

The dynamics of pastoralism in the Mahafaly Plateau region

General situation

Livestock keeping is a core activity for two of the three main ethnic groups in the study area. For both Tanalana and Mahafaly people, livestock keeping is of high economic and cultural importance: Livestock (zebus, goats and sheep) is a mean of income generation, which copes easier with drought than the local crop production does. Livestock sacrifices and donations are mandatory components of all important rituals and cultural events.

In general, the herds of a household of a Tanalana or Mahafaly family are guarded by family members and roam the pastures in the vicinity of the villages. Herds are guided towards areas where water and fodder plants are available in quantity and quality, which means that herds may be guided farther away from the family residential area in times of drought, when both fodder plants and water might be locally scarce. This is a general pattern, although the composition of the herd in terms of livestock species also determines its mobility, as different species prefer different fodder plants. Other needs of the animals also shape the herds' movements, as they need for example the salty depressions on the plateau, or the very dense shrubland with high friction to get rid of ectoparasites, etc. Apart from these, the movements are also influenced by social aspects such as visiting family or friends, market days in the home village or other locations, and festivities.

Traditionally, the herds of the Tanalana people living in the coastal region perform a transhumance movement during the rainy season: After the first heavy rainfalls, the herds are guided within one to two days to the plateau region. In this season, water is available on the plateau and fodder quantity is higher than in the coastal region. The exact location where the herds move used to be determined by the local availability of water and grass. However, nowadays it is also to a great extent determined by the local security situation, as well as family and friendship bounds (*longo*) among the Tanalana families from the coastal region and the families on the plateau. Thus, some villages receive comparatively fewer herds in the transhumance period. In the last years, some villages also were abandoned because of the local activities of *malaso* (e.g. Ankazomateila).

The problem of cattle theft (*malaso*)

Cattle theft is a problem that has increased much in Madagascar in the last years. The cattle thieves (locally called *malaso*, but nationwide known *dahalo*) may act locally or belong to organised criminal gangs who steal cattle and other livestock to sell the meat on markets outside the study area region (probably in the regions of Toliara and Edjeda). However, the local risk of cattle theft is higher on the plateau than in the coastal region, and also differs within the plateau area.

Cattle theft is a severe threat to the wealth (and therefore security) and social standing of the family, as well as the herder's health, as the thieves are armed and often do not hesitate to kill a herder if he tries to defend his animals. Therefore, the pastoralists seek to avoid the risk of a *malaso* attack, especially because the power of the governmental agencies such as the police is virtually nearly absent in this remote area.

Individual herders seek to avoid the risk for their particular herds. Sometimes the herdsmen are armed with rifles or traditional lances while guarding the herds, and some individual herders even hire military to protect their herds. Moreover, in some areas on the plateau, soldiers are hired by the village communities and their administration. Additionally, the livestock pens are often protected by performing rituals and therefore are also subject to several taboos. The most common reaction of the herders is a spatial reaction – they seek to avoid the areas where the *malaso* activities are estimated to be high during that time. This leads to a concentration of herds in the coastal plains that are assumed to be safer.

The herders from the coastal region who stay in the riskier plateau area during the rainy season's transhumance movement nowadays tend to return to the coastal region only after some weeks – historically, they stayed some months on the plateau with their herds. Back then, the vegetation in the coastal region with very poor sandy soils and an even lower precipitation than on the plateau had time to recover in the rainy season while the herds were grazing on the plateau. Nowadays, the early return of the herds from the transhumance to some extent hinders the regeneration of the vegetation, both of fodder grasses and of the *samata* tree (*Euphorbia stenoclada*), an arborescent spurge-species with coral-like branches rich in latex, which serves as important supplementary forage plant during the dry season. The situation has become even more critical with the increased tendency of herders from the plateau area to cope with the high risk of cattle thefts in the dry season by temporarily moving their herds to the coastal region. This new movement leads to an even higher grazing pressure on the pastures and the fragile vegetation in the coastal region.

On a community level, several attempts have been undertaken to minimise the risk of cattle thefts. The local people have performed social pacts/oaths (*titike, kine*) on different levels. This social pact is a malediction of persons who are possible thieves. It is a form of moral protection of the herds and menace of potential criminals. Whereas on the plateau this procedure has only taken place at village level, in the coastal region this did also take place on regional level: In February 2013, the clan chiefs (*mpitan-kazomanga lava*) of the clans Temahaleotse and Tevondrone have conducted a big region-wide *titike* concerning all clans of the Tanalana and Vezo. On the plateau, the chiefs of the clans, the *fokontany*, and the communes of Behaitse, Betioke and Ejeda, have created a supra-community rule (*dina be*) against the participation of villagers in cattle thefts. By this, the problem of has considerably diminished (state: May 2015).

The depletion of fodder resources in the coastal region

The accumulation of herds in the coastal region is especially critical because of the small area that is available. In the west, the coastal region is limited by the ocean (Mozambique Chanel) and in the East by the National Park Tsimanampetsotse where livestock is officially forbidden in the ecotourism and core zone. This area was a traditional pastoral area and still is part of the road for the traditional movements between coastal region and plateau in the transhumance season when the herds are allowed to bypass the park. Especially with the extension of the park from 43.200 to 203.740 hectares (2006/2007), the traditional pastoral area was restricted to a size which does not offer enough space for herding the cattle. In consequence, despite the interdiction, nowadays there are still herds entering the Park regularly, but also illegally, with the threat of punishment in case of being caught by the authorities.

Another aspect that limits the availability of pastures in the coastal region is the on-going expansion of the families' crop fields at the expense of the common pasture areas. Population growth and nutrient leaching due to non-sustainable agricultural techniques lead to this on-going process. The over-grazing of the coastal region already lead to vast areas of anthropogenic low productive grassland and half-open shrubland which is significantly poorer in plant species richness, especially indigenous woody plants, while the proportion of alien plant species rises with their degradation. The relics of forests are still rich in indigenous species, but their extent has declined over time. The unpredictable climate with years of severe drought exacerbates the situation. The carrying capacity of the pastures is much lower in those years, and the over-grazing in these times may lead to irreversible damages to the ecosystem. Its regeneration in moister years is hampered by the high livestock densities.

Overall, the provisioning of natural resources is decreased and some habitats are degraded. At the same time, the local population is dependent on the exploitation of the natural resources: They do not only need livestock fodder, and human food, but also firewood, construction material for houses, furniture, ox carts, boats and coffins, medicinal plants, and specific species used for specific rituals.

As explained above, the climatic and edaphic conditions in combination with the altered herd movement characteristics and the restricted pasture area do not support livestock raising based only on fodder grasses in the coastal region. The herders are dependent on supplementary fodder plants to avoid lower productivity of their herds or even to guarantee their survival. In the coastal region, these supplementary fodder plants even exceed the importance of grasses, at least during the long dry season.

Some supplementary fodder plants are obtained from the private land of families and are therefore strictly private; this includes crop residues, grass, weeds, cactus (*Opuntia spec.*, locally called *raketa* or *viro*), leaves of trees, and high growing shrubs, made

accessible for the animals by shaking or cutting off bigger branches and the *samata*-fodder tree. These privately owned resources are in first place only accessible to members of the household, but are sometimes also shared with relative and friends from the plateau, and even sold to other villagers and guest herders.

Among the resources that are common property, the stocks of wild *samata* play a key role. During the dry season (May-November/December) both herds originating from the coastal region as well as from the plateau are located in the coastal region, but fodder grasses are in this season very sparse and of low quality. The branches of the *samata* tree are cut off the plant, chopped to small pieces, and then fed to the animal to provide fodder and moisture. By this use, the trees are severely harmed but if they are not over-exploited, they regenerate after 1-3 years of enough rain. However, the high demand for this fodder resource has led to an actually severe over-use of many stocks: The first cutting of a young tree takes place earlier, and whole trees are cut down or cut so heavily that they die, or at least do not really regenerate. Moreover, the lower rainfalls lead to lower growth and regeneration rates. Over time, the available *samata* stocks have in many areas turned out to no longer be sufficient to fulfil the needs of all local herds. Thus, the herders are obliged to buy supplementary fodder from local villagers who own private *samata* trees, or to search for *samata* trees further away from their home village. Locally, the shortage in available *samata* biomass even leads to temporal migration of coastal herds within the coastal region. As the *samata* stocks are still more abundant in the less populated southern part of the region, the herd movements nearly all move in a north-south direction.

The privatization of fodder resources in the coastal region

Another reaction of the local villagers in the coastal region on the increasing demand for *samata* fodder is the tendency towards privatisation of *samata* trees. In general, property right rules outside the village are simple by now: Fenced areas (normally with hedges) are private, while all other areas and their resources are common property and may be exploited by everybody. Consequently, *samata* trees growing in fenced enclosures for protecting crops or grass (*valan-boka* and *valan-baiboo*), and in livestock pens (*kialo*), are clearly private property and their use restricted to the owners. Also the *samata* trees around the livestock pen are considered private, but the radius and thus amount of private trees is still a matter of local discussion.

As the people do not know any method to multiply the *samata* tree with seedlings or cuttings, they instead increase their own private stocks by digging out small trees from the wild stands on the common grounds, and replanting them onto their private land. This practice is widely accepted, but hampers the regeneration of the wild population.

In the last years, people have started to fence much of the common land in order to appropriate the *samata* stocks on the land. Today, even people without livestock own their own private stocks for selling the branches to herders. A regional market for

samata has emerged with still increasing prices, turning this plant into a regional cash crop. Prices are determined principally by negotiation between seller and buyer and the overall supply in the village. Converted to an amount of *samata* that feeds 15 cattle for 5 months, prices (from 2013) range between 17,000 and 855,000 MGA (4,8€ - 242€, median 75 000) and if paid in cattle between 0.14 and 4.69 animals (median: 0.5, mainly of *tamana*-category, one to two year old females, data from 2012/2013). The increasing scarcity has led to a considerable rise in prices in the last five years. *Samata* is however mostly preferred over cactus, as the latter is more expensive and besides chafing also requires burning off the spines.

Different meetings and discussion on the *commune* and *fokontany* level have taken place in order to find a common rule for the management and privatization of the *samata* fodder resource. Some *fokontany* and *communes* of the region have also created new rules, however these are only poorly implemented and the unregulated privatization is ongoing.