

Permaculture-Station Andasibe

Report – December 2015

During the last 12 months our efforts have been to explore how Permaculture can be implemented at the East Cost of Madagascar. Motivated by the wish to offer a solution to:

- the destruction of the forest by slash and burn agriculture,
- the following erosion,
- poverty of the population.

Insights and happenings so far:

The Problem

Traditional farming in most parts of Madagascar is based on the slash and burn method. Natural forests are cut and the biomass burned. Doing this, the organic matter is lost and the humus-cycle interrupted. When rain comes, the nutritious ash, as well as the upper layers of the soil, are washed away, reducing extremely the fertility of the fields.

The second problem is the drainage of water. Soil in this state is unable to absorb the water, it flows quickly away and groundwater can't be replenished = groundwater levels sink.

In short: rain-times mean flooding and dry times are droughts – no balancing properties to ease these extremes.

On the fields created by slash and burn people are growing most of the time only one generation of maize, rice, and beans. Removal of occurring weeds requires a lot of labour. Later the fields become overgrown with wild plants and go through a biannual fallow period. Only by allowing these fallow times, the fields can be planted once more. This is a downward spiral. With each slash and burn (called in Malagasy: tavy) the soil's quality is decreasing. The natural process of regeneration (succession) is regularly interrupted. Partly whole slopes are sliding down, leaving craters.

After a period of approx. 20-30 years, the fields have to be left behind and next parts of the forest have to be cut down. The land utilised per person is 3 hectares, sometimes more (own food plus cash crop). This is an extreme amount of labour input for only a very small return.



Permaculture Tools: The Solution

First step: Digging ditches, called swales, horizontal along the slopes. They collect the rainwater as well as the soil and nutrients, which have been washed away so far.

Second step: Creating terraces between the ditches which further stop the erosion.

Third step: along the slopes, between the terraces, we plant a mix of perennial plants (Mischkultur). They consolidate the soil that nothing can slide down any-more. The vegetation provides a sustaining harvest as well. We plant: trees for timber, fruit trees, coffee, cacao, soft fruits and bananas. And as ground cover: mint, sweet potatoe strawberries an more.



The terraces can be planted with annual crops like: maize, beans, pumpkins, rice, vegetables, potatoes, and dwarf beans. There is no limit to the creativity how the systems can be planted. After 3 months, the farmers are able to harvest the first time. (beans and potatoes). This entire Vegetation is mimicking the natural process of succession = how wild plants occur over time. We combine deep-rooting plants, like root vegetables, trees, comfrey... with nitrogen fixing leguminous plants (acacias, beans, peas, peanuts) and biomass producing crop like maize, bananas, sugar cane and pumpkin. The combination of these plants makes facilitate the rebuild and recovery of the genuine fertile soil.

The terraces and swales contribute also to maintenance of fertility. This is the accumulating, synergistic effect of permaculture tools. This leads long term to the most possible „maximum-growth“. What this will be here we still have to find out. But due to the more intensive use of the land, improvement of moisture and nutrient supply, we assume, that an increase of production by minimum a factor of three can be achieved.



Conclusion

When the farming on frequently changing fields can be stopped, by applying Permaculture methods, it will be a successful protection of Madagascar's remaining natural forests. Using terraces eliminates the need of fallow times, and reduces directly the need for land to about a third of the use now – which sets space free for reforestation.

In the next step we can even reduce the landneed furthermore: due to the more concentrated use of the land, improvement of moisture and nutrient supply- an increase of production per acre by a factor of 3 can be expected. This can either lead to total farmland-reduction with the factor of 9, or a multiplied harvest by the factor of 3 (in comparison to yields by farming conventional method).

This has the real potential to end poverty.

In our theoretical calculations we figured out: We could even increase production by factor 5 as mentioned, when we include the fallow land, the number rises, to a factor of 15 times more harvest-per-hectare, than the presently used farming methods. In this theory the further, utilisation of land could be divided by 15. But, this might well be calculated too high, since this would mean that one

person could meet their needs from 2000m² instead of 30 000m². However we can not completely dismiss this thought, because 5kg crop per m² on 365 days growing time is reasonable. (means i.e. 1,5 tons of food per person, enough to eat and to have cash-crop). We harvested, on medium quality soil, already 1kg/m². Beans and potatoes need 90 days from seed to harvest. Therefore we can harvest four times and yield 4kg per m² and year. Not so far away.



Economical and Social Challenges

We experienced, that our method is working well. It confirms that the plan is realistic. Now we are exploring, how the whole project can be put into practise considering the human, social, cultural, legal and, with priority, the economical level. Madagascar accommodates about 4 million families on smallholdings. Our work will only be sustainable, when we find a solution for all of them.

Until now we have, two smallholder families, our permaculture station and one school-garden in the east-cost region of Moramanga, plus a request for a next school-garden. In the High-lands we juststarted a new site that will be a economical operation to fund further farms.

In addition we want to have a farm for ourselves, as a base for all activities. The Permaculture Station is just too small.

As a next development-step, we want to stretch the programme to the number of 50 smallholders. It will extend our experience, and provide the possibility to put on trial, how the new techniques can be applied over large areas. We know meanwhile that the Malagasy don't like to work single on the fields. Observing this, we have got the idea to create teams. They can work together and rotate all over the fields of the team-members. As a side-effect the already experienced workers can to introduce and teach newcomers. The whole process of change and education takes three years. In year 2-3 the students turn into teachers, to broadcast the new knowledge. To support more and more smallholdings without a monetary input, we have the following plan: From year 2-3 onwards we will request 30% of the harvest for 8 years, as a feed back contribution to the permaculture station and so to next farms. Malagasy will help malagasy.

That's it for today, kind regards from Madagascar
Lukas Uhl

www.tany.ch/permakulturstation

