### Green Revolution in Africa?

The assumption that the "miracle" of the Green Revolution can be replicated in Africa is flawed on two grounds. Firstly, India was not an ecologically ravaged continent in the 1960's like Africa is today. Secondly, the miracle was not such a miracle even in India, as the experience of e.g. Punjab illustrates.

The "miracle seeds" of the Green Revolution were meant to free the Indian farmer from constraints imposed by nature. Instead, large-scale monocultures of exotic varieties generated new ecological vulnerability by reducing genetic diversity and destabilizing soil and water systems. Punjab was chosen to be India's breadbasket through the Green Revolution, with high-response seeds, misleadingly called high-yielding varieties. The Green Revolution led to a shift from earlier rotations of cereals, oilseeds and pulses to a paddy-wheat rotation with intensive inputs of irrigation and chemicals. The paddy-wheat rotation has created an ecological backlash with serious problems of waterlogging in canal-irrigated regions and groundwater mining in tube-well irrigated regions. Further, the high-yielding varieties have led to large-scale micronutrient deficiencies in soils, particularly iron in paddy cultivation and manganese in wheat. Over the last year there have been 42 new insect pests and 12 new diseases in rice monocultures! We seem to forget to measure sustainability in nature's terms.

The fading miracle of the Green Revolution is now creating pressure for India to adopt the African strategy of export-oriented cash crop production. Growing cash crops for export has been tried elsewhere and is a proven way to be trapped into food scarcity and spiralling debt burdens.

### The post-Green Revolution era

The failures of the Green Revolution are now apparent both to farmers and to those in global think-tanks. Farmers have stopped using "miracle" seeds. In Kerala, women rice farmers are reported to have said, "When we sowed only government-approved varieties, we had a loss". In the Philippines, rice farmers called the IRRI seeds "seeds of imperialism", and in Negros, they are shifting again to traditional seeds as a basis of agriculture which is ecological and equitable. As the myth of the miracle seed gets exposed, international agencies are talking of going "beyond the Green Revolution".

The post-Green Revolution era could involve a more rapid breeding out of the feminine principle by deepening trends towards uniformity and vulnerability, and transferring the control of seeds and crops from the hands of women and peasants into the hands of corporate giants. The present trends in biotechnology point in this direction.

It could, however, also be based on a recovery of the feminine principle in agriculture – consisting of a recovery of genetic diversity, self-renewability and self-sufficiency in food production, with control in the hands of those who provide sustenance.

What are the lessons from e.g. African women farmers? □

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# African women farmers utilize local knowledge

## Monika Hoffmann-Kuehnel

**Womens' knowledge of multiple cropping makes an important contribution to ensuring systainability. (Photo: Coen Reijntjes).**

The rains in the dryland zone of the lands behind Kitui, southeast of Nairobi, Kenya, have again been months too late. There is also no sign that they will come. Mama Kalakuku has to walk a few more kilometers to find any remaining leaves and wild fruits from the dry, half-naked shrubs and trees to keep her ten children and herself alive. One wonders how people can survive in such harsh environments.

This concern was the main question to be answered in a travelling workshop on "Women as Managers of Knowledge". Thirty women farmers and scientists from Kenya, Tanzania and Uganda met in August 1988 for a travelling workshop coordinated by KENGO to share and appraise traditional knowledge and skills of women in managing natural resources. The workshop was conducted in the Swahili language (with English translation) and held in villages in three different ecological zones: Kitui in the semiarid zone, Nyeri in the wet highlands, and Siaya, Bungoma and South Nyanza in the lake basin.

### Knowledge of indigenous plants

The workshop revealed that the most important component of the "survival economy" developed by the women living in all three zones was their knowledge of wild and cultivated indigenous plants and ways of growing, conserving and processing them. In the dry season and especially in drought years, the women gather wild fruits and vegetables (e.g. *Vigna spp., Amaranthus spp., Berchemia discolor, Adansonia digitata*) to feed their families. The berries and leaves are usually eaten fresh, but some are also systematically cultivated and preserved for periods of scarcity. These indigenous plants are important genetic resources for sustainable landuse systems, as they are resistant to drought and diseases, do not need special fertilizers, have high nutritional value and can be used not only for food but also for medicines, fodder, fuel, dyes and fibres.

### Ecologically-oriented farming

The women's traditional knowledge of multiple cropping and terracing methods make an important contribution to ensuring sustainability. For example, farmwomen from Tanzania reported how certain types of trees (*Acacia spp., Terminalia spp., Combretum spp., Commiphora spp.*) are grown together with millet, groundnuts and vegetables to prevent soil erosion and – through their foliage and root systems – to conserve moisture and soil fertility.

However, the indigenous trees and shrubs, the traditional cereal crops such as millet and sorghum, and intercrops such as black nightshade (*Solanum nigrum*) and various legumes (e.g. *Digera nuricata, Cassia singuena, Cucurbita spp.*) which contribute to a well-balanced diet are now being replaced by monocultures of maize and export crops such as coffee and tea which are promoted by agricultural extension services.

The skills of local women in ecologically-oriented landuse and their knowledge of indigenous plants – and the plants themselves – are increasingly threatened with extinction. Promotion of exotic fruit trees and vegetable cultivation and of "modern" value systems ("cabbage means civilization") has led to the marginalization and depreciation of traditional foods. Since the introduction of compulsory schooling, children are learning western knowledge of little relevance to their everyday life instead of the vital traditional knowledge which their mothers could pass on to them. One workshop participant commented: "Schooling is de-skilling".

### Women ensure survival

It became obvious during the course of the travelling workshop that the main responsibility for ensuring survival of rural families lies in the hands of women. When market and export crops are promoted on the better soils, the women's food crops are forced back onto marginal land and they have to increase their efforts. In addition to providing food for their families, they also have to tend, harvest and often also transport the cash crops grown by the men. When many of the male family members leave the villages to look for work in the cities, the women remain behind and nourish the children, the old and the sick.

### Esteem of women's skills

The daily life of rural women in East Africa which was experienced and reported during the workshop revealed how women have to compensate for the negative impacts of agricultural modernization by working longer and harder. But this novel meeting of farmwomen and scientists also had an encouraging effect. The fruitful exchange of experiences strengthened the farmwomen's self-esteem in their ability to manage natural resources. Through the contact with African women scientists, they saw new possibilities of improving their working and living conditions, for example, by restoring and improving the traditional diversified forms of agriculture and by trying out different methods of storage and processing.

The workshop also gave new impetus to the participating scientists and NGO personnel. It raised the question whether we should try more often to take new, unconventional paths (such as a "women's travelling workshop") so as to experience the problems and strengths of rural women and to take direction from their knowledge and ideas.

The workshop ended with a huge cooking party in Siaya. All the participants spent hours peeling, cutting, pounding, mixing and tasting in order to prepare typical foods from their home areas. At the end of the day, the tables assembled from the entire village bent under the weight of numerous dishes made of indigenous cereals, vegetables, seasonings and fish. In the eating was the proof of the immense variety and tastiness of traditional African cooking. ■

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Five German women from the financing institution, the Protestant Association for Cooperation in Development (EZE) also attended the workshop, which covered questions not only of indigenous wild and cultivated plants but also of water and fuel supply, women's workload, appropriate technologies, marketing, storage and food processing. **For more information**, contact Monika Hoffmann-Kuehnel, EZE, Mittelstrasse 37, D-5300 Bonn, F. R. Germany, or Monica Opole, KENGO, P. O. Box 48198, Nairobi, Kenya.

**The information provided by Vandana Shiva** is based on her book "Staying Alive" (1989) and her lecture at the Novib conference "South-North confrontation on ecological alternatives", Amsterdam, 11-12 October 1989. Irene Dankelman and Vandana Shiva are planning to do some research on the issue of genetic resources, indigenous knowledge and women, and on the consequences of biotechnological development on genetic diversity and women. They are highly interested in receiving any material on this topic at the addresses mentioned below.

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## *Beans, beans, glorious beans*

Yellow, green, brown, red, violet and a multitude of shades in between: so diverse are the mixtures of beans grown by farmwomen in Rwanda. Outside the research station, I never saw a plot with a pure stand of one variety. Each contains at least 10, sometimes up to 30 different bean varieties.

The women know their beans extremely well. They know which varieties grow best on upper slopes, on lower slopes, with shade, without shade, on sandy soils, on poorly drained soils etc. They tend to grow certain varieties on the poorer soils and others on the better soils but, in all cases, they grow many different ones in each plot. They are then assured of a yield, regardless of whether the season is unusually dry or unusually wet or – something which doesn't happen very often – simply "average". The women retain their own seed for the next growing season, selected according to size, shape and various other criteria which they have never needed to express, for they have selected seed ever since they can remember, learning while helping their mothers.

The Rwandan-Swiss project in Kibuye brought in some new bean varieties which had been tested on the national research station and tested them in the project area to see if the plants thrived there as well. Then we distributed the more promising varieties to local farm families so that they could try them out – not to replace the present bean varieties but rather to join them. One of the suggested varieties has actually been integrated by the local women as the so-to-say 31st variety in their bean mixtures. So now the bean market is even richer in diversity, and the women have an additional component in their bean production system. ■

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