AFB/PPRC.2/8
September 10, 2010

Adaptation Fund Board
Project and Programme Review Committee
Second Meeting
Bonn, September 15, 2010

PROPOSAL FOR MADAGASCAR

I. Background

1. The Operational Policies and Guidelines for Parties to Access Resources from the Adaptation Fund, adopted by the Adaptation Fund Board, state in paragraph 41 that regular adaptation project and programme proposals, i.e. those that request funding exceeding US$ 1 million, would undergo either a one-step, or a two-step approval process. In case of the one-step process, the proponent would directly submit a fully-developed project proposal. In the two-step process, the proponent would first submit a brief project concept, which would be reviewed by the Project and Programme Review Committee (PPRC) and would have to receive the approval by the Board. In the second step, the fully-developed project/programme document would be reviewed by the PPRC, and would finally require Board's approval.

2. The Templates Approved by the Adaptation Fund Board (Operational Policies and Guidelines for Parties to Access Resources from the Adaptation Fund, Annex 3) do not include a separate template for project and programme concepts but provide that these are to be submitted using the project and programme proposal template. The section on Adaptation Fund Project Review Criteria states:

> *For regular projects using the two-step approval process, only the first four criteria will be applied when reviewing the 1st step for regular project concept. In addition, the information provided in the 1st step approval process with respect to the review criteria for the regular project concept could be less detailed than the information in the request for approval template submitted at the 2nd step approval process. Furthermore, a final project document is required for regular projects for the 2nd step approval, in addition to the approval template.*

3. The first four criteria mentioned above are:
   1. Country Eligibility,
   2. Project Eligibility,
   3. Resource Availability, and
   4. Eligibility of NIE/MIE.

4. Based on the Adaptation Fund Board Decision B.9/2, the first call for project and programme proposals was issued and an invitation letter to eligible Parties to submit project and programme proposals to the Adaptation Fund was sent out on April 8, 2010.

5. According to the paragraph 41 of the operational policies and guidelines, a project or programme proposal needs to be received by the secretariat not less than seven weeks before a Board meeting, in order to be considered by the Board in that meeting.

6. The following project concept titled "Promoting Climate Resilience in the Rice Sector" was submitted by the United Nations Environment Programme (UNEP) which is a Multilateral Implementing Entity of the Adaptation Fund. This is the first submission of this proposal. It was received by the secretariat in time to be considered in the 11th Adaptation Fund Board meeting. The secretariat carried out a technical review of the project concept, assigned to it the diary number AFB/MIE/Agri/2010/1, and filled in a review sheet.

7. In accordance with a request to the secretariat made by the Adaptation Fund Board in its 10th meeting, the secretariat shared this review sheet with UNEP, and offered it the opportunity of providing responses before the review sheet was sent to the Project and Programme Committee of the Adaptation Fund.

8. The secretariat is submitting to the Project and Programme Review Committee the summary of the project, prepared by the secretariat, in Annex 1. The secretariat is also submitting to the Committee the technical review sheet and the responses provided by UNEP, and a revised proposal as confidential documents.

Project Summary

Madagascar –Promoting Climate Resilience in the Rice Sector.
Implementing Entity: *UNEP.* Executing Entities: *Ministry of Environment and Forests, Ministry of Agriculture and Farming, Republic of Madagascar*

Project execution cost: USD 300,000
Total project cost (execution included): 4,125,000
UNEP management fee: USD 380,000 (~9.2%)
Total amount of financing requested: USD 4,505,000

Project Background and Context: Madagascar is subject to extreme weather events related to current climate variability, chief among them cyclones, flooding, and droughts. Most of Madagascar's rice is grown in the central highlands under rain fed conditions and is already vulnerable o land degradation and climate hazards, mainly droughts. Rice grown in the lowlands is also subject to climate hazards and events including from flash floods and extreme temperatures. Climate variability and climate change have already had observable impacts and many farmers have had to resort to ad hoc shifts in planting calendars. Climate change has also had visible impacts in other sectors including health. This project seeks to address vulnerability of the rice sub-sector climate variability and projected climate change. The project will be piloted in the Alaotra-Mangoro region located on the Central Highlands of Madagascar. The overall objective of the project is to initiate the transformation of the rice sub-sector to make it more resilient to current climate variability as well as expected climate change and associated hazards.

Component 1: Scientific and Technical Capacity (USD 800,000)

The expected outcome of this component is the inclusion of tools and methods in Malagasy government, research institutions and local communities to assess, monitor, and understand climate change impacts on rice. Expected outcomes include the development of a knowledgebase on best practices for climate resilience in rice, a field test and SWOT analysis for existing climate rice varieties adaptable to other eco0regions, mapping of country-wide crop models for rice vulnerability, training of agricultural extension staff on climate risk management in an agro-ecosystem context, selection and adaptation of best available technologies for resilient rice production, and the dissemination of updated, dynamic agricultural calendars and agricultural early warnings taking into account current and projected variability.

Component 2: Adapted and resilient rice production cycle (USD 2,550,000)

The expected outcomes of this component are the sustainable increase in rice yields, an improvement in food security, the prevention of new disease spread and an improvement in health, and the maintenance of ecosystem services. Expected outputs include a multiplication and dissemination scheme for adapted seed varieties, the introduction of organic fertilizers, management of chemical fertilizers, and integrated pest and vector management for soil fertility, and the introduction or rehabilitation of water efficiency, management and conservation technologies. Other outputs include the dissemination through training of best available land preparation, production and harvesting techniques, the introduction or revitalization of producer's cooperatives and water user associations for collaborative natural resources allocations and management, introduction of watershed management and rehabilitation in productive landscapes, the monitoring of rice ecosystem agro-biodiversity, and water quality monitoring and management for disease vector control. Additional outputs include the introduction of rice by-product management techniques, the institution of community-managed storage and reserves for

droughts and flooding periods, and the introduction of post-harvest storage facilities with phytosanitary control.

Component 3: Policy and awareness raising (USD 475,000)

The expected outcome of this component is that conditions are in place for a full adaptation of the rice sub-sector. Expected outputs include a review and modification (where necessary) of technical norms and standards in rice cultivation taking climate change into account, dialogue on the review of the rice policy in order to identify gaps and possible maladaptations and provide recommendations to create enabling conditions for rice sub-sector reform, the production of official bulletins and circulars on resilient rice production and the implementation of a comprehensive Information, Education and Communication campaign focusing on climate change adaptation.

REQUEST FOR PROJECT/PROGRAMME FUNDING FROM ADAPTATION FUND

The annexed form should be completed and transmitted to the Adaptation Fund Board Secretariat by email or fax.

Please type in the responses using the template provided. The instructions attached to the form provide guidance to filling out the template.

Please note that a project/programme must be fully prepared (i.e., fully appraised for feasibility) when the request is submitted. The final project/programme document resulting from the appraisal process should be attached to this request for funding.

Complete documentation should be sent to

The Adaptation Fund Board Secretariat
1818 H Street NW
MSN G6-602
Washington, DC. 20433
U.S.A
Fax: +1 (202) 522-3240/5
Email: secretariat@adaptation-fund.org

ADAPTATION FUND

DATE OF RECEIPT:
ADAPTATION FUND PROJECT ID:
(For Adaptation Fund Board Secretariat Use Only)

PROJECT/PROGRAMME PROPOSAL

PART I: PROJECT/PROGRAMME INFORMATION

PROJECT/PROGRAMME CATEGORY:	REGULAR PROJECT
COUNTRY/IES:	MADAGASCAR
TITLE OF PROJECT/PROGRAMME:	**PROMOTING CLIMATE RESILIENCE IN THE RICE SECTOR**
TYPE OF IMPLEMENTING ENTITY:	**MULTILATERAL ENTITY**
IMPLEMENTING ENTITY:	**UNITED NATIONS ENVIRONMENT PROGRAM**
EXECUTING ENTITY/IES:	**MINISTRY OF ENVIRONMENT AND FORESTS, MINISTRY OF AGRICULTURE AND FARMING, REPUBLIC OF MADAGASCAR**
AMOUNT OF FINANCING REQUESTED:	**4,505,000** (IN U.S DOLLARS EQUIVALENT)

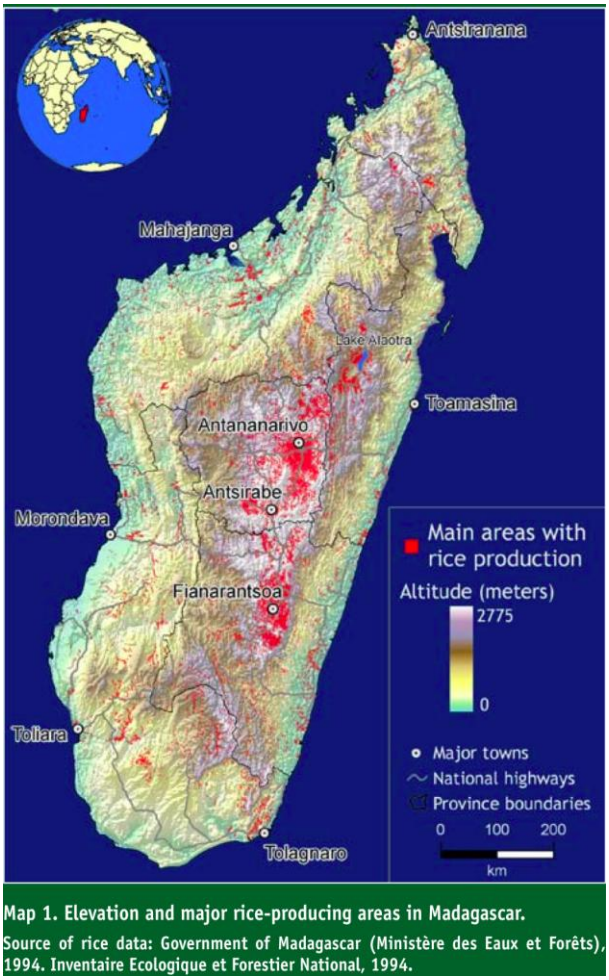
PROJECT / PROGRAMME BACKGROUND AND CONTEXT:

Provide brief information on the problem the proposed project/programme is aiming to solve. Outline the economic social, development and environmental context in which the project would operate.

The island of Madagascar is home to nearly 20 million people (2006), 80% of which live in rural areas. Incomes are generally low, with the UN estimating in 2000 that 75% of Malagasy population is living below the poverty line, most of them in rural areas. The country is ranked 145th out of 177 countries according to the Human Development Index. Performance against the MDGs remains low, with only 26% of population having access to potable water (2000) and only 18% having access to electricity, compounded by rural-urban inequalities.

The primary sector (agriculture, livestock and fisheries) remains the principal engine of the national economy, providing 95% of food intake nationally and 75% of foreign exchange thanks to the export of coffee, vanilla, clove, pepper, cocoa and various marine products. The secondary sector is beginning to develop, but there are very few large enterprises, and much of the sector is dominated by informal markets. The industrial sector contributes less than 18% to GNP. Finally, the tertiary sector is dominated by touristic enterprises. Five economic sectors have been identified as particularly vulnerable to climate change during the development of Madagascar's First national Communication: agriculture and livestock, public health, water resources, coastal zones and forests.

Madagascar is subject to extreme weather events related to current climate variability, chief among them cyclones, flooding and droughts. The island is subject to around 11 tropical disturbances, 3 of which usually reach the stage of tropical cyclone. These disturbances have become more and more frequent, and have gained in intensity over the past decades, occurring almost on a yearly basis, and leading to important infrastructure damages, losses of life, decreases in productivity, degradation of natural resources, and coastal erosion, with negative and prolonged effects on food security, access to clean water, irrigation, public health. These impacts place the Malagasy population and their development in a constant and increasing situation of vulnerability and precariousness.



Map 1. Elevation and major rice-producing areas in Madagascar.
Source of rice data: Government of Madagascar (Ministère des Eaux et Forêts), 1994. Inventaire Ecologique et Forestier National, 1994.

Figure 1: reproduced from "The price of rice in Madagascar", by Robert Hijmans and Alice Laberte

In Madagascar, rice plays a central role in the national economy. Rice trade dominates food-marketing channels, as rice is the staple food of both rural and urban populations; and it is estimated that rice cultivation employs nearly 60% of the workforce.

National demand amounts to 2.2 million tons per year, and domestic production of about 2 million tons is insufficient even in years with normal rainfall regime.
About 200,000 tons is annually imported, and more than 47 % of the national territory arable lands are allocated for rice production.

Rice production in Madagascar occurs in all types of rice production ecosystems, from the rainfed central highlands, to the irrigated and terraced lowlands, and semi flooded coastal zones[1].

Most of Madagascar's rice is grown in the central highlands, under rainfed conditions, and is already vulnerable to land degradation and climate hazards, mainly droughts.

Rice grown in the lowlands is also subject to climate hazards and events, including from flash floods and extreme temperatures.

Climate model projections developed during the National Communication and NAPA development processes indicate that climate change effects in 2100 could lead to a mean annual increase of 2.5°C to 3°C for the whole country, a reduction of mean annual precipitation with sharper decreases during the dry seasons and intensification of precipitation events during rainy seasons, except for the southern part of the island where precipitations would remain lowest. Rainfed crops in the highlands and lowlands are likely to suffer most from this increased variability, unless careful water management practices are put into place, as water supply is expected to decrease at country level. In addition, severe precipitation events, coupled with deforestation, are likely to increase soil erosion.

Climate variability and climate change have already had observable impacts, and many farmers have had to resort to ad hoc shifts in planting calendars, with sometimes dire results in terms of crop losses. Climate change has also had visible impacts in other sectors, for example in terms of health, with the recent expansion of malaria zones to the highlands and the spread of water borne diseases (diarrhea, cholera), decreases in agricultural productivity, and in water quality.

[1] According to the recognized rice production systems: rainfed upland, rainfed lowland, irrigated lowland, mangrove swamp (semi-flooded) and deepwater (flooded); see IRRI.

These impacts are compounded by the fact that an estimated 225 m of coast could disappear by the year 2100 owing to Sea Level Rise, thereby limiting further the country's agricultural expansion or economic diversification options.

A number of underlying constraints further exacerbate these projected climate change impacts, chief among them deforestation, unsustainable agricultural practices (e.g. slash-and-burn, ad hoc or excessive planting and flooding, and unwise use of fertilizers), water pollution, hazardous exploitation of coastal resources and the destruction of buffer ecosystems such as mangroves and wetlands for agricultural or touristic expansion.

Low access to adequate agricultural inputs and technologies, such as fertilizers, management practices and calendars, as well as the degradation of irrigation infrastructure and, in some areas, the total absence of water conservation structures or practices, are further constraints on resilience in the rice sector in Madagascar. As a result of these factors, and despite adaptations such as the introduction of the System for Rice Intensification (a set of adaptive rice cultivation practices designed to increase yields), rice yields remain stagnant, and about 1.5 million inhabitants face seasonal food insecurity during the hunger (rainy) season. In addition, there is a lack of climate related guidance for the rice sector, and existing norms, standards and practices, including the deployment of extension and research services, are not taking climate change into account.

This project seeks to address the vulnerability of the rice sub-sector to climate variability and projected climate change, as the potential basis for agricultural and rural growth. This will be achieved by strengthening the necessary scientific and technical capacities for determining further adaptive options in the rice sector, implementing a set of changes in the rice cultivation cycle, as well as removing key policy barriers and potential maladaptations (such as perverse economic or social incentives).

This project will be piloted in the Alaotra-Mangoro region located on the Central Hihglands of Madagascar, and considered as the national top rice producer. It is among the most important river bassin of the Central-eastern part of the island, and is identified by the NAPA as one of the most vulnerable region. In this region, fluctuating increases of rice productions have been observed during the last four decades; but they have not been balanced with population growth, and overall rice production remains low (approximately 1 ton per ha). The region is home to approximately 1 million people, as well as some of the country's remarkable and fragile ecosystems and biodiversity, including the Lake Alaotra, wetlands (which are classified as a Ramsar site), and various species of waterbirds and lemurs.

The Initial National Communication, as well as the NAPA for Madagascar, both stress the urgent need of promoting adaptation in the rice sector, while achieving progress in productivity. A priority is also placed on health and preventing the spread of water and vector-borne diseases. As water management is a key factor in rice production, special attention could be paid to controlling water-borne diseases and the spread of potential disease vectors in rice growing areas without promoting the excessive use of pesticides that could pollute downstream water, or destroy fragile rice biodiversity.

PROJECT / PROGRAMME OBJECTIVES:

List the main objectives of the project.

The overall objective of the project is to initiate the transformation of the rice sub-sector to make it more resilient to current climate variability as well as expected climate change and associated hazards. This overall objective will be achieved namely by pursuing the following secondary objectives:

- Strengthening the scientific and technical capacities of Malagasy authorities to understand, analyse and manage climate risks to the rice sub-sector, as well as to determine further adaptation options for the sector.
- Implementing and disseminating a series of changes to the rice production practices, from input to harvest management, including measures designed to restore and maintain ecological services around rice ecosystems
- Identifying and addressing the key policy barriers, gaps or maladaptations in order to create the conditions for upscaling adaptation in the rice subsector.

This transformation would involve implementing significant changes at all steps of the production cycle, from the selection of cultivation inputs, to the dissemination of proven successful production techniques (including water management), to early warning and storage. In addition, these measures would have to be accompanied by the appropriate changes in legislation and by an adequate level of scientific capacity.

The approach selected for this project will be inspired by the ecosystem approach to adaptation in that it will seek to create opportunities for generating co-benefits for vulnerable communities and ecosystems, thereby creating mutually reinforcing aspects of resilience.

PROJECT / PROGRAMME COMPONENTS AND FINANCING:

PROJECT COMPONENTS	EXPECTED CONCRETE OUTPUTS	EXPECTED OUTCOMES	AMOUNT (US$)
1. Scientific and Technical Capacity	– Knowledge base on best practices for climate resilience in rice, based on existing local knowledge and international research – Field test and SWOT analysis for existing climate resilient rice varieties (e.g. stress resistance, drought tolerance, growth cycle, heat and CO2 absorption) adaptable to other eco-regions (lowlands and flooded areas) – Country-wide crop models for rice vulnerability mapping – Agricultural extension staff trained on climate risk management in an agro-ecosystem context – Best Available Technologies for resilient rice production selected and adapted where necessary (e.g. SRI) – Updated, dynamic agricultural calendars and agricultural early warnings taking into account current and projected variability	Malagasy government, research institutions and local communities have the tools and methods to assess, monitor, and understand climate change impacts on rice.	800, 000

	disseminated to local population		
2. Adapted and resilient rice production cycle	*2.1 Input Management* – A multiplication and dissemination scheme for adapted seed varieties using existing institutions and structures – Introduction of organic fertilizers, management of chemical fertilizers when necessary, and integrated pest and vector management for soil fertility, downstream pollution control and water availability, and disease prevention – Water efficiency, management and conservation technologies introduced or rehabilitated, including drainage and irrigation infrastructure, storage basins. *2.2 Production Management* – Best available land preparation, production and harvesting techniques disseminated through training to reduce deforestation, maintain soil fertility and integrity, and to provide adequate growing conditions – Introduction or revitalization of producer's cooperatives and water user associations for collaborative natural resources allocations (e.g. land and water) and management – Watershed management and rehabilitation in productive landscapes introduced, including through reforestation, wetlands restoration and protection. – Rice ecosystem agro-biodiversity monitored and preserved for productivity and ecosystem services (nutrient cycling, soil fertility) – Water quality monitoring and management for disease vector control *2.3 Harvest management* – Introduction of rice by-product management techniques, especially rice straw – Community-managed storage and reserves instituted for droughts and flooding periods – Post-harvest storage facilities with phytosanitary control, serving as trading points and markets	- Sustainable increase in rice yields - Food security improved - Health improved and new disease spread prevented - Ecosystem services maintained	2,550,000
3. Policy and awareness raising	– Review and where necessary, modification of technical norms and standards in rice cultivation to take climate change into account – Dialogue on the review of the rice policy in order to identify gaps and possible maladaptations and provide recommendations to create enabling conditions for rice sub-sector reform – Production of official bulletins and circulars on resilient rice production – Implementation of comprehensive Information, Education and Communication campaign focussing on climate change	Conditions in place for a full adaptation of the rice sub-sector	475, 000

	adaptation, specifically in the agriculture sector –		
4. Project/Programme Execution cost			300, 000
5. Total Project/Programme Cost			4,125,000
6. Project Cycle Management Fee charged by the Implementing Entity (if applicable)			380, 000
Amount of Financing Requested			4,505,000

PROJECTED CALENDAR:

Indicate the dates of the following milestones for the proposed project/programme

MILESTONES	EXPECTED DATES
Start of Project/Programme Implementation	June. 2011
Mid-term Review (if planned)	June 2013
Project/Programme Closing	July. 2015
Terminal Evaluation	Aug . 2015

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Describe the project / programme components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience. For the case of a programme, show how the combination of individual projects will contribute to the overall increase in resilience.

The overall objective of the project is to initiate the transformation of the rice sub-sector to make it more resilient to climate change impacts such as temperature increases, rainfall decreases and variability. As a first step the project will seek to pilot the various elements of a sectoral transformation, considering each aspect of the rice production cycle. The project will also seek to apply the tools and methods originating in the ecosystem approach to adaptation, by attempting to restore and maintain key ecosystem services, and thereby generating co-benefits for people and ecosystems.

This project proposes the implementation a set of concrete adaptation options in a targeted agricultural sub-sector, supported by a set of enabling measures such as science, technology and policy capacity. The concrete measures in this project are direct applications of best avaialable knowledge, technology and approaches and aim at effecting an immediate change in behaviour in the rice cultivation cycle. The measures proposed in this project depart from the baseline management of the rice sector in Madagascar in that they are either additional activities (for example, water conservation) or different approaches (for example, the application of different fertilizers at different times), that are expected to make rice production more productive and resilient in the face of climate change.

Component 1: Scientific and Technical Capacity. Although this project is based on current knowledge and scientific research, additional elements of investigations are necessary for a well targeted transformation of the rice sector towards resilience. For example, although common knowledge indicates that rice yields would overall suffer a decrease under climate change, some reseach points to potential opportunities for rice under specific management conditions. Hence research into these threats and opportunities would assist in building

the government's capacity to make informed decisions regarding future rice policies. This research would be based on an analysis of the existing knowledge base regarding best practices for climate resilience in rice, using indigenous and local knowledge as well as expertise from international research centers, such as the International Rice Research Institute (IRRI).

In addition, in order to support future decision making, government and other agricultural institutions need to develop the capacity to understand and analyse climate change impacts and their effects on the productive sectors of Malagasy economy. Hence, the project will provide the tools for crop modeling and vulnerability analysis, particularly focusing on the rice sector, but expandable to others, and taking advantage of ongoing climate-related programming in the country. Similarly, the project will assist in identifying the best production technologies, starting with the possibility of extending techniques arising from the System of Rice Intensification, but benefitting from other rice-related research around the world, and adapted to the various rice cultivation systems (highlands, lowlands, rainfed or irrigated, flooded or not). Finally, in conjunction with component 2, this component will provide farmers with enhanced agronomic services, including adapted extension services and updated crop calendars, and ensure that linkages with existing early warning systems are in place, for disaster risk management as well as for appropriate cultivation management.

Component 2: "seed to store" rice sector transformation. This Component, which comprises the bulk of the project, is comprised of 3 sub-components targeted to each step of the production cycle. Based in part on the outputs of the Component 1, and on the existing scientific and technical knowledge, this component aims to implement a set of changes to the rice cultivation cycle.

Sub-Component 2.1 concerns primarly "*Input Management*" and is concerned with providing farmers with the appropriate working material, starting with adapted seeds and varieties, appropriate fertilizers and adequate quantities and quality of water. Seed and other genetic material will be taken from existing varieties, recognized as resistant, unless (or until) research activities under Component 1 identify more appropriate materials. These will be disseminated to the targeted communities under the aegis of a formally constituted distribution network (relying on producers' cooperative, see Sub-Component 2.2). Activities under this sub-component will also pay particular attention to water mobilization and management as an agricultural input, including by ensuring that appropriate water infrastructure is in place and that these installations are built up to norms that take climate change into account (future precipitation regimes, drainage and run-off). This may entail creating provisions for irrigation in previously rain-fed areas, based on rainwater harvesting, as a means to supplement water supply during droughts. This is expected to have co-benefits in terms of drinking water, as water quality monitoring will also be instituted thereby ensuring accesss to safe drinking water in pilot communities. Integrated pest management, as well as limitations to the use of chemical fertilizers will also assist in ensuring better water quality downstream, and to manage potential disease vectors and waterborne diseases.

Sub-component 2.2 "Production Management", concerns primarily the land and agro-biodiversity management practices. Techniques identified in Component 1 will be disseminated through training, to ensure that cultivators are implementing the best available management practices. Producer's cooperatives, natural resource user groups (specifically water user groups) will also be mobilized for this project, so as to serve as a basis for the seed dissemination activities, as well as for cooperative management of resources. This will include land and water allocation systems, as well as the collaborative management of secondary productive assets (e.g. forests, wetlands). This will also have co-benefits in terms of economic development, as groups can then commercialize their products with less transaction costs.

In order to restore and maintain the ecosystem services that are key to agricultural productivity, community-based watershed management and rehabilitation activities will also be included in this sub-component. These activities will include reforestation and the restoration or protection of wetlands, with potential linkages to activities related to the Payments for Ecosystem Services being implemented elsewhere in the country. This

may also serve as an income-generating scheme, thereby helping to reduce the population density by hectare of rice field in the region. This will be supplemented by local monitoring (with the support of extension services) of rice ecosystem biodiversity as providers of ecosystem services such as nutrient cycling. Finally, locally managed water quality monitoring will be instituted as a means for disesase prevention and vector control, and service as key relay points for a health early warning systems for potential epidemics in cases of extreme events (e.g. cholera, diarrhea, malaria).

Sub-component 2.3 concerns primarily Harvest Management, and is designed to assist communities in coping with climate shocks such as droughts and floods, while providing the infrastructure for trading. As the rehabilitation of rural infrastructure falls outside the scope of this project, this sub-component seeks to ensure the availability of trading infrastructures at least at the communal or provincial level, to avoid sudden price fluctuations due to transport costs in times of flooding, that may lead to further unsustainable practices. Hence the main activities under this sub-component will be the creation of community-managed reserves in cases of floods or droughts, which will be supported by the above-mentioned community mobilization schemes; and the creation of post-harvest storage facilities equipped with appropriate phytosanitary controls, that could serve as trading points and markets. In addition, this project will seek to reduce the burning of rice straw, which is a byproduct of paddy cultivation, and which emits high levels of CO2 and black carbon, adding to climate change.

Component 3: Policy and Awareness Raising. This component aims to deal with the specific policy barriers that prevent adaptation in the rice sector, while also providing tools and methods that might be applicable to other sectors, agricultural or not. Closely related to Component 1, activities under this component will include the review and modification, where necessary of the various technical norms and standards, circulars and bulletins related to rice cultivation in the country, so that future climate conditions can be taken into account in a proactive manner, or that spontaneous adaptations can be implemented.

The project will also seek to launch a broader policy debate on revising the rice policy (implicit and explicit), including reserves, import quotas and other macro-economic tools, in order to enable broader rice policy reform. This activity will be undertaken in conjunction with other activities aiming at strengthening the agricultural sector, or the overall governance and economic planning mechanisms. Finally, this component will also allow for the development and implementation of an awareness campaign focussing on climate change adaptation, specificallly in the agriculture sector and rice sub-sector.

B. Describe how the project / programme provides economic, social and environmental benefits, with particular reference to the most vulnerable communities.

As stressed above, Madagascar is particularly vulnerable to climate change because of the over-dependence on a single rainfed crop and the high incidence of poverty. Rice trade dominates food-marketing channels and rice is the staple food in Madagascar. As this project is designed to build resilience in the rice sector, with a potential side benefit of increasing rice yields, it is expected to have beneficial impacts on local food security, including through the creation of reserves in case of climate shocks. Sustainable land and water management techniques, along with water quality monitoring, are also expected to have benefits for local health.

Community-based watershed management is expected to preserve the local ecosystems, including fragile biodiversity from further degradation and pollutions; reforestation will have benefits for water retention, soil fertility and drainage, along with flood control and carbon sequestration. The use of organic fertilizer and rational utilization of chemical fertilizer will prevent soil nutrient depletions, along with a careful management of rice field agro-biodiversity.

The region of Alaotra-Mangoro selected as proejct target area is home to some of the country's remarkable and fragile ecosystems and biodiversity, including the Lake Alaotra, wetlands (which are classified as a Ramsar site), and various species of waterbirds and lemurs. So, the project interventions in this this region will result in global environemntal benefits.

Drastic changes in rainfall patterns coupled with rising temperatures are likely to introduce unfavourable growing conditions that, unless abated by appropriate management techniques, could reduce crop productivity. Once upscaled, the transformation of the rice sector towards resilience could have lasting impacts on the country's economy, with the agricultural sector generating economic growth that could be redistributed.

C. Describe or provide an analysis of the cost-effectiveness of the proposed project / programme.

The selected adaptive measures contained in this project consist mainly of a series of small activities. Expensive infrastructures were excluded (for example rural roads), although some infrastructure rehabilitation and development has been deemed necessary in order to address the most urgent needs for water management and conservation, such as for example the rehabilitation of water mobilization and conservation structures (cisterns, small earthen dams, pipes). The activities in this project form a collection of low-regret or no-regret strategies and activities that can be easily managed and that will lead to easily identifiable benefits for local communities. The issues this project addresses often constitute keystone for the amelioration of the livelihood and the well-being of rural populations, in particular women and children in the face of climate change.

Experience in other countries and global research (e.g. West Africa Rice Development Agency, International Rice Research Institute) have shown that the most cost-effective approaches to adaptation in the rice sector involve a blend of relatively minor practice or behaviour shifts, such as variety improvement, changes in land and water management, and the careful management of ecological services. This blend of changes has been shown to generate both gains in productivity as well as environmental benefits.

In the case of water management, the proposed interventions are cost effective in that large infrastructural investments are not considered, but also because the proposed interventions are expected to have side benefits in terms of health, environmental integrity and biodiversity conservation, and poverty reduction.

In the medium to longer term, and in the absence of a readily available economic alternative, seeking the adaptation of the rice sub-sector is more cost efficient than other options, for example to re-orient agricultural production towards other crops, or to diminish agricultural production in favor of other sectors (with the risk that food imports would remain too expensive for ensuring food security).

D. Describe how the project / programme is consistent with national or sub-national sustainable development strategies, including, where appropriate, national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist.

This project is consistent and supports national orientations, and takes into account the country needs stated in national planning and strategy documents. These orientations and priorities have been embodied particularly in the Millennium Development Goals (MDG), the Madagascar Action Plan (MAP), the National Environmental Action Plan (PAE), the National Action Plan for Adaptation (NAPA), the Initial and Second National Communications, the Rural Development Management Plan (PADR), and some local development plans. The MAP is a strategy document developed by the government of Madagascar to guide development

planning in the country. Among other objectives, it commits to doubling rice production over the next five years.

Currently, these projects/plan/programmes are being implemented on the national territory. However, underestimation of climate change risks and impacts could jeopardize some of the benefits provided by these national actions. Inexistence of adaptive measures on current agricultural activities arise, among other factors, from the lack of public awareness on climate change issues and associated impacts, as well as from a lack of policy and technical capacity. The present project will have beneficial impacts towards the realization of the stated objectives of these strategy documents, by including innovative approaches that contribute to the sustainable development of the country as well as to preserve environmental integrity.

The present project is consistent with the MDG, particularly the Millennium Target 1: "Eradicate hunger and extreme poverty", MDG 7 on environmental sustainability, the MAPs sixth commitment "high-growth economy", the PAE's objective "Ensure poverty eradication". This project is consistent with the MAP's fourth commitment "rural development and green revolution", the PADR's objective "intensification and professionalization of agricultural productivities" and the NAPA's third project "emphasizing the intensification of agricultural productivities". As mentioned above, Component 3 will address these issues.

The project is consistent with MAP's seventh commitment: "Cherish the environment", PAE's objective "Preserve and valorize environmental resources", NAPA's second project "Implementation and/or strengthening of water managing associations", and the Initial National Communication.

E. Describe how the project / programme meets relevant national technical standards, where applicable.

There are currently no widespread government supported standards for organic agriculture in Madagascar. Standards regarding rice production and commercialization are in force, as promoted by the Ministry of Agriculture, however, due to weaknesses in the extention system it is unsure if these standards are enforced in all locations. Interventions regarding the dissemination of rice varieties and other inputs will be deployed in line with current Malagasy norms and standards, including as regards the use of chemical fertilizers, pesticides and other inputs.

The System of Rice Intensification was first designed in Madagascar, and is well-known by most rice cultivators; however it is largely unapplied in many rural parts. It involves planting at earlier dates, and managing or reducing field flooding, as well as modified planting techniques. If needed, the SRI could be adapted to emerging climate conditions under each rice system type.

Interventions designed to enhance water mobilization and conservation infrastructure in rice cultivation areas will be conducted in strict adherence with Malagasy codes and legal texts regarding environmental impacts, when triggered. Strategic environmental assessments may also be conducted where necessary.

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

The package of interventions proposed in this project is not currently being supported by any other source. However, this project relies on a number of ongoing efforts in the country, including efforts to modernize the rural and agricultural sectors, to improve governance, access to water and sanitation and to promote food security. A number of relevant activities are underway in the country or in the pilot region, with which partnerships or learning may be sought (this list is not exhaustive, and it should be noted that a number of operations were suspended in 2009, requiring a more comprehensive study of activities currently ongoing):

Title	Partner/Funding partner	Objective	Amount (Million US$)
Third Environment Program Support Project	World Bank - GEF	aims at improving the protection, and sustainable management of critical biodiversity resources at the field level, by mainstreaming conservation into macroeconomic management and sector programs, and establishing sustainable financing mechanisms.	139.9
Transport Infrastructure Investment Project	World Bank	to rehabilitate the country's major transport infrastructure in order to reduce transport cost and to facilitate trade	150
Rural Development Support Project for Madagascar	World Bank	to increase incomes and reduce poverty in rural areas, while preserving the natural resource base. The project is part of the Rural Development Action Plan, a broad-based program approved by the Government in 1999 to promote sustainable growth in agricultural production, foster food security, and enhance access to basic services in the rural areas. There are five project components. The first makes a partial contribution to demand-driven income-generating sub-projects proposed by farmer organizations and village groups. The project supports three types of productive investments along with support services needed for identifying and implementing sub-projects. The second component provides extension and training services to rural communities and producer organizations. The third component strengthens rural communities and producer organizations by supporting the preparation of community development plans and business plans, developing organizational and managerial capabilities, and workshops. The fourth component establishes adequate statistical systems in the ministries responsible for agriculture and livestock, and strengthens environmental assessment. The fifth component supports project management and administration.	106.9
Rural Income Promotion Programme	IFAD	Aims, through partnership poles between producers/transporters/processors and traders, of increasing the income and food security of the rural inhabitants of Toamasina Province, 87.9 per cent of whom are poor. The programme has two specific objectives. The first is to improve small producers' market access by building up commodity chains and	28.2

		helping them to optimize their produce. The second objective of the programme is to intensify and diversify agricultural production in order to improve yields and develop export crops, for which the region has great potential.	
Support to Farmers' Professional Organizations and Agricultural Services Project	IFAD	The goal of the project is to strengthen existing farmers' organizations, with the aim of improving agricultural production and increasing the incomes of rural households. The project's specific objectives are to:reinforce farmers and their organizations to better integrate them into the economy; facilitate farmers' access to services by matching demand and supply; increase production levels by establishing financial mechanisms responding to demand for services, through the Agricultural Development Fund and the Regional Agricultural Development Fund.	56.4
Water and environment support project	UNDP	Temporary objective: to support technical aspects related to water management in Madagascar, such as field analyses towards the development of a national water and sanitation plan, an institutional study and technical studies on water transfers as a means to ensure drinking water to southern islanders.	1.9 million (2009)

A number of initiatives related to environmental issues and climate change have been supported through the GEF and its partners in Madagascar. A more thorough survey should help define the lessons from these initiatives, as well as any possibilities for partnerships and coordinating mechanisms which will be explored in the course of the full fledged project formulation process .

Agency	Title
UNEP	First National Report to the CBD
UNEP	Clearing House Mechanism Enabling Activity
UNDP	Enabling Madagascar to Prepare its Initial National Communication in Response to its Commitments to UNFCCC
UNDP	Participatory Community-based Conservation in the Anjozorobe Forest Corridor
UNDP	Consultations for the Second National Report on Biodiversity (add on)
IBRD	Third Environment Programme
UNDP	National Capacity Self-Assessment (NCSA) for Environmental Management
UNEP	Biodiversity Enabling Activities Add-on: Assessment of Capapcity Building Needs and

	Establishment of a National Clearing House Mechanism
IBRD	SIP-Watershed Management
UNDP	SIP-Stabilizing Rural Populations through Improved Systems for SLM and Local Governance of Lands in Southern Madagascar
IBRD	Support to the Madagascar Foundation for Protected Areas and Biodiversity
UNEP	Enabling Activities for the Stockholm Convention on Persistent Organic Pollutants (POPs): National Implementation Plan for Madagascar
UNEP	BS Support for Implementation of the National Biosafety Framework of Madagascar
UNDP	Network of Managed Resource Protected Areas
IBRD	Preparation of a National Action Program to Adapt to Climate Changes

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

One of the ambitions of this project will be that it would be transposable for other parts of the island. Lessons learned during project implementation will be exploited and the project is supposed to be remade in other regions having similar environmental conditions. Specific attention will be paid to lessons learned and conditions for replicability within the project's Monitoring and Evaluation Plan. In addition, the project will also seek to learn lessons from previous or ongoing initiatives in the rice sector or related sectors, and will seek to build partnerships with regional centers of excellence in agricultural research, such as the African Rice Development Center, the West African Rice Development Agency, the International Rice Research Institute and other research partners.

As part of the project activities, a comprehensive campaign will be launched to illustrate adaptive activities in the pilot sites so as to promote public learning on resilient rice cultivation. Mass-media will be utilized to disseminate lessons and information on adaptive measures in Madagascar and elsewhere, such as radio, television, print and, where available, internet.

At the community level, pilot communities will serve as hosts for inter-communal learning events, so that the successes and lessons of the project can be gradually disseminated to surrounding localities.

H. Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation.

This project was extracted from the National Actions Programme for Adaptation document, which is based on many consultations from many levels from governmental authorities to vulnerable communities, including priority stakeholders and the most vulnerable segments of population. Activities in this project respond to multiple priorities expressed by vulnerable populations in the NAPA, including increasing rice yield, disaster management, water management and health.

Consultations and preparation meetings for the further development of this project are currently underway, and will be reported upon following full project development. Further public consultations will be undertaken during project development, with a particular focus on project sites, and will be maintained throughout the project implementation (we should also say that local participation is key to the transformation of the rice sector).

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

Funding is being requested for the implementation of activities directly related to the modifications required in the rice cultivation sub-sector in order to promote its resilience to anticipated climate change impacts. Total funding required for this project is 4,505,000 US$, including management and execution fees.

There are very few adaptation activities in the country, and even less activities that are directly considering the resilience of the rice sector. Hence this project, although it relies on the deployment of business-as-usual rice sector activities, proposes a set of entirely additional activities.

Component 1: Scientific and Technical Capacity. Ongoing activities in the rural, agricultural and rice sector have so far failed to take climate change and its impacts into account. Although there are initiatives related to the dissemination of agricultural technologies and practices, including the SRI, the capacity of the government's institutions to understand and broadcast climate change information, including extension services, is low. Ongoing rice research in the country is focusing on current climate conditions and is designed to provide yield-increasing varieties, however there is significant research going on internationally that could be useful to provide adaptation avenues for rice in Madagascar.

Additional adaptive activities proposed by this project will provide opportunities for testing climate resilient rice varieties developed nationally and internationally, as well as to understand the major constraints and opportunities faced by the different types of rice cultivation in Madagascar. It is expected that this research will support future rice policy and standard development. In addition, government technical services and ministries will be provided with training and technical assistance in order to conduct crop modeling, thereby informing future land use policies. This will thus enable government services to disseminate better knowledge and technologies to rice cultivators, through seasonal and early warnings, better crop calendars and recognized land management practices.

Component 2: Adapted and Resilient Rice Production. As mentioned earlier, despite the technological advances presented by the SRI, this technology is not as widely disseminated as need be. In addition, the SRI practices may need to be gradually adapted to future climate conditions, depending on the ecosystems. Ongoing rice cultivation practices are suffering from a number of constraints and unsustainable practices that not only limit yields, but also prevent resilience by degrading the ecosystem. Communities are still facing food insecurity, which is likely to be exacerbated by rainfall variability, droughts and floods, unless mitigated by appropriate risk management strategies.

Additional adaptive activities proposed by this project are in reality modifications to the ongoing practices of rice cultivation at all stages of the production cycle, from planting to harvest. The project is intended to facilitate technology and knowledge transfers to local rice cultivators, using existing institutions, in order to accelerate the rate of uptake of sustainable practices. The project will therefore not seek to create new processes or institutions – for example the seed dissemination scheme or early warnings – but will rely on and, where needed, strengthen, existing mechanisms. The additional components of the project therefore reside in the new knowledge, better approaches, and capacity development efforts.

In the water sector, stronger investments may have to be made in the development of new water mobilization and management techniques that take into account future predicted rainfall patterns, hence promoting water conservation and storage, rainwater harvesting or other irrigation techniques where they may not have been practiced before. Finally, an innovation for this project will be the introduction of community-based watershed management and rehabilitation, which represents an additional adaptation measure targeted towards the restoration and maintenance of key ecosystem services.

Component 3: Policy and Awareness raising. Although there are a number of national planning processes that have potential relevance to the rice subsector, this project has chosen to focus its policy interventions on key

elements of the policy make-up of the country. It also will rely on efforts being led by other partners to support broad-based rural development, water management, climate adaptation policy and governance. No efforts are currently targeted towards the rice sub-sector, and current rice policy (which is not formalized) and standards are not well applied or coordinated with other macro-level policies.

Therefore the additional activities being supported by this project are those directly targeted at the rice sub-sector, and will aim at reviewing existing policy and normative frameworks so as to determine the optimal conditions for adaptation in this vital sector of the economy. This will also involve an examination of current macro-level policies in order to determine if there are any maladaptations that could be corrected. A dialogue would be launched at the government level to discuss both technical and policy issues raised by these reviews.

Finally, since it has been found that climate change awareness remained low throughout the country, and particularly in rural areas, the project will implement an Information, Education and Communication Campaign, as promoted in the NAPA and the National Communication, which will also serve as a supporting activity to accelerate the adoption of adaptive technologies. There are currently no such campaigns, targeted at the rural sector or the rice sector in particular.

PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project / programme implementation.

The Malagasy Ministry of Environment and Forests (MEF) is the tutor organism of all actions toward climate change impacts minimization in Madagascar. Climate Change Directorate (DCC), particularly the Adaptation to Climate Change Service (SAECC), supervises and coordinates all projects related to climate change adaptations. These two structures are both located within the General Directorate for Environment of the Malagasy Minister of Environment and Forests. Through the SAECC, the MEF cooperates with concerned sectors, from the highest level to local communities; and cooperates with public and private, international and national, institutions, working onto the implementation of climate change adaptation projects.

Through the Direction of Climate Change, the Ministry in charge of Environment will ensure the central-level National Coordination of the project as the National Coordination Unit (NCU) and will be responsible for the project monitoring and evaluation (M & E). The Ministry of Agriculture will be entrusted with the technical coordination of the project and deployment of on-the-ground activities.

There will be a national- level steering committee, in which all the major stakeholders will be represented, and who will be tasked with the regular monitoring of the project, including approval of annual programmes and budgets, reports and any significant policy decisions.

Local supervision may be ensured by Local Coordination Units (LCU) who will manage local, cooperative and association-level activities. Further details on project management will be provided following full project design consultations.

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

Administration functioning is slow in Madagascar. Institutional capacity building, particularly NCU staff, is already taken into account to resolve this problem. As far as concern LCU coordination, trainings for technical staff on project coordination and supervision will be provided when necessary within this project. In addition,

capacity building for local technicians responsible (hydraulic infrastructures maintainers, agriculture technicians) are an integral part of this project.

Another risk that may be encountered by this project is political changes that occur frequently in Madagascar. Central administration staff concerned by this project, as well as their regional counterparts will produce reports about their achievements on the current realization of the project so as to facilitate transitions, if necessary. In addition, a significant effort will be made to entrust the implementation of key activities to local and community based organizations, in order to maximize learning at all stages.

Finally, lack of population buy-in on project activities constitutes a very important risk. Awareness campaigns about climate change are included as part of the project in order to demonstrate the possible impacts of climate change as well as the benefits of adaptation. An important part for these campaigns is the diffusion of information about the opportunities climate change effects can offer when appropriate adaptive measures are considered.

A complete risk management strategy will be developed before project implementation.

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

Project monitoring and evaluation (m & e) will be undertaken according to recognized international standards, at all levels and stages of project implementation. This will include financial and activity-based reporting at quarterly and annual points; an inception report; an independent mid-term evaluation and a final evaluation. Annual financial audits will be conducted in accordance with recognized practice. Meetings of the steering committee will be documented and decisions recorded. Local Monitoring and evaluation fieldwork will be undertaken on an ongoing basis by NCU (DCC & SAECC team), in partnership with the Multilateral Implementing Entity.

D. Include a results framework for the project proposal, including milestones, targets and indicators.

A full results framework, including indicators, will be developed in the course of the project preparation to serve as the basis for monitoring the project impact and results.

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

A. RECORD OF ENDORSEMENT ON BEHALF OF THE GOVERNMENT[2] *Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:*

Jane A. Razanamiharisoa *Chief of Service of Adaptation to the Effects of Climate Change* *Direction of Climate Change* *Ministry of Environment and Forests*	Date*: 12 July 2010*

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

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (Millennium Development Goals (MDG), Madagascar Action Plan (MAP), National Environmental Action Plan (PAE), the National Action Plan for Adaptation (NAPA), the Initial and Second National Communications, the Rural Development Management Plan (PADR) and subject to the approval by the Adaptation Fund Board, understands that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.

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

Name & Signature Implementing Entity Coordinator	
Date: *(Month, Day, Year)*	Tel. and email:
Project Contact Person:	
Tel. And Email:	