

## Adapting to Cyclones in Madagascar's Analanjirofo Region



*Landscape of Analanjirofo (Photo : Nosy, Alizany, CCAA-Madagascar)*

Located on the northeast coast of Madagascar, the region of Analanjirofo enjoys a tropical climate favorable to crops, particularly clove trees which are a major source of foreign exchange. However, it is often traversed by tropical cyclones that have become more frequent and intense in recent years. Thus, the cultivation of cloves, which was once the farmers' main source of cash income in the country, is in serious decline. The future outlook is compounded by climate change, with the main risk facing this part of the island being the intensification of cyclones. Forecasts predict an increase in cyclone intensity even as their annual frequency is expected to remain stable.

To adapt to this alarming situation, farmers in the region call for other export crops considered more resilient and more resistant to cyclones, such as pepper and vanilla. However, the development of these sectors depends not only on agricultural exports but also on factors such as the selling prices of crops

whose cultivation requires support from government and agencies working toward rural development. In Analanjirofo's latest regional development plan, promoting the vanilla industry ranks only third among the seven priorities and promising development sectors identified. And pepper cultivation is not included at all. This paper showcases some adaptive solutions developed by the farmers of Analanjirofo and the support needed to enable them to improve their capacity to adapt to cyclone intensification.

### **The clove : a tree very sensitive to cyclones**

From colonial times until the 1980s, clove fields in this region formed dense forests. At that time, production was secure enough that farmers could offer their clove seedlings as collateral for loans. Since the 1990s, these "forests" of clove trees have been thinning out, following the passage of intense cyclones (Table 1). Years of good production have

become increasingly rare due to the combined effects of natural variability and devastation caused by storms. The clove tree, whether young or mature and already in production, is very sensitive to cyclones. After a violent storm, the tree is completely stripped of leaves and resumes production only after three to five years. Consequently, some are uprooted and die.

### Adaptive Solutions from the Grassroots

As an anti-risk practice, most farmers in the region prune their clove trees to reduce the load-bearing capacity of the aerial part and reduce the risk of uprooting. At the same time, they distill the leaves from the cutting to extract the essence of cloves. Despite

this practice, clove trees planted on wind-exposed slopes remain leafless and unproductive for years following the cyclone.

To address this challenge, focus group discussions were initiated at the grassroots level by a project in Madagascar supported by the Climate Change Adaptation in Africa program. In this context,

Periods	Number of Cyclone Categories 4 – 5 (wind speed > 250 km/h)	Percentage of Total Number of Cyclones Formed
1975 – 1989	23	18
1990 – 2004	50	34

Table 1: Frequency and intensity of cyclones in the Southwest basin of the Indian Ocean from 1975 to 2004 (Rabefitia et al., 2008)

new adaptive solutions emerged to cope with the decline in clove production. These include, among others, developing the cultivation of pepper, vanilla and coffee, considered more resilient and more resistant to cyclones, since these plants have an agile support that can regenerate in less than a year after the passage of a storm. For this purpose, a demonstration site was established for each of the three crops and the project granted polyethylene grains for pepper and coffee tree nurseries. Furthermore, to ensure food security as an accompanying measure aimed at helping farmers cope with these shifts, two varieties of short-cycle rice (X265 and I05J) were piloted in farmers' fields.

These innovations have resulted in a number of changes within the community, including : (i) spontaneous investment in the technologies introduced (evidenced by an increase in orders from farmers who contributed to the purchase of grains); (ii) an increase in the number of farmers practicing techniques applied at pepper

cultivation demonstration sites; and (iii) the enrolment of focus group members in a formal association (the Farmers' Association against Climate Change) to develop adaptive alternatives.

### Limiting factors and support needed

The group reflected on the factors that could impede their goal of reducing their vulnerability to climate change. Findings reveal that farmers fear, above all, the market volatility of pepper and vanilla. To address this, they need support from rural development organizations as well as regional and national authorities. This support would inter alia integrate these options among the priority and promising development sectors in the region. ■

*Supporting the development of pepper and vanilla cultivation could help farmers in northeastern Madagascar's Analanjirofo region to adapt to cyclones.*



*A farmer from Analanjirofo pollinating vanilla plants (Photo: Nosy, Alizany, CCAA-Madagascar)*

### **Acknowledgement :**

The Project «Vulnerability and Climate Change Adaptation of Agrarian Systems in Madagascar» is supported by the Climate Change Adaptation in Africa (CCAA) program, a joint initiative of Canada's International Development Research Centre (IDRC) and the United Kingdom's Department for International Development (DFID). The views expressed in this paper do not necessarily represent those of IDRC or DFID.

