

## 11 *How Organic Agriculture Contributes to Sustainable Development*

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Organic agriculture can contribute to meaningful socio-economic and ecologically sustainable development, especially in poorer countries. On one hand, this is due to the application of organic principles, which means efficient management of local resources (e.g. local seed varieties, manure, etc.) and therefore cost-effectiveness. On the other hand, the market for organic products – at local and international level – has tremendous growth prospects and offers creative producers and exporters in the South excellent opportunities to improve their income and living conditions. Establishing whether organic agriculture is a viable alternative for a particular holding needs to be carried out on a case-by-case basis.

What potential does organic agriculture have for solving the problems of hunger and poverty? What can organic agriculture contribute to achieving socially and ecologically sustainable development in poor countries? To date, no systematic attempt has been made to evaluate the benefits and effects of each system. The article presents results from current projects conducted by the Swiss Research Institute of Organic Agriculture FiBL, which demonstrate these benefits, based on experiences gained in practice. It should be noted that there are numerous organic development projects carried out by further institutions showing similar results. Most of the organizations carrying out such projects are members of the International Federation of Organic Agriculture Movements (IFOAM), and a list is available at the IFOAM homepage<sup>2</sup>.

To assess the contribution of organic agriculture to food security, poverty alleviation and environmental conservation, a network of long-term farming systems comparison trials was launched in 2006 by FiBL. Much of the work will be based on the experience gained in the DOK long-term trial in Switzerland (Mäder et al. 2002). The local partners of the network are:

- In Kenya: Institute of Insect Physiology and Ecology (ICIPE), Tropical Soil Biology and Fertility Institute (TSBF-CIAT), Kenyan Agricultural Research Institute (KARI), and School of Environmental Studies and Human Sciences of Kenyatta University (KU)
- In India: bioRe India; local University and/or international agricultural research center to be identified
- In Bolivia: Partner selection presently on-going

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<sup>2</sup> International Federation of Organic Agriculture Movements (IFOAM): Organic Directory Online. The IFOAM Homepage, available at [www.ifoam.org/organic\\_world/directory/index.html](http://www.ifoam.org/organic_world/directory/index.html)



**Picture 1: Organic farmers from Karatinga (Kenya) discussing their experiences with organic farming in a pepper nursery. These pioneers in organic farming in Africa are important partners of the network of long-term farming systems comparisons in the tropics. Participatory on-station and on-farm research generates new knowledge that is shared with other farmers. Such learning processes lead to sustainable innovation.**

Photograph: Christine Zundel, FiBL, Frick, Switzerland

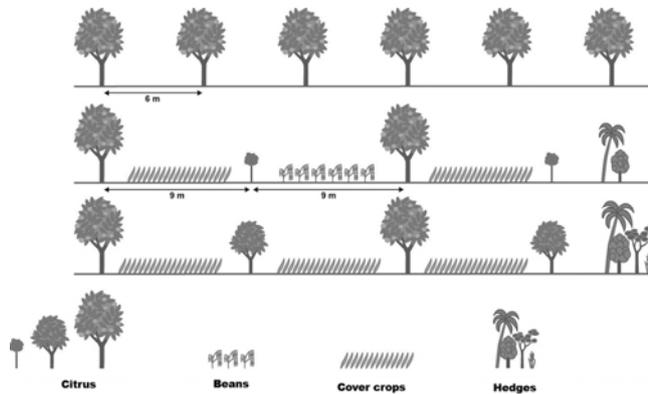
### *Organic agriculture is sustainable and diverse*

Diversity of the production system is of special importance in the tropics: simplified systems and monocropping harm soil fertility and the ecological balance to a much greater extent than in temperate climates because soil oxidation and pest population dynamics run permanently and more rapidly in the tropics. Heavy rainfall and high temperatures accelerate mineralization of the nutrients and retard accumulation of soil organic matter. Tropical farming can only be sustainable if the primary rules of this natural system are respected. Organic production reduces the risk of yield failure, stabilizes returns and therefore enhances food security for small farmers' families. Organic farmers do not fight against the natural dynamics; on the contrary, they use them to their advantage. The perennial vegetation in the tropics offers excellent alternatives to simplified production systems:

- 1) Agroforestry: agricultural production in forestry systems and under shade trees.
- 2) Intercropping: a combination of two or more crops on the same plot and at the same time.
- 3) Rotation: one crop is followed by another crop, preferably from a different botanical family.

Organic farmers in the tropics combine the systems referred to above to achieve an optimal mixture of diversity in space and diversity in time. The Cuban example shows how the diversity and sustainability of the system can be increased systematically in the conversion process of citrus plantations (see chart).

- 1) Increase the distance between the rows of citrus trees from six to nine meters, cutting down several rows of citrus trees. Lower-density plantings are better adapted to the organic production system; they increase ventilation and light interception and thus decrease disease pressure. Lower tree density gives space for crops in the alleyway between rows.
- 2) Plant young trees between the rows. At the same time, intercrop beans for self-sufficiency and leguminous crops for fodder, or just cover crops, such as *Neonotonia wightii*.
- 3) Create a diverse mosaic of citrus units and other crops from an existing plantation: divide large plots (more than 100 hectares) into smaller plots of about one to two hectares and plant hedges or other fruit trees along the plot borders.
- 4) Between the rows (in the alleyway), it may be possible to intercrop permanently with pasture (sheep), beans or other crops. However, this may be difficult in the case of older plantations where the trees are adapted to a certain type of management; in such cases, a step-by-step procedure is recommended (introduction of new crops and elements at yearly intervals), to allow the root systems of the citrus trees to adapt to new competition in the soil. For larger, mechanized organic farms, it may be difficult to continue intercropping as soon as the newly planted citrus trees are in production. In such cases, cover crops may be more appropriate in order to avoid disturbances in citrus management.



**Chart: Conversion of an existing citrus orchard into an intercropping system**

Chart: Lukas Kilcher, FiBL, Frick, Switzerland

### *Organic farmers conserve resources*

Organic farmers protect their soil from erosion by soil bunds and terraces, minimum tillage and contour cultivation. Planting cover crops, mulching, intercropping and agroforestry play an important role in protection against erosion and landslides, because their rooting system stabilizes the soil. Further, these technologies increase the organic matter content of the soil, which also has positive effects on water-holding capacity. Additionally, the vegetation cover conserves humidity by protecting the soil from direct solar radiation.

Fortunately, in the humid tropics, it is not only decomposition processes that are rapid, but also composition processes. Animal manure, green manure and compost favor the composition processes and can replenish nutrients required by crops and supply the soil with essential organic matter. Additionally, legume plants are a highly valuable source of nitrogen. Closed nutrient cycles and efficient use of local resources – for example compost, dung or seeds – are especially important for subsistence farmers depending on few and limited assets. For this reason, organic agriculture means adapted technologies.



**Picture 2: Organic farmers in the tropics promote the balance between growth, decomposition and mineralization. Organically managed soils have a high potential to counteract soil degradation, as they are more resilient both to water stress and to nutrient loss. In the picture: Organic farmers from Hazoua (Tunisia) discussing strategies to reduce water evaporation of the soil.**

Photograph Lukas Kilcher, FiBL, Frick, Switzerland

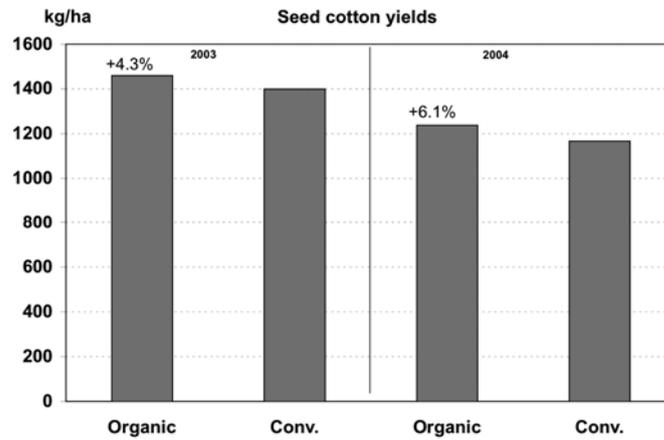
Organic farming helps to conserve resources not only in the humid tropics, but also in the arid tropics; organically managed dryland soils have a high potential to counter soil degradation and desertification, as they are more resilient both to water stress and to nutrient loss. Water and nutrient retention capacity is increased due to a higher level of organic matter and permanent soil cover. Microorganisms have a good feeding base and create a stable soil structure. Due to the resulting higher moisture retention capacity, the amount of water needed for irrigation can be reduced substantially. Several practical examples of organic agricultural systems in arid areas show how organic agriculture can help restore degraded lands to fertility.

***Organic farmers produce more, better-quality products and achieve higher incomes***

Organic farmers do not only produce more crops, but also achieve more sustainable yields, better quality, and in many cases even higher yields and incomes, mainly due to the following reasons:

- In developing countries where organic agriculture is not subsidized, synthetic inputs are expensive and labor is relatively cheap, market-oriented organic farmers can achieve higher returns thanks to reduced production costs and diversified production. In many cases, price premiums are not a sufficient incentive to certify and market organic products. Farmers have adopted organic practices nevertheless because the avoidance of external inputs saves on production costs while yields are more stable.
- The risk of crop failure due to drought or pest damage is lower in organic production, mainly due to higher diversity and improved overall soil fertility (soil structure, biological activity etc.).
- Efficient use of locally available resources such as manure, seeds and irrigation water contribute significantly to more stable and even higher yields, especially if highly valuable local resources (e.g. animal manure) had been lost before conversion.
- Cultivation is more intensive (e.g. irrigation, crop care) due to improved financial situation.
- Pesticide residues are lower than in conventionally grown foods (El-Hage and Hattam 2002). However, organic foods are not pesticide free, due to many factors beyond the control of the organic farmer, for example, pesticide spray drift from adjacent fields or soil or irrigation water contamination.
- Organic farming can contribute significantly to improving the livelihood of smallholders, as it generates higher incomes and involves less risk. Organic farming therefore motivates farmers to invest in their future: in capacity building, in production, processing and marketing, in work force and in their family.

Most comparisons of the efficiency of alternative production systems focus merely on the gross yield of marketable commodities. However, yield and productivity comparisons offer a limited, narrow, and often misleading picture of the different production systems. Profitability and long-term economic viability would be a better indicator for evaluating the benefits and limitations of a production system. Moreover, the multiple environmental benefits of organic farming, difficult to quantify in monetary terms, are essential ingredients in any comparison. The FiBL long-term farming system comparisons in the tropics take this issue into consideration.



**Chart 2: To investigate the economic viability of organic cotton farming and its impact on the livelihood of the involved farmers a detailed study on organic cotton farming was conducted in the bioRe India project in central India (Eyhorn et al. 2005)<sup>1</sup>.**

**Over a period of two years, an Indo-Swiss research team collected and compared agronomic data from 60 organic and 60 conventional farms. One striking (though statistically not significant) result was that average cotton yields in organic fields were 4 to 6 percent higher in the two years of observation. The research results show that organic cotton farming has the potential to be an economically sound business proposition even for marginal farmers.**

Chart taken from Eyhorn et al. 2005

<sup>1</sup> This study was mandated to FiBL by the Swiss Agency for Development and Cooperation (SDC) and WWF Switzerland.

### ***Organic products provide market access and create added value***

Certified organic products provide access to attractive local and international markets for developing countries, while the producers generate higher incomes. In addition, due to long-term contracts, income is generated more continuously than in conventional trade: To guarantee a fair share of the international organic trade benefit to those contributing most to the production of food, trade must include social regulations. For this reason, numerous organic products in developing countries also embrace social standards in accordance with fair trade labels such as 'Max Havelaar' or 'Transfair'.



**Picture 3: Lebanese consumers are quality-conscious and sensitive to regional provenance. The organic market initiative 'Wadi El Tayim' is a women's cooperative that produces Lebanese specialties using artisan processing techniques. Their main markets are Arab communities abroad, familiar with the much-valued Lebanese cuisine.**

Photograph: Paul van den Berge, FiBL, Frick, Switzerland

A project for the development of organic agriculture in Lebanon<sup>1</sup> pursues two main strategies: founding a Lebanese-owned certification body, Libancert, and developing the market for organic produce. For the latter strategy, a multiple-target approach was chosen. As a first step, the stakeholders in organic agriculture were brought together under the umbrella of the newly founded Association for Lebanese Organic Agriculture (ALOA).

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<sup>1</sup> This project is funded by the Swiss State Secretariat for Economic Affairs (seco) and has been carried out by FiBL since 2005.

The tasks of the association are to provide market intelligence to the operators in the organic market and to foster demand for organic produce. The second step is to support several organic market initiatives that are expected to have a significant impact on the development of the market for organic produce. Despite all the setbacks of the war, the organic movement in Lebanon will fight to continue its development.

### ***Organic agriculture raises self-confidence and mobilizes new partnerships***

Very often, conventional agriculture puts farmers in a situation of high dependency on agro-industry and its high-tech solutions, which are difficult to understand. Organic agriculture profoundly respects indigenous knowledge, women's knowledge and local solutions. Producers thus gain control over the production cycle and increase their self-confidence. Local and international organic producers play an active role in advancing their production methods and in developing standards.



**Picture 4: India is already exporting a range of organic products such as tea, spices, cotton, rice, etc. The Indian domestic market is promising, although still small.**

To gain consumers' confidence, valid certification is an essential prerequisite for marketing. In 2001, a group of organizations and corporate bodies took the initiative to set up the Indian Organic Certification Agency INDOCERT<sup>1</sup>. It has become an important element of the organic movement in India and mobilizes new forces and partnerships. In 2003, together with other partners, INDOCERT created the International Competence Center for Organic Agriculture (ICCOA)<sup>2</sup>, a service provider for networking, capacity building and market development in the organic sector in India<sup>3</sup>. Among other activities, ICCOA implements the Indian Organic Market Development Project (2005-2007), which focuses on the following main areas: awareness raising, market intelligence, developing organic market initiatives, and the India Organic Trade Fair<sup>4</sup>.

Photograph: Samuel Moser, FiBL, Frick, Switzerland

<sup>1</sup> Indian Organic Certification Agency INDOCERT, [www.indocert.org](http://www.indocert.org), Kerala-India

<sup>2</sup> International Competence Centre for Organic Agriculture, Bangalore, India, [www.iccoa.org](http://www.iccoa.org)

<sup>3</sup> Both projects are funded by the Swiss State Secretariat for Economic Affairs (seco) with technical support from FiBL.

<sup>4</sup> India Organic Trade Fair, c/o ICCOA, Bangalore, India, [www.indiaorganic2006.com](http://www.indiaorganic2006.com)

Developing organic farmers' organizations, standards, certification systems, extension services, education, research and markets brings producers together in a new manner. Stronger partnerships within the organic community enable better connections with external institutions. Such communities are in a stronger position to demand and assert their rights and to maintain or improve their economic position.

### ***Investments to overcome constraints on the road to organic farming***

The above discussion provides evidence that organic agriculture is a great opportunity for poor countries and can contribute substantially to sustainable development. The target-oriented implementation of organic farming enables efficient use of locally available resources, which is a central element of adapted technologies. Organic agriculture also presents an opportunity to achieve socio-economic sustainability, because it is committed to:

- 1) Participatory technology development
- 2) Fair trade
- 3) Autonomy and self-determination.

Nevertheless, there are some critical questions towards organic farming from the point of view of development policies:

- 1) 'Brussels, Tokyo and Washington' are defining organic agriculture worldwide. Such 'desk-created' standards may create trade barriers for some developing countries (Vogl et al. 2005). How can producers from poor countries increase their participation in global standards development and how can they define their own locally adapted standards in order to increase sovereignty and identification?
- 2) Inspection, certification and accreditation are becoming increasingly complex and thus a greater hurdle for small farmers in developing countries. The creation of local, indigenous certification programs and smallholder group certification, which build on the presence of an internal control system, are important solutions. How can the standard-setters in government authorities, IFOAM, UNCTAD, FAO and private labeling programs consider this issue in their discussions on harmonization? How can they include 'accreditation' in current discussions on harmonization?
- 3) Many small farmers in poor countries do not have access to the organic market. How can authorities and market partners from richer countries make the organic market more transparent and improve market access for small farmers from poor countries? How can they reduce especially non-tariff trade barriers such as organic certification?
- 4) Income and benefits for organic trade are not always equally distributed. How can organic trade guarantee a fair share of consumers' expenditure to all participants in the value chain, especially to producers? Is certified fair trade the right and only answer to this question?
- 5) Organic agriculture is a know-how-intensive farming method. To be competitive, organic farmers need to experiment with new techniques, and must manage land, labor, capital and innovations quite differently from conventional farmers. How can research and development improve access for small farmers to this know-how and to specific inputs, such as seeds and biological methods of pest control?

- 6) Does organic agriculture reach the poorest of the poor? Are other models such as 'low external input systems' more appropriate for this target-group?

The greatest constraints faced by poor farmers on the road to organic agriculture are lack of knowledge, access to markets, certification, agricultural inputs, and lack of organization. Greater investment in practice-oriented research, capacity building and extension, accessible local certification schemes and harmonized standards, organic market initiatives, fair trade relationships and inspiring partnerships within the movement can help to overcome these constraints. Developing these tools and services in such a way as to enable participatory learning processes will lead to sustainable innovation within the rural communities and thereby contribute to sustainable development.

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