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## **A sensitive question: biodiversity conservation with the local population. A case study in Central Menabe, Madagascar**

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### **Introduction**

Madagascar is a well-known biodiversity hotspot. About 80% of its fauna and flora are endemic. The Island represents a little continent according to its forest formation type, from rainy forest formations in its eastern reaches to various types of dry forest and bush in the west. The Central Menabe represents one of the larger blocks of this type of dry forest in Madagascar (NELSON and HORNING, 1993; FARAMALALA, 1995). The dry forest is more fragile than rainy forest because it needs more time to regenerate. This richness in biodiversity is beset, like all natural forest, by many problems of forest degradation and disappearance. Most of the time, the damage is caused by the conversion of forested areas to agriculture land (FAO 1993). In the Menabe region the dry forest covers less than 20 % of the total area. About 14% of the forest lies within a protected area. In order to protect the unique biodiversity of Madagascar, the Malagasy government wants to increase the area under protection from 1.7 million to 6 million hectares. On the West Coast, the establishment of a protected area is underway in Central Menabe region.

A number of initiatives were launched for the conservation of the Menabe dry forest since 2000. Plans emerged to designate the Menabe Central forest as a protected area classified as an IUCN category V protection zone covering 125'000 ha; called « Menabe Antimena ». The area in question comprises dry forest, humid zones and mangroves. In another way, since 1978, a lot of information has been gathered concerning biodiversity and many themes are treated, both within the forest (fauna, flora) and outside of it (socio-economics).

As in all forest zones, the population in the West of Madagascar is dependent on natural resources (FAVRE, 1990 a et b). Forests offer villagers many kinds of products (wood and non-wood). For farmers' households, moreover, the forest is useful for its soil and a way to acquire arable land and pasture. Especially for wood, it takes a big place in infrastructure and as source of energy for people around forest area. For these reasons, when thinking about the sustainability of forest resources, it is crucial to take the population's needs into account in order to preserve the forest's natural potential and protect biodiversity. A balance must be found between the needs of humans and the needs of nature. Based on a population's need for forest resources, the question that research must attempt to answer is: "How can a reconciliation be found between the population's requirements for forest products and the importance of preserving the biodiversity of Central Menabe?" The aim is to propose criteria for a sustainable management of forest resources in a forest landscape.

### **Research methodology**

Seven village terroir represent the site zone of the study. These villages are situated in or around the new protected area: Ampataka, Andranolava, Ankoraobato, Beroboka South, Kirindy, Mandroatra and Marofandilia. Each terroir has a designated area where the populations' rights of

use apply. In some of the villages, forest management associations exist. In the delimitation of the protected area, villagers' lands are situated near the edges of the core zone and are considered as belonging to the protected area. Two kinds of methods were used in the study: one biological, provided by the forest inventory, and the other social, based on direct observation and interviews.

### ***Inventory methods***

An inventory of the forest was conducted in order to determine the actual potential of tree resources. The sites chosen for the inventory were vigorous forest, degraded forest and fallow land around villages that was not being cultivated. 120 sample unit of a variable-area transect method have been done in 4 types of forest formation according to the length of fallow after cultivation: (1) Natural forest formation that had never been used as agricultural land; (2) forest formation 20 years after slash-and-burn cultivation; (3) forest formation between 11 and 20 years after slash-and-burn cultivation and (4) formation less than 10 years after slash-and-burn cultivation

### ***Social methods***

Some elements from the PRA methods were employed for the social part of the work. The elements used were: open interviews, interviews with questionnaires (open and closed questions), direct observation, group meetings and focus groups. A sample of 30 families in each village was interviewed, with the exception of one village. A total of 202 households have been asked. 12 further people, members of associations managing forest area, were also consulted. During interviews, emphasis was on how the population actually use tree forest resources and why they use these instead of other products. The main question for the researcher was to learn how keen the villagers were to manage forest resources on their own territories and how they foresaw their future living and livelihood situations within the context of the new protected area in the region. For each interviewed household, questions concentrated on use of tree resources from forest or fallow land, the quantity and quality of tree they use and its end use, as well as the different rules managing access to tree resources. In the interviews with members of associations that manage natural resources, the focus was on the reason for their adherence and experience with the association, and the association's activities in their village.

Additional interviews were carried out with people who work in the woods and related activities to obtain their opinions and ideas on the existence of the protected area and how it may affect their work. Informal interviews were also conducted with key persons, such as leading community members or village chiefs. All villages that formed the object of the study work with many partners that help them to promote development in villages. Interviews were carried out with many such partners.

### **Flora Biodiversity in the Central Menabe**

Forest formation in Central Menabe is formed by dry dense deciduous forest composed of species like *Commiphora spp* and *Dalbergia spp*. Mangroves can be seen along the coast. These forest formations have been exploited for a long time with a "creaming off" of interesting tree species. Some types of forest degradation have been noted (IEFN, 1996): (1) Secondary forest issued from extended fallow land, in process of vegetation near the original climax; (2) Forest fallow land after cultivation of tree and shrub issued from stump tiller, a lot of liana from high tree and pantropical species; (3) Savannah with species *Hyparrhenia rufa* and *Heteropogon sp* and some pseudosteppe with *Aristida rufescens*, with some original trees; (4) Relicts of species of clusters of palm trees, such as *Medemia nobilis* and *Hyphaene shatan*; (5) Indigenous pioneer species, such as *Poupartia caffra*, *Stereospermum variable*, and *Terminalia seyrigii* or introduced species, such as *Ziziphus mauritiana* and *Flacourtia ramontchii* that lead locally to a monospecific overgrowth.

During the research, about 200 species of woody plants (trees and liana) were inventoried and identified by their vernacular names. Most of them are endemic to Madagascar. At the same time a small number of these are put to diverse uses by the population, the main one being wood for construction which requires hard and durable wood. The density of the population tends to reduce when we go from the natural forest formation to the fallow less than 10 years.

### **Human and Forest Interface in Central Menabe**

The Menabe Region is characterized by its pluriethnicity. Many ethnic groups co-exist: the indigenous Sakalava, Vezo, and Masikoro peoples and the Merina, Bara, Betsileo, Antesaka and Antandroy from other parts of Madagascar.

The population of the Central Menabe is heavily dependent on forests. The inhabitants rely on forest for its soil and they also collect various timber and non-timber products for energy, infrastructure, foodstuff and medicine. All arable land (except some rice field) has been created by shift cultivation by slashing and burning forest. After three to maximum six years, the field is abandoned and becomes a “monka”, which means old or used. New forest area is cleared for agricultural purposes. A project that was launched in 1987 aims to help farmers make better use of the monka so that they will be able to stay in one place and no longer need to clear areas in new forest (LAURENT, 1996). Actually, any permit to clear forest is delivered by the forest administration. This means that farmers increasingly have to re-use abandoned fields and they are beginning to vary their cultures.

The research show that wood is the unique source to meet the population’s requirements for domestic fuel. 100% of interviewed households use wood as a source of energy. Alternatives resources are not considered as wood is still easily available nearby the village and they do not need to buy it. Houses are built using mainly wood, especially poles, planks, leaves, bark and fibre collected in the forest or on fallow land surrounding the village. Each head of the household builds their own house, taking from one week to two months to do so. 80 to 240 poles between 5 and 15 cm DBH are used for the frame of the house. The choice of species depends on the hardness of the wood and the experience of the builder. Five species are highly prized by villagers: *Cedrelopsis grevei*, *Cedrelopsis microfoliolata*, *Cedrelopsis graciles*, *Securinega seyrigii* and *Dalbergia spp.* Nonetheless, the villagers will use almost any straight wood they find in their territories, even though, in this case, the wood needs to be replaced every two or three years. Built with hard wood, a house can last five to ten years, depending on how the family takes care of it.

Forest management associations exist in 5 of the 7 villages where we carried out our studies. The remaining 2 villages are under private ownership and the owner manages the territory. In the first five villages, fewer than 40% of interviewed households are members of the association. The adherence to the association is individual. However, the member of a family enjoy the benefits of the association if one of them (normally the head of household) is member. The main advantage of being a member is that members pay lower fees for cutting wood. They do not realize that the only reason they do not have to go to the nearest forest administration to get permission to cut timber is because the association does it for them.

### **Learnt Lessons and Discussions**

Using natural resources is normal for farmers; natural resources are present in every aspect of their lives. They depend on them for nourishment (tubers, animal protein, fruit, etc.), social life (house, working tools, furniture), energy (cooking, heat, light), as economic resources (market path of forest products like honey, game or wood; or sometimes, ecotourism) and for cultural reasons (places of worship, tombs). About 91% of interviewed households see the forest as soil reserve. Concerning wood product, around 98% take firewood from forest or secondary forest

and 97% cut whole trees from the forest to cover their need for building, infrastructure and furniture.

Many organizations are present in the villages to promote development and to conserve biodiversity. The local population sees the work of managing natural resources as properly belonging to their partner from the city (conservation organizations or development organizations), work in which they have to participate. The interests of these organizations are not the same as the farmers'. The aim of organizations is to preserve biodiversity because of its high importance. The pressing problem for those who live off the land is their own survival, not the survival of biodiversity. Due to the high pressure this places on the forest, it is rapidly disappearing or degrading. This emphasizes the urgency of finding the balance between forest-based livelihoods and biodiversity preservation. In other way, forest administrator, owners of the forest cannot ensure total control, as they are usually located far from the forest area and they need to rely on the villagers to manage the areas for them. Clearly, this is why partnership with villagers cannot be ignored and two measures could lead the way: (1) to find ways of developing the villagers' principal activity without destroying forest area and (2) interesting them in protecting the forest for its own sake.

The main activity of inhabitants in Central Menabe is agriculture. It is therefore important to look for activities, interesting to farmers, which are concentrated on territory outside the forest or in old cut forest. Some inhabitants now practice association of culture. The surplus produce is then sold in local market and buyers come to villages to buy. The network has to be well organized for the inhabitants to get more benefit from their culture. Partners for development need to help the inhabitants with this organization and provide them with information about the market. New products should also be introduced.

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