Organic farming: Way to nourish the nature

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**Abstract:** Organic farming is a contemporary and sustainable approach to agriculture that offers consumers fresh, natural farm products. Instead of working against nature, organic farming operates in harmony with it. This is accomplished through the use of techniques that enhance crop yields without causing harm to the natural environment or the people living and working within it. Organic agriculture combines eco-friendly practices that require minimal external inputs, thereby contributing to improved food availability. It has a positive impact on various aspects such as birds, insects, weeds, wildlife, and the diversity of soil flora and fauna. In contrast, conventional farming is capital-intensive, relying on a higher quantity of manufactured inputs and energy when compared to the knowledge- and labor-intensive practices of organic farming. Organic agriculture utilizes energy more efficiently than conventional methods. Moreover, organic farming produces cost-effective food products that are free from synthetic fertilizers and pesticides. It also generates employment opportunities and economic benefits for local communities. Although the methods employed in organic farming may be more expensive and labor-intensive initially, they prove to be more cost-effective in the long run. Switching to organic farming methods can help farmers worldwide address the climate crisis as organic agriculture promotes the sequestration of greenhouse gases in the soil. Additionally, organic farming has the potential to address food security concerns. Numerous studies provide compelling evidence that organic crops are a superior source of nutrients compared to their conventionally grown counterparts. Organic systems also enhance animal immunity and increase disease resistance in plants, resulting in crops with 50% fewer mycotoxins and a prolonged shelf life.

Organic foods exhibit a higher presence of plant secondary metabolites, elevated levels of micronutrients, and increased concentrations of conjugated fatty acids, thereby contributing to improved human health outcomes, including a reduced incidence of noncommunicable diseases. Organic agriculture integrates modern techniques, traditional practices, and scientific principles to effectively manage the interconnected environment, fostering equitable relationships and enhancing the overall quality of life for all stakeholders involved

**Key words:** Organic farming, Conventional farming, Organic foods and Economic benefits etc.

# 1.Introduction

In recent decades, organic farming has garnered significant interest as a means to sustain agricultural production while addressing the environmental impacts associated with conventional farming practices. Organic farming not only yields high-quality and nutritious food products but also contributes to the enhancement of soil fertility and quality (Isaac 2012). Organic food production strictly adheres to the absence of synthetic fertilizers, pesticides (including insecticides, herbicides, and fungicides), plant growth regulators (such as hormones), livestock antibiotics, genetically modified organisms (GMOs), and the application of human sewage sludge (John, 2011).

Biological pesticides derived from natural sources can be utilized in organic food production. However, precautionary measures must be taken prior to adopting advanced technologies in organic agriculture due to the substantial risks associated with unpredictable tools such as genetic engineering (Tuomisto *et al*., 2012). Organic farming operates on the principles of ecological cycles, aiming to minimize the reliance on external inputs. This approach reduces resource consumption on farms and prevents the accumulation of excessive nutrients in the system, thereby mitigating the risks of phosphorus and nitrogen eutrophication and avoiding over fertilization.

Organic livestock farming follows environmentally friendly practices that prioritize animal welfare, ensuring the production of high-quality yields. This approach aligns with the preferences of an increasing number of consumers (Sundrum, 2012). Organic agriculture, with its emphasis on minimizing damage to ecosystems, humans, and animals, contributes to increased food availability while keeping external inputs low. However, some critics argue that organic farming may result in lower yields, potentially necessitating additional land to achieve similar food production levels as

conventional systems. This could lead to biodiversity loss and extensive deforestation, potentially undermining the ecological benefits associated with organic practices (Seufert, 2012).

According to the Codex Alimentarius Commission, “organic agriculture is a holistic production management system that avoids use of synthetic fertilizers, pesticides and genetically modified organisms, minimizes pollution of air, soil and water, and optimizes health and productivity of interdependent communities of plants, animals and people.” Organic farming is a production scheme, which mainly prohibits or avoids the utilization of artificial pesticides, fertilizers, livestock feed additives, and growth regulators. The objectives of environmental, financial, and social sustainability are the fundamentals of organic farming. The major features include protecting long-lasting fertility of soil by preserving organic matter level, nitrogen self-sufficiency through the use of biological nitrogen fixation and legumes, careful mechanical intervention, fostering soil biological activity, successful recycling of organic materials including livestock wastes and crop residues, and pest control relying mainly on crop rotation, diversity, natural predators, resistant varieties, and organic manuring. A huge emphasis is made on preserving the soil fertility by returning all the wastes to it primarily through compost to reduce the gap between nitrogen, phosphorous, and potassium (NPK) addition and its removal from the soil.

# 1.1 Food and Agriculture Organization (FAO) and Organic Agriculture (OA)

As defined by Food and Agriculture Organization (FAO), “Organic farming is environmental friendly ecosystem management in which use of all kinds of synthetic input is eliminated.” In March 1999, organic agriculture was officially included into FAO’s agenda as a way to support sustainable progress. The interest of FAO in organic agriculture stems from its potential to contribute to rural development and global food security. FAO member countries in the International Conference on Organic Agriculture and Food Security in Rome (2007) emphasized the organic agriculture’s capability to create a more stable food supply, increased access to food in rural areas, and maintenance of natural resources (Morgera *et al*. 2012).

# Problems associated with the Chemicals used in conventional Agricultural System

 **Environmental Issues**

The current agriculture based on the intensive used of chemical fertilizers which has several negative impacts on the environment. That are as follows

* + 1. Artificial herbicides and fertilizers are susceptible to leaching and runoff, leading to the contamination of aquatic ecosystems, including lakes, rivers, and watercourses.
		2. Long-term application of artificial fertilizers results in diminished soil organic matter content, making the soil vulnerable to erosion caused by precipitation and wind.
		3. A growing reliance on artificial fertilizers necessitates an increasing quantity each year to maintain consistent crop yields.
		4. Artificial chemicals negatively impact soil microorganisms, leading to the deterioration of soil structure, reduced aeration, and limited availability of essential nutrients.
		5. The emergence of pesticide resistance among pests and diseases poses significant challenges in their control. Furthermore, the use of pesticides contributes to a decline in natural pest populations due to habitat loss and direct toxicity.
		6. Thinning of bird eggshells is observed as a consequence of exposure to certain artificial chemicals.
		7. The intensified agricultural practices contribute to the increased extinction rates of predatory bird species.
		8. Adverse effects on wildlife occur due to the cumulative impacts of various agricultural chemicals on the environment.
		9. The current intensive agriculture system leads to an ecological imbalance with far-reaching consequences (Deshmukh, 2010).

# Impact on the Human Health

* + 1. Toxic residues from pesticides have been associated with various adverse effects, including skin reactions and allergic sensitization.
		2. The nervous system is susceptible to unfavorable impacts, such as peripheral neuropathies and impairments.
		3. The endocrine system can experience disturbances due to pesticide exposure.
		4. Carcinogenic properties have been observed in certain pesticides.
		5. Pesticide exposure may lead to a suppression of the immune system.
		6. Prolonged exposure to low levels of pesticide residues in food commodities has been linked to several health issues, including an increased risk of spontaneous abortions and miscarriages.
		7. In girls, early puberty initiation has been associated with pesticide exposure, while undesirable effects have been observed in the male reproductive system.
		8. Pesticide residues in food have been shown to affect kidney, liver, and brain function.
		9. Exposure to pesticides during pregnancy can lead to deformities and abnormalities in newborn babies (Deshmukh, 2010)

# Principles of organic Farming

Organic farming operates on the principles of agro-ecology, encompassing both general and practical aspects:

## General principles include:

1. Enhancing and sustaining the agro-ecosystem by conserving soil, water, and biodiversity.
2. Preventing the exploitation and pollution of natural resources.
3. Reducing reliance on non-renewable energy sources.
4. Producing nutritious and high-quality agricultural products.
5. Preserving indigenous knowledge and traditional farming systems.
6. Safeguarding the autonomy and independence of farmers concerning seed sovereignty, inputs, and markets.
7. Promoting diversity and decentralization.

## Practical principles include:

* 1. Conserving soil through appropriate management practices.
	2. Maintaining soil fertility using natural methods.
	3. Mobilizing nutrients naturally within the agro-ecosystem.
	4. Implementing pest management through biological control methods.
	5. Expanding the genetic base through increased biodiversity.
	6. Avoiding the use of synthetic chemicals and agrochemicals.
	7. Prohibiting the application of Genetic Engineering and related products.
	8. Utilizing farm manures and crop residues as organic fertilizers.
	9. Cultivating biologically active soil life to support ecological balance

# Advantage of organic farming

The advantages of organic farming can be categorized into four main areas:

## Economic Benefits:

1. Organic farming reduces reliance on external inputs by maximizing the use of organic produce.
2. It harnesses the full potential of plant and animal species through biological and genetic means.
3. Organic practices promote sustainable production levels, ensuring long-term viability.
4. Improved management and conservation of soil, water, energy, and biological resources lead to more profitable and efficient production.
5. Organically cultivated plants exhibit higher resistance to diseases and pests, reducing the need for costly treatments.

## Ecological Benefits:

1. Organic farming consumes less energy compared to conventional methods, making it more environmentally friendly.
2. By avoiding the use of harmful chemicals, it maintains biodiversity and preserves natural habitats.
3. Organic farming results in lower CO2 emissions compared to other agricultural systems.
4. It plays a crucial role in preventing environmental degradation and can aid in regenerating degraded areas.

## Social Benefits:

1. Organic farming practices can be readily adopted by small farms, providing benefits to marginal farmers.
2. By reducing dependency on external inputs and expensive technologies, organic farming helps resource-poor farmers.
3. It contributes to local employment generation and benefits the community.

## Soil Health Benefits:

1. Organic fertilizers are considered complete plant food, and organic matter can neutralize soil pH, unlike nitrogenous fertilizers, which can make the soil acidic.
2. Organic inputs, especially organic manures, supply all the essential nutrients needed by plants.
3. Organic farming improves the physical properties of the soil.
4. The carbon in organic matter serves as a source of energy for beneficial microbes, aiding in soil aggregation and overall soil health.

# IFOAM’s Definition of Organic Agriculture

The IFOAM (International Federation of Organic Agriculture Movements) definition of organic agriculture is based on four key principles:

1. **The Principle of Health:** Organic agriculture aims to maintain and improve the health of plants, soil, animals, humans, and the planet. It recognizes that the health of individuals and communities is closely linked to the health of ecosystems and soil. Organic farming endeavors to sustain and enhance ecosystem health, benefiting all living organisms, from the smallest organisms in the soil to humans.
2. **The Principle of Ecology:** Organic agriculture is founded on ecological cycles and systems, seeking to mimic and support them. It promotes ecological balance through practices like habitat establishment, maintaining agricultural and genetic diversity, and designing farming systems that work in harmony with nature.
3. **The Principle of Fairness:** Organic agriculture strives to create fair associations and equal opportunities for all, both in terms of livelihood and access to resources. The utilization of environmental and natural resources for production and consumption should be economically and socially just, ensuring that these resources are preserved for future generations.
4. **The Principle of Care**: Organic agriculture approaches farming with a responsible and precautionary mindset to safeguard the health of present and future generations, as well as the well-being of the environment. This principle emphasizes the importance of considering responsibilities and taking precautionary measures in the development, management, and technology choices in organic agriculture.

# Prospectus of organic farming in India

Traditionally, India has a strong foundation in organic agriculture; however, the widespread adoption of modern scientific input-intensive farming practices has posed significant challenges to its traditional methods. Nevertheless, there is a growing awareness of the importance of food safety and quality standards, which has led to increased interest in the long-term sustainability of

organic farming. Moreover, accumulating evidence suggests that organic farming can be equally productive as conventional methods.

Organic farming has emerged as a viable alternative system that not only addresses concerns related to food quality and environmental sustainability but also offers a pathway to debt-free and profitable livelihoods. For the organic movement to succeed in India, there needs to be substantial growth in the domestic market. Currently, India ranks among the world's largest organic producers, highlighting the potential significance of organic agriculture in the country.

# Conclusion

Organic farming represents an ecologically sound alternative to conventional farming practices, fostering a harmonious relationship with nature. The surging popularity of organic food is driven by consumer demand for healthier and more nutritious options. This form of agriculture effectively preserves soil health and environmental integrity, consequently benefiting the well-being of consumers. The global market for organic products, including India, is experiencing remarkable growth. The holistic approach of organic agriculture not only enhances consumer and environmental health but also contributes to national economic growth through income generation. In the foreseeable future, India has the potential to cultivate a nutritionally, ecologically, and economically thriving nation by prioritizing and advancing organic farming practices.

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