UPPSALA UNIVERSITET

Madagascar

Progress report from the field season of 1999

The field season was conducted by Dr Chantal Radimilahy assisted by Dr Amelie Berger and Dr Jean-Aimé Rakotoarisoa together with colleagues from Musée d'Art et d'Archeologie, Université d'Madagascar. This project is an integrated part of the Human Responses and Contribution to Environmental Change Programme . Theme 3 of this programme deals with long-term shifts in resource utilisation and points out si important factors to focus upon: agriculture, cattle and marine resources for food procurement, metals, housing and trade.
The aims of the project is to provide a realistic view of possible early cultivation systems in relation to known archaeological settlements in eastern and southern Africa. To assess the carrying capacity and the long-ter effects upon environment of these production systems i order to understand shifts in resource utilisation and settlement patterns.

UPPSALA UNIVERSITET

Madagascar

Progress report from the field season of 1999

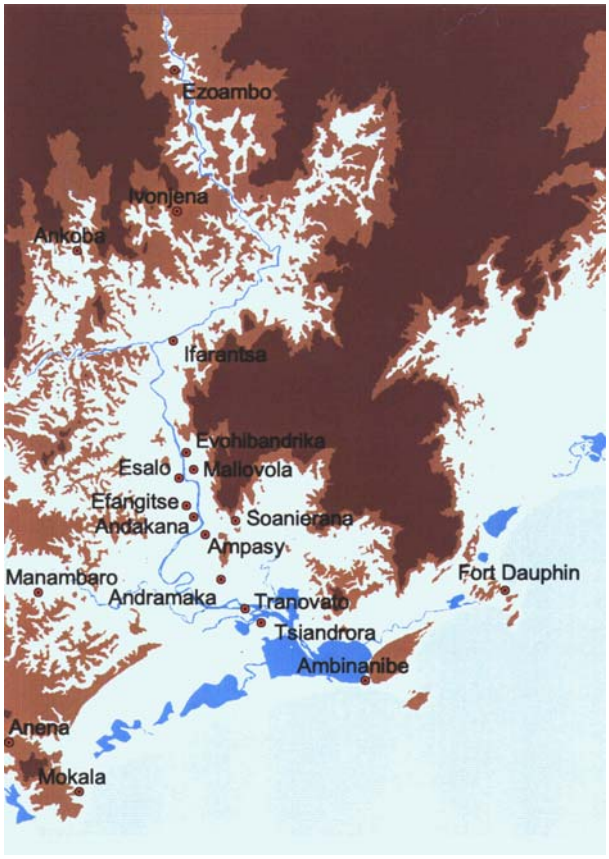
Part 1: Introduction

This project is an integrated part of the Human Responses and Contribution to Environmental Change Programme . Theme 3 of this programme deals with long-term shifts in resource utilisation and points out six important factors to focus upon: agriculture, cattle and marine resources for food procurement, metals, housing and trade.

The aims of the project is to provide a realistic view of possible early cultivation systems in relation to known archaeological settlements in eastern and southern Africa. To assess the carrying capacity and the long-term effects upon environment of these production systems in order to understand shifts in resource utilisation and settlement patterns.

There are two major questions to be answered: Seen in a long-term perspective, how do climate and environmental conditions, such as length of growing period, set the limits for agricultural production at the various sites of archaeological settlements in southern and eastern Africa and what impact may people's agricultural activity have had in these areas?

One of the two proposed areas of study is the Anosy area which is located near Fort Dauphi (Tolanaro) in the Southeast of Madagascar. The area has been investigated by Jean Aimé Rakotoarisoa (Rakotoarisoa, 1994) and contains a wide range of sites (from AD 1100 - 170(representing different types of environment. After a short visit of five days in 1998 when I first got to know Anosy (Berger, 1998) I returned back in February 1999.



Together with Dr Jean-Aimé Rakatoarisoa and Dr Chantal Radimilahy field work was planned for three weeks (including travelling by land rover from Antananarivo). Besides J-A Rakatoarisoa (five days) and C. Radimilahy (14 days includin travelling), the team consisted of Mr Stéphan Rakotonandrasana (botanist) (full time) and Mr Victor Razanataro (driver and facilitator).

The field work consisted of two majc tasks:

1) to survey the Anosy area with regard to land use and vegetation

2) to collect information about food production/food acquisition taking t account not only crops, domestic animals and fishing but also the use of wild plants and animals.

After three long days in the land rover, we successfully but not without difficulties reached Fort Dauphin.

In Anosy (see map) we stayed most of the time in the countryside. Base in Ambinanibe, Soanierana and Montifeno (representing three different land systems) we had the opportunity to come in close contact with the residents in these villages. We also did short visits to other villages in the neighbourhood. Extended data was collected from two villages in the coastal area (Ambinanibe and Mokala which both have archaeological sites), two villages in the midland river valley (Soanierana and Esalo, located close to the archaeological sites of Efangitse and Maliovola) and two villages in the upland (Montifeno and Fanjahira). Interviews were also conducted with people living near the archaeological sites of Maliovola and Efangitse. We went by boat from St Etienne to the archaeological sites of Tsiandrora and Tranovato and further up the river to the bridge near Soanierana.

UPPSALA UNIVERSITET

Madagascar

Progress report from the field season of 1999

Methodology

While travelling from one place to another we took notes of vegetation and cropping system using transparent overheads with a 1 cm grid which were placed on top of the map of Fort Dauphin, scale 1:100 000, thus each square giving the size of 1 km². Each square showing the occurrence of a particular crop was marked. This was done for the three major crops of rice, cassava and sweet potato.

Extended data was collected from two villages in the coastal area (Ambinanibe and Mokala which both have archaeological sites), two villages in the midland river valley (Soanierana and Esalo which are located close to the archaeological sites of Efangitse and Maliovola) and two villages in the upland (Montifeno and Fanjahira). Interviews were also conducted with people living near the archaeological sites of Maliovola and Efangitse. We went by boat from St Etienne to the archaeological sites of Tsiandrora and Tranovato in the lowland river valley (fig. 1).

When collecting data in the villages we practised both qualitative and quantitative methods. In the beginning we had open-ended and semi-structured interviews with the villagers about food production, use of wild plants and animals, household economy, trade and life in general. This took place in formal meetings headed by the presidents of the villages and during informal talks with people in smaller groups (fig. 2). The presidents were key-informants but their information was cross-checke with other members of the village. In Soanierana six children aged 10-14 years assisted us for two days.

In Ambinanibe, Soanierana and Montifeno (representing three different land systems) we were walking through the bush where we were shown many edible wild plants and samples of these were taken for identification and/or confirmation (fig. 3 and 4). A preference rankir for the 5 most important plants was given. The lists of plants (one for each land system hav been complemented with data on habitat, abundance, bio-geography. Lists of edible wild animals (including fishes, birds, insects and mammals) were also compiled, however, there were some difficulties in identifying the names because we lacked samples and the local names sometimes vary from place to place.

At the end of our stay in each village we asked for more detailed information about the importance of a specific food resource in relation to all other resources used in the diet usin a ranking procedure from 1 (little) to 3 (much) (fig. 5). Attention was also paid to the yearl variation so that ranking was done for each month or during 'Asotry' (May – October i.e. the dry period) and 'Asara' (November- April i.e. the wet period). In this way it will be possible to construct pie-charts of food resources from each village using six different sections: crop wild plants, domesticated animals, wild animals, marine and fresh water resources.

UPPSALA UNIVERSITET

Madagascar

Progress report from the field season of 1999

Cropping in relation to the land systems

There are three major land systems: the crystalline, alluvial and dunal land. The crystalline land can be divided in mountains above 100m (which at least above 200m to a large extent is covered by primary forest), hills (25 – 100m) and riverine of Efoha with adjacent rivers (fig. 5).

The riverine of Efoha has three distinct parts: the lowland where the river meanders from th lagoons near the coast through the flood plains, the midland where the river goes fairly straight from the flood plains to the interior and finally the upland riverine. Alluvial land is dominated by the lowland riverine flood plain and coastal marshes at the edge of lagoons (fig.6).

Dunal land comprises of hilly ancient inland dunes and recent coastal dunes. The river Efoha connects the different parts of the region and provides an important way of communication between coast and inland (figs. 7 and 8 right).

Although the research area is not very large and many crops are grown in all land systems (or sub-units of these) there is a differentiation in crop production. In the coastal areas with dunes, some crystalline mountains and marshes (Ambinanibe and Mokala) the dominant crops are maize, sweet potato and cow pea (*Vigna unguiculata*) (figs. 9 and 10).

Rice is not grown in Ambinanibe but in Mokala which, in spite of being located near the sea, is surprisingly dependent on agricultural production. This is possible because of the neighbouring crystalline mountain which provides the accumulation of water near the base of the slopes which in turn allows construction of water controlled terraces (fig. 11). Fruit trees are few: coconut, papaya and banana.

In the lowland riverine (Tsiandrora and Tranovato) and on the flood plain crop cultivation is limited (fig. 12). Cassava is usually grown near the edge of the river because it is less susceptible to uncontrolled flooding. Mango and banana. The flood plain once was covered by two big 'riziéres' but they have been abandoned (fig. 13). The explanation is that the irrigation system has collapsed as a result of too much sand coming from eroded areas of the inland mountains where the trees had been cut. Except for minor rice fields cassava is grown on the flood plain. Coconut trees and sugarcane are common as well as 'viha' (*Typhonodorum lindeyanum*) (fig. 8 above) which naturally grows in the rivers and is used as a crop of famine.

In the midland riverine (Soanierana, Efangitse, Maliovola, Esalo and Ifarantsa) cassava becomes a major crop sometimes grown in rotation with sweet potato. Paddy rice is important. The majority of the rice fields ('horacas') are located at the bases of the crystalline mountains (as in Mokala) but there are also fields along the riversides (fig. 14 below). There is limited cultivation of maize and pulses (including cowpea and groundnut).

The region is very ric in cultivated fruit trees: avocado, banana, 'coeur du boeuf' and corossol (*Annona* spp.), citrus

guava (three species of *Psidium*), jackfruit jambolan (*Eugenia brasilensis*), litchis and mango (fig. 15).

The upland area (Montifeno, Ezoambo and Fanjahira) is characterised by mountains (more or less covered by forests), savannah and riverines. Near the mountains there are plenty of rice fields together with cassava, sweet potato, groundnuts and maize (fig. 16). Sugarcane is frequent. Several fruit trees are grown: banana, citrus, corossol, jackfruit, 'kardibefo', litchi, mango and papaya. The slopes are primarily used for grazing ('ronga'). The savannah is covered by Poaceae grass and 'vontaka' (*Strychnos spinosa*) which is an indicator plant of degraded grassland (fig. 17). There are tiny riziéres' in the small riverines and slash-and burn cultivation ('tavy') is widely practised for cassava but to a very limited extend for rice (fig. 18). Another form of dryland rice cultivation is 'lemoki' located next to the paddy rice fields near the river and below the hills (fig. 19).

Important wild plants are 'lamonty' (*Flacourtia ramontchii*)(fig. 21). There are (at least) three potential food plants of yams, *Diascorea heteropoda (fig. 22), D. sosi* and *D. sansibarensis.* The fern 'boreko' (popular legume) and *D. sosi* are threatened species. Several cultivated and wild plants found in the field are mentioned in the documents by Flacourt (Histoire de la Grande Isle Madagascar) from the middle of 17th century when Flacourt was staying in Fort Dauphin. His detailed description of the living conditions at tha time includes listing of many plants and will be used as a source for reconstructing the cultivation and food acquisition systems of the Anosy people.

UPPSALA UNIVERSITET

Field season 99
Report part 1 Introduction
Report part 2 Methodology
Report part 3 Cropping in relation to land system
Illustration list

UPPSALA UNIVERSITET : Arkeologi och Antik historia : Afrikansk och jämförande arkeologi : Projects

Madagascar

Progress report from the field season of 1999