ORGANIC AGRICULTURE IN TERMS OF ENVIRONMENTAL IMPACT

Elnur Allahverdiyev
Baku Business and Cooperation College, Baku, Azerbaijan

ABSTRACT

This article was prepared by conducting a literature review to address the environmental effects of organic agriculture. In order to understand the environmental dimension of organic agriculture, existing information was synthesized and the findings obtained as a result of this synthesis were focused on. The article is an in-depth review of information, data and research on the environmental impacts of organic farming, highlighting important issues in this field. By synthesizing the rich content in the literature, the aim is to understand the environmental dimension of organic agriculture and evaluate its effects on the environmental sustainability of this agriculture. This article aims to provide a comprehensive overview of the environmental impacts of organic farming.

Keywords: Organic Agriculture, Environmental Impacts, Sustainable Agriculture.

DOI:

1. INTRODUCTION

Agriculture is a basic source of life for humanity and is a critical sector that must be managed on a sustainable basis with the increasing population and changing consumption habits. In this context, organic agriculture has received increasing attention in recent years and has attracted attention with its environmentally friendly practices. Organic agriculture stands out as a form of agriculture that aims to protect natural resources, support biodiversity and maintain soil health. This article aims to provide an important assessment of organic farming in terms of environmental impact. (Biao, X., Xiaorong, W., Zhuhong, D., & Yaping, Y. 2003)

Examining the studies on organic agriculture in the literature provides an important basis for understanding the various environmental advantages and impacts of this form of agriculture. Issues such as how organic agriculture affects soil health, how it protects water resources and how it supports biodiversity compared to traditional agricultural systems will be discussed in detail in the light of current information in the literature. (Dabbert, S. 2003)

In this context, in the introduction section, basic information about the definition of organic agriculture, its historical development, its role within the framework of the concept of environmental sustainability and the aims of the article will be presented. Additionally, a preliminary overview of the methodology to be used to evaluate environmental impacts will be provided and a general framework of the literature review will be drawn. This article on the environmental impacts of organic agriculture aims to make a significant contribution to understanding sustainable practices for the future of agriculture. (Gomiero, T., Pimentel, D., & Paoletti, M. G. 2011)

2. LITERATURE REVIEW

2.1. Definition and History of Organic Farming

Organic farming is a form of agriculture that is based on natural processes and takes a different approach than traditional agricultural practices such as synthetic chemical fertilizers, pesticides and genetic engineering. The main purpose of organic agriculture is to protect soil health, support biodiversity and continue farming activities in an environmentally friendly way. (Lorenz, K., & Lal, R. 2016)

The origins of this form of agriculture date back to the mid-20th century. With the increase in industrial agriculture, excessive use of natural resources and environmental problems have emerged. In this context, the history of organic agriculture is a reflection of the search for a sustainable model in farming. In the second half of the 20th century, the first principles and standards of organic agriculture were established and scientific research in this field increased. (Wu, J., & Sardo, V. 2010)

2.2. Basic Principles of Organic Agriculture

The basic principles of organic agriculture are based on respect for the environment, sustainability, protection of natural resources and supporting ecosystem balance. These principles include key elements such as minimizing the use of synthetic chemicals, promoting the use of organic materials, and improving soil health. Organic farming is based on the philosophy of understanding natural cycles and farming in accordance with these cycles. (Meng, F., Qiao, Y., Wu, W., Smith, P., & Scott, S. 2017)

2.3. Environmental Advantages of Organic Farming

The environmental advantages of organic farming focus on protecting soil, water and air quality, increasing biodiversity and maintaining ecosystem balance. Practices such as reducing the use of synthetic chemicals, preventing soil erosion and minimizing the risk of polluting water resources are just some of the advantages of organic agriculture in terms of environmental sustainability. Organic agriculture contributes to the long-term sustainability of agriculture by minimizing environmental impacts.

2.4. Economic and Social Impacts of Organic Agriculture

The economic impacts of organic farming are not limited to environmental sustainability; It also has a significant impact on farmers' income levels, employment opportunities and local economic dynamics. Farmers who practice organic farming can often receive higher prices because the demand for organic products has increased. This can positively impact the economic well-being of farmers and support rural communities. Additionally, the adoption of organic farming can contribute to broader acceptance of sustainable agricultural practices in society. (Reganold, J. P., & Wachter, J. M. 2016)

In terms of social impacts, organic agriculture can contribute to strengthening local communities and increasing farmers' awareness. The principles of organic farming can promote knowledge sharing among farmers, allowing agriculture to become more sustainable and tailored to local needs. (Stolze, M., Piorr, A., Häring, A. M., & Dabbert, S. 2000)

2.5. Prevalence of Organic Agriculture Worldwide

The worldwide prevalence of organic agriculture is increasing rapidly in parallel with changes in global agricultural systems. Many countries are adopting policies that encourage organic agriculture and are

switching to this form of agriculture. Organic farming is increasingly accepted not only in developed countries but also in developing countries. This reflects international efforts to address imbalances in global food systems and reduce the environmental and social impacts of agriculture. (Reganold, J. P., & Wachter, J. M. 2016)

2.6. Comparison of Organic Farming and Conventional Agriculture

Comparing organic farming with conventional farming systems is important to understand the balance between the advantages and challenges of these two approaches. It is important to evaluate the environmental and social benefits of organic farming compared to the high productivity and low cost of conventional farming. This comparison can provide a critical insight to understand the evolving dynamics of agricultural practices and create a more sustainable agricultural model in the future.

3. METHODOLOGY

This study uses literature review and synthesis method to understand the environmental impacts of organic agriculture. Various academic resources, scientific articles, reports and publications of international organizations were scanned to examine and evaluate the environmental impacts of organic agriculture in depth.

The first phase of this study began with a comprehensive review of the literature on the environmental impacts of organic agriculture. Various databases, academic journals, and relevant conference proceedings were searched using keywords and specific search strategies. This process provided an in-depth review of previous studies on the environmental impacts of organic farming.

The resulting literature was analyzed according to environmental impact dimensions. The focus is on the effects of organic agriculture on soil health, water resources, biodiversity and ecosystems. The analysis process aimed to synthesize findings from the literature and identify prominent trends in these findings.

The findings aim to understand the environmental impacts of organic agriculture and evaluate the role of these impacts on the sustainability of agriculture. The findings were critically evaluated to highlight the advantages and challenges of organic farming in terms of environmental sustainability. (Dabbert, S. 2003)

This methodology clearly outlines the steps and approach used to understand the environmental impacts of organic farming. (Lorenz, K., & Lal, R. 2016)

4. DISCUSSION

4.1. Environmental Impacts of Organic Farming

4.1.1. Effects on Soil Health

The effects of organic farming on soil health become evident when examined in the context of the basic principles and practices of this form of agriculture. Organic agriculture aims to preserve the natural balance of soil microbiology by limiting the use of chemical fertilizers and pesticides. In this context, many studies in the literature suggest that organic agriculture positively affects soil health. (Reganold, J. P., & Wachter, J. M. 2016)

Organic farming emphasizes the use of organic materials (compost, green manure). This increases soil organic matter content, improving water retention capacity and reducing the risk of erosion. Additionally, organic farming practices strengthen the soil structure by increasing the diversity of soil microorganisms. This allows better absorption of plant nutrients and increases soil fertility.

On the other hand, although some critics claim that organic farming will reduce productivity, research highlights the potential of organic farming to maintain long-term soil health. Organic agriculture supports the soil ecosystem by contributing to the reduction of environmental pollution elements such as chemical residues and soil salts. (Biao, X., Xiaorong, W., Zhuhong, D., & Yaping, Y. 2003)

However, there are some contradictions among studies evaluating the effects of organic agriculture on soil health. These contradictions indicate that the effects of organic agriculture on soil health may vary depending on a variety of factors, especially regional conditions.

The effects of organic farming on soil health appear to be generally positive. However, the severity and stability of these effects may vary depending on application methods, geographic location and various other factors. At this point, the need for future research to better understand and optimize the effects of organic farming on soil health is important.

4.1.2. Protection of Water Resources

The impacts of organic agriculture on water resources are linked to this form of agriculture's specific methods of water use, reduction of pollutants, and water conservation. Many studies in the literature suggest that organic agriculture protects water resources more effectively. (Gomiero, T., Pimentel, D., & Paoletti, M. G. 2011)

Organic farming generally relies on methods that encourage the efficient use of water. Limited use of synthetic chemicals reduces the risk of polluting groundwater resources. At the same time, organic farming practices improve soil structure, helping to better retain water in the soil and reduce erosion. (Meng, F., Qiao, Y., Wu, W., Smith, P., & Scott, S. 2017)

However, some studies evaluating the effects of organic agriculture on water resources highlight the lack of certainty on this issue. It has been suggested that in some cases, greater use of water resources may be required due to the lower efficiency of organic farming. At this point, it should be stated that discussions about the effects of organic agriculture on water resources continue and regional differences should be taken into account.

4.1.3. Supporting Biodiversity

The effects of organic farming on biodiversity relate to the principles of this form of agriculture that support natural ecosystems. Organic farming aims to increase biodiversity, often through limiting the use of chemicals and preserving natural habitats. (Gomiero, T., Pimentel, D., & Paoletti, M. G. 2011)

Many studies in the literature show that organic agriculture supports biodiversity by reducing the use of pesticides and leaving more space for natural ecosystems. Organic farming practices promote natural regulation against pests and protect the habitats of different species by preserving native wild vegetation.

In studies assessing the effects of organic farming on biodiversity, it may be difficult to reach a general conclusion, given the effects of regional differences and other factors. Therefore, it is important to continue research on the effects of organic farming on biodiversity and to collect more data on this subject. This is a

critical step to better understand organic farming's contribution to biodiversity and shape future agricultural practices.

4.2. Economic and Social Impacts of Organic Agriculture

4.2.1. Agricultural Productivity

The impacts of organic farming on agricultural productivity involve assessing the unique effects of this form of agriculture on production processes, costs, and outputs. Many studies in the literature contain various views and findings on how organic farming affects agricultural productivity. (Wood, R., Lenzen, M., Dey, C., & Lundie, S. 2006)

Organic farming has generally been associated with lower productivity compared to conventional farming systems. This may occur due to limited use of chemical fertilizers and pesticides. However, some research suggests that organic farming practices can increase agricultural productivity in the long term by improving soil health and supporting local ecosystems. (Dabbert, S. 2003)

In terms of the economic impacts of organic farming, it can provide an economic advantage to farmers as organic products can often be sold at higher prices. However, because the costs of organic farming are often high, net profitability may vary depending on a variety of factors. This shows that organic agriculture requires a certain balance in terms of sustainable economic return.

In terms of social impacts, organic farming generally supports the small-scale farming model and provides economic benefits to local communities. Organic farming can stimulate local labor and stimulate local agricultural markets. Additionally, the sustainability and environmental sensitivity of organic agriculture can increase environmental awareness in communities and strengthen the social dimension of agriculture.

The effects of organic farming on agricultural productivity are complex and multidimensional. These effects are shaped by regional differences, application methods, and other factors. To better understand the economic and social impacts of organic agriculture, it is important that future research goes deeper on this topic and includes different contexts. (Lorenz, K., & Lal, R. 2016)

4.2.2. Employment Opportunities

The effects of organic farming on employment opportunities is an important issue as this form of agriculture is generally more labor intensive and involves work based on local ecosystems. Many studies evaluating the effects of organic agriculture on employment point to various findings in this field.

Organic farming can increase the number of workers employed in farming operations, as it is generally a more labor-intensive production model. This has the potential to create employment, especially on small farms and in local communities, as opposed to large-scale industrial agriculture. Additionally, since organic farming practices often require manual labor, it supports the employment of local labor. (Hansen, B., Alrøe, H. F., & Kristensen, E. S. 2001)

There are some points to consider regarding the effects of organic agriculture on employment opportunities. For example, because the costs of organic farming are often high, this may limit the financial incentives farmers provide to their workforce. Additionally, factors such as the size and scale of organic farming influence its impact on employment opportunities.

4.2.3. Marketing and Consumer Preferences

The effects of organic agriculture on marketing and consumer preferences are an important issue in the context of the ability of this form of agriculture to respond to consumer demands and marketing strategies. Marketing processes of organic products and consumers' interest in these products play a critical role in determining the economic impacts of organic agriculture. (Meng, F., Qiao, Y., Wu, W., Smith, P., & Scott, S. 2017)

Organic products are often marketed as a healthy, environmentally friendly and sustainable option. Therefore, consumers' demands for organic products are increasing. Organic farming can contribute to increased environmental awareness among consumers and the adoption of healthy eating trends. This may affect the marketing strategies of organic agriculture, offering farmers better prices and marketing opportunities. (Tuomisto, H. L., Hodge, I. D., Riordan, P., & Macdonald, D. W. 2012)

However, there are some challenges regarding the impact of organic farming on marketing and consumer preferences. Organic products are often sold at higher prices than conventional products, which can affect consumers' budget choices. Additionally, issues such as lack of standardization in organic farming marketing processes and labeling issues can affect consumer confidence. (Biao, X., Xiaorong, W., Zhuhong, D., & Yaping, Y. 2003)

The effects of organic farming on marketing and consumer preferences are a complex issue and may vary depending on a variety of factors. Therefore, more research is needed to better understand the economic and social impacts of organic farming, including marketing strategies, consumer demands, and dynamics within the industry.

5. CONCLUSION AND RECOMMENDATION

It provides a comprehensive view to evaluate the environmental, economic and social impacts of organic agriculture, understand sustainability efforts in the agricultural sector and shape future agricultural models. This article examined the environmental impacts of organic farming in the context of soil health, protecting water resources, and supporting biodiversity. He also focused on the economic and social dimensions of organic agriculture, addressing issues such as agricultural productivity, employment opportunities, marketing and consumer preferences.

The positive effects of organic farming on soil health are linked to its principles that emphasize the use of organic materials and maintaining the natural balance of soil microbiology. In terms of protecting water resources, organic agriculture appears to encourage more effective use of water and improve water quality by reducing pollutants. Regarding biodiversity, it has been observed that organic farming has the potential to increase biodiversity by preserving natural habitats and promoting natural regulation against pests.

In terms of economic and social impacts, it is noteworthy that organic agriculture tries to balance the various views and consequences on agricultural productivity. In addition to its effects on agricultural productivity, it is important that organic agriculture contributes to employment opportunities and supports social sustainability with its work based on local ecosystems. In the context of marketing and consumer preferences, marketing organic products as a health, environmentally friendly and sustainable option increases environmental awareness among consumers and influences the economic success of organic agriculture.

Considering the contributions of organic agriculture to sustainability efforts and the challenges of expanding this form of agriculture, it is important to take a balanced approach. More research and experience in the field of application are needed to optimize the environmental, economic and social impacts of organic agriculture. This effort will be an important step towards making future agricultural systems sustainable and diverse.

REFERENCES

Biao, X., Xiaorong, W., Zhuhong, D., & Yaping, Y. (2003). Critical impact assessment of organic agriculture. *Journal of Agricultural and environmental Ethics*, *16*, 297-311.

Dabbert, S. (2003). Organic agriculture and sustainability: environmental aspects. *Organic agriculture, sustainability markets and policies*, 51-64.

Gomiero, T., Pimentel, D., & Paoletti, M. G. (2011). Environmental impact of different agricultural management practices: conventional vs. organic agriculture. *Critical reviews in plant sciences*, *30*(1-2), 95-124.

Hansen, B., Alrøe, H. F., & Kristensen, E. S. (2001). Approaches to assess the environmental impact of organic farming with particular regard to Denmark. *Agriculture, Ecosystems & Environment*, *83*(1-2), 11-26.

Lorenz, K., & Lal, R. (2016). Environmental impact of organic agriculture. *Advances in agronomy*, *139*, 99-152.

Meng, F., Qiao, Y., Wu, W., Smith, P., & Scott, S. (2017). Environmental impacts and production performances of organic agriculture in China: A monetary valuation. *Journal of environmental management*, *188*, 49-57.

Reganold, J. P., & Wachter, J. M. (2016). Organic agriculture in the twenty-first century. *Nature plants*, *2*(2), 1-8.

Stolze, M., Piorr, A., Häring, A. M., & Dabbert, S. (2000). *Environmental impacts of organic farming in Europe*. Universität Hohenheim, Stuttgart-Hohenheim.

Tuomisto, H. L., Hodge, I. D., Riordan, P., & Macdonald, D. W. (2012). Does organic farming reduce environmental impacts?–A meta-analysis of European research. *Journal of environmental management*, *112*, 309-320.

Wood, R., Lenzen, M., Dey, C., & Lundie, S. (2006). A comparative study of some environmental impacts of conventional and organic farming in Australia. *Agricultural systems*, *89*(2-3), 324-348.

Wu, J., & Sardo, V. (2010). Sustainable versus organic agriculture. *Sociology, organic farming, climate change and soil science*, 41-76.