

We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

6,900

Open access books available

185,000

International authors and editors

200M

Downloads

Our authors are among the

154

Countries delivered to

TOP 1%

most cited scientists

12.2%

Contributors from top 500 universities



WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?
Contact book.department@intechopen.com

Numbers displayed above are based on latest data collected.
For more information visit www.intechopen.com



Environmental Benefits of Organic Farming

Farhad Nejadkoorki

Department of Environmental Engineering, Yazd University, Yazd, Iran

Abstract

Predictions of human population and its requirements to generate new farmlands are unavoidable. On the other hand there have been significant concerns over threats of the agriculture expansion over the next 50 years globally. This is due to public concerns on quality of agricultural products and environmental concerns. Organic farming is kind of agricultural that provide the consumers, with fresh, tasty and reliable food while regarding natural life-cycle systems. There are tremendous attentions in organic farming and foods nowadays both in developed and developing countries. In addition to health benefits of organic products for consumers, there are vital environmental benefits for the earth. An organic farming keeps biodiversity and reduce environmental pollutions such air, water. And soil. This paper investigates and highlights these environmental concerns.

Keywords: Organic food, environment, benefits

1. Introduction

Organic farming is kind of agricultural that provide the consumers, with fresh, tasty and reliable food while regarding natural life-cycle systems. In order to reach organic farming a number of practices should be implemented. Unnatural substances such as chemical synthetic pesticide and synthetic fertiliser livestock antibiotics, food additives and processing aids should be limited. The use of genetically modified organisms should be prohibited. Taking advantage of on-site resources, such as livestock manure for fertiliser or feed produced on the farm. Choosing plant and animal species that are resistant to disease and adapted to local conditions. Raising livestock in free-range, open-air systems and providing them with organic feed.

There have been significant concerns over threats of the agriculture expansion over the next 50 years globally. Predictions of human population and its requirements to generate new farmlands are unavoidable. This means changing more land use from farmland and rangeland to agriculture lands. As a consequence biodiversity is expected to decrease. Furthermore using more machinery and chemical pesticides and herbicides world will be facing more environmental pollution (water, air, soil).

Nowadays, organic farming has received increasing attention in agricultural policy and rural development. With growing public concern for food quality and safety, animal welfare and natural resources, the organic farming philosophy and practice become more accepted [1]. Organic market has been welcoming by developed countries [2].

Organic farming as an environmentally friendly version of agriculture is been selected especially by people of developed countries. It provides organic food which is healthier because it does not

contain synthetic pesticide traces. The soil structure on organic farms is much better leading to less pollution from nitrate and is healthier for the crop plant, and environmentally organic is better than the other forms and is chemical free [5]. In contrast agriculture with use of pesticides and other chemical materials have been reported to produce foods leading to cancer [5].

2. Biodiversity

Natural ecosystems have been providing a home for plants and animals. The current diversity in species is result of million years of evolution of such systems. However, when we simplify natural ecosystems to anthropogenic ones, home of unwanted plants and animals appear to be limited. A contemporary agriculture system destroys complex ecosystem such as forests and rangelands through clear cutting. Furthermore using chemical based substances to get rid of pests and weeds make the problem doubles.

Organic farming have less impact on hedge bottom vegetation, with hedges on organic farms displaying significantly higher species diversity than those on conventional farms [2].

Evidence from comparative studies under arable regimes indicated a general trend for higher earthworm abundance under organic management. There have been reports that the presence of grass-clover leys within organic rotations is the principal reason for the significantly higher non-pest butterfly, spiders, beetles abundance [2].

3. Air pollution and climate change

A major theme in organic practices is to operate in tight nutrient cycles to minimise losses to the air and water reserves [3]. There is a reduction in air pollution not just from the lower carbon footprint but also from the absence of chemical sprays which get into the atmosphere. There have been tremendous amount of chemicals which are used to direct lands to yield only desired products and not pests and weeds. This is especially can be tracked after agricultural revolution through using planes and tanks of materials.

Agriculture is both cause and victim of climate change. According to the Intergovernmental Panel on Climate Change (IPCC), the annual amount of greenhouse gases emitted by the agricultural sector is estimated about six giga- tonnes CO₂ in 2005. This represents approximately 10-12% of total greenhouse gases. As a consequence an organic farming system is only substitute to produce healthy products without any side effects locally (air pollution) and globally (climate change).

4. Water and soil pollution

Intensive aquaculture may leave substantial amount of nutrients and poisons to water bodies [4]. Water pollution is largely associated with the use and discharge of water in both animal and plant farming. For instance in a fish pond each time water is exchanged, wastewater is discharged to the surrounding surface waters. The wastewater carries a number of pollutants, reflected in the selected indicators. These pollutants ultimately stem from chemicals, fertilizers and feed added to the ponds [4]. Therefore in an organic farming, water pollution is lower, as there is much reduced eutrophication of chemical inputs. Soil structure on organic farms is much

better leading to less pollution from nitrate and is healthier for the crop plant, and that environmentally organic is better than the other forms and is chemical free [5].

5. Summary and conclusion

This paper has highlighted the most environmental benefits of organic farming compared to conventional agriculture. It was discussed that the main environmental costs of non-organic farming are narrowing biodiversity and increasing different types of pollution (e.g. water, air, soil). However, if an organic farming is preferred a number of environmental benefits will be met. A holistic assessment can be seen in table1 [6].

Organic agriculture perform :	Much better	Better	The same	Worse
Biodiversity and landscape		X		
• Floral diversity		X		
• Faunal diversity		X		
• Habitat diversity			X	
• Landscape			X	
Soil		X		
• Soil organic matter		X		
• Biological activity	X			
• Soil structure			X	
• Soil erosion		X		
Ground and surface water		X		
Nitrate leaching		X		
Pesticides	X			
Climate and air			X	
• CO		X		
• NO			X	
• CH ₄			X	
• NH ₃		X		
• Pesticides	X			
Farm input and output		X		
• Nutrient use		X		
• Water use			X	
• Energy use		X		

Table 1. Assessment of organic farming compared to conventional agriculture

The author suggests that more local studies should be taken to compare and quantify the economical and environmental trade off between organic and non-organic farming. A life cycle assessment is an efficient approach to compare these two by addressing a holistic approach.

6. References

- [1] Kerselaers, E., et al., Modelling farm-level economic potential for conversion to organic farming. *Agricultural Systems*, 2007. 94(3): p. 671-682.
- [2] Hole, D.G., et al., *Does organic farming benefit biodiversity?* *Biological Conservation*, 2005. 122(1): p. 113-130.
- [3] Hansen, B., H.F. Alr, e, and E.S. Kristensen, *Approaches to assess the environmental impact of organic farming with particular regard to Denmark*. *Agriculture, Ecosystems & Environment*, 2001. 83(1): p. 11-26.
- [4] Anh, P.T., et al., Water pollution by intensive brackish shrimp farming in south-east Vietnam: Causes and options for control. *Agricultural Water Management*, 2010. 97(6): p. 872-882.
- [5] Trewavas, A., A critical assessment of organic farming-and-food assertions with particular respect to the UK and the potential environmental benefits of no-till agriculture. *Crop Protection*, 2004. 23(9): p. 757-781
- [6] Stolze M., Piorr A., Haring A. and Dabbert S. (2000) *The Environmental Impacts of Organic Farming*. University of Hohenheim. Stuttgart, Germany. 6. 127.