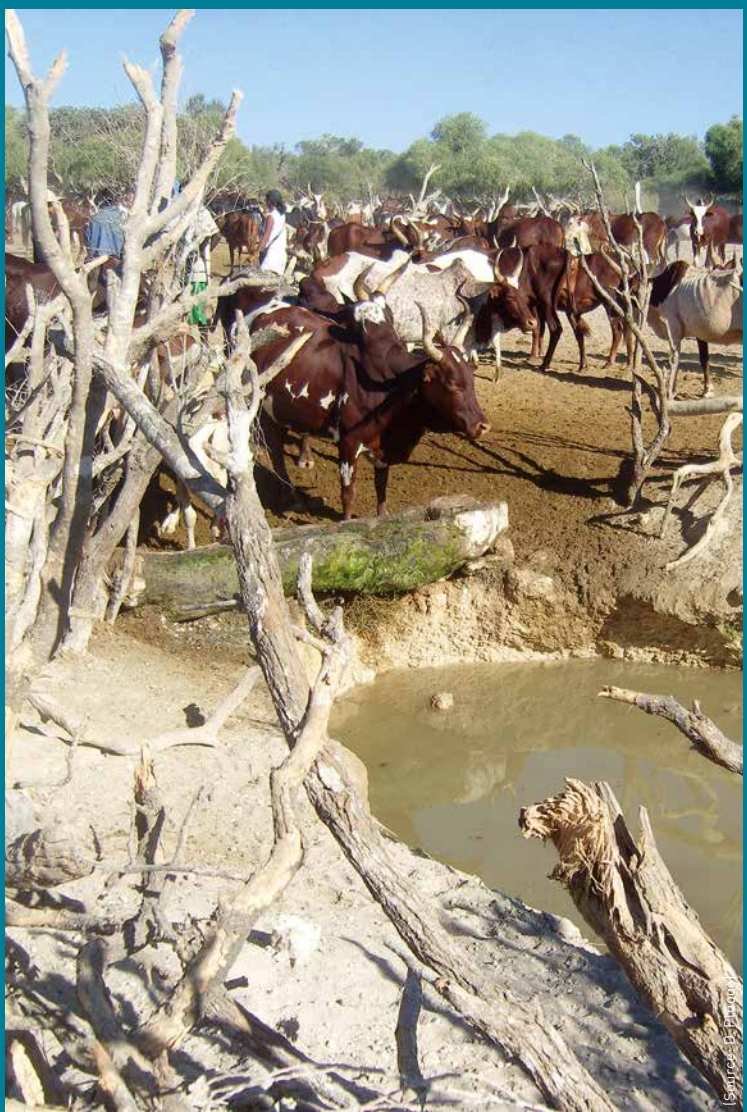
SUSTAINABLE LAND MANAGEMENT

GREATER SUSTAINABILITY FOR MADAGASCAR



The Baobab tree with its vast water storing trunk is characteristic of Madagascar's dry regions.

The south-west of Madagascar is regarded as one of the poorest parts of the island. For the people who live here, survival is often difficult in this region plagued by drought. Now, however, experts from Germany and Madagascar are trying not only to improve the living conditions of the native population but also to ensure better protection of the island's unique flora and fauna in the SuLaMa research project.

Madagascar is the home of the lemurs. Around 100 species of these animals with the characteristic big eyes that belong to the order Primates live here. The lemurs are representative of many other endemic animal and plant species that occur only on this island off the eastern coast of Africa. »The number of endemic species in Madagascar is unique worldwide and from the point of biodiversity therefore of great interest to scientists«, says Jörg Ganzhorn. The zoology professor from the University of Hamburg is leading the research project funded by the German Federal Ministry of Education and Research, »Participatory research to support sustainable land management on the Mahafaly Plateau in south-western Madagascar«, or SuLaMa for short. Six German universities, the two Madagascan universities Antananarivo and Toliara and five non-governmental organisations are involved in the project.

Forestry scientists, economists, agronomists and social and cultural scientists from Germany and

Lake Tsimanampetsotsa is a 15-kilometre long salt lake which gives its name to the national park in the study region.

Madagascar are working together to develop alternative land use strategies for several different ecological areas in the south-west of the island. Ganzhorn sees the bi-national project as taking an innovative approach, and describes its central aim as follows: »Through sustainable land management we want to find new ways of improving the living conditions of the local population without harming the ecosystem and the extraordinary biodiversity«. Conditions in the natural landscape of the 800,000 hectare Mahafaly Plateau make it difficult for people to live here: the region is the driest in the whole of Madagascar. It is therefore very hard to farm and raise cattle here. »The people practise subsistence farming, and are dependent upon what nature provides«, says Ganzhorn. There is virtually no economic development; the region is regarded as one of the poorest of the island. In order to survive, some people use natural resources extensively, resulting in degraded and eroded soils, fragmented forests and sedimented river valleys.

»The number of endemic species in Madagascar is unique worldwide.«

»This is harming the basis of the local people's livelihood in the long term and destroying a unique ecosystem«, says Ganzhorn.

Manioc is one of the basic foodstuffs in the region, along with maize.

One of SuLaMa´s subprojects is therefore concentrating on the question of how new types of agricultural land use can make life easier for the people, and how natural resources can be used more effectively at the same time. Until now, for example, the people have not been in the habit of fertilizing the land or leaving crop remains lying on the fields in order to replenish the humus content of the soil. »So already just by small measures the people will be able to increase yields«, says Dr. Susanne Kobbe, a biologist at the University of Hamburg and the SuLaMa project coordinator.

Fertilizer trials on manioc fields

Scientists from the University of Kassel have therefore laid out trial fields in several villages on the Mahafaly Plateau where they are using cattle and goat dung and charcoal to fertilize manioc, or cassava. They wish to investigate how productivity and nutrient availability can be increased using varying dosages of different fertilizers. Local farmers are also participating in the trials, and discuss the results with the scientists at information events and workshops. »If the experiments bring visible positive results, those farmers who are open to innovation will also want to spread dung on their fields«, reports Dr. Katja Brinkmann, who is conducting research at the Department of Ecological Plant Cultivation and Agricultural System Research in the Tropics and Sub-Tropics (OPATS) of the University of Kassel. Joint field trials with local farmers are also taking place in two other villages, where

The people on the Mahafaly Plateau live essentially by transhumance and animal husbandry.

drought-resistant cereal types such as sorghum wheat and millet are being grown along with different varieties of maize. The experiments are intended to demonstrate how productivity can be increased using dung from the people's zebu herds. The results are important because project leader Ganzhorn expects that this region of Madagascar will suffer the most severe effects of climate

»If it rains even less here in the future, then the whole social system in the region will collapse.«

change, and especially an increase in dry periods. »If it rains even less here in the future, then the whole social system in the region will collapse«, he says, emphasising the importance of the research into alternative crop types. The German-Madagascan research team is also conducting trials in vegetable cultivation in the coastal region. These should help the inhabitants to increase yields of tomatoes, carrots, onions and aubergines from their gardens by methods such as small-scale irrigation systems. »We have handed out seeds to the farmers at information events and suggested different farming methods to them«, explains Brinkmann. The farmers can then decide for themselves which options work best for them: with or without fertilizer, with zebu dung or charcoal, with varying levels of irrigation or growing crops under trees for shade.

In rural Madagascar there is virtually no economic development.

The few natural and agricultural products are traded at small local markets.

»Results are not yet available, but our scientists are gathering and analysing the data at regular intervals«, says Brinkmann.

A culture with many taboos

Because this type of ecosystem-based, practical research approach is new for this region of Madagascar, the German scientists rely heavily on the assistance of local universities and partners such as WWF and on the close cooperation with the local population. »This is not meant to be an academic exercise; the aim is rather to develop solutions together with the inhabitants in order to help them to survive«, says Ganzhorn, and cites an example: if the harvests fail in the region due to long periods of drought, the people go into the forest and dig up yam roots as a food substitute. This type of emergency solution should belong in the past, which is why initiatives such as the small-scale irrigation systems are so important.

In order to be able to implement such measures the scientists have to win the trust of the native population. This is not so easy: interpreters are needed for the meetings and interviews with the people, and their culture is completely different. »There are many taboos in the villages which never cease to amaze us Europeans«, says Daniel Plugge from the University of Hamburg, who is investigating the ecosystems and their functions in another sub-project.

Why which taboos and rules exist is often unclear and just one of the many questions to which social scientists wish to find answers in a further SuLaMa sub-project. What is the people's understanding of nature? How do they perceive nature? How can the cultural and spiritual importance of the ecosystem services be integrated into sustainable land use programmes? Questions such as these are the focus of the sub-project »Socioculture and Governance« coordinated by Dr. Nadine Fritz-Vietta, a social scientist conducting research at the University of Greifswald. »In Madagascar, alongside the formal regulations there is a system of informal rules, prescribed by the ancestors and spirits and observed by the people«, she says. This system is difficult for outsiders to comprehend, but absolutely must be taken into account in the implementation of land use measures. Thus for example people wishing to use a piece of land must first seek permission from the ancestors with gifts.

»Alongside the formal regulations there is a system of informal rules prescribed by the ancestors and spirits and observed by the people.«

Spiritual aspects such as these also play an important role in the people's moral concept of the eco-system services. One example are the mighty Tamarinds, which grow as characteristic trees in the villages and also in the open countryside. The trees not only give shade and bear fruits that can be made into lemonade and fruit


[Source: E. Brasholz]

Tamarinds not only provide the people with fruit and timber but also hold particular cultural significance for them.

syrup; they also have important socio-cultural value. »These are sacred trees, believed by the villagers to be inhabited by spirits and natural beings who must be treated with due respect«, explains Fritz-Vietta. Use may be made of the trees, provided that the natural beings agree to this.

»The sacred forests have important cultural value.«

Just as there are sacred trees, there are also sacred forests which the people may be forbidden to enter. »These forests have important cultural value«, says Daniel Plugge, who is investigating the usage, commercial exploitation and carbon storage capacities of the forests. He and his research team wish to find out for example, which tree species occur here, how they are distributed and how they are used by the local population. Besides the striking Tamarind and the monkey-bread trees one also finds for example the tree species Samata, a member of the Euphorbiaceae family. The leaves of this species can be fed to cattle when there is no grass left in the pastures. »This tree could be important because it could help to reduce the grazing pressure on the land«, says forestry scientist Plugge. The Katafray tree can also be used: its trunk provides good hard timber that can be used for furniture and house building, while the leaves relieve stomach ache.


[Source: J. Hammer]

The radiated tortoise is one of many endangered species living on the Mahafaly Plateau.

The scientists are also seeking to demonstrate that the diversity of reptile species for example can be preserved without jeopardising the livelihood of the local population on the basis of sustainable use of natural resources. This is of particular importance because a large national park has been established on the Plateau. The scientists therefore wish to investigate how important animal species such as the radiated tortoise react to different land use methods such as irrigation and cattle rearing, and how they cope with the increased penetration of humans into their environment through tourism, traffic and illegal tree felling.

Difficult underlying conditions

Social change is perceptible in the region. »The population is increasing, droughts are becoming more frequent and the people are feeling hemmed in by the national park«, says Fritz-Vietta. There is increasing economic pressure to use the land even more intensively. The political situation is also uncertain: the island state has been in political crisis ever since a non-elected government seized power in 2009. This halted the international aid, and the contacts changed in many authorities. A further difficulty is that it is often unclear to whom land really belongs. »There is national and regional jurisprudence and then there is the Council of Elders, which shares out the land in the village«, says Ganzhorn. The uncertainty of ownership prevents the farmers from investing in their fields.

Zebus are not only work animals and a source of meat but also a status symbol and an investment.

Great need for communication

The SuLaMa scientists are aware that all these factors will make it difficult to implement the management plan in which they will present their findings and recommendations in 2015. »If we succeed in involving the capabilities and potentials of the local population, however, I see good chances of realizing our recommendations«, says social scientist Fritz-Vietta. She anticipates this as a protracted process which will require a great deal of communication, but which could succeed. Encouragement for the scientists also comes from WWF Madagascar. »Thanks to the SuLaMa project we can set up a regional databank and create a platform where knowledge of the landscape and its use can be collected«, says WWF programme leader Domoina Rakotomalala. The strategies and models from the research project will assist the regional decision helpers and influence the regional development plan.

Wooden pirogues are used in the coastal fishing industry.

Production systems researched in the region are: agriculture (extensive), forestry, livestock

SuLaMa

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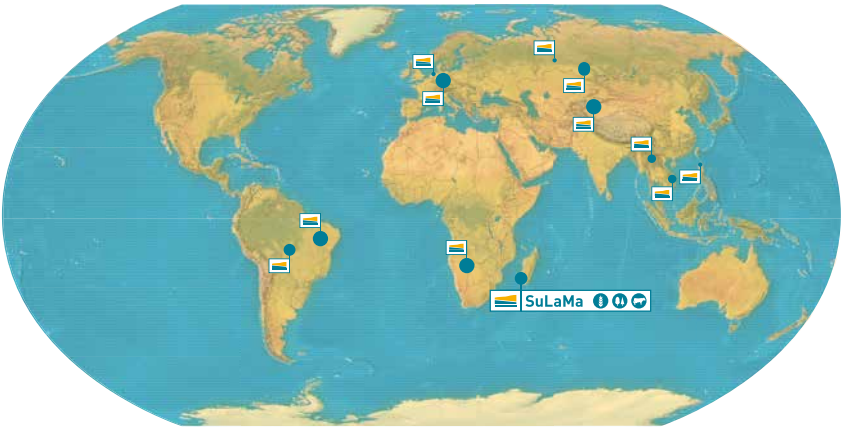

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