

*In 1990 the Tamil Nadu LEISA Network was founded. It is dedicated to development of sustainable, small-scale rainfed agriculture and its members are resource-poor farmers and small non-governmental organisations. ILEIA gives information support and in that context Coen Reijntjes visited the Network in November 1994. A travel report.*



Photo: Coen Reijntjes

# Networking for sustainable agriculture

**Coen Reijntjes**

**A**griculture in Tamil Nadu is changing fast due to various trends which have a major impact in economic, social and ecological terms. In the context of Structural Adjustment Policies, prices of chemical fertilisers and pesticides have gone up due to partial reduction of subsidies and uncontrolled price raising. Where chemicals have been used for some time, their effectiveness is decreasing. Higher levels of chemical fertilisers have to be applied to maintain the same level of production. As prices of products did not increase at a comparable rate, profitability decreased. This explains the growing interest of commercial farmers in alternatives that depend less on the use of costly external inputs.

The amount of protective perennial biomass, trees as well as grasses and creep-

ers, is now very low on sloping drylands. Soil degradation has become a widespread phenomenon. As not enough biomass and nutrients are returned to the land and chemical fertilisers are too costly, yields are very low and vulnerability to drought has increased. Most farmers have grown very poor. Returns are low, so they do not invest much time nor money in dryland agriculture and therefore deplete the land. All this causes actual production from drylands, livestock as well as crops and trees, to be far below its potential.

Many families cannot survive from their land alone and therefore have to look for additional income. During the dry season, but often also during the wet season, men are increasingly engaged in wage labour on commercial farms with irrigated land or in towns. Cities are growing very fast, especially Bangalore. The higher wages there attract many people who no longer see a future in agriculture and in their villages. However, many do not find jobs as employment growth seems to stagnate. Those who sold their land to rich people speculating in commercial trees - an increasing trend - can never come back. These trends together with overpumping of ground water and increasing instability of the climate, provide clear economic, social and ecological indicators of declining sustainability.

## **Eco-farmers as innovators**

Although the members of the network are only a very small group when compared to the total number of farmers and other actors involved in agricultural develop-

ment in Tamil Nadu, their contribution to development towards sustainable agriculture is important. The eco-farmers and founding members of the Network, like Narayana Reddy, Granabathy and Thangasamy are a source of inspiration and information for other farmers and development workers. Due to the Network's farmer-to-farmer sharing activities, the group of eco-farmers has grown to 25 families.

The majority of farmers are not motivated to go for complete ecological farming. Yet, for economic reasons many farmers are interested in specific techniques such as planting trees (teak, mango and many others, estimated yearly increase in value Rs 1000 per tree 1 US\$ = 35 Rs), cultivation of fish in wells or rice fields (Rs 1000 profit obtained from 11 fishes in six months), duck raising (Rs 300 per month profit obtained from 25 ducks), use of green manures and biopesticides which can increase the profit of rice production from Rs 3000 to Rs 6000 per acre, and cultivation of herbs and use of traditional seed varieties.

The eco-farmers are important, especially for farmers with land irrigated from wells. Some NGOs tend to concentrate on supporting this category of farmers as spreading of techniques takes place via farmer-to-farmer extension without the need for many incentives and hence external funds. Farmers with well-irrigated land normally can afford to pay for some investments like trees. The Farmers Solidarity Association (FSA) in Perambur is an example of an NGO supporting farmers

In the rainfed zone of Tamil Nadu there are four main types of agriculture: land irrigated from wells or from tanks and dryland used for arable farming or for grazing. The landscape is flat to undulating and steep. Soil fertility is modest to low. Rainfall is erratic, averages are between 500 and 900 mm/year, divided over two rainy seasons, the short season in June/July and the long season in October/December. The average size of farms is between 1 and 2 ha., only about 20% of farmers have access to irrigation.

interested in ecological alternatives such as trees, green manures and biopesticides. In 1994, they supported some 120 farmers. For 1995 another 100 farmers have indicated their interest in the programme.

Dryland farmers with commercial crops are also very interested in biopesticides. A good example is Chellama, a woman farmer from a village near Dharmapuri. After receiving advice from another Network farmer, she developed a biopesticide to protect her cotton crop. She prepares the biopesticide on the basis of local plants with a bitter taste (such as Neem) and cow urine. The leaves are left in a container with water for two weeks. When needed, 1 l urine, 1 l mixture and 20 l water are mixed and applied. Chellama applies the biopesticide in a preventive way once a fortnight or whenever there is a pest attack. Insects run away and die. By using biopesticides Chellama saves Rs 2000 per acre. Her neighbours are now interested as well. She teaches them how to make and apply the biopesticide.

### Successful dryland models

Originally, the Network intended to focus on dryland farming. However, it proved to be difficult for dryland farmers to adopt ecological practices. Firstly, there were no convincing time tested models ready for application. Secondly, the investments needed to improve dryland farming are much higher than for irrigated farming and returns to these investments take more time. The Social Forestry Information Project (SFIP) in Madurai together with a group of 29 farmers on 300 acres of land succeeded to develop a convincing dryland development model. Through water conservation measures and tree planting (commercial trees as well as green manures) biomass production has increased considerably. This led to improved soil management which enhanced soil fertility and drought resistance and hence, increased yield and yield security. Water conservation measures raised the watertable. Five farmers with land below the treated land received credits from the government to dig wells. The programme allowed them to increase their acreage of irrigated land.

After 4 to 5 years the trees produce the first fruits. A fully grown mango tree can produce up to 1000 mangos/year. Each mango can be sold for Rs 1. However, market saturation could become a problem when too many farmers plant mango trees, therefore a mixture with other trees and annual crops is needed. In five years the value of the land and trees has increased to ten times the original value, from Rs 4000 to Rs 40,000. In a few years more the investment is paid back.

Most dryland farmers cannot afford to invest their time and money in such a development programme without external support. Therefore, incentives were given

to cover the costs of initial labour and tree seedlings. SFIP staff invested considerable time in discussing with the farmers to increase their awareness, motivation and accountability. For such a minimum watershed programme an investment of Rs. 2500 per acre is needed (not including costs of NGO staff and voluntary work by farmers).

Another Network NGO in the Madurai zone, Body Bio Farm, started with testing different fodder grasses and fodder trees to stabilisation sand dunes and increase milk production and income from livestock. They calculated that with water conservation and improved fodder production income from dairy farming can increase threefold. Women groups supported by Myrada/Plan (not a member of the Network) in the Dharmapuri zone (higher rainfall) experienced a net profit of Rs 4000 from intensive fodder production and dairy farming on 50 cents land (Helen and Vasudeva, 1994).

### Experiments

All NGOs stimulate farmers to experiment with these low-cost ecological techniques. But comparing results is often difficult. The NGOs AME (member of the Network) and ARCOD (not a member) started a programme on Participatory Technology Development (PTD) involving some 70 farmers. The farmers conducted experiments with e.g. biofertiliser, rock phosphate, trap crops, light traps, biopesticides and vetiver grass. Results are analysed by the farmers and the NGO staff in a systematic way so that better insight can be gained on the real effects of the techniques. The first impression is that the results of the experiments are very positive.

### Involving other actors

The Agricultural Universities, like the Tamil Nadu University in Coimbatore, are getting more and more involved in development of Integrated Pest Management and Integrated Plant Nutrient Strategies for agriculture in Tamil Nadu. IFAD funded a research programme on organic farming at the Tamil Nadu Agricultural University. Probably, the main focus of these governmental programmes will be on irrigated agriculture and commercial crops like rice, cotton, sugar cane, etc. Nevertheless, this shift in approach creates more openness on the side of research and policy to low-external-input and ecologically sound agricultural approaches as developed by the LEISA Network.

### The balance

The conditions for development of sustainable agriculture are becoming more and more favourable. New opportunities are opening the eyes of farmers, development workers, researchers and policy makers. They now see the potential and importance of these practices not only for their

direct economic interest but also as the basis of further intensification and ecological sustainability. This does not mean that agrochemicals can be abandoned. Balanced and efficient use of chemical fertilisers will be needed complementary to ecological soil fertility management practices to compensate losses of nutrients which can not be recycled. Selective use of chemical pesticides may be needed to combat pests and diseases which can not (yet) be prevented or combatted in any other way. Also improved seeds can have a place within systems based on optimal use of local resources.

The activities of the Network and its members have been very supportive to satisfy the growing need of farmers and NGO staff for information on and training in new practices and approaches. However, the capacity of the Network is limited. As the motivation for ecological agriculture will probably remain weak among farmers, much will depend on economic developments, pricing of inputs and outputs and development of markets for common and new products from rainfed agriculture. Effective policies have to be developed. Also research has an important role to play. For example, there is an urgent need to analyse the toxicity of biopesticides. A wider choice of green manures is also needed to suit the different situations of farmers. Bankers and funders should think of how best to provide incentives and credits, accessible to poor farmers and women, to make large-scale investment in dryland farming possible. As conditions for farming will continue to change, the key to sustainable agriculture is the capacity of farmers and all other actors in agricultural development, as well as the wider society, to learn, experiment, adapt and cooperate in an effective way.

Coen Reijntjes, ILEIA.

### Reference

- Helen, S. and R. Vasudeva. 1994. **Strategy for viable dairying**. Denkanikottai, Myrada/Plan Dharmapuri Project.