

Organic Agriculture and Biodiversity



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Organic agriculture is good for biological diversity. A simple statement, but one backed up by an increasingly large body of scientific research and evidence-based practice. Biological diversity, or biodiversity, refers to the variety of all life on earth: genetic diversity, species diversity and ecosystem diversity.

Conserving biodiversity is not just about protected areas. Most conservation strategies start by preserving samples of the world's most valuable habitats and associated species in protected areas. But these are seldom enough on their own to protect all biodiversity. They need to be complemented by a range of sustainable land and water management strategies that encourage the spread of native biodiversity into anthropogenic areas. Approximately 37 per cent of the earth's land surface is used for agricultural production (regionally this rises to over 50 per cent in Asia and the Pacific and over 40 per cent in Sub-Saharan Africa). Much of this area has lost or is losing its native biodiversity. Ensuring the survival of biodiversity, both natural and agricultural, in our farming landscape therefore has to be a priority.

Agriculture was once at the centre of preserving and encouraging diversity. Biodiversity provides the foundation for all agriculture. In agricultural systems it is biodiversity that performs essential ecosystem services, such as the recycling of nutrients, control of local climate and buffering of hydrological processes.

But as agricultural systems become simplified and biodiversity is reduced these services are lost and are often replaced by human intervention and external inputs, such as chemical pesticides and fertilisers.

Agricultural diversity is in crisis. Today no more than 70 plant species are grown over most of the approximately 1,300 million ha of cultivated land in the world. And only a few varieties of each species are grown. In the United States, 60–70 per cent of the total bean area is planted with only two or three varieties. The Food and Agriculture Organisation of the United Nations estimate that about 75 per cent of the genetic diversity of agricultural crops has been lost in the last 100 years and at least one breed of domestic animal becomes extinct each week. Indigenous wheat, rice and many other food crop varieties have virtually disappeared from their original centres of diversity.

How can organic farming help enhance and protect biodiversity? By respecting the natural capacity of soil, plants, animals and the ecosystem, organic agriculture aims to maintain a high level of biodiversity within the agricultural landscape. It makes use of natural ecological functions to enhance both productivity and pest and disease resistance. Synthetic fertilisers, pesticides and genetically modified organisms (GMOs) which negatively affect both health and biodiversity are banned.



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Boosting Diversity: Organic agriculture relies on local conditions instead of agrochemicals. Organic systems therefore encourage the use of locally bred and indigenous crop varieties and livestock breeds. Organic farms are also likely to have higher biodiversity because of greater crop rotation diversity and more crops cultivated.

Research projects have also shown that organic systems increase both the numbers and variety of wild species on farms. A recent review of 76 research projects from Europe, Canada, New Zealand and the US found that organic farming increases abundance and/or species richness at every level of the food chain – from bacteria to mammals. The review concluded that organic farming aids biodiversity by using fewer pesticides and inorganic fertilisers, by adopting wildlife-friendly management of habitats outside production areas and by mixing arable and livestock farming.

Working with nature. Coffee and cacao are shade-loving plants, but yields increase – at least in the short-term – if grown in full sun. Faster growth is however a strain on the plant, making it more susceptible to disease. Growing coffee and cacao under shade is thus more sustainable, helping farmers to increase the long-term viability of plants and reducing external inputs needed to control disease. The tree canopy also provides important bird habitat. Research carried out by the Smithsonian Migratory Bird Centre identified over 90 per cent fewer bird species in sun-grown coffee plantations as opposed to shade-grown coffee in Colombia and Mexico.



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Organic cacao is being used to help farmers produce sustainably and to conserve biodiversity in the MesoAmerican Biological Corridor: a complex of protected areas and sustainable management stretching over seven countries and involving over a hundred NGOs and a thousand communities. A local NGO, Asociación ANAI, has been introducing agroforestry systems to the indigenous farmers of the Talamanca region of Costa Rica. Some 1,500 now farm a range of produce, including bananas, ginger and 20 per cent of the world's organic cacao.

Saving traditions. Throughout the world, maintaining traditional local practices can help to conserve both wild and agricultural biodiversity and sustain rural economies.

Rice cultivation has developed in many important wetland areas throughout Europe, providing both an ecological and an economic incentive for the survival

of wetlands. Demands for water in Southern Europe now present a major threat to natural hydrological regimes. The Sociedad Española de Ornitología has been working with farmers to develop organic production as an economically and environmentally sustainable model of cultivation in the Ebro Delta in Spain. The area has been important for rice growing since the 19th century and is a major breeding, migration and over-wintering site for over 50 internationally important bird species.

Supporting sustainable development. By producing a wide variety of food, organic agriculture can in many situations result in increased productivity and thus food available to local communities. Organic agriculture can therefore help to reduce pressure on land, by reducing the need for agricultural expansion.

Increases in human population have resulted in intensive land reclamation, for agriculture and urban settlement, along China's major river valleys. The wetland ecosystem has been severely fragmented leading to the disruption of natural processes, and the social, economic and environmental effects of increased flooding. WWF-China has been working with a variety of partners on a series of projects to develop an integrated management approach in the Yangtze River basin. In one pilot project farmers have voluntarily opted to restore the wetlands in order to develop more economically and environmentally sustainable hill-based organic farming.

Threats to biodiversity. Whilst this leaflet has concentrated on the benefits of organic farming to biodiversity, there are also some major threats which need to be checked. Invasive exotic genes introduced through Genetically Modified Organisms (GMOs) are a particularly serious case. For example, in Mexico GMO contamination was found in 24 per cent of the 2,000 plants analysed from 138 farming and indigenous communities who took part in the research.

The patenting of life through policies such as the World Trade Organisation's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) present another threat to diverse farming systems. The imposition of patent rights over biological resources and traditional knowledge unfairly deprive local communities of their rights over, and access to, the resources they have nurtured and conserved over generations.



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Supporting organic agriculture

There is a need for a wide range of activities to ensure that farming can once again become synonymous with biodiversity, rather than be seen as a threat. The points below show how consumers, organic farmers and research organisations, NGOs, and governments could all help.

Policies

- Promote organic agriculture to governments not just as an export crop, but as a tool for food security and biodiversity conservation
- Encourage environment ministries to include organic farming in their national biodiversity plans
- Encourage donors to include biodiversity elements in their project proposals and to fund projects on organic farming and biodiversity
- Evaluate the impact of agricultural practice subsidies on biodiversity

Research and Extension

- Promote exchanges of successful biodiversity farming examples among farmers and technicians
- Develop and disseminate long-term data sets on organic farming and biodiversity
- Investigate the role of organic farming in halting biodiversity loss and environmental degradation, particularly in third world countries
- Identify, develop and maintain varieties and breeds with the potential to perform well in local conditions

Promoting Markets

- Promote and develop markets for organic products, particular small holders, such as local alternative distribution systems (i.e. box schemes, farmers markets)
- Promote biodiversity aspects of organic agriculture to consumers

Mitigating Threats

- Introduce the polluter-pays-principle for agricultural producers
- Research the effects and potential effects of GMOs on biodiversity
- Use the legal frameworks developed under the Convention on Biological Diversity and Cartagena Protocol to develop bio-safety laws at the national level
- Reject privatisation of genetic resources and protect farmers' rights to develop, exchange, sell and save seeds



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Biodiversity standards

IFOAM is currently developing global Biodiversity and Landscape Standards to be included within its Basic Standards. The standards require that a biodiversity and landscape management plan be drawn up for each farm, and include sections on genetic diversity, species diversity, ecosystem diversity, landscape, pastoral lands, water management and handling and processing.

Sources of information on organic agriculture and biodiversity

IFOAM has convened three international workshops on Organic Agriculture and Biodiversity, the proceedings of which can be ordered via the IFOAM web-site: www.ifoam.org

El-Hage Scialabba, N and C Hattam (2002); *Organic agriculture, environment and food security*, FAO, Rome

Hole, D.G., A.J. Perkins, J.D. Wilson, I.H. Alexander, P.V. Grice, A.D. Evans (2005); Does organic farming benefit biodiversity?, *Biological Conservation* **122** (2005) 113–130

IFOAM (2002); *Norms: IFOAM Basic Standards for Organic Production and Processing*, IFOAM, Germany

Stolze, M, A Piorr, A Häring and S Dabbert (2000); *The Environmental Impacts of Organic Farming in Europe. Volume VI Organic Farming in Europe: Economics and Policy*, University of Hohenheim, Germany

IFOAM's mission is leading, uniting and assisting the organic movement in its full diversity. Our goal is the worldwide adoption of ecologically, socially and economically sound systems that are based on the principles of Organic Agriculture.

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