

Agrobiodiversity –

The key to food security



A diversified diet is likely to be particularly beneficial to the health of women and children. This picture was taken in southern Mali.

Photo: H.F.W. Rattunde

It is estimated that at least 852 million people worldwide suffer from hunger and malnutrition; four-fifths of them live in rural areas (FAO, 2005). Tackling hunger has for many years been one of the issues at the heart of international cooperation. The eradication of extreme poverty and hunger is also named as the first of the eight UN Millennium Development Goals (MDGs) proclaimed in 2000.

Five years after the declaration of these goals, experts from 25 nations have stated that the conservation and sustainable use of the diversity of cultivated plants and domestic animal breeds is key to the attainment of the first MDG (IPGRI, GFU, MSSRF, 2005). It is this diversity that has in the past enabled people to settle in almost all the regions of the Earth and to provide food for themselves under even the harshest of conditions. This potential is currently under-utilised and could turn out to be a vast treasure trove, especially for people dependent upon agriculture in marginal rural areas.

Producing more food through the optimal use of resources

Critics admit that the higher yields of major food crops achieved through the “Green Revolution” have contributed to food security in many countries. But even where “high-tech agriculture” predominates, greater species

The basis of food security

The World Food Summit of 1996 in Rome defined food security as follows:

“Food security [...] is achieved when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”;

(http://www.fao.org/index_en.htm)

There are three core determinants of food security:

- **Availability** involves the production of a sufficient quantity of food that is available at the right time and in the right place.
- **Access** concerns the demand side, in particular the problems of people who cannot buy enough food even if it is available.
- **Utilisation** involves the correct storage, processing and combination of foods.

Very poor people often live in a situation of chronic food insecurity, while seasonal food shortages, price rises or the sudden breakdown of the supply infrastructure can lead to temporary food insecurity;

(BMZ, 2003;

www.fantaproject.org/focus/foodsecurity.shtml).

diversity could in the long term help to develop new products, stabilise yields and optimise the utilisation of resources such as fertilisers or water for irrigation.

However, regions such as deserts or mountainous areas that are disadvantaged by their natural situation have seen very little rise in yields over recent decades. It is in these very areas that local plant species and animal breeds are often advantageous, since they are optimally adapted to the local conditions. Together with traditional knowledge and practices, they help farmers make the best use of limited resources.



Buckwheat not only helps to secure the nutrition of families dependent on small-scale agriculture; it also has potential for being marketed as a highly nutritious health product. Photo: W. Arnold

Buckwheat

Buckwheat is a traditional crop cultivated in parts of China and the Himalayan region. It is well adapted to mountain areas with their poor and often degraded soils. It has a short growing cycle and its cultivation can therefore help ease seasonal food shortages and failures of other crops. In addition, buckwheat grains, unlike many cereals and tuber crops, contain proteins of excellent quality. Buckwheat can therefore not only help to secure the nutrition of farming families, but also has potential for being marketed as a high-grade “health product”.

However, traditionally cultivated crops and local animal breeds are often endangered by the processes of social and economic change that affect rural communities. Agricultural policies and market conditions often focus exclusively on the “modern” varieties that dominate the market. In addition, social change often leads to a shortage of family labour and the loss of traditional knowledge. Any plan to counteract this must actively promote the exchange of information about traditional plant varieties and animal breeds. It must also encourage the development of infrastructures for marketing and processing local products, and foster the conservation of animal breeding populations and the conservation of seeds.

Diversity on the field and on the table – the best means of preventing “hidden hunger”

Filling one’s belly is often not enough. People who live on the brink of poverty often lack a varied diet. Yet the

“Hidden hunger”

“Hidden hunger” is the lack of essential micro-nutrients (vitamins and minerals) in the everyday diet. The effects are wide-ranging and may include delayed mental development, weakening of the immune system and loss of strength and energy. It is estimated that some two billion people are affected by lack of iron, and around 800 million are deficient in vitamin A, lack of which can in severe cases lead to blindness.

In the short term the effects of “hidden hunger” can be alleviated by giving vitamins and minerals in tablet form or by enriching basic foods with particular micronutrients. However, this requires functioning health systems or the industrial processing of food – and presupposes that the target group has access to such systems or food. In the long term, therefore, there is no substitute for a healthy and varied diet (www.micronutrient.org).

appropriate use and combination of foods can contribute to long-term health, particularly among children.

Leafy vegetables, fruits, legumes, roots, tubers, spices, and herbs are essential for human nutrition and complement staple crops such as rice or maize. Many leguminous crops, such as cowpea and winged bean, are excellent sources of protein and micronutrients. Tropical fruits – including citrus fruits, mangoes and lychees – have a high vitamin and mineral content. The same is true of many African vegetables, such as the various squashes, or the tinangkong variety of sweet potato grown in the Philippines, the leaves of which contain significant amounts of vitamin A (Garí 2004). The fruits and leaves of wild and semi-wild plants that grow near fields and pastures can also add variety to the menu. The children of animal herders in the arid regions of East Africa and India enjoy harvesting the berries of *Ziziphus mauritania*, which have a vitamin C content several times higher than that of oranges.

Home gardens often accommodate a particularly rich diversity of crops. As home gardens are usually run by women, most of the production is directly used for cooking, benefiting all the family. The establishment and appropriate support of home gardens is therefore a promising option for improving the nutritional status of poor people both in rural and in peri-urban areas. They also serve to raise awareness of the importance of the diversity of traditional food plants.



A school garden in the village of Salli, Trincomalee District, Sri Lanka. Photo: I. Reinhardt

Sri Lanka: Home gardens help combat hunger

School and home gardening programmes are an important component of the Integrated Food Security Programme in the Trincomalee district of Sri Lanka, which is supported by GTZ.

As a result of the civil war many people suffer from poverty and food insecurity. The main objectives of the programme are therefore to promote food availability, improve the nutritional status of families and create employment opportunities.

The school gardening programme focused on the production of quality vegetable seedlings and fruit tree saplings, since it appeared that the lack of planting material was the major obstacle to a further expansion of home gardening.

The combination of instruction and practical skill building was successful. Ninety percent of the students planted the saplings at home, and families passed on their knowledge to neighbours. As a result, some 1,100 tonnes of fruit and vegetables were produced in 4,000 home gardens within five years. This contributed to the better nutrition of families and also enabled them to generate additional income through selling seedlings in local markets; (Wanasinghe, 2003).

Better access to food through new sources of income

A further cause of food insecurity is chronic or temporary shortage of money. Even if food is available in sufficient quantity and quality, not everyone has the resources to buy it. Improving the income situation of such people is

an essential part of improving food security. Special, often little-known plant varieties and livestock breeds offer potential for income generation. This may involve processing to food, medicines, cosmetics and craft products, or developing new markets and market niches for such products. The organic and fair trade markets provide potential for long-term initiatives in these areas.

The rediscovery of quinoa

Quinoa is a traditional crop of the Andean highlands. It is adapted to marginal soils and the harsh climate and is a source of high-quality protein and important minerals. However, production of quinoa declined because imported wheat was cheaper. Since the beginning of the 1980s the quinoa crop has been experiencing a revival, and quinoa products are now on the shelves of every organic supermarket.

In Bolivia, the national association of quinoa producers, ANAPQUI, founded in 1983, promotes cultivation of the crop. Some is exported to the USA and Europe, but innovative products such as quinoa pasta and snacks have also been developed for the domestic market. European fair trade organisations and the private enterprise “Coronilla” in Cochabamba, Bolivia, are reliable partners for these activities. This means higher and more stable prices for farmers as well as the creation of new jobs in processing and marketing, (www.gepa3.de/htdocs/service).

Harmonizing food aid and agrobiodiversity

In times of acute food insecurity, people need immediate help. Food aid may be provided either as pure humanitarian aid or as part of rehabilitation programmes such as those involving “food for work”. In addition, in countries such as India poor people regularly receive subsidies, for example in the form of vouchers or ration cards which can be used to buy staple foods at subsidised prices.

This has an impact on local food markets and the diversity of the produce available there. While the effect on prices is temporary, food aid – usually provided in the form of maize, rice or wheat – can bring about a long-term change in food habits, reducing the demand for traditional products. Over a prolonged period food aid can be counterproductive for local agriculture. It is therefore important to align food aid with longer-term development goals, such as the conservation of biological diver-

sity (cf. the Issue Paper “Agrobiodiversity and Emergency Response” in this series).

Obstacles and opportunities

The greatest opportunity for the conservation of agrobiodiversity in the context of food security is perhaps at the same time the greatest obstacle. A decentralised approach is required, based on local knowledge, local resources and “on the ground” activities. This in turn needs local leadership and local implementation capacities.

The problems to be addressed concern primarily the following areas:

- **Knowledge:**

Existing knowledge and experience needs to be collected and evaluated, and public awareness of the link between agrobiodiversity and food security must be promoted.

- **Scope:**

Measurable effects can only be achieved if schemes are supra-regional in concept but at the same time take account of different local and cultural requirements.

- **Institutional development:**

Wider implementation is hampered by the limited involvement of the rural population in national and international programmes. Another obstacle is the lack of coordination between individual sectors and disciplines, such as those involved in the conservation of biological diversity, agricultural development, food security and health. Diversity conservation must form a fundamental

The Issue Paper series “People, Food and Biodiversity” aims to:

- stimulate an interest in the conservation and sustainable use of biological diversity,
- present quickly and clearly concrete actions and experiences,
- explain new concepts and issues relating to the topic of biological diversity,
- encourage and stimulate the mainstreaming of this topic within development cooperation projects and programmes.

We look forward to your suggestions and experiences so as to enable us to improve this series.



Pounding sorghum to remove the seed husks, shown here in Mali.

Photo:
E. Weltzien

part of policies and programmes relating to poverty reduction, agriculture, health and nutrition. This means that it must be integrated into food security projects, emergency response measures, national poverty reduction strategies, agricultural policy programmes and guidelines, and school nutrition programmes (www.biodiv.org/doc/meetings/sbstta/sbstta-11/official/sbstta-11-03-add1-en.pdf).

It may not be possible to achieve large-scale results in the short term by means of this approach. It nevertheless offers a unique opportunity to link food security measures with other development goals such as education, the empowerment of women, or the protection of resources and the environment. The importance which agrobiodiversity had in the past for the survival of humankind would then take on a new dimension.

References:

BMZ (2003): Ernährungssicherung in der Entwicklungszusammenarbeit. Übersektorales Konzept (draft version). BMZ, Bonn/Germany.

FAO (2005): The state of food insecurity in the world. FAO, Rome (www.fao.org/documents).

Garí, J. A. (2004): Plant diversity, sustainable rural livelihoods and the HIV/AIDS crisis. FAO, Rome and UNDP, Bangkok.

GTZ (2005): Home gardens – treasure troves of diversity. Issue papers People & Biodiversity. GTZ, Eschborn/Germany.

IPGRI, GFU and MSSRF (2005): Agricultural biodiversity and elimination of hunger and poverty. The Chennai platform for action.

Wanasinghe, A. D. (2003): From school garden to home garden. Adoption of agricultural practices. Integrated Food Security Programme Triconmalee, Sri Lanka (www.ifsp-srilanka.org/TP-29-garden-aruna.pdf).

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