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Sustainability of Organic Farming

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Abstract: *The two key elements of food quality and safety are receiving more and more attention from the general public. The inclusion of increased levels of pesticide residue, more nitrate, heavy metals, hormones, antibiotic residue, and genetically modified organisms in conventionally farmed food has a significant negative impact on health. Additionally, foods grown traditionally are less nutrient-dense and contain fewer antioxidants, which are protective. Due to its potential health benefits and rising food safety concerns, demand for foods grown organically has expanded over the past few decades.Organic farming is growing food without using synthetic insecticides, growth hormones, or antibiotics, as well as chemical fertilisers and synthetic pesticides. A growing number of people are choosing to eat organic foods because of their advantages in terms of nutrition and health. Additionally, organic farming safeguards the environment and has a bigger socioeconomic impact on a country. India is a nation endowed with native abilities and growing potential for organic agriculture. India, which for a variety of reasons lagged behind other countries in adopting organic farming, is now one of the world's top producers of organic food, thanks to its tremendous rise in organic agriculture. As a result, organic farming has a significant impact on India's health.*

Keywords: History organic farming, 5 government initiatives to support organic farming in India, The organic farming procedure.

I. INTRODUCTION

An agricultural practise known as "organic farming" makes use of biological pesticides and fertilisers derived from plant or animal waste. Using plant or animal waste in organic farming. The use of chemical pesticides and synthetic fertilisers has a negative impact on the environment, which is why organic farming was first introduced as a solution. In other terms, organic farming is a new approach to agriculture or farming that restores, upholds, and enhances the ecological equilibrium. As a result of its nutritional and physiological advantages, organic food is becoming more and more popular every day. Environmental protection and increased socioeconomic effect are benefits of organic farming.

II. LITERATURE REVIEW

The literature review has shown that opinions about organic farming are divergent, especially among the experts. Disagreements about the profitability and yield increase in organic farming are acute, but there is a strong consensus on its eco-friendly nature and inherent ability to protect human health. There are strong views against organic farming mainly on the ground of practicability of feeding a billion people, its financial and economic viability, availability of organic inputs and dissemination of know-how.

However, many studies have revealed that organic agriculture, advocate a careful conversion of farms into organic, so that yield loss is taken care to the extent possible. Presently, there is lack of government subsidies or support to make conversion to organic status easier or cheaper. The questions about the yield and financial viability of organic farming are crucial and there are no empirical studies available in the Indian context comparing the economic and ecological returns of organic farms visa-vis conventional farms. Organic agriculture has been neglected in the agriculture policy, and therefore there is less government assistance for the promotion of organic agriculture in the form of subsidies, agriculture extension services and official research. Given progress tremendously in India, especially in the dryland regions of the country, taking advantage of the diverse soil and climatic conditions.

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Organic farming: Status, Issues and Prospects

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III. DISCUSSION

Definition

Organic farming is agriculture that makes healthy food, healthy soils, healthy plants, and healthy environments a priority, along with crop productivity

History

According to history, the push for contemporary organic agriculture started at the turn of the 20th century, first in Europe and then in the United States, as concerns about soil erosion and depletion, a lack of crop variety, and inadequate food quality grew at the time. Agriculture quickly became mechanised, which greatly boosted agricultural productivity and reduced the cost of farming. In other words, industrialised agriculture and the current organic movement both got their starts at the same time.

- The British botanist Sir Albert Howard, who is frequently credited with founding modern organic agriculture (in 1905) at Pusa, Bihar, documented ancient Indian farming techniques and eventually came to believe they were superior to contemporary agricultural science. In the book The Agriculture Testament, he chronicled his experiences. "The Soil and Health, A Study of Organic Agriculture" was published in 1947 by Sir Albert Howard. the first book with "organic farming/agriculture" in the title.
- Rudolf Steiner, an Austrian philosopher, developed biodynamic farming in Germany in 1924; it is thought to have been the first complete system of organic farming. Steiner stressed the significance of the farmer in maintaining a balance in the relationships between soil, plants, and animals. For their sustenance, healthy animals depended on plants in good health, which in turn depended on soil in good health (for the manure). His system was founded more on his anthroposophical philosophy than it was on a solid understanding of science. The Agricultural Experimental Circle of Anthroposophical Farmers and Gardeners of the General Anthroposophical Society was founded by Steiner to conduct study on the development of his farming system.
- Lord Northbourne, a British agronomist, first used the term "organic farming" in his book Look to the Land (written in 1939, published 1940). From his idea of "The Farm as an Organism," he provided a comprehensive, ecologically sound method of farming.
- Masanobu Fukuoka, a microbiologist who lived in Japan in 1940, created a "Not-Till" organic farming style that he practised and advocated for thirty years. Natural farming or Fukuoka farming are the modern names for his approach.

Ancient History of organic farming in India

India is not a new adopter of the organic agricultural concept. It has been used for thousands of years in India. Organic farming was a pillar of the great Indian civilization. Traditional Indian agriculture was conducted entirely utilising organic methods, with fertilisers and pesticides derived from both plant and animal sources. Although the term "organic farming" has gained popularity recently, it actually dates back 10,000 years to when early farmers began cultivating only using natural resources. Several organic ingredients are briefly mentioned in our ancient literature, like the Rigveda, Ramayana, Mahabharata, KautilyaArthasashthra, etc. In truth, ancient agricultural methods that developed in innumerable villages and farming communities are the origins of organic agriculture. during the epoch. The Indian economy's mainstay was organic farming and fertiliser made from cow dung was used.

After Independence

After 1965, under the influence of the Green Revolution, farmers and consumers progressively went back to organic farming because it is a healthy method of farming due to the negative impacts of conventional farming on the environment and human health.

After 1947

IFOAM: A non-governmental organisation (NGO) called Organics International was established in 1972 in Germany as the International Federation of Organic Agriculture Movements (IFOAM), which serves as the global umbrella

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organisation for the organic agriculture movement and encourages the adoption of organic farming practises. With nearly 800 affiliates spread throughout 117 nations, it is still a real ministry today.

Switzerland's Research Institute of Organic Agriculture (FiBL) was established in 1973. The National Federation of Organic Farming in France (FNAB) was founded in 1978. The fundamental guidelines and rules governing the certification of organic agriculture are established by IFOAM in 1980. Austria becomes the first nation to implement regulations for organic farming in 1983. The Agriculture Biologique (AB) mark, which serves as the symbol for organic goods, was established in 1985. The United States' Law on Organic Agriculture was approved in 1990. 1990 saw the founding of Germany's first organic products trade show, BioFach.

After Economic Reform 1991

A legal framework for the designation of organic agriculture was established by the European Union in 1991 (No. 2092/91, updated in 1999, 834/2007, and 889/2008). 1997 saw the publication of the USDA's initial National Organic Program (NOP). Codex Alimentarius, a commission operated by the UN's World Health Organization, was established in 1999.

The Latest initiative to promote organic Farming

5 government initiatives to support organic farming in India. Through a variety of programmes, the Indian government aids in encouraging organic farming throughout the nation.

1. **Paramparagat Krishi Vikas Yojana (PKVY)**
   The PGS (Participatory Guarantee System) certification programme Paramparagat Krishi Vikas Yojana supports cluster-based organic farming. The programme supports cluster formation, training, certification, and marketing. A farmer receives assistance of Rs. 50,000 per ha for three years, of which 62% (or Rs. 31,000) is given as a financial incentive to use organic inputs.

2. **Mission Organic Value Chain Development for North Eastern Region (MOVCDNER)**
   Through Farmer Producer Organizations (FPOs), the programme encourages third-party certified organic growing of specialty crops in the north-eastern region with a focus on exports. For three years, farmers are offered financial help of Rs 25,000 per hectare for organic inputs such as bio fertilizers, organic manure, and other inputs. The scheme also offers support for the establishment of FPOs, capacity building, and post-harvest infrastructure up to Rs 2 crore.

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3. **Capital Investment Subsidy Scheme (CISS) under Soil Health Management Scheme**
Under this programme, state governments and government organisations receive complete help in setting up mechanised fruit and vegetable market waste and agro waste compost production units, with a cap of Rs 190 lakh per unit (3000 Total Per Annum TPA capacity). Similar aid is offered to private organisations and individuals up to 33 percent of the cost limit, or Rs 63 lakh per unit.

4. **National Mission on Oilseeds and Oil Palm (NMOOP)**
As part of the Mission, Rs. 300 per hectare in financial support at a 50% subsidy is being given for a variety of components, including bio-fertilizers, the provision of Rhizobium culture, Phosphate Solubilizing Bacteria (PSB), Zinc Solubilizing Bacteria (ZSB), Azatobacter, Mycorrhiza, and vermicompost.

5. **National Food Security Mission (NFSM)**
Under NFSM, financial assistance is provided for promotion of bio-fertiliser (Rhizobium/PSB) at 50 percent of the cost limited to Rs 300 per hectare.
As per international resource data from Research Institute of Organic Agriculture (FiBL) and the International Federation of Organic Agriculture Movements (IFOAM) Statistics 2020, India stands at 9th position in terms of certified agricultural land with 1.94 million hectare (2018-19).

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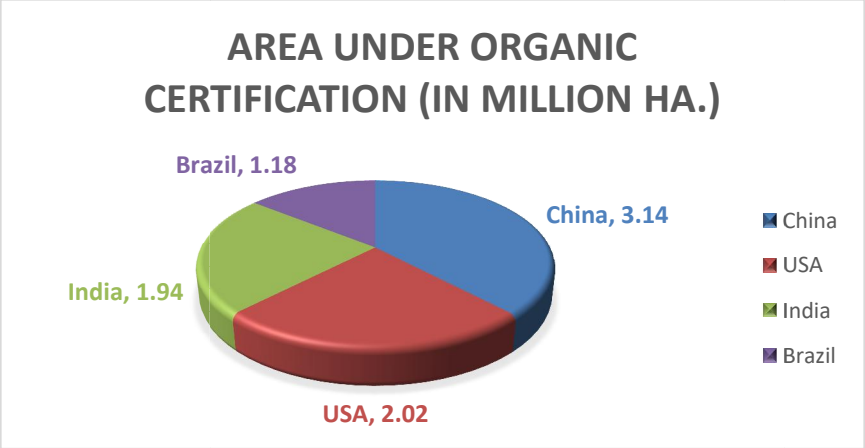
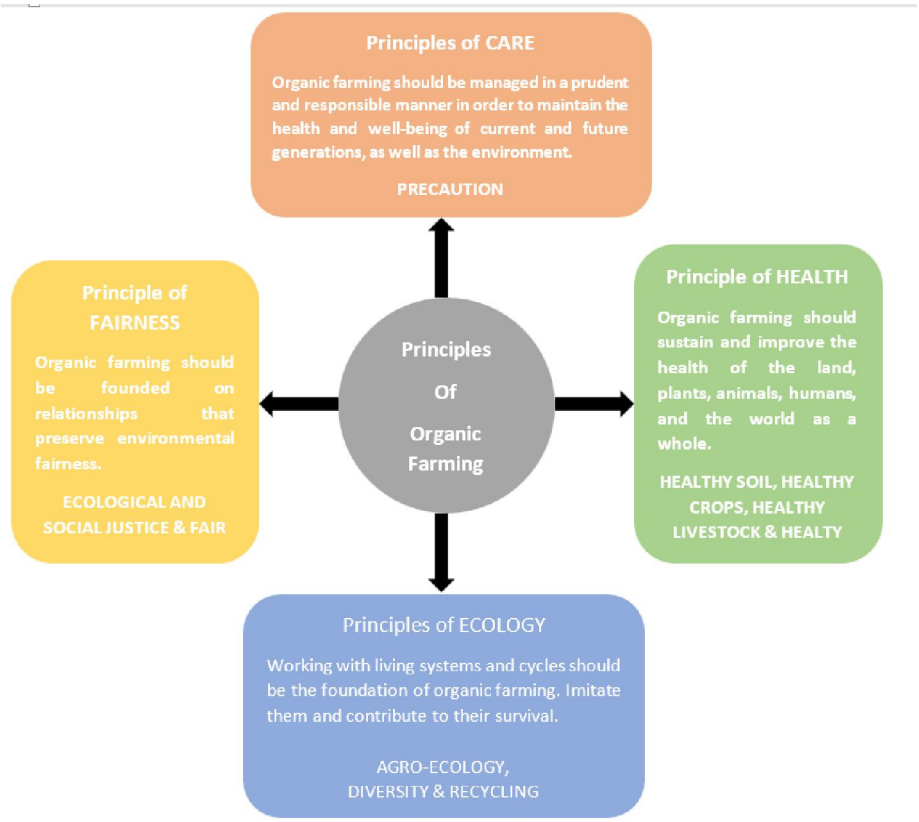
Information comparing organic farming in different nations



The organic farming procedure

Organic farming and food processing processes are diverse, necessitating the creation of a socially, environmentally, and commercially sustainable food production system. The International Federation of Organic Agriculture Movements (IFOAM) has proposed four fundamental principles of organic farming: health, ecology, fairness, and caring.(figure 1) The primary principles and practises of organic food production are to inspire and improve biological cycles in the farming system, to maintain and improve deep-rooted soil fertility, to reduce all types of pollution, to avoid the use of pesticides and synthetic fertilisers, to conserve genetic diversity in food, to consider the vast socio-ecological impact of food production, and to produce high-quality food in sufficient quantity (IFOAM, 1998).



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Agriculture requires specified prerequisites for both agricultural cultivation and animal husbandry, according to the National Organic Programme administered by the USDA Organic Food Production Act (OFPA, 1990). Crops must be grown in fields free of synthetic pesticides, chemical fertilisers, and herbicides for three years before harvesting, with a sufficient buffer zone to reduce contamination from neighbouring farms. Genetically modified foods, sewage sludge, and ionising radiation are all legally forbidden.

Soil fertility and nutrient content are generally regulated by farming practises such as crop rotation and the use of cover crops enhanced with animal and plant waste manures. Pests, illnesses, and weeds are mostly controlled by the use of physical and biological control systems that do not rely on herbicides or synthetic pesticides. Organic cattle should be raised without the use of growth hormones or antibiotics on a regular basis, and they should have adequate outdoor access. Preventive measures such as routine vaccination and vitamin and mineral supplementation are also required (OFPA, 1990).

Why is there need for organic farming?

1. Organic food Industry is growing fast and guarantees high profitability

Again, the institute emphasises that, in recent years, annual sales of organic products have tripled due to the growing construction of natural food stores selling a variety of organic items. The health benefits and improved quality as well as flavour of organic items over conventional agricultural produce are largely responsible for the fast development rate and high profitability level. At the same time, people are becoming more aware of the importance of organic food and farming, changing the agriculture industry into an appealing economic choice. The rising diversity of consumers around the world has undoubtedly aided in the acceptability of organic products, making it the fastest-growing agricultural industry. As a result, retail sales of Organic products are predicted to grow at a rate of more than 20% each year in the next years. In 2001, the estimated market value of certified organic products was at $20 billion. According to the Natural Marketing Institute, current market trends show that organically produced products are becoming more widely accepted around the world.

2. Environmental Sustainability and Food Security

Organic farming also saves energy since its production methods are more energy efficient than traditional ways, reducing the depletion of natural resources used to generate electricity. In addition to mitigating the effects of global climate change, organic agriculture can reduce emissions from fossil fuels, owing to the use of cover crops and grass clovers in organic rotations. Furthermore, a recent study published in Science-Digest emphasised that encouraging organic farming could enhance yield production, particularly in poor nations where conventional agriculture inputs are prohibitively expensive, contributing to increased food security. Long-term research on organic farming practises has revealed that it can provide an impressive mechanism for encouraging ecological harmony, biodiversity, and biological cycles, all of which are essential for environmental sustainability. The final word Organic farming goals are based on soil management and conservation, encouraging the nutrient cycle, ecological balance, and biodiversity conservation.

3. Improvement of Human health

Organic products decrease public health hazards at all levels, including farmworkers, their families, and consumers, by reducing exposure to harmful and persistent chemicals on the farm and in food, as well as the soil in which they work and play, the air they breathe, and the water they drink. Organic standards impose stringent requirements on finished products for human consumption to be devoid of synthetic chemical components, genetically engineered manufacturing processes, and any other perceived natural poisons. Organic produce, more than any other accessible food product, provides the safest items for human consumption.

4. Rich in Nutrients

Organically cultivated food is higher in nutrients such as Vitamin C, iron, magnesium, and phosphorus than conventionally grown food, with less exposure to nitrates and pesticide residues in organically grown fruits, vegetables, and grains. In the meantime, a study published in the journal Food Chemistry discovered that organic soybeans have a better nutritional profile than conventionally cultivated or genetically engineered Roundup Ready soybeans. A study

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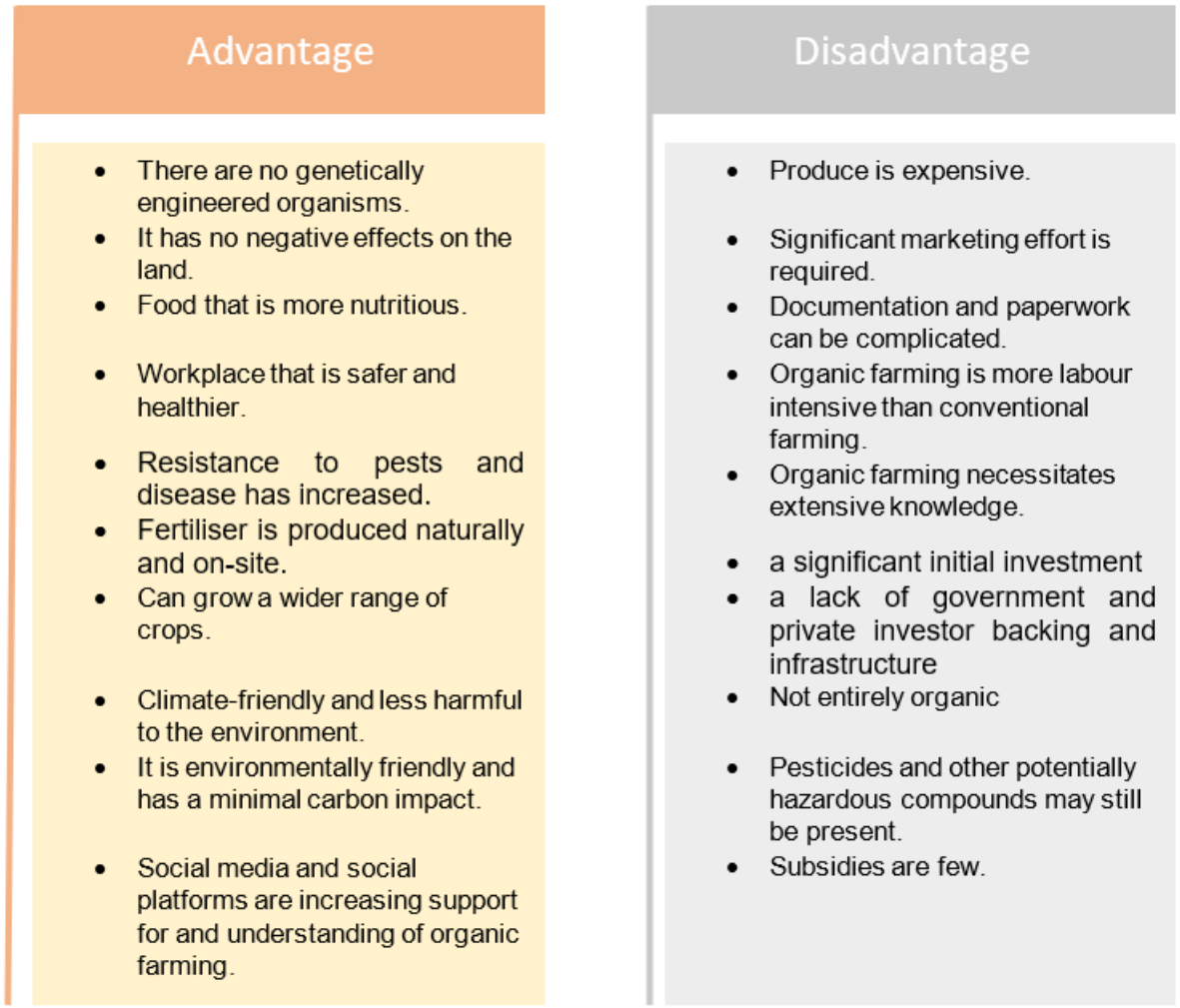
published in the journal PLOS ONE discovered that organic whole milk has much higher quantities of heart-healthy omega-3 fatty acids than milk from cows bred on conventionally managed dairy farms.

5. Rich taste of Organic Produce

The taste of food also influences its quality. Organic food frequently tastes better than conventional food. Organically cultivated fruits and vegetables have a higher sugar content, which adds flavour. Brix analysis, which has traditionally been employed in the wine, sugar, carbonated beverage, fruit juice, maple syrup, and honey industries, can be used to assess the quality of fruits and vegetables. Brix degrees (sign °Bx) are used to calculate the sugar content of an aqueous solution.

6. Analytical Authentication Assures Quality Product

Consumers' interest in organic food is growing because a product must pass quality checks and the manufacturing process must be thoroughly researched to qualify as organic food. Food products are classified into two types: those of plant origin (crops) and those of animal origin (meat, milk and dairy products, eggs and fish). These quality inspections and investigations screen out quacks who aim to take advantage of the organic food label by delivering commercially produced items instead. It ensures that consumers are receiving genuine organic foods.



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IV. CONCLUSION

Organic agriculture produces more healthy and safe food. Organic food is becoming increasingly popular as consumers seek out organic foods that are regarded to be healthier and safer. As a result, organic food may ensure food safety from farm to plate. Organic farming is more environmentally friendly than conventional farming. Organic farming promotes consumer health by keeping soil healthy and maintaining environmental integrity. Furthermore, the organic produce market is now the world's fastest expanding market, including India. Organic agriculture enhances a nation's consumer health, ecological health, and economic growth by generating money in a holistic manner. At the moment, India is the world's largest organic grower (Willer and Lernoud, 2019), and with We can deduce from this vision that boosting organic farming in India will result in a nutritionally, environmentally, and economically healthy nation in the near future.

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