

This case study deals with the analysis of the situation of small-scale family farming in Tauá municipality in the state of Ceará, Northeastern Brazil and the participatory process farmers of Tauá and staff of ESPLAR and AS-PTA were involved in to formulate the Agroecology Development Plan. The practical experiences of farmers and scientific insights of project staff were merged to provide the basis for the wider development plan, which involves the whole municipality. The process was started on request of the small farmers' union, putting forward to the NGOs the need to adopt a scale of activities wider than in any other NGO experience in Brazil.



Photo: Pedro Jorge F. Lima

Communal participation in agroecological planning

Jean Marc von der Weid

Tauá, which consists of over 200 communities, is among the largest municipalities of the state of Ceará, with an area of 4400 km² and a population of 51,000, of whom 29,000 live in the rural areas. Its climate is hot and dry: an average rainfall of 453 mm (mainly January to April). In such harsh conditions for rainfed agriculture, farms with less than 200 ha are considered small. Small farms make up 88% of the total number of farms, but they occupy only 43% of the total amount of the land (there are some 2,900 small farmers with an average farm size of 50 ha).

Environmental conditions are quite diverse. Patches of high or medium fertility soils are found in most places. The soils in the riverside area are particularly fertile. Trici and Jaguaribe are the only perennial rivers in the municipality. The native vegetation has been very much destroyed and there are only very few patches of more developed secondary forests left, in which xerophyte species are quite common.

The most frequent agricultural system in Tauá combines sheep, goats, maize and beans. Cotton (especially an arboreal variety) and castor-oil used to be traditional crops in this system. Both were planted mainly to be marketed, while maize and beans were mostly for consumption. Domestic animals were kept for multiple reasons: for marketing, as food and as

"savings account", depending on the situation. Many other crops and domestic animals are of secondary, but still significant importance such as rice, cassava, sweet potatoes, pumpkins, watermelons, bananas, various vegetables, sugarcane, domestic fowl and pigs. All these are used mostly for home consumption. Several products are taken out of the forest, especially firewood, both for domestic use and for marketing (charcoal).

Crops are planted in patches of cleared land where the native vegetation has been burnt. Soil and topographic diversity are meticulously exploited, resulting in fields with a great diversity of species, even though maize and beans are predominant. With the exception of patches of deeper, alluvial soils, fields are usually cultivated for one year and afterwards left fallow for long periods (from 12 to 25 years). The use of organic fertiliser, manure as well as legumes, is sporadic and limited to home gardens. Domestic animals get their food not only from natural grazing land in deforested areas, but also from herbaceous and shrubby species in fallow or forest land. Crop residues are also very important as animal fodder.

Farming is still very traditional, agrochemicals are nearly not used because chemical fertilisers, pesticides and herbicides are too expensive and frequent droughts make the use of these inputs very risky. When available at subsidised prices, farmers sometimes use "ant-killers". Certified seeds of beans and

maize have been commonly used since a state programme started to provide them at competitive prices. However, these varieties are not well adapted to all growing conditions in the region. Many local and traditional varieties have disappeared since the introduction of the programme.

Small farmers' problems

In the last ten years, three factors have led to a profound unbalance in the traditional agricultural system in this region:

- a growing irregularity of rainfall over the year
- the disappearance of cotton (because of bollweevil (*Anthonomus grandis*) infestation) and castor-oil (because of marketing difficulties)
- the growing fragmentation of small farms due to population growth and concentration of land in the hands of few farmers. This makes long fallow periods to recover the soil's lost fertility impossible. For the same reason, livestock pressure on pastures and fallow lands is too high. Water and soil conservation measures are not taken. Degradation of the natural environment leads to increased vulnerability to droughts and pests and predators are no longer balanced. Pest incidence, especially of ants and caterpillars, increased enormously.

The effect of these three factors is disastrous for small farmers. Forced to search for new cash crops, farmers began to plant more maize and beans, both having a

secure market, but not always selling at a good price because of the commercial system, which is strongly controlled by middlemen. Selling their subsistence crops makes farmers much more vulnerable. Forced by increasing debts, farmers sell their products immediately after the harvest when prices are lowest. It is therefore impossible to build sufficient food reserves. In periods of hunger, when prices are highest, they have to buy food back again. In years with low yields this means malnutrition and hunger. To obtain cash income, farmers frequently have to sell livestock, which means they slowly lose their capital reserve.

Drought periods are getting more and more frequent, which makes the situation even more difficult. In these dry years, farmers try to supplement the small support they get from the government with burning and selling charcoal, which significantly speeds up the destruction of what is left of the natural vegetation.

The situation in the region would have been even more serious if the farmers, especially the youngsters, had not tried to find a solution for their problems by migrating to the cities, the agricultural front in the west of the country or the Amazonian mines. This may take some pressure of the land but creates a new problem: farming is left to women, children and old people. Finding a job in the cities or the West also becomes more and more difficult and labour conditions in the mines are very bad.

Due to the difficult food and income situation and the fact that only half of the farmers have secure access to land, investing in improving farm systems is nearly impossible for most households.

ESPLAR's action strategies

In the period between 1986 and 1991, ESPLAR aimed at wide action, involving the whole state of Ceará, through a training programme in agroecology for village leaders. The programme included theoretical and practical workshops and was divided into 12 periods of three days, concentrated in the six or seven months between harvest and the next planting season. All aspects of the production system were studied and in the final workshops, farm planning was addressed. Participatory teaching methods and intensive exchange of experiences among the farmers themselves resulted in a very dynamic process, which in five years attracted more than hundred village leaders from all over the state. The workshops took place in ESPLAR's demonstration farm, which made it possible for the trainees to see and practise the methods proposed during the courses.

However, when this strategy was evaluated, the results did not quite live up to the expectations. First of all, the adoption rate of the proposed technologies was less



Photo: Jean Marc von der Weid

than 10%. Farmers chose only very few of the many practices presented during the workshops. Farmers never adopt too many new practices in their farming system at once. Instead, they prefer to cautiously make small changes over the years. In the workshops all practices were introduced at once, and therefore, those not chosen by farmers for immediate adoption could easily be lost altogether. The evaluation also showed that some of the practices presented were adopted by more farmers than others. This indicated their relative appropriateness to the farmers' situation and the importance of the problems these practices relate to. Shortage of labour made it necessary to abandon proposals such as compost making and land preparation without burning.

Secondly, results of strategies for diffusion in the villages, in which the trained leaders had a major role, differed greatly. The immense amount of new knowledge acquired left many of the trainees confused and this blocked initiatives to transfer this new knowledge to the villages. It would be better to offer a limited number of practices per agricultural season and set up a programme of training, experimenting and adopting, which runs for several years.

Successful experiments

Despite all these problems, quite a few village activities took place in Tauá and other regions. Some examples:

- The comeback of arboreal cotton cultivation, in mixed cropping with leucaena, *algarrobo* (*Prosopis juliflora*) and *sabiá* (*Mimosa caesalpiniaefolia*). A shorter cycle variety was introduced, which together with control of bicudo beetle through hand-picking or animal grazing, made it possible to recover cotton fields.

Successful experiments caused a comeback of mixed cropping. In this photo, maize and castor-oil can be recognized. Beans have been harvested already, while leucaena has been pruned.

- The use of small dams for irrigated vegetable production.
- Enhancing the *capoeiras* (areas with secondary vegetation regrowth) through plant species selection made it possible to support 50% more goats per land unit.
- Introduction of herbaceous legumes for fodder (especially *cunha* [*Bradburya sagittata* Rose]), in crop mixtures or rotated with maize and beans.
- Planting along contour lines to reduce runoff.

Hardly ever, more than one practice at a time was adopted in the same village. Even though much of the practical information was not used in the end, agroecological consciousness had settled in the minds of youth leaders, women groups and leaders of Tauá's small farmers' union. This proved to be very important in developing a new strategy.

Participatory planning

After identifying the problems with the training programme strategy, it was decided that a plan for successive transformation of the municipality's agroecological systems should be made. To achieve this, together with the farmers, the main bottlenecks in the agroecosystems, had to be identified, their causes and the necessary successive transformation in the next ten years. The union and many grassroot organisations participated.

About 600 small farmers were involved in interviews and meetings. Ten technicians from AS-PTA, ESPLAR and other

organisations linked to the AS-PTA-Northeast network, together with forty village leaders from Tauá worked at this appraisal for ten days. It produced very rich results, but there was a serious problem concerning the development of the plan. Because wide interest in the process was shown, it became impossible to stay within the limits originally designed, namely to concentrate the work in 20 selected villages. The small farmers' union membership demanded a plan for the whole municipality, putting forward to the NGOs the need to adopt a scale of activities wider than in any other NGO experience in Brazil.

The technical measures proposed were based on the Tauá experiences and also on practices known to technicians from NGOs and research centres that helped to design the plan. The most important experiences proved to be the ones dealing with small-scale irrigation and reintroducing cotton. Farmers expect the development of small-scale irrigation to decrease the impact of drought. Even with a maximum of one ha per family it is possible to guarantee and diversify production. Reintroducing cotton, which is very well adapted to the local semi-arid conditions, is expected to increase income as well as fodder production. All proposals were widely discussed among the villagers, who were responsible for selecting the sequence of changes in their system.

AS-PTA and ESPLAR combined these different strategies into the Agroecology Development Plan for Tauá. This plan includes building an infrastructure and buying equipment for irrigation and storage, providing credit, planting and marketing of crops, training and experimenting. As more than half the farmers do not have secure access to land, and therefore do not have the possibility and interest to change their farming system, the plan also intends to buy land. Beside a considerable increase and stabilisation in food production and income, the new approach is expected to also have long-term effects on conserving and regenerating the natural resources.

Farmers take over

In the first year, technicians will play a major role in the training programmes, helped whenever possible by farmers who have already adopted some of the practices. By the end of the first year, farmers will be selected who prove particularly capable of practising the adopted measures, and who have a talent to communicate their experiences to other farmers. It is assumed that these pioneer farmers can take over the training programme, assisted by technicians. After some time, the role of these technicians will be reduced and they will become only consultants for new problems that could arise when the agricultural systems are modified.

Problems

There are three major problems that hinder the implementation of the Tauá plan. The first one is funding. Resources now at hand cover only 25% of the two million dollars needed. The small farmers union, the small farmers associations and the cooperative are now all pressing the authorities (municipality officials, Ceará state government, federal government) and the World Bank, trying to obtain the remaining part of the money needed.

The second problem is the state of calamity of Tauá municipality, hit by the worse drought of the last thirty years. For the implementation of the plan to start, it is necessary that the small farmers keep getting food aid for the next eight months, assuming that it will rain by the beginning of next year. The plan presumes that this aid will be furnished by the Federal Government Emergency Programme, in exchange for the small farmers' labour in building infrastructure facilities and preparing the soil for planting, as proposed in the plan.

The third problem is the multiplication of seeds of the 4M cotton cultivar. Present seed production level of rural villages involved in this experiment is far from enough to keep up with the rapid expansion of the seed demand expected according to the plan. ESPLAR has already managed to buy all seed avail-

able, but a complementary supply by the government's research stations will be needed. This requires a political decision, not only a budgetary one.

Too ambitious?

ESPLAR's and AS-PTA's evaluation of the whole process up to this moment identified two major drawbacks:

- Making a broad and participatory appraisal, without being able to give short-term answers to the problems that were identified, forced us to develop an extremely ambitious plan, taking the potential of ESPLAR and AS-PTA into account. Without the high degree of organisation and involvement of grass-root members of the small farmers union, the whole plan would be impossible.
- At the lower levels of the municipality's peasant movement, the degree of understanding the agroecological principles behind the proposal is limited. Lack of time did neither permit conveyance of a complete understanding nor thorough demonstration of the proposed measures in all rural villages. This will force the plan's coordinators to make an intensive effort in the first two years to make things clearer.

We believe that those involved in the Agroecological Development Plan will understand the plan's measures better step by step. We will keep room for yearly revisions of the individual village activity plans, to make adaptations in the transformation strategies for their agricultural systems possible.

The challenge of linking insights and experiences from the micro to the macro level was taken up in conditions that were far from perfect, but we believe that the participatory features of the whole process will help us to obtain the best results.



Without soil and water conservation measures, the environment degrades rapidly. Even when slopes are not very steep, rainfall can cause tremendous erosion.

Note: This article presents my own view on the process in Tauá and does not necessarily correspond to the views of ESPLAR or the farmers.

Centro de Pesquisa e Assessoria, or ESPLAR, is the NGO responsible for projects in Tauá. Assessoria e Serviços a Projetos em Agricultura Alternativa, AS-PTA began to work with ESPLAR at Tauá municipality when efforts aiming at the transition from the micro-level (village) to the macro-level (municipality) started to be made.

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