareness of decision makers of climate risks and increasing low technical capacity of authorities and officials of key ministries, particularly the Ministries of Agriculture, Livestock, Water, and regional and local governments to incorporate these climate risks and adaptation measures into appropriate policies, strategies, plans, budgets and local development;

- Low technical capacity of vulnerable communities to identify, develop and implement strategies for long-term adaptation to climate change. They lack access to agricultural inputs, climate resilient plant materials and appropriate agricultural advisory support that could enable them to address current climate variability and later climate change;
- Low technical capacity of the institutions in charge of the water and sanitation: In 2008 a Ministry of Water (Ministère de l'Eau) was set up specifically dedicated to water and sanitation. While this is a first step towards sectorial coordination, much remains to be done to realize effective coordination. Linkages between the government and other sector actors are weak. In both water supply and sanitation, the NGO and domestic private sector have skills to support the reform efforts, and are a necessary part of the solution. Capacity needs at Government level are the single most severe bottleneck, ranging from engineers and technicians to project and financial managers who can bridge the gap between investment availability and implementation. The weak linkages between policy frameworks, budgets, and monitoring and evaluation (M&E) frameworks have hindered the flow of investments. Furthermore,
- Stakeholders at all levels do not have access to information on the interrelation between agriculture, livestock, forestry, water, sanitation and hygiene (WASH), public health and climate – which would have enabled them to integrate climate risks in their decision making process. In the context of climate change and variability, it is essential that the agricultural, livestock, forestry, WASH, strategies and programs be underpinned by relevant meteorological and climate related information, such as cropping calendars, agro-climatic zoning, and agro-climatic-hydro forecasts for various future temporal horizons. This requires development of a framework for combining multiple sources of information (climate, environmental, social), the infrastructure to access and combine these data, as well as ways to communicate and update such information based on feedback from technical officers supporting communities development;
- The lack of a performing inclusive finance system to overcome the low financial capacities of vulnerable communities in order to allow them to make the necessary investments for strengthening their adaptive capacity, e.g. afford quality inputs, farms lay-out, anti-erosion, water control and wind-break infrastructures, and also diversify their sources of incomes;
- There is little consolidation and dissemination of knowledge and experiences of successful models and strategies (including endogenous strategies) for the management of climate risks.

Project objective

12. The objective of this LDCF project is to strengthen the resilience of livelihoods of the most vulnerable communities of Analamanga, Atsinanana, Androy, Anosy, and Atsimo Andrefana to climate change. In the context of the objective, the project will achieve the following outcomes (results):

Component 1: Strengthening the climate change adaptation capacities of the main institutions supporting the livelihoods and living conditions of the communities of Analamanga, Atsinanana, Androy, Anosy, and Atsimo Andrefana

Outcome 1: The institutional and technical adaptation capacities of the ministries in charge of agriculture, animal husbandry, water and sanitation and of the local communities in the regions of Androy, Anosy, Atsimo Andrefana, Analamanga, and Atsinanana are strengthened

Baseline Situation

13. The Malagasy government, in collaboration with its development partners including UNDP, is currently implementing a program to strengthen the capacities of national, regional and local actors, including civil society, mandated to supporting the enhancement of the livelihoods and living conditions of the communities within the regions of Androy, Anosy, Atsimo Andrefana, Analamanga, and Atsinanana. Among these programs, we can identify the following projects:

a) The “Sustainable Livelihoods and Fight against Poverty” / MSDLCP Project (US\$4.5 millions)

14. This UNDP led initiative, financed to the amount of US\$5.5 million, has as objective to improve sustainable access of vulnerable groups of the communities of the Regions of Analamanga, Androy, and Atsimo Andrefana, to basic infrastructure and opportunities and activities generating sustainable incomes and employments. Specifically, US\$4.5 m of this project will support the following: i) the development and the implementation of the 3 master plans for water and sanitation for the Agencies of the Basins of the South, East and Centre and the strengthening of national and regional capacities for the implementation of the master plans and the monitoring of the water resources of these 3 basins ; ii) the organization and strengthening of Fokontany (rural and urban communities) and community based organizations capacity to identify and seize opportunities for economic and social development.

15. The ongoing UNDP supported project is in the process of finalizing the 3 “master plans of water and sanitation. Climate risks have not been taken into account, an obvious deficiency in context of what we now understand is a significant emerging problem for Madagascar. In addition, the capacity building activities for the of the national institutions in charge of implementing those master plans do not integrate a climate change module that will enable them to integrate the climate risks in the management of water resources of vulnerable watersheds and the infrastructure for water supply and sanitation. Moreover, it is understood that the main livelihoods and the opportunities for creating income and employment in the South, Eastern and Central regions are related to the agro-sylvo-pastoral sector, which are clearly vulnerable to climate change. Unfortunately the iTAFAs, as well as the Fokontany and the community based organizations, do not have the means to inform the targeted populations of the climate change risks on these economic opportunities, nor on strategies to face to such risks.

16. The populations who might also be interested in making use of such opportunities do not have the financial and technical capacities to face such risks. Furthermore the capacity building programs of Fokontany and iTAFA, planned by the MSDLCP project do not take account of climate change issues in manner that will allow them to provide advisory support to the populations to cope with and manage expected climate risks.

b) The « Sustainable mechanisms for the development of access to water and sanitation in rural areas (MEDDEA II) « Project (US\$1 million)

17. The MEDDEA is a project financed by the EU to the amount of US\$4.2 million with a contribution of the Malagasy government of US\$ 0.66 million, and will be implemented from June 2013 to May 2016 in 5 regions of Madagascar including the region of Atsinanana. The objective of the project is to enhance health and life quality among the rural populations through a better access to drinking water and sanitation and to develop the skills of the various interveners and actors involved in such issues.

~~18.~~ To reach this objective, 1 million of the project resources will support in the region of Atsinana: i) the elaboration and the implementation of the municipality plans for the development of access to water and sanitation (PCDEA) for 3 municipalities ; these PCDEA are planning tools for the improvement of communities access to water and sanitation by specifying especially the projects to be completed to reach the target 7.c of the MDGs in those communities ; ii) the capacity development of various public and private stakeholders involved in the management of drinking water resources and sanitation services

19. For the implementation of the PCDEA, the MÉDDEA II program will build on the work achieved and decision making tools developed during the MÉDDEA I. Indeed, the first phase of the MEDDEA (2008-2012) has tested local water and sanitation planning tools, water supply and sanitation technologies, developed tools for water and sanitation project assessments (technological choices and design, economic assessment of infrastructure and strategies, planning and monitoring), setting up water and sanitation community management units. However, climate projections predict climate disruptions (increase in the recurrence and intensification of dry periods, in frequency of torrential rains and flooding, cyclones, rain patterns disruptions...) that may affect the accuracy of tools and technologies that will be used by the MEDDEA II to design the drinking water supply and sanitation infrastructures and affect the operation and sustainability of these latter. Indeed, the projected climatic disruptions may result in, amongst others, increasing in number of days in which the outlet channels will have to be pumped out because of rise in

river level, a more frequent outflowing in toilet pits, which increase the exposure of populations to pathogenic agents and in contamination of non-protected water sources, increase of sediments in water intakes because of runoff, destruction of sanitation and drinking water supply infrastructures, decrease in water available for the populations and unplanned and unbearable costs for sanitation and drinking water supply if these risks are not integrated in the design and the planning of the operation of these infrastructures. Thus, the elaboration of the PDCEA should integrate these climate concerns. Furthermore, the capacity building activities of the MEDDEA should also include training module that will allow the beneficiary of these trainings to acquire the capacity and skills to integrate the climate risks in the planning and management tools and technologies developed by the MEDDEA as well as address these climate risks and implement the climate proofed PDCEA.

c) The UNDP Goal WASH program (US\$250,000)

20. GoAL-WaSH is a UNDP program that aims to accelerate the achievement of access to water and sanitation through strategically targeted interventions that strengthen governance of the water and sanitation sectors at appropriate levels. GoAL-WaSH is an integral part of the UNDP's Water and Oceans Governance Program.

21. The project is delivered through UNDP country office and carried out in close coordination with government and key development partners active in water and sanitation at country level. The GoAL-WaSH program aims at addressing key bottlenecks to delivering water and sanitation services. Specifically, GoAL WaSH focuses on identifying gaps, needs, constraints and opportunities in national WASH plans, strategies and capacities, promoting governance reform, leadership and policy advocacy.

22. GW has commissioned 3 inventories, mapping out WASH facilities, use and access in 3 regions including Atsinanana.

23. In the first quarter of 2014, a comprehensive objective assessment of the WASH capacity building needs of Madagascar will be carried out at the municipal, district, regional and national levels. However, the mapping out and inventories already made did not include an analysis of climate vulnerability of the current WaSH system, and the vulnerabilities of communities regarding WaSH. It is important to assess the climate vulnerabilities of WaSH systems in order to allow the government and the municipalities to take the appropriate steps to prevent and/or minimize the impacts of climate risks. These risks can potentially be: i) an increasing in number of days in which the outlet channels will have to be pumped out because of rise in river level, ii) a more frequent outflowing in toilet pits, which increase the exposure of populations to pathogenic agents and in contamination of non-protected water sources, iv) increase of sediments in water intakes because of runoff, v) destruction of sanitation and drinking water supply infrastructures. It is thus now a necessity to include climate change management capacities in the objective assessment of the Wash Capacity building needs of Madagascar that will be done by the GW in 2014.

d) Project for supporting the strengthening of professional organizations and agricultural services - AROPA (US\$4 million)

24. The AROPA project funded by the IFAD to the amount of \$19,2 million will be implemented over a period of 9 years (2010 to 2019) in 5 regions of Madagascar including Anosy and Androy. Its general objective is to improve the incomes of smallholders and reduce their vulnerability to food insecurity by facilitating their access to service supply (including advisory support services) and equipment adapted to their needs. To do so, the project is dedicating US\$4 millions of its resources to strengthen the capacity of extension workers in agricultural service centers (CSA) and promote the emergence of private agricultural support services within the beneficiary communities of Anosy and Androy in order to improve farmers access to information, knowledge, technologies and advisory they need to increase the competitiveness of their products within the market and at remunerating prices.

25. However the project does not include in its implementation the strengthening of the capacity of public and private agricultural support services on climate change adaptation techniques that will allow them to

provide to farmers relevant advisory support they need to manage the climate risks for the regions of Anosy and Androy.

Additionality

26. Building on the capacity building activities of the UNDP MSDLCP project, the MÉDDEA II, the the AROPA project of IFAD and the UNDP Goal WASH, the LDCF project will support the design and implementation of a training program for key stakeholders within the key line institutions (named below) in managing climate risks. The UNDP Goal WASH program is planning to carry out an assessment of the WASH capacity building needs of Madagascar at the commune, district, regional and national levels. The MEDDEA, and the UN Joint program will also be carrying out capacity gap assessment. The LDCF project, will build on these capacity gap assessments to carry out a comprehensive assessment of capacity needed at the national, regional and local levels for addressing vulnerable communities' climate change issues. The project preparation will help to determine the main climate change vulnerabilities for agricultural related livelihoods and water and sanitation systems and identify the key priority issues to be addressed and on which the capacity gap assessment will focus. Based on the results of the capacity gap assessments, this outcome will develop and integrate appropriate climate change modules within the capacity building program of above-cited baseline projects. The training program will involve at least:

- 50 senior executives involved in policy making and 100 regional and local technicians from the ministries in charge of agriculture, livestock, water and sanitation, forestry including technicians of agencies of water basins in the regions of the South (Androy, Anosy, Atsimo Andrefana), the Center (Anamanlaga) and the East (Atsinanana) in medium and long term climate risk assessment and monitoring , the design, implementation and monitoring of appropriate adaptation measures, and the integration of the climate risks and adaptation measures into the key policies and strategies of these sectors, including the water and sanitation master plans of the 3 concerned water basins, the 15 PCDEA supported by the MEDDEA as well as the water and sanitation planning, management and monitoring tools developed by MEDDEA and their related budgets. The preparation phase will allow conducting a capacity gap assessment and tailor the capacity building activities accordingly;
- 100 decision makers and technical staff members of local authorities for climate risk assessment, economic assessment of adaptations strategies and initiatives and integration of climate change into the local development plans of the local authorities in the regions of Androy, Anosy, Atsimo Andrefana, Analamanga, and Atsinanana and their related budgets
- 50 research technicians in agriculture and livestock from the FOFIFA research center in the identification, testing and dissemination of climate resilient agro-sylvo-pastoral technologies;
- 300 agricultural and livestock extension workers (including the private services providers structures supported by the AROPA project) to give them the required capacity to disseminate and provide to beneficiary communities advisory support services on climate resilient agro-sylvo-pastoral practices and technologies developed by the FOFIFA;
- 200 other stakeholders from the NGOs and OCBs operating in the regions of Androy, Anosy, Atsimo Andrefana, Analamanga, and Atsinanana so that they integrate climate risks and adaptation measures in the design and implementation of their development support programs and initiatives.

27. The preparation phase of this project will include taking stock of the lessons learnt from the other climate change related capacity building initiatives in Madagascar, and the region. These lessons will be taken into account when developing a strategy for the sustainability of the capacities created under this component.

28. This component will also support the development /up-grading of the required policy, regulatory and institutional frameworks to support the sustainability of the capacity created under this component and the

adoption by the communities and line institutions of the climate change adaptation technologies and strategies the project will develop and disseminate through the component 3. This will be done through the integration of relevant climate change concerns into the local development plans of the regions of Androy, Anosy, Atsimo Andrefana, Analamanga, and Atsinanana, the 15 municipality plans for the development of the communities access to water and sanitation (PCDEAs) developed by the MEDDEA project, the water and sanitation master plan for the 3 agency basins of the South, Center and East regions, the National Program of Access to Drinking Water and Sanitation (PNAEPA), the National Seed Strategy Paper (DSNS), the National Strategy for Agricultural and Rural Training (SNFAR), the national reforestation strategy and the budgets and multi-year investment plans of the ministries involved. The identification of the relevant climate change concerns to mainstream in the instruments and policies quoted above will start during the project preparation phase and will be deepened the first year of the project implementation.

Component 2: Production and dissemination of meteorology and climate information for informed decision making in rural development

Outcome 2: Meteorological and climatic information are packaged into decision support information and disseminated to relevant stakeholders of the line ministries and communities to enhance the resilience of their livelihoods and living conditions face to climate risks in the regions of Androy, Anosy, Atsimo Andrefana, Analamanga, and Atsinanana

Baseline Situation

29. The integration of climate and severe weather related disaster risks (including cyclones) into rural development policies and strategies, as well as the development of adaptation strategies to these risks must be underpinned by relevant weather and climate forecasts information. The General Directorate of Meteorology (DGM) has already installed 06 weather stations in Ihosy - Ihorombe - Atsimo Andrefana, 24 rainfall stations and 24 other standardizations in the SAP area in the Southern part of Madagascar, 02 climatological stations installed in the Mikea area, a climatological station and a hydrological station in the Fivondronana of Ampanihy, 01 climatological station and 07 rainfall stations installed in the South Western area. Although these devices allow to provide relevant information to support decision making in the management of climate and weather risks, the current network of weather stations does not cover all the project intervention areas and will not enable collecting enough climate and weather data in the required quantity, quality and scope to efficiently support decision-making in the sectors vulnerable to climate risks.

30. The DGM thus reckons that additional equipment will be needed to strengthen the climate and weather monitoring network in the project intervention area. In addition, there is no mechanism or decision support system for coupling the information on climate risks with available social and environmental information in order to enable effective and informed decision making at the community level and in the development and implementation of policies and strategies for rural development and emergency preparedness. Moreover, even if DGM has a competent staff in the field of meteorology, these human capacities need to be strengthened in areas such as the use of satellite observations and collection of rainfall, vegetation, soil moisture data, and their translation into meaningful information that can support decision making in all vulnerable sectors and components of the economy.

Additionality

31. The LDCF resources will assist in identifying the weather and climate information necessary to support livelihoods and living conditions that are resilient to climatic and meteorological events. Through this outcome, the priority needs of meteorological and climatic information, especially early warnings on adverse weather conditions, in the most vulnerable communities, will be identified and additional meteorological and climate monitoring equipment will be installed in the right locations to enhance the network of weather and climate observations in the project areas. In that respect, the LDCF project will support the installation of two agro meteorological stations in Ampanihy and Amboasary Sud, the creation of a network of five hydrometric stations in the watershed of Menarandra and 12 ones in that of Mandrare,

the installation of two synoptic stations in Betroka and Faux Cap and of three auxiliary climate stations in Betroka, Beroroha, and Sakaraha. The installation, operation and maintenance of this equipment may have risks of environmental and social impacts that need to be managed. These risks relate to the likely perturbation of soil topography and structures that might render the land less stable and more prone to landslides, flooding and therefore more vulnerable to cyclones and other natural and climate disasters. Also, the hydrometric stations will be installed in the watershed and might disturb the watercourse soils, ecology and hydrometric structures and there is the risk of increasing the potential of siltation rates. Other impacts include the risks of pollution of the watercourse by the materials used (including chemicals) for the construction, the operation and the maintenance of these infrastructures. The project preparation phase will better assess these risks and propose mitigation measures in accordance with UNDP policies.

32. These additional facilities will enable DGM, in collaboration with the above mentioned ministries, to implement a decision making support (DMS) for early warning and disaster and climate risk management and to integrate climate change in the processes of design, planning and implementation of development policies and strategies for the most relevant national and local actors supporting the socio-economic development of the regions of Androy, Anosy Atsimo Andrefana, Analamanga, and Atsinanana. The DMS will consist of equipment and software allowing for spatial combination of different data sources, including: climate monitoring data from meteorological stations, seasonal weather forecasts, projections of climate change, simulations of agricultural models and of other rural economic activities, monitoring satellite images (vegetation, soil moisture, rainfall) environmental databases on agriculture (soil, agricultural systems, soil management, rivers etc.), infrastructure dimensioning (infrastructure for drinking water supply and sanitation, roads, bridges), water resources, and other information about the vulnerability of agricultural systems to climate hazards (market information, input prices, etc.). In addition, the DMS, thanks to internal and external partnerships, will receive information about extreme weather events, present it in the form of appropriate early warning and distribute it to the population and decision makers at national, regional and local levels in order to achieve a better prevention and management of adverse impacts of climate and weather-related disasters such as floods and cyclones.

33. Specifically, the DMS will provide the necessary information that will enable:

- the Ministry of Water monitoring and modeling the intra-annual variability and the medium and long term evolution of surface and underground water resources according to meteorological forecasts and climatic projection, as well as the other climatic factors such as risks of cyclone, floods, intra-annual and inter-annual rainfall variations, and other weather parameters that can influence the effectiveness of water and sanitation services;
- the Ministry of Agriculture producing agro meteorological products relevant for climate resilient agriculture, including water trends, changes in temperature, rainfall and winds over the short and long term, and the development of agricultural calendars, meteorological bulletins, monitoring and modeling the evolution of the agro-ecological zones in the medium and long term and the feasibility of key agricultural crops of Madagascar according to the changes in the agro-ecological zoning;
- the Ministry of livestock monitoring and modeling the medium and long term changes in grazing areas, climatic factors such as rainfall, temperature, humidity, wind, etc. .. that may influence or exacerbate outbreaks of to the critical epizooties for the livestock industry including the Varroase, the Rift Valley Fever and other climate influenced animal diseases;
- the Ministry in charge of Civil protection and disaster preparedness producing and disseminating early warning information on cyclones, hurricanes, floods and other climatic and meteorological disasters in the most vulnerable dwellings and the agricultural production zones.
- The ministry in charge of forest resources management to identify the most vulnerable forest areas and the priority zones to reforest to contribute in increasing agricultural landscapes resilience and to mainstream climate risks and adaptation strategies in the management of vulnerable forests areas

34. The mechanisms of transmission of data from the DMS will build on GPRS local networks (mobile telephony networks). Thus, the preparation phase will enable identifying the GPRS networks that are the

most suitable to provide such services and identifying partnership conditions with such networks that will be materialized during the implementation of the project.

35. The DMS will be available to all partners (including the climate resilient advisory support group established under the output 3.3 below) and will serve as a tool to understand what information is useful to rural actors and how it should be interpreted, to explore effective and net-benefit maximising farm management decisions, to support economic valuation of the net-benefits of alternative adaptation options. It will also provide data and images to be used in the agricultural advisories.

36. The preparation phase of the project will enable identifying the institutional arrangements and the coordination mechanisms among the various national institutions for an efficient working of the DMS. In the long term, the data generated, stored and managed (thanks to the project support) can be used to better map the different agro-ecological zones and develop very high resolution scenarios on climate change for Madagascar. Furthermore, the project preparation phase will allow developing a strategy for the sustainable financing of the operation, the maintenance and update of the meteorological system installed under this outcome. This strategy will also be coordinated with the private public partnership that will be developed under the *output 3.5* in order to promote the participation of the private sector and the communities (under the form of payment for meteorological services) in the sustainable financing of the meteorological system.

37. For the successful implementation of these activities, the LDCF project will support the capacity development of technical staffs in DGM and other above mentioned key ministries in the collection and analysis of weather and climate data and the production of information and tools for decision support. In that respect, the LDCF resources will fund the development and implementation of a program of capacity building for at least 20 DGM officials, 5 officers of each of the above mentioned departments in the areas of collection, processing, and dissemination of i) agro meteorological information, ii) early warning on severe weather events and iii) tools for decision support to promote climate and meteorological resilient agricultural practices at community level. This capacity building program will include training on the implementation of methods and tools for economic analysis of the impacts of climate change on agriculture, as well as the adaptation options. Training on the development and use of seasonal forecasts will be made, as these tools are not currently used by the DGM on an operational basis. The use of weather forecasts to assess possible floods, cyclones and other severe weather events on the short term will also be encouraged. Additionally, the capacity building program will include training the DGM technical staff on the maintenance of the meteorological system. This training for the equipment maintenance will be integrated in the procurement of the meteorological system.

Component 3: Introduction of climate resilient strategies in the most vulnerable communities

Outcome 3: Adaptation measures including technologies are transferred and implemented to communities in Androy, Anosy, Atsimo Andrefana, Analamanga, and Atsinanana

Baseline situation

38. With the goal of fighting against poverty and improving the living conditions of the most vulnerable populations in the regions of Androy, Anosy, Atsimo Andrefana, Analamanga, and Atsinanana, the government of Madagascar with support from its financial and technical partners, is currently implementing a number of initiatives aiming to improve livelihoods and reduce vulnerabilities to poverty of communities in these regions. Among these projects, we can retain the following projects:

a) The joint Program for the reduction of vulnerability of population in three Regions in the Southern part of Madagascar (US\$ 5, 800, 000)

39. The objective of this joint initiative of the United Nations system in Madagascar, budgeted to the amount of USD 27.5 million (from June 2013 to May 2017), is to strengthen agricultural productivity and production and fight against food insecurity in the Southern part of Madagascar. For this purpose, US\$ 5.8 million of the resource of this project are dedicated to the provision of agricultural equipment and quality inputs, technical and financial support of NGOs, CBOs and seeds growing associations (GPSs) for

the production and dissemination of seeds, seedling and other inputs, the dissemination of conservation agriculture and agroforestry technologies and practices in order to protect and restore agricultural landscape productivity and strengthen the resilience of farmers households against the external choc and the climate change impacts. Additionally, these resources will support the Centers for Agricultural Services (CSAs), and NGOs (through agricultural technology training and provision of functioning equipment) to improve of the agricultural advisory support they provide to communities. This project will also finance the construction and rehabilitation of agricultural infrastructures such as irrigation systems, cereals banks in the Southern Madagascar.

40. Nevertheless, as shown above, the agro-sylvo-pastoral activities in the Southern region are severely affected by the increasing recurrence and intensity of droughts, disruptions in rainfall regimes, and flooding. And the climate projections show that this vulnerability risks to be accentuated in the future if adequate measures are not implemented. Now, the communities benefiting from this program are not prepared technically and financially to face such risks and, the joint program does not integrate the management of such risks in its actions, neither building the capacity of beneficiary communities and supporting regional institutions to face to such risks.

b) Project for supporting the strengthening of professional organizations and agricultural services - AROPA (US\$8 million)

41. To improve the income and reduce the vulnerability of smallholders in the regions of Anosy and Androy, the IFAD AROPA project is, also, supporting the development of the small-scale agriculture productivity and production. In this perspective, 8 millions of the AROPA project resources (out of US\$19.2 million) have been earmarked for the funding of agricultural micro-projects for smallholders and the construction of community agricultural infrastructures and farm equipment. This project is a relevant initiative to strengthen climate resilience of farmers in this sense it tackles one of the root causes of smallholders climate vulnerability, in particular, the weak access to agricultural advisory support services to undertake a sustainable and performing agriculture. However it does not include in its implementation the provision of climate change adaptation advisory services that will enable farming communities of the regions of Anosy and Androy to effectively manage climate risks that threaten their livelihoods and food security. One implication of the foregoing is that the support AROPA aims at providing for the financing of the agricultural production and the supply of advisory support services may not take into account the financial needs of producers regarding the management of climate risks.

c) The Global Funds for Social Development (FGDS) of the Ambatovy Project (US\$ 5 million)

42. Ambatovy is a project for mining nickel and cobalt from the region of Atsinanana over a period of about 30 years. The construction of the mineral storage terminal, the processing factory and the pipelines has required the relocation of two communities and their rice fields. In this framework, the project has built 300 new houses for 1,200 people who had to be relocated. Furthermore each household has received a plot of land for agriculture and pasture: 150 hectares of agricultural land were also distributed for growing rice and an additional area of 47 ha was prepared for vegetable and fruit gardens. Ambatovy is supporting the relocated villages through the development and the implementation of an Overall Plan of Social Development (PGDS).

43. This plan financed, to the amount of US\$ 25 million, aims at sustainably improving the inhabitants' living condition quality. 5 million of the PGDS are meant to support the strengthening of agricultural productivity and food security within the relocated communities. In this framework, the PGDS has financed the creation of an agricultural training center (CFA) since June 2010 to help the rural populations affected by the activities of Ambatovy, to improve their skills and knowledge in terms of small scale commercial agriculture. The CFA plans to train 6,000 farmers in the next three years in the areas of agriculture, animal husbandry, accounting, and administration. In addition, PGDS supports villagers through an agricultural technical assistance, distribution of tools and seeds in order to improve the livelihoods of the communities which are traditionally based on agriculture. The programs supported by the PGDS adopt a diversified approach of agriculture including short cycle food crops, vegetable crops, perennial crops, as well as forestry.

44. Despite its relevance to strengthen climate resilience of the beneficiary communities' livelihoods, the PGDS does not take into account the climate risks such as cyclones, disruptions in rainfalls, flooding, which may negatively affect the success of projects and initiatives supported by the PGDS. This is translated into the absence of module on climate change in the curriculum of the CFA and of strategies and techniques for managing climate risks in the programs supported by the PGDS of the Ambatovy project.

d) Project for developing the Malagasy zebu industry (US\$4 Million)

45. This project financed up to MGA 12,470,000,000 (US\$5.6 million) by the Malagasy Government from its own resources will be implemented from October 2013 to September 2017 in 22 regions, including the regions of Atsinanana, Analamanga Androy, Anosy, and Atsimo Andrefana). Its objective is to improve productivity of zebu livestock in terms of number and weight and to improve commercialization of Malagasy zebus. To reach such objective, US\$4 million of this project will support i) the enhancement of the sanitary prophylaxis with a view to reducing mortality rates among calves; ii) training programs for the livestock breeders on species and genetic performance improvement; iii) the diffusion of pasture management techniques within breeders communities to increase the live weight of the Malagasy zebu; iv) the improvement of the advisory support to livestock communities

46. Now, the climate projection for the southern, eastern and central regions of Madagascar could lead to change in the distribution of plants, the displacement of the localization of the pasture areas and water points and the reduction of the grazing capacity of pasture areas. These climate related risks could affect the productivity of the zebu industry. The climate risks for the Zebu industry include also the risk of outbreaks of bovine diseases vectors such as the bovine Varroasis, the Rift Valley fever. Unfortunately the livestock breeders do not have the capacities enabling them to face such risks and the livestock supporting actors and decision makers of the sector do not have the required technical capacities to face such risks. Furthermore the capacity building programs of this project does not include building capacity of the sector actors in management of climate changes risks for the zebu industry.

e) The « Sustainable mechanisms for the development of access to water and sanitation in rural areas (MEDDEA II) » Project (US\$3 million)

47. In top of improving the capacity of the institutional actors for the management of the water and sanitation sector, the MEDEEA project has dedicated 3million (out of 4.86) for the financing the creation of drinking water supply systems for about 100,000 people, sanitation facilities such as public toilets for nearly 30,000 people. The MEDDEA II will also provide technical (training, advisory) and financial support to 30 entrepreneurs who are positioned on the sector of water, sanitation, and hygiene in order for them to provide to the populations better products and services of quality.

48. However, the current and projected climate risks could negatively affect the performance of these water and sanitation infrastructures if these risks are not integrated in the design / building, the operation and maintenance of these infrastructures. .

Additionality

49. Based on the Joint South Program of the United Nations System, the AROPA project, the Global Social Development Plan (PGDS) of the Ambatovy project, the Development of Madagascar Zebu industry, and the MEDDEA project, the LDCF project through this component will support the development of climate resilient livelihood and drinking water supply and sanitation services. To do so, the LDCF resources will support the development and diffusion of agro-forestry-pastoral models adapted to the context of climate variability and change in the Southern, Central and Eastern regions of Madagascar towards 3,000 beneficiaries (of whom 50% women) among the most vulnerable farmers of the regions of Androy, Anosy, Atsimo Andrefana, and Atsinanana. These models will be built around the use of climate resilient seeds resilient, of relevant meteorological and climate information, of climate resilient agroforestry techniques that integrate animal husbandry, and of techniques of land fertility and moisture management.

50. Building furthermore on the project for the development of the Malagasy Zebu industry, this LDCF will develop climate resilient pastoral systems that combine the use of zebu species resilient to likely climate induced cattle epizooties, of protocols for the prevention and management of the outbreaks of these epizooties, techniques for producing climate-resilient fodder, and the integration of climate change in the management of agro-pastoral landscapes. It is worth to highlight that these activities may increase environmental and social risks such as social conflicts between the livestock breeders and farmers, the risk of deforestation and ecosystem perturbation, the emergence and dissemination (within the species and across the species) of livestock disease and pest resistance related. The project preparation phase will assess these risks and propose mitigation measures as required by the UNDP procurement Ethics and Environmental Procurement Guide.

51. These modules will be designed by the FOFIFA Research Institute in partnership with the Centers for Agricultural Service (CSA) and international research centers, and the full participation of beneficiary communities. To support the technical feasibility of these climate-resilient agro-sylvo-pastoral models, the LDCF project, will support the development of a climate resilient agricultural and livestock input supply system laying on the seed growers association, the NGOs, and CBOs. The project preparation will help developing a strategy and safeguards measures that will make sure that the pesticides used or promoted in the framework of this project will comply with the related international agreements (namely Stockholm, Rotterdam and Basel conventions as well as the Montreal Protocol and other international agreements dealing with livestock health and phytosanitary issues). Furthermore, these measures will also promote within the beneficiary communities the safe use of the pesticides registered under international and national regulations in order to prevent the negative effect on the environment or human health inherent to the inappropriate use of any chemicals.

52. Furthermore, the dissemination of climate resilient agro-forestry-pastoral models will be supported by the establishment and operation of advisory support groups which will provide to communities advisory support they need for the successful implementation of these technologies. These groups will be composed of community members who are trained and will be supervised by extension workers from the Agricultural Service Centers (CSAs) and private agricultural consultancy services which have been first and foremost trained under Component 1 of this project. In order to strengthen the climate resilience of the water and sanitation systems of communities around Androy, Anosy, Atsimo Andrefana, Analamanga, and Atsinanana, the LDCF project will also support the strengthening of the resilience of the community sanitation and drinking water supply infrastructure and system installed by MEDDEA and MSDLCP so that they can better withstand natural and climate disasters that Madagascar could suffer. It will be about assessing the vulnerability of the already built infrastructures and the ones at the design phase, to identify the required measures to strengthen their resilience, and to implement the priority ones among these measures. The vulnerability assessment of these infrastructures and the identification of the measures to strengthen their resilience will take place during the preparation phase of the project. The vulnerability assessment of the WASH infrastructures will build on the WASH infrastructure inventory and mapping being currently implemented by UNDP. Indeed the UNDP GW project has commissioned 3 inventories, mapping out WASH facilities, use and access in 3 rural provinces (Atsinanana, Alaotra Mangoro and Amoron'i Mania). In end of 2013, 2 more WASH inventories will be completed (Analanjirifo and SAVA regions). The measures to strengthen the infrastructures' resilience could include the implementation of plans for dredging sewage and rainwater canals, of high intensity of labor force works and low-cost measures to fight against the silting of canals, the raising of contours and / or the strengthening of vulnerable points of these infrastructures. These measures could have environmental and social impacts that will need to be managed. The environmental and social risks related to these interventions include the conflicts within the communities related to the selection of workers, the perturbation of social organizations, the risks of accidents during the works, the contamination of underground and surface waters with the outputs of sewage canals dredging, etc. The project preparation phase will assess these risks and propose mitigation measures in accordance with UNDP procurement Ethics and Environmental Procurement Guide.

53. The LDCF project will support consultations between the government and the private sector, including the Ambatovy project, to promote the private sector financial and technical participation in the management of climate risks in vulnerable communities. The prospection for the development of a public-private partnership will also include the private entrepreneurs supported by the MEDDEA II project in order to enhance the participation of the private sector in the management of the climate risks for the sanitation and drinking water supply services. Indeed, the MEDEEA II project is currently supporting 30 private entrepreneurs of the sector of water, sanitation, and hygiene to improve the quality of the services they provide to the populations.

54. In addition, the LDCF project will support the introduction of new climate resilient income generating activities in the most vulnerable communities to enhance the resilience of their livelihoods against climate risks. The LDCF project will, through this component, provide technical and financial support to microfinance institutions (MFIs) to develop innovative financial products to allow farmers acquiring climate resilient inputs, financing low-cost investments necessary for agricultural land erosion control, water resources management, sustainable and resilient management of land and soil fertility, and for the operation of climate resilient alternative income generating activities. This technical and financial support may lead to an increase of the use of chemical pesticides and fertilizers causing the pollution of water and foods resources, the increase of the occurrence of chemical acute and chronic poisoning, the domination of one or two cash crop in detriment of the food crops and agriculture diversification in the targeted communities. The other risks are related to the perturbation of the ecosystems that might increase the vulnerability of the ecosystems to flooding, landslides, land and water related conflicts, etc. The project preparation phase will assess these risks and propose mitigation measures in accordance with UNDP procurement Ethics and Environmental Procurement Guide.

55. The AROPA project will set up regional agricultural development funds enabling MFIs to finance the investment needs of Southern regions farmers. Building on these AROPA activities, the LDCF project will support raising awareness and capacity building activities for the key staffs of these MFIs on how to integrate climate risks and adaptation measures in market analysis and business plan development, how to carry out feasibility studies for climate change adaptation options including climate resilient alternative income generating activities, how to develop innovative financial products like climate risks insurance and to match them with the regulations in effect in the country. This activity is additionally aiming to put in place in these MFI networks the capacity and interest that will promote the sustainability of such mechanism. The LDCF resources will also finance the guarantees necessary for small scale producers' access to credit.

A.2.: Identify key stakeholders (including civil society organizations, indigenous groups, and others) and describe how they will be involved in the implementation of the project

STAKEHOLDER	ROLE
Ministries and related Agencies	
General Directorate of Climate Changes (DGCC)	<ul style="list-style-type: none"> • National implementing Agency of the project and will therefore have to report on the implementation of the project. • Will be a member of the Steering Committee. • Will chair the Technical Committee of the Project (CTP). • Will appoint within itself a National Director of the project • will host the Project Management Unit (assignment of appropriate work, with electricity and water supply, telephone and internet connectivity).
Directorate National of meteorology	<ul style="list-style-type: none"> • In charge of the execution of the Component 2 • Member of the Steering Committee and the Technical Committee of the Project
Directorate General of Agriculture	<ul style="list-style-type: none"> • Will be responsible for the execution of the outputs 1.4; 3.1; 3.3; 3.4 and will be involved in the implementation of the outputs 1.1; 1.2; 1.4; 2.2; 2.3; 3.5 and 3.6 of the project • Member of the Steering Committee and the Technical Committee of the Project
Directorate of Livestock	<ul style="list-style-type: none"> • Will be involved in the implementation of the outputs 1.1; 1.2; 1.4; 2.2; 2.3; 3.1;

	<p>3.3; 3.4; 3.5 and 3.6 of the project</p> <ul style="list-style-type: none"> Member of the Steering Committee and of the Technical Committee of the Project
General Directorate of Water	<ul style="list-style-type: none"> Responsible for the execution of the outputs 1.3 and 3.2 and will be involved in the implementation of the outputs 1.1; 1.2; 2.2; 2.3; and 3.5 of the project Member of the Steering Committee and of the Technical Committee of the Project
Water Basin Agencies of the South, East and Center	<ul style="list-style-type: none"> Will be supporting the General Directorate of Water in the implementation of the outputs 1.3 and 3.2 and will be involved in the implementation of the outputs 1.1; 1.2; 2.2; 2.3; and 3.5 Will be Member of the Steering Committee and of the Technical Committee of the Project
Silo national de Graines Forestières (SNGF)	<ul style="list-style-type: none"> Will be involved in the implementation of the outputs 1.1; 1.2; 1.4; 3.1; 3.4; 3.5 and 3.6 Member of the Steering Committee and of the Technical Committee of the Project
Research and Training Institute	
FOFIFA, CNRO, CNRE	<ul style="list-style-type: none"> Member of the Technical Committee of the Project and will be represented in the steering committee
Public and Private Universities, Technical Training Centers	<ul style="list-style-type: none"> Member of the Technical Committee of the Project and will be represented in the steering committee
Local Authorities of the Southern, Central and Eastern regions	<ul style="list-style-type: none"> Member of the Steering Committee and of the Technical Committee of the Project Will be involved in the implementation of the 3 components
Associations, OCBs, NGOs	
AUE, (Association of Drinking Water Users), Association of Producers, Villages Cooperatives, and other communities associations	<ul style="list-style-type: none"> Beneficiaries of interventions, Members of the Technical Committee of the Project and will be represented in the steering committee. They will also be participating in the project preparation phase in terms of identification and the design of the adaptation measures that will be supported by LDCF resources. The project preparation phase will hold community level consultation for this purpose. Furthermore, CSOs will participate in the implementation of the project as per component 3. CSOs will also be involved in the implementation of the component 1 by contributing towards the mainstreaming of climate change into the local development plans, the policy and strategies targeted by the outcome 1. The project preparation phase will identify the most dynamic associations and CSOs, and assess their capacity to implement the targeted activities of the project.

A.3 Risk. Indicate risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the project design (table format acceptable):

Risk	Risk level	Risk Mitigation Measures
Resurgence of the socio political crisis: Madagascar is currently recovering from several years of socio political crisis. While the situation is currently calm, the political and social situation is still fragile and could be disturbed again with the new coming election.	Medium	A document analysing other projects implemented during the period of instability and gathering lessons learned will help define strategies to tackle this risk.
Institutional reorganization after election and recurrent institutional instability : the principal risk for the proposed LDCF project would be the change of the	High	The project will promote raising awareness towards decision and policy makers on the relevance of addressing climate change concerns. This will contribute to maintain climate change in the agenda of the high-level policy makers and

agenda of the new appointed ministers and senior officers and the lack of coordination between the key Ministries		officers
Lack of community involvement in some project sites	Low	The assessment of available community workforce and cash-for work-modalities in target sites prior to project inception combined with raising awareness on project benefits for communities' livelihoods (during the project presentation) could contribute to raise their interest to participate in the project activities.
The non-adoption of alternative income-generating activities and climate resilient technologies by villagers because they do not see the benefit of new practices or social conflicts hinder taking up the practices	Medium	The risk of non-adoption of alternative income generating activities (IGA) and climate resilient technologies could be related to the lack of interest for these activities, lack of capacities and knowledge to implement these activities, financial support, incentives mechanisms like the existence of a market and marketing supports. However, this risk is low given that the project is responding to a demand driven request for development of alternative income generating activities and climate resilient technologies. Moreover, the IGAs and climate resilient technologies will be developed in full consultation with communities including raising awareness of targeted communities about options for strengthening livelihood resilience. This will allow targeted communities to identify and select themselves the alternative IGA (based on climate risk assessment information).
Unusual and catastrophic climatic events in project sites during project implementation such as cyclones, floods, etc	Low	Unusually difficult climatic circumstances could threaten the projects field activities. Although the overall mitigation strategy is to diversify livelihoods options and build climate resilient agro-sylvo-pastoral and water supply and sanitation systems, major natural disasters could hamper the local level activities. As the project intervention is planned over a five years' time period, annual variations should be accounted for. Furthermore, UNDP is supporting the government in this specific area including shifting the emphasis more towards prevention, not only recovery measures.

A.4. Coordination. Outline the coordination with other relevant GEF financed and other initiatives:

The coordination and the management arrangements will be defined in detail during the preparation phase of the project. Based on initial discussions with the Government of Madagascar, the Department of Climate Change (DCC) of the Ministry of the Environment and Forestry will ensure the overall coordination of the project as a national implementing agency, and in close collaboration with the Directorate of Agricultural Production (DPA), the General Directorate of Water (DGE), the Department of Livestock and the Silo National des Graines Forestieres (SNGF). The Project Coordination Unit will be hosted by the DCC. The DCC which is also the main implementing partner of the FAO/LDCF project "Adapting coastal zone management to climate change in Madagascar considering ecosystem and livelihood improvement" will play a significant role in the coordination of the components 1 and 2 of the FAO /LDCF project with the implementations of the components 2 and 3 of this proposed LDCF in the regions of Androy, Anosy, Atsinanana and Atsimo Andrefana.

56. The Ministry of Agriculture assures the lead for the AROPA project, which provides the main entry point for the outputs 1.4 of the LDCF project. It will ensure that the implementation of these outputs will be coordinated with the Joint South Program (PCS), the Global Fund for Social Development of the Ambatovy project and the implementation of the outputs 1.1; 1.2; It will also work with the DGE, the Directorate of livestock in order to ensure the coordination of these outputs with the capacity building and policy and

institutional framework strengthening activities of the MEDDEA, the Malagasy Zebu Program and MSDLCP.

The Ministry of Agriculture, coordinates also the Output 1 of the Joint South Program (PCS), aiming to increase food security sustainably and to promote their economy and which is also the main entry point for Component 3 of the LDCF project will also coordinate the implementation of the outputs 3.1; 3.3 and 3.4. It will also be involved in the implementation of the outputs 2.2; 2.3; 3.5 and 3.6. In that respect, it should ensure the coordination of these outputs of the LDCF with PCS also PGDS of the Ambatovy project for the development and dissemination of agro-forestry-pastoral models and livelihoods that are more resilient to climate change. Similarly, the Ministry of Agriculture will coordinate with the Ministry of Livestock, and the Malagasy zebu project in the development of climate resilient pastoral models. It will also have to coordinate with the agencies of the Basins in the Southern, Eastern and Central parts and the MEDDEA project and MSDLCP in strengthening the resilience of water supply and sanitation infrastructure. The Ministry of Agriculture is also coordinating the project "Enabling climate resilience in the agriculture sector in the Western area of Madagascar" of GEF LDCF / AfDB, which aims to secure and improve the livelihoods of farmers through strengthening the resilience of irrigation infrastructure and management of waterborne diseases in the South -western part of Madagascar. The Ministry of Agriculture will also ensure the coordination of actions of the two projects. Furthermore, the Ministry of Agriculture and Farming being (with the Ministry of Environment and Forests) the main executing agency of the UNEP/Adaptation Fund project "Promoting Climate Resilience in the Rice Sector" will make sure to coordinate the implementation of the outcome 3 of the proposed LDCF project with the UNEP led AF project.

57. The Ministry of water resources assures the lead of the UNDP Goal WASH and MEDDEA projects. It will be the executing partner for the outputs 1.3 and 3.2 and will be involved in the implementation of the outputs 1.1; 1.2; 2.2; 2.3; and 3.5. In this perspective, it will make sure that the output 1.1 will be coordinated with the Goal WASH and the MEDDEA capacity building activities. Furthermore, it will also assure the coordination of the outputs 1.2 and 1.3 with the MEDDEA and UNDP GW activities related to strengthening of the national, regional and local WASH policy, regulatory and institutional frameworks. It will also work with the DGM to ensure that the implementation of the outcome 2 will also provide to the MEDDEA and UNDP GW the required climatic and meteorological information they need for their climate sound implementation. Finally, the DGE will coordinate with the Ministry of Agriculture, the the DGM to ensure also that the implementation of these outputs will be coordinated with the PCS, the AROPA, and the MSDLCP.

58. The National Directorate of Meteorology will provide the coordination of the Component 2 of the project on the production and dissemination of required climatic and meteorological information for climate sound decision making at the national, regional, level and individual levels. In this perspective, the DGM will coordinate with the ministries in charge of agriculture, livestock, forestry, and Water, the agencies for the water basins in the Southern, Eastern and Central to collect, process and provide the weather and climate information needed by these ministries to provide the beneficiary communities with the support they need to enhance their capacity to adapt to climate change. It will ensure that the implementation of the Outcome 2 will also coordinate with the implementation of the baselines projects led by these institutions named above. The DGM will furthermore assure the coordination with the World Bank led project "Emergency infrastructure preservation and vulnerability reduction in Madagascar" which aims at preserving key lifeline infrastructure and reduce household vulnerability in targeted areas in Madagascar. It will, indeed, coordinate with the CPGU (*Cellule de Prévention et de Gestion des Urgences*) - DRM to make sure the coordination of the execution of the WB led project component related to the rehabilitation of critical elements of hydro-meteorological monitoring network and improvement of Early Warning Systems (EWSs) with the implementation of the component 2 of this proposed LDCF.

59.

Description of the relevancy of the project to:

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

60. Madagascar submitted its NAPA in 2006. The NAPA has identified and classified seven (7) priority sectors including infrastructure, management of water resources, agriculture and livestock, which are the subject of this project, respectively ranked first, second and third:

- **Infrastructure:** The project will contribute to building resilience to climate change among sanitation facilities and drinking water supply in the regions of Androy, Anosy, Atsimo Andrefana, Analamanga, and Atsinanana.
- **Management of water resources:** The project will contribute to the resilience of water supply services by strengthening the resilience of water supply infrastructure and also by strengthening the adaptation capacities of institutions and individuals involved in the management of drinking water supply services.
- **Agriculture and Livestock:** The project will strengthen the adaptation capacities of agricultural and pastoral communities and support the development, demonstration and transfer to such agro pastoral communities, climate resilient strategies including the use of agrometeorological tools, climate resilient inputs and agricultural technologies.

61. The options and priority adaptation measures proposed by the NAPA of Madagascar take into account the NAP / CCD strategies, especially those related to the production of resilient livelihoods within agricultural communities, environmental and natural resources protection including land. Moreover, adaptation options are chosen in synergy with the Convention to Combat Desertification (UNCCD) and the Convention on Biological Diversity (CBD) country-related objectives as embodied in the National Strategy and Action Plan on Biological Diversity and the National Action Plan to Combat Desertification (PAN/LCD).

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

62. This PIF was formulated in compliance with LDCF guidelines and is aligned with the updated Results-Based Management Framework for the LDCF and SCCF (GEF/LDCF.SCCF.9/Inf.4, October 20, 2010). The project is in line with Objective 2 of LDCF/SCCF results framework aiming at “increasing adaptive capacities to respond to the impacts of climate change, including variability at local, national, regional and global levels” and Objective 3 which aims at promoting transfer and adoption of adaptation technology. The links to related expected outcomes in the LDCF/SCCF Result Based Management Framework include the outcome 2.1 “Increased knowledge and understanding of climate variability and change-induced risks at country level and in targeted vulnerable areas”, the outcome 2.2 “Strengthened adaptive capacity to reduce risks to climate-induced economic losses” and the outcome 3.1 “Successful demonstration, deployment, and transfer of relevant adaptation technology in targeted areas”.

B.3 The comparative advantage of the agency for the implementation of the project:

63. The project strategy is aligned with the country cooperation framework 2008-2011, which has been extended and continues to be in force in waiting the finalization and the adoption of the new national strategy documents, and the corresponding action plans., The UNDP country cooperation framework makes provision for the support to the implementation of the phase 3 of the national environmental program aiming at managing the environment and natural resources while satisfying development needs of the communities in a context of climate change and variability.

64. In this framework, UNDP is supporting the government of Madagascar to move towards a sustainable and innovative development, particularly in the establishment of institutional and legal frameworks and structures, the development of strategies and the strengthening of national capacities for planning, coordination, and monitoring of environmental actions.

65. UNDP also extends its support to the access of the majority of low-income households and micro-entrepreneurs to sustainable and varied micro finance services through the Program for Inclusive Finance in Madagascar which is implemented in collaboration with UNCDF. Thanks to this project, UNDP has developed a capacity and expertise in the area of strengthening microfinance institutions (MFIs) capacity for the development of appropriate financial products for the most vulnerable groups such as low-income households, women, and those who are excluded from the traditional financial market.

66. In addition, UNDP has supported Madagascar since 2008 in the development and implementation of systemic and institutional management of natural disasters and climate risks. This has enabled the country carrying out a number of actions aiming to improve the capacity of ecosystems to act as a natural barrier against natural disasters. This support has made the UNDP office in Madagascar a privileged partner in disaster risk management (DRM). Additionally, the GOAL WASH and other water and sanitation interventions implemented through other UNDP projects since 2008 have contributed to create within the Country Office strong skills and experience on the subject. The UNDP office in Madagascar, through the Small Grants Program (SGP), also supported a number of pilot initiatives for the development of alternative income generating activities in the areas of adaptation and mitigation of impacts of climate change. Numerous interventions of the UNDP country office in the various areas of convergence of national cooperation have enabled it developing skills and gaining experience in the areas of food security, sustainable energy, participatory local governance, climate change adaptation, water and sanitation, biodiversity conservation, poverty reduction, inclusive finance and development, as well as mainstreaming of gender into national projects and programs.

67. Furthermore, the Environmental Unit of the UNDP office in Madagascar has within itself, 4 Program officers, of which 2 are senior officers. Furthermore, it benefits from the support of the units responsible for the procurement, finance and human resources and senior executives of the country office. The UNDP office in Madagascar maintains good working relationships with national and international stakeholders of this project. The Environment Unit of the UNDP office in Madagascar is supported by the Regional Coordination Unit of UNDP-GEF in Addis Ababa including a francophone Regional Technical Advisor, the UNDP Water Governance Facility at SIWI in Stockholm and officers who will be able to support the implementation, monitoring and evaluation of the project.

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

69. **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 template. For SGP, use this [OFP endorsement letter](#)).

NAME	POSITION	MINISTRY	DATE (MM/dd/yyyy)
Ralalaharisoa Christine Edmee	General Director of Environment	MINISTRY OF FORESTRY AND ENVIRONMENT	08/14/2013

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 project identification and preparation.

Agency Coordinator, Agency name	Signature	DATE (MM/dd/yyyy)	Project Contact Person	Telephone	Email Address
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