



Characterization of the karstic aquifer of Mahafaly region's eocene limestones for an implementation study of deep drillings.

▶ Project duration

12 months starting January 2014

▶ Intervention Zone

Mahafaly plateau, Madagascar

▶ Project objectives

Identifying and testing the different options in order to improve, in a context of high-climatic stress, a durable access to water resources for the population of the Mahafaly Plateau, South-West of Madagascar.

▶ CONTEXT AND BACKGROUND

The populations of the Mahafaly region, in Atsimo Andrefana, South of Madagascar, are regularly confronted to chronic food insecurity on a seasonal basis, during the hunger gap; they are also confronted to a high structural poverty, a lack of economic opportunities and low access to basic services. Therefore, households are often vulnerable to severe food insecurity and endure periods of food deprivation of variable scales. The repetition of shocks does not allow them to recapitalize and weakens their resilience capacities: consequently, the country reaches levels of chronic malnutrition as high as 41,6% in 2009 (INSTAT, Ministry of Economy & Industry, Madagascar; demographic and health survey 2008-9).

Furthermore, with an average access to water estimated at 15% (research protocol), the villages located on the Mahafaly region are among the most underserved in the Atsimo Andrefana region. Yet, the low access to drinking water and inadequate hygiene practices increase the risks of waterborne diseases, which can be an underlying cause of malnutrition. Water access for the inhabitants is thus one of the major problems of the area that affects human and economic development in the region considerably.

As part of its malnutrition prevention programme in 5 villages of the Betioky Atsimo district, ACF engaged with stakeholders, particularly the European Union, in providing drinking water to the Mahafaly region's populations. The intervention area located on this calcareous plateau represents two of the five villages of intervention of the programme and 1/3 of final beneficiaries.



Carte Madagascar,
Source : ongdefi.org

▶ SUMMARY

The Mahafaly plateau is generally constituted by a thick layer of limestone which rarely lets the rock outcrop in the studied area, slightly angled towards the sea. The challenge of the research project thus resided in the identification of optimal locations for drilling implementation enabling a durable supply of drinking water for the populations of the Mahafaly region. In other words, the project ought on one hand to determine the optimal areas for an acceptable exploitation depth, in keeping with the populations' management capacities (<120m depth), and on the other hand to sharpen the current understanding of this karstic system, in order to determine the durability of the water resource.

The research methodology is based on combined prospecting methods, in order to have a better understanding of the hydrogeology in the studied area: geology, hydrogeophysics, and hydrochemistry. The study is composed of two phases: the first one consisting in a comprehensive characterization of groundwater resource, and the second one consisting in an accurate determination of the most favorable locations in the implementation of groundwater drawing infrastructures, through geophysics and geology. Finally, the study should allow for an operational strategy to be designed and implemented.

Following this operational research project, ACF proposed a decision table to estimate the probability of drilling success.

▶ PRIMARY OBJECTIVE

- ◆ Identifying optimal implementation areas for the setting up of drillings going no further than a 100-120m depth (permitting exploitation in balance with the populations' management capacities) and providing a durable access to water for the inhabitants of the Mahafaly Plateau.

▶ SPECIFIC OBJECTIVES

- ◆ To improve the global understanding of the Mahafaly Plateau's karstic system, particularly with the realization of its hydrological review (delimitation of the catchment area, outflows identification, intake and outtake identification...) in order to characterize the resource and assess its durability.

▶ EXPECTED OUTPUTS

- ◆ Increased understanding of the hydro-system: realization of geophysical measurements, and characterization of the chemical features of the karst waters.
- ◆ Elaborate a specific operational prospection protocol for a karstic environment in humanitarian context.
- ◆ Identify potential boreholes locations.

▶ Implementing agency

- ◆ Action Contre la Faim - France

▶ Sponsor

- ◆ Action Contre la Faim – France
- ◆ Avignon University

▶ Scientific partners

- ◆ Avignon University

▶ For more details...

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