

# THE GEO MENO FOUNDATION AND ITS WORK IN THE VILLAGE OF GERODHERE, INDONESIA

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The Geo Meno Foundation is a newly developed self help community development institute established in 1988. Farm and Social Forestry are used by the Foundation as methods for coping with several agriculturally related problems. Experiences with other NGOs led to the decision that there was a need for more practically oriented research and implementation with the rural poor. Tonny Djogo together with members of his family, students and the people of Gerodhere village began to tackle local land degradation problems by establishing a nursery centre for various kinds of multipurpose trees and shrub species either local or introduced.

Initial activities included the establishment of a nursery, soil conservation measures using hedgerows of *Gliricidia sepium*, *Acacia villosa*, *Leucaena leucocephala* and *Cassia siamea*, and an arboretum and seed gardens.

## **The First Phase**

One of the first activities was the inventory and selection of local multipurpose trees and shrub species useful for agroforestry. The survey focussed on drought resistant species as this area is in the dry zone of Nusa Tenggara Timur. During the research a large quantity of seeds were collected and distributed to many farmers. Seed germination trials were also started in the local nursery to obtain some understanding of their germination capability. Most of the species studied are growing naturally but farmers rarely grow them deliberately on their own farms.

## **List of Local Species from Timor for Preliminary Trials**



In conjunction with research on suitable plants work was also carried out on local agro-ecosystems including traditional agroforestry systems practised by local farmers.

### **Reconnaissance Survey From Bajawa to Gerodhere**

In 1988 two members of the project made a preliminary approach to the people of Gerodhere and to local government officials. This visit also enabled the project staff to familiarise themselves with the local farming systems and biophysical conditions. A collaborative relationship was established between the project and the local agricultural office in Bajawa.

The biophysical environment of Gerodhere is different in many ways from most of the villages in Flores. It is an 'enclave' of uplifted clayey marine terraces on a volcanic island. Soils are calcareous and clayey, and annual rainfall is about 1500mm over a period of 3-4 months. In the 1960s local people established a large furnace for burning natural local limestone to convert it to a material suitable for building. However, the furnace required 32 m<sup>3</sup> of firewood every time a load of rock was baked. Eventually the supply of wood diminished and the furnace was no longer viable and also poor road access made it difficult to market the converted limestone.

Gero and Dhereisa are the two main hamlets that comprise Gerodhere. Traditionally people of Gerodhere used to build terraces on the slopes for soil erosion control. However, soil fertility was not maintained by the farmers and gradually as farm plots became exhausted farmers would clear more land for agriculture by burning. Thus the area of degraded land spread as farmers moved further into previously uncultivated areas.

Now the landscape of Gero is dominated by grasslands with very few trees or shrubs. In the 1950s-60s, it was reported that there were still large areas of dense forest, and farmers were able to support large numbers of cattle. Now there is only grassland and very few livestock. This decline in the number of livestock is due to a number of factors: sale of cattle to supply cash for food; the lack of fodder; and the spread of anthrax.

The supply of firewood is also becoming a major problem. Many trees have been cut down for firewood and for building materials or have been destroyed by fire in the quest for additional agricultural land. The decline in forest cover has led to a change in the types of firewood used by women. Women are now forced to supply their needs with twigs collected from their gardens or river banks. Previously, ample supplies of firewood were available from the forests.

The degrading biophysical environment has also led to changes in households' diets and a decrease in food diversification since the 1960s-70s. At this time there were several main staple foods - maize, sorghum, millet, 'keo' (Job's tears), rainfed rice, sesame seed and about four or five types of wild root crops (*Dioscorea* spp.). Cassava and sweet potatoes are also major sources of food. In November-December local people went to the forests to collect mangoes. Ripe mangoes were sliced and dried and then stored in baskets to be used as emergency food if there was a poor harvest from the farmers' plots. Legumes used as a source of protein included *Cajanus cajan*, rice bean (*Phaseolus* spp.), local soya bean, green gram and peanuts. At that time there were also various types of fruit trees but since then the numbers and varieties have declined. These fruits included guava (*Psidium guajava*), pineapple, orange, mango, *Annona squamosa*, *A. reticulata* and

*A. muricata*. There were also many types of gourds and pumpkins. All these plants and trees occurred in large stands in the bush, on farmers's plots, and in homegardens. Now most of these species are rarely seen.

This decline in local germplasm of both crops and trees is influencing the stability and sustainability of the agro-ecosystem. Farmers' diets now tend to be dominated by rice. Intensification of rice production has not always led to increased production as many farmers cannot afford the necessary inputs to increase the fertility of their land. This radical and rapid change in traditional cropping systems has led to long periods of famine and to the increased out-migration of young men in search of non-farm based work.

In the 1970s, the government introduced cashew nut plantations in Gero, as was common in most areas of Nisa Tenggara Timur. Although this was a community project which involved individual farmers' land, cashew was also planted on some communal land. But as farmers did not obtain direct benefits from the project most of the cashew trees were not cared for and in many cases the trees were felled. The project had also promised the local people that the cashew nuts would realise a high cash value. However, when the cashew trees produced fruits and seeds there was no market. This also led to widespread local dissatisfaction and resulted in the felling of more cashew trees. Thus when the world market for cashews picked up the farmers had insufficient trees with which to supply the market, and by this stage they were not prepared to reinvest in cashew and thus disturb their existing farming system.

There are several major issues to be addressed by the Foundation in Gerodhere village:

1. Soil conservation measures must be introduced to improve and ensure an ecologically sound agricultural system.
2. Fodder supplies pose serious problems for the development of livestock husbandry. There are vast grasslands but their botanical composition together with the land tenure system does not make these areas suitable for livestock.
3. The existing systems of integrating trees and crops on farmers' land should be strengthened with new agroforestry technologies.
4. Tree species should be appropriate and of benefit to villagers.
5. Firewood is a problem for all households, and thus needs to be addressed. This is in contrast to most Timorese villages where firewood is abundant.
6. There is limited water availability which will hinder any new developments within the village.
7. Slash and burn systems together with hunting will continue to devastate natural resources. This may also hinder the planting of trees on communal and private lands.

Following a survey of trees on farmers' land a nursery was established with seedlings of a number of different species both local and exotic. All the species used are to fulfil needs identified by farmers. Several enthusiastic local farmers are involved in trials of tree species on their own land. The remainder of the seedlings raised will be used in village-level reforestation programmes.

### **On-Farm Field Trials**

There are several types of programmes and trials planned for the implementation of agroforestry interventions:

1. Direct on-farm trials in the form of hedgerow establishment to reinforce existing terraces on farmers' land and as a measure for erosion control and soil fertility maintenance.
2. Establishment of a seed garden and arboretum of all the desired species to act as a seed supply and store. Seed supply is one of the major constraints in any agroforestry intervention as seed is required in large amounts for hedgerow planting. Species suitable for hedgerow planting include: *Acacia villosa*, *Gliricidia sepium*, *Cassia siamea* and *Leucaena leucocephala*. Species suitable for live fences include: *Thevetia peruviana*, *Acacia farnesiana*, *A. catechu*, *Parkinsonia aculeata*. Species raised for fodder include: *Sesbania grandiflora*, *Acacia polyantha* and *Albizia lebekioides*.
3. Design of improved agroforestry systems. This is based on upgrading existing agricultural production systems using an agroforestry approach. Any systems introduced are simple in order to facilitate adoption by farmers. Home garden improvement will also form part of future strategies.
4. Social forestry planning. Agroforestry will be developed together with a social forestry programme. Agroforestry will cover interventions solely on farmers' land whereas social forestry will be based on both farmers' land and communal land.
5. Micro-watershed management will be based on initial agroforestry work carried out on farmers' land. All initiatives will be built on farmers' understanding of their own land, and from this basis farmers' will be encouraged to increase their understanding of the larger environment in which they live i.e. the watershed. In conjunction with social forestry planning the watershed programme will conform to the general objective of improving existing agricultural production systems using multipurpose trees and shrub species.

## **CONCLUSIONS**

This newly established NGO takes a grass-roots approach and has learnt from the successes and failures of existing NGO programmes. Its focus is on farmers' needs and it is based on an understanding of the key local agricultural problems. A combined farm-social forestry approach is taken to provide some solutions to the current land degradation problems. The programme is supported by scientific research conducted in conjunction with farmers and research institutes. The research will be applied and relevant and will focus on working with key farmers. Thus it is hoped that this type of multi-faceted approach will help farmers to improve their local environment.