



WWF

FACTSHEET

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## ALA MAIKY - Terrestrial Programme

# TESTING ADAPTATION AND RESPONSE TO CLIMATE CHANGE IN THE MAHAFALY PLATEAU REGION

The natural heritage of the Spiny Forest ecoregion of Madagascar, which includes the calcareous Mahafaly Plateau, is a source of economic, social and cultural benefit for current and future generations of Malagasy people and forms the basis of their sustainable development. The Mahafaly Plateau, with large forestry blocks on 7500 km<sup>2</sup> of 12 500 km<sup>2</sup>, has a high endemism rate in terms of biodiversity. About 300 000 of people, mainly farmers and cattle-breeders even though semi-desert climate condition and low-rate of rainfall make these two activities more and more insecure, live around the plateau.



## How does climate change occur ?

For years, the Mahafaly Plateau region has been impacted by climate change:

- Shift in seasons: a longer dry period (7 to 8 months), shorter rainy season (2 months from February)

	Oct.	Nov.	Dec.	Janv.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.
Before	Rainy season				Fresh and dry season				Hot and dry season			
Nowadays	Hot and dry season				Rainy season		Fresh and dry season			Hot and dry season		

*Change in seasonal calendar presented by a local cattle-owner*

- Change in rainfall pattern: Five years ago, the annual rainfall fluctuated between 800 to 900 mm while it rarely reaches 500 mm nowadays. The distribution of rain has also changed unpredictably. Storms have become less frequent and more intense.
- Temperature increase: Each year, the heat increases in intensity particularly in the inland areas (north and east of the plateau Mahafaly).
- Change in wind pattern: Extension of the strong wind period (Tsioka Atimo, southern wind) likely to be related to the extended dry period; the period of strong winds lasts much longer these days.

## Impacts

- Agriculture – which is highly dependent on climatic conditions - is the most affected by climate change. Since 2005, farmers have experienced three years of poor harvests. Food insecurity has worsened in many parts of the region. All the 13 communes (about 250 000 inhabitants) that compose the Mahafaly plateau are now declared vulnerable while only 7 communes were concerned by food insecurity in 2005.
- Erosion: Only two days of rain were enough to erode one meter of the banks of the Linta River.
- The population's health is also strongly affected because of food shortage and the physiological consequences of strong heat waves. Mothers and babies are particularly vulnerable. Because of the stretching famine period, they are forced to breastfeed their babies for most of the time to prevent them from dehydrating.
- Many farmers have already lost a significant proportion of their herds. A farmer in a north-east village of the plateau has lost 150 zebus because of starvation while another farmer based in the southeast lost 50 animals. Weakened by hunger and thirst, the animals, especially females with infants die of fatigue because they have to go back and forth between grazing areas and watering points. Twice a week, the herd has to travel for about 50 km.



## Community responses

- A farmer who has actively participated in reforestation actions in his village noted that making holes few weeks before transplanting seedlings is very beneficial to young plants and helps retain sufficient moisture. This year, seeing that the rain is so unpredictable and scarce, he decided to make holes while waiting for the first rain. The corn he planted in the holes, just after the first rain, got enough water to get off and he hopes the plants will make it until the next rain.
- Several farmers decided to stop seeding before the rain fall to avoid losing their time, energy and seeds.



- Farmers are used to organize the plantation by observing natural signal like blooming of tamarind-trees, birds' migration, animals laying eggs, etc. Most of them have abandoned these habits because they are not reliable any more. Communities are not yet able to manage themselves with these changes so many parents decided to send their children to school to get knowledge which lack to elders.
- Some farmers decided to plant lines of trees as windbreak against wind erosion and grass against running water erosion.



## WWF adaptation projects



### Agriculture:

- Since 2003, WWF has promoted agro-ecological practices to help communities to better adapt their agricultural activities and techniques to the harsh climatic conditions: these are vegetative cover seeding to reduce evaporation by retaining the maximum of moisture on the plants and soften heat's effects, culture association (leguminous with graminous, cassava with Brachiaria, etc.) and culture rotation to increase the productivity and preserve the soil for a longer period of production, agroforestry and grass plantation to reduce the effect of wind and running water on soil and plants, improvement of plant's variety to shorten the production cycle, etc.
- Traditional agriculture systems that rely on rainfalls have become increasingly risky and communities have been trained to conduct market gardening around water points. Market

gardening has always been done after the cropping season (winter) but this year, communities were advised to start this new system earlier to shorten the lean period which if the current trend continues might last until next year. Farmers have installed shadows to protect the vegetables against the heat and have intensified the biological fights against worms and insects.

### Farming:

- The cattle are led to graze into the forest during the dry season and then brought back to water points to drink because there are none in the forest during this period. WWF has promoted the improvement of pasturing system through the introduction of drought-resistant grass species such as Brachiaria, Stylosanthes, etc.. Water points have also been created on some transhumance routes to reduce the movements of herds, which are very stressful for the animals.



### Forest restoration:

- Seedlings grown in nurseries do not survive the dry period. The communities have suggested their gradual acclimatization to drought and heat when they are still in the nurseries so as to reduce their need for water and shadow once they are transplanted in the forest.

## Awareness and Information

- With a group of students, the Climate Witness Toolkit, created and used in Fiji, was tested in three sites where natural resources management systems are operational. At the end of the field work, the toolkit will be adapted and documents on the impacts of climate change developed. These studies will also help to identify the first set of indicators on the resilience of ecosystems and communities to climate change in this region.
- National and international scientists started working on assessment of vulnerability of key species and habitats to climate change.
- About 30 rain gauges have been distributed to communities across the Mahafaly Plateau to allow villagers to collect rainfall data themselves. During the first quarter of 2010, these villagers will be trained in the exploitation of the data so they can use them in their daily life (organization of the plantation and transhumance agendas, etc...). Data are made widely available and accessible to villagers. Starting on 2011, the National Meteorological Office will work with WWF to improve the rainfall data collection and exploitation system. In addition to rainfall data, information on local temperature will also be collected. The raingauge network will be expanded to cover larger area. The Meteorological Office will translate collected data to understandable information for local communities.



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