

Introduction to Organic Agriculture

SUMMARY:

Organic agriculture is an integrated production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles and soil biological activity (FAO/WHO Codex Alimentarius Commission, 2007). It emphasizes the use of natural inputs (i.e. mineral and products derived from plants) and the renunciation of synthetic fertilizers and pesticides.

KEYWORDS:

[organic agriculture](#) [1]

[Sustainability](#) [2]

[Biodiversity](#) [3]

[Crop rotation](#) [4]

[soil fertility](#) [5]

[Soil conservation](#) [6]

CATEGORY:

[Crop production](#) [7]

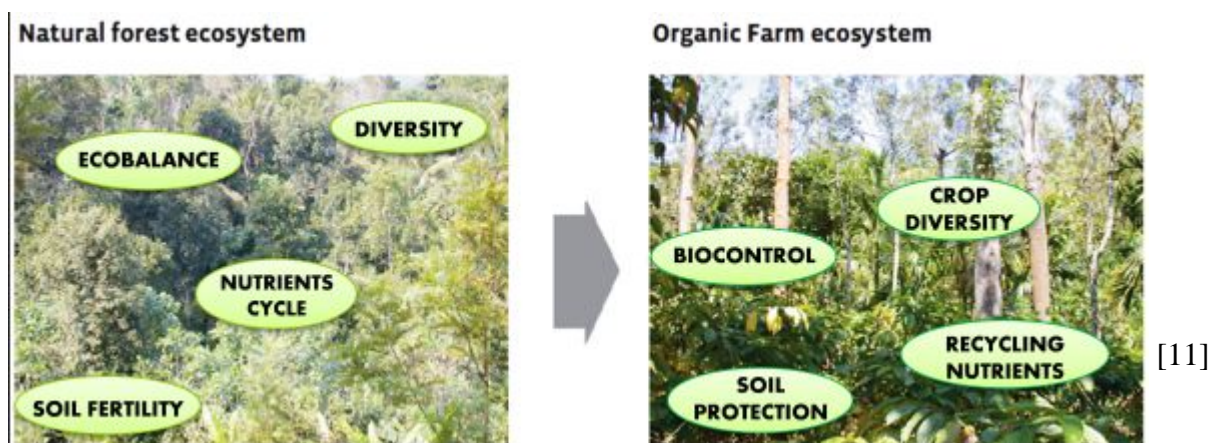
[Livestock production](#) [8]

[Natural Resources Management](#) [9]

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DESCRIPTION:

Organic agriculture follow the principles and logic of a living organism, in which all elements (soil, plant, farm animals, insects, the farmer, local conditions) are closely linked to each other. This is accomplished by using, where possible, agronomic, biological and mechanical methods, following the principles of these interactions, using natural ecosystem as a model.



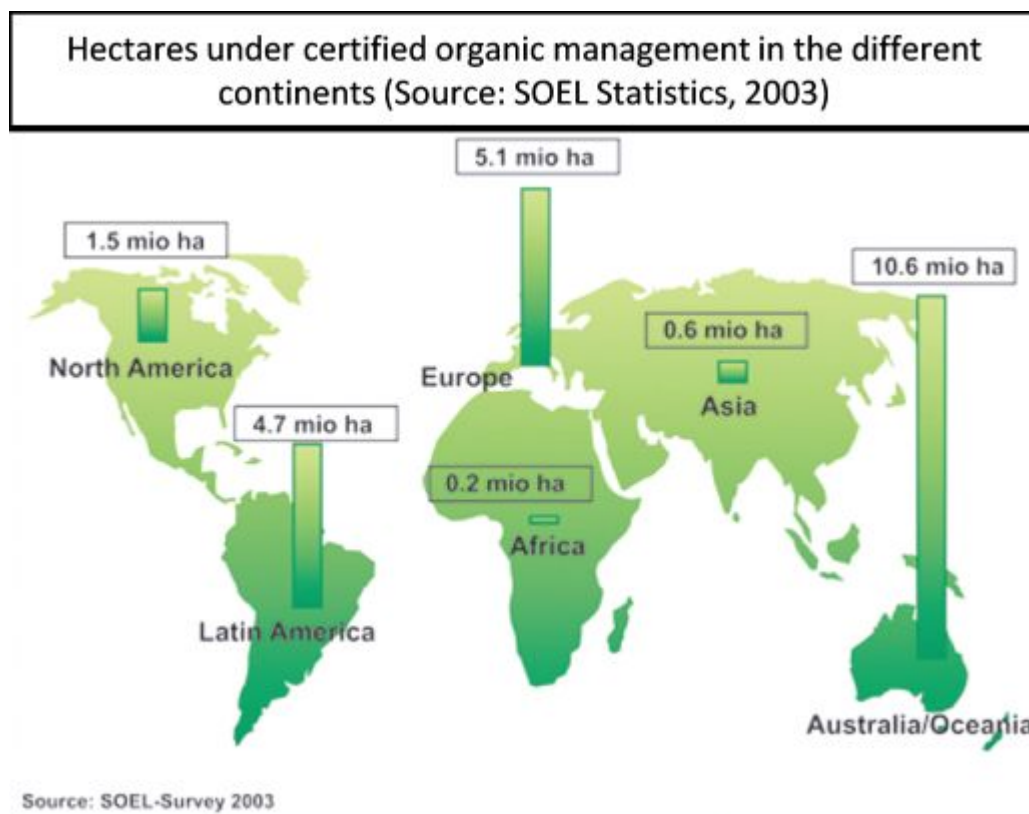
Organic agriculture shares many techniques used by other sustainable agricultural approaches (e.g. intercropping, crop rotation, mulching, integration of crops and livestock). However, the use of natural inputs (non synthetic), the improvement of soil structure and fertility and the use of a crop rotation plan represent the basic rules that make organic agriculture an unique agricultural management system.

- According with the Guidelines of Organically Food Produce of the Codex Alimentarius (2007), an

organic production system is designed to:

- Enhance biological diversity within the whole system;
- Increase soil biological activity;
- Maintain long-term soil fertility;
- Recycle wastes of plant and animal origin in order to return nutrients to the soil, thus minimizing the use of non-renewable resources;
- Rely on renewable resources in locally organized agricultural systems;
- Promote the healthy use of soil, water and air as well as minimize all forms of pollution that may result from agricultural practices;
- Promote the careful processing methods agricultural products in order to maintain the organic integrity and vital qualities of the product at all stages;
- Become established on any existing farm through a period of conversion, the appropriate length of which is determined by site-specific factors such as the history of the land, and type of crops and livestock to be produced.

In addition, the International Federation of Organic Agriculture Movements (IFOAM), a non-governmental organization internationally networking and promoting organic agriculture, has established guidelines that have been widely adopted by the organic community for organic production and processing.



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According with IFOAM (2002), the organic agriculture practices are based on the following principles:

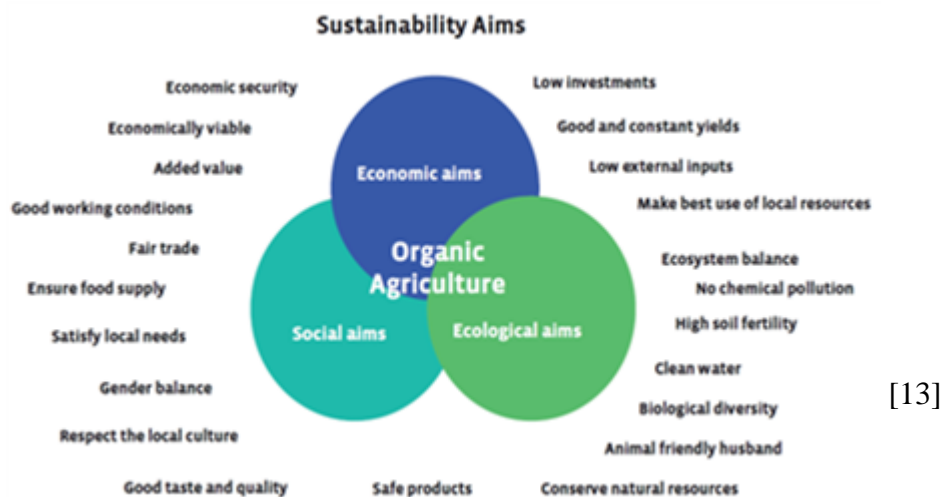
- **Principle of health:** the role of organic agriculture, whether in farming, processing, distribution, or consumption, is to sustain and enhance the health of ecosystems and organisms from the smallest in the soil to human beings. In view of this, it should avoid the use of fertilizers, pesticides, animal drugs and food additives that may have adverse health effects.
- **Principle of ecology:** organic agriculture should be based on living ecological systems and cycles, work with them, emulate them and help sustaining them. Organic management must be adapted to local conditions, ecology, culture and scale. The reduction of inputs by reuse, recycle and the efficient management of materials and energy will contribute to improve environmental quality and will conserve resources.

- **Principle of fairness:** This principle emphasizes that those involved in organic agriculture should conduct human relationships in a manner that ensures fairness at all levels and to all parties ? farmers, workers, processors, distributors, traders and consumers. It also insists that animals should be provided with the conditions and opportunities of life according with their physiology, natural behaviour and well-being. Natural and environmental resources that are used for production and consumption should be managed in a socially and ecologically fair way and should be held in trust for future generations. Fairness requires systems of production, distribution and trade that are open and equitable and account for real environmental and social costs.
- **Principle of Care:** This principle states that precaution and responsibility are the key concerns in management, development and technology choices in organic agriculture. Science is necessary to ensure that organic agriculture is healthy, safe and ecologically sound. However, it must consider valid solutions from practical experiences, accumulated traditional and indigenous knowledge and prevent significant risks by adopting appropriate technologies and rejecting unpredictable ones, such as genetic engineering.

Why organic agriculture?

The goal of organic agriculture is to contribute to the enhancement of sustainability. **But what does sustainability mean?**

In the context of agriculture, sustainability refers to the successful management of agricultural resources to satisfy human needs while at the same time maintaining or enhancing the quality of the environment and conserving natural resources for future generations. Sustainability in organic farming must therefore be seen in a holistic sense, which includes ecological, economic and social aspects.



Only if the three dimensions are fulfilled an agricultural system can be called sustainable. But how are they achieved? Some examples are described as follow:

The organic agriculture techniques are known to be ecologically sustainable by:

- Improving soil structure and fertility through the use of crop rotations, organic manure, mulches and the use of fodder legumes for adding nitrogen to the soil fertility cycle.
- Prevention of soil erosion and compaction by protecting the soil planting mixed and relay crops.
- Promotion of biological diversity through the use of natural pest controls (e.g. biological control, plants with pest control properties) rather than synthetic pesticides which, when misused, are known to

kill beneficial organisms (e.g. natural parasites of pests, bees, earthworms), cause pest resistance, and often pollute water and land.

- Performing crop rotations, which encourage a diversity of food crops, fodder and under-utilized plants; this, in addition to improving overall farm production and fertility, may assist the on-farm conservation of plant genetic resources.
- Recycling the nutrients by using crop residues (straws, stovers and other non-edible parts) either directly as compost and mulch or through livestock as farmyard manure.
- Using renewable energies, by integration of livestock, tree crops and on farm forestry into the system. This adds income through organic meat, eggs and dairy products, as well as draught animal power. Tree crops and on-farm forestry integrated into the system provide food, income, fuel and wood.

Social sustainability

Sustainability is also about equity among and between generations. Organic agriculture contributes to the social well-being by reducing the losses of arable soil, water contamination, biodiversity erosion, GHG emissions, food losses, and pesticide poisoning.

Organic agriculture is based on traditional knowledge and culture. Its farming methods evolve to match local environments, responding to unique biophysical and socio economics constraints and opportunities. By using local resources, local knowledge, connecting farmers, consumers and their markets, the economic conditions and the development of rural can be improved.

Organic agriculture stresses diversification and adaptive management to increase farm productivity, decrease vulnerability to weather vagaries, and consequently improves food security, either with the food the farmers produce or the income from the products they sell.

Economic sustainability

Organic farming appears to generate 30% more employment in rural areas and labor achieves higher returns per unit of labor input. By using local resources better, organic agriculture facilitates smallholders' access to markets and thus income generation; and relocalizes food production in market-marginalized areas.

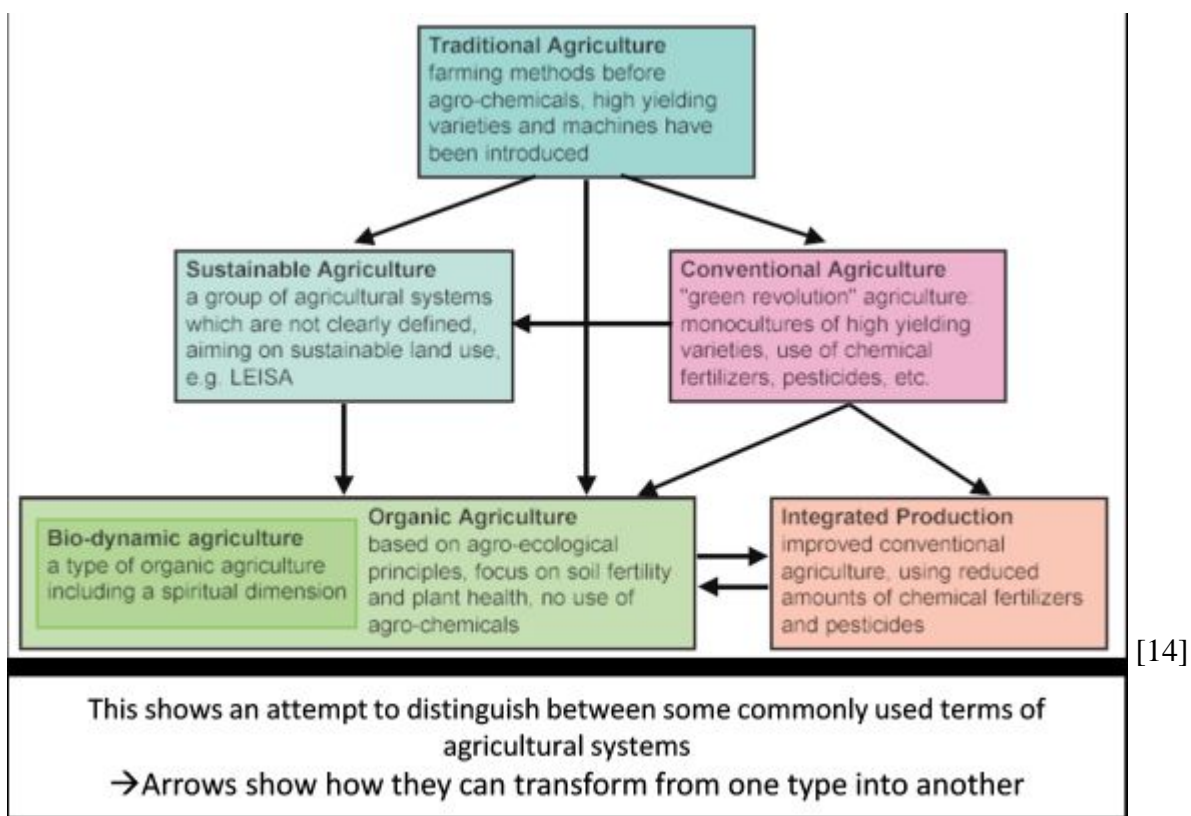
Generally, organic yields are 20% less as compared to high-input systems in developed countries but could be up to **180%** higher as compared to low-input systems in arid/semi-arid areas. In humid areas, rice paddy yields are equal, while the productivity of the main crop is reduced for perennials, though agroforestry provides additional goods.

Operating costs (seeds, rent, repairs and labor) in organic agriculture are significantly lower than conventional production, ranging from 50-60% for cereals and legumes, to 20-25% for dairy cows and 10-20% for horticulture products. This is due to lower input costs on synthetic inputs, lower irrigation costs, and labor cash costs that include both family labor and hired workers. Total costs are, however, only slightly lower than conventional, as fixed costs (such as land, buildings and machinery) increase due to new investments during conversion (e.g., new orchards, animal houses) and certification.

Market opportunities

The demand for organic products creates new export opportunities. Organic exports are sold at impressive premiums, often at prices 20% higher than the same products produced on non-organic farms. Under the right circumstances the market returns from organic agriculture can potentially contribute to local food security by increasing family incomes.

Entering this lucrative market is not easy. Farmers require hiring an organic certification organization to annually inspect and confirm that their farms and businesses adhere to the organic standards established by various trading partners. During the conversion period to organic management, which lasts 2 to 3 years, farmers cannot sell their produce as 'organic' and thus, tap price premiums. This is because consumers expect organic produce to be free of residues. However, according to the Codex Guidelines on Organically Produced Food (2007), products produced on land under organic management for at least one year, but less than the two-three year requirement could be sold as "**transition to organic**"; but very few markets have developed for such products.



While most developing countries producers have historically targeted international export markets in the EU and north America, domestic market opportunities for organic food are emerging worldwide. Acknowledging the role of domestic organic markets in supporting a vibrant organic sector, alternative systems to certification have emerged worldwide. In developed countries, consumers and organic producers have built direct channels for home delivery of non-certified organic produce (e.g. Community Supported Agriculture). In the United States of America (USA), farmers marketing small quantities of organic products are **formally exempt from certification**. Increasingly in developing countries, Participatory Guarantee Systems (PGS) are recognized as substitute to third part certification (e.g. India, Brazil, Pacific islands).

More recently, organic agriculture has become an option to improve household food security, or to achieve a reduction of input costs. With the economic crisis, this phenomenon is seen also in developed countries. Produce is used by farmers for their own consumption or it is sold on the market without a price distinction as it is **not certified**.

Economic objectives are not the only motivation of organic farmers; the goals are often to optimize land, animal and plant interactions, preserve natural nutrient and energy flows and enhance biodiversity, while safeguarding human health of family farmers and contributing to the overall objective of sustainable

agriculture.

This is part of a training guide on Organic Agriculture. Further reading is available on the following topics:

1. **Introduction** to Organic Agriculture
2. [Considerations for Conversion to Organic Agriculture](#) [15]
3. [Step by Step Conversion to Organic Agriculture](#) [16]
4. [Mulching in Organic Agriculture](#) [17]
5. [Water Management in Organic Agriculture](#) [18]
6. [Crop Planning and Management in Organic Agriculture](#) [19]
7. [Nutrient Management in Organic Agriculture](#) [20]
8. [Pest and Disease Management in Organic Agriculture](#) [21]
9. [Weed Management in Organic Agriculture](#) [22]
10. [Soil Cultivation and Tillage in Organic Agriculture](#) [23]
11. [Plant Propagation in Organic Agriculture](#) [24]
12. [Animal Husbandry in Organic Agriculture](#) [25]

You manipulate and/or use pesticides? Make inquiries before!

Pesticide can be harmful to your health, the health of your family, of the consumers and of the environment. Adopt the right gestures to use pesticides safely:

Click on [?Reducing risks while manipulating pesticide \[26\]?](#)

This techniques has been compiled by Ilka Gomez.

FURTHER READING:

IFOAM. 2003. Training Manual for Organic Agriculture in the Tropics. Edited by Frank Eyhorn, Marlene Heeb, Gilles Weidmann, p 24-46, <http://www.ifoam.bio/> [27]

FAO. 1999. Organic Agriculture. Fifteen Session of the Committee on Agriculture. Retrieved from: <http://www.fao.org/docrep/meeting/x0075e.htm> [28]

FAO and WHO.2007. Codex Alimentarius: organically produced food. Third edition. Retrieved from: <http://www.codexalimentarius.org/standards/thematic-compilations/en/> [29]

SOURCE:

[IFOAM - Organics International](#) [30]

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Links:

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- [2] <http://teca.fao.org/keywords/sustainability>
- [3] <http://teca.fao.org/keywords/biodiversity>
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- [9] <http://teca.fao.org/technology-categories/natural-resources-management>
- [10] <http://teca.fao.org/technology-categories/nutrition-better-life>
- [11] <http://teca.fao.org/sites/default/files/image1%20Using%20natural%20ecosystem%20as%20a%20model001.jpg>
- [12] <http://teca.fao.org/sites/default/files/image2%20Overview%20of%20organic%20production%20in%202003002.jpg>
- [13] http://teca.fao.org/sites/default/files/3%20The%20three%20dimensions%20of%20sustainability_0.png
- [14] <http://teca.fao.org/sites/default/files/image4%20Definition%20of%20some%20farming%20systems004.jpg>
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- [25] <http://teca.fao.org/read/8378>
- [26] <http://teca.fao.org/read/8348>
- [27] <http://www.ifoam.bio/>
- [28] <http://www.fao.org/docrep/meeting/x0075e.htm>
- [29] <http://www.codexalimentarius.org/standards/thematic-compilations/en/>
- [30] <http://teca.fao.org/node/8324>