

An Analysis of Organic Agriculture and its Contribution to Sustainable Farming in India

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Abstract

This research article explores the relationship between organic farming and sustainable development in India, with a specific focus on the state of Karnataka. Organic farming is an agricultural system that cultivates land without the use of synthetic fertilizers, pesticides, growth regulators, or livestock feed additives. Instead, it relies on natural techniques such as crop rotation, composting, biological pest control, and mechanical cultivation to maintain soil productivity and manage pests. The principles of organic farming emphasize soil fertility, efficient water usage, enhanced biodiversity, and improved animal welfare. Furthermore, it seeks to minimize environmental degradation by reducing energy consumption and preventing pollution. Organic agriculture is, therefore, a holistic production system that sustains the health of soils, ecosystems, and people by relying on ecological processes and locally adapted biological cycles. This paper aims to examine the role of organic farming in promoting sustainable agricultural development and to analyze various methods and practices of sustainable farming within the context of organic agriculture.

Keywords: Organic Farming, Growth, Methods, Area, and Production.

Introduction

Organic farming has a long way of life and a tradition in our Indian farming system over centuries. It has its own

system in controlling pest and diseases in raising the crop and livestock, by avoiding the use of different synthetic chemicals or gene manipulation. There are different types of organic farming are followed in a diverse climate of the country, like forest produce by default fall under this category. Organic farming among all different kind of farming system is gaining more attention due to the positive effect on the ecosystem. Also, organic farming is labour intensive, this increases rural employment and long term improvement in the quality of the resources. According to available statistics, India ranks second in the world in terms of the total number of organic producers and ninth in terms of organic agricultural land (IFOAM, 2024). The country produces a wide variety of organic products across different agro-climatic zones. Approximately five million farming families are expected to benefit from organic farming, generating an estimated additional annual income of ₹12,500 crore. By adopting the principles and practices of organic farming, the produce obtained is free from synthetic pesticides, environmentally sustainable, and potentially reduces the risk of chronic diseases, making it safer than conventionally grown products. Organic food is cultivated using natural inputs such as manure and compost, while weeds, pests, and diseases are managed manually or through eco-friendly methods.

A total of 3.566 million ha area is under the organic certification including cultivated and wild harvest area in 2020-21 (APEDA, 2023) and among all the states Madhya Pradesh has the highest area under organic certification. Indian organic market has the highest growth in the organic food sector, followed by textile, beauty and personal care. During 2023-24, the market is projected to grow at a CAGR of over 23% with the help of Governmental policies along with an increase in organic cultivation area in India.

Research Objectives

1. To examine the performance of organic farming and sustainable agricultural development in India, with a specific focus on Karnataka.
2. To study various sustainable farming methods adopted in the agricultural sector.
3. To analyze the growth trends in the area and production of organic farming in India and Karnataka.

Research Methodology

This research article is based entirely on secondary data. Information has been collected from a wide range of published and unpublished sources to examine the historical evolution and current progress of organic farming both in India and internationally. Key sources include websites, academic journals, research articles, books, periodicals, and newspaper reports. In particular, data and insights from the International Federation of Organic Agriculture Movements (IFOAM), the Ministry of Commerce and Industry, and the Agricultural and Processed Food Products Export Development Authority (APEDA) have been extensively utilized in the preparation of this paper.

Performance of Organic Farming in India: Growth and Development

Organic farming practices such as crop rotation, intercropping, cover cropping, the use of organic fertilizers, and minimum tillage significantly enhance biodiversity, improve soil nutrient content, and increase the soil's water retention capacity. According to the Food and Agriculture Organization (FAO), organic agriculture also contributes to mitigating the greenhouse effect and global warming through its potential to sequester carbon in the soil. During the year 2020–21, approximately 9.86 lakh farmers in India were brought under organic farming initiatives. Under the Paramparagat Krishi Vikas Yojana (PKVY) scheme, about 9.48 lakh hectares of land were brought under organic cultivation, as reported by the Ministry of Agriculture & Farmers' Welfare. As of 31st March 2021, the total area under the organic certification process in India was 4,339,184.93 hectares. This includes 2,657,889.33 hectares of cultivable land and 1,681,295.61 hectares designated for wild harvest collection.

Table - 1
Growth in Trends of Organic Farming in India (As on 2020-21)

S. No	Particulars	2020-21
A	Area (In ha)	
1	Cultivated (Organic conversion) + Area In-	2657889.33
2	Wild Harvest Collection Area	1681295.61
	Total	4339184.93
B	Production (In MT)	
1	Farm Production	3468991.98
2	Wild Harvest Production	27808.36
	Total Production	3496800.34
C	Operators	
1	Individual farm producers	3495
2	ICS groups	4781
3	Total processors	1703
4	Total Trader	745
5	Wild Operators	71 (Total Collectors 8724)
6	Total Operators (Nos.)	10795
7	Total Farmers	1599010

Source: Government of India (2020), Ministry of Commerce and Industry, Agricultural and Processed Food Products Export Development Authority (APEDA) – 2022.

The data presented in the table indicates the status of organic farming in India as of the year 2020. It clearly outlines the area under organic cultivation, production levels, and the number of certified organic operators in the country. Among all the Indian states, Madhya Pradesh accounts for the largest area under organic certification, followed by Rajasthan, Maharashtra, Chhattisgarh, Himachal Pradesh, Jammu & Kashmir, and Karnataka.

During 2020–21, India produced approximately 3,496,800.34 metric tonnes (MT) of certified organic products. This includes a wide range of commodities such as oilseeds, fibers, sugarcane, cereals and millets, cotton, pulses, aromatic and medicinal plants, tea, coffee, fruits, spices, dry fruits, vegetables, and various processed food items. Organic production in India is not confined to the edible sector alone; it also includes non-edible products such as organic cotton fiber and functional food products.

In terms of exports, the total volume during 2020–21 was 888,179.68 MT, with an export value realization of approximately ₹707,849.52 lakhs (USD 1,040.95 million). Indian organic products are exported to several countries, including the United States, European Union, Canada, United Kingdom, South Korea, Israel, Switzerland, Ecuador, Vietnam, and Australia, among others. In terms of export value, processed foods including soy meal accounted for the largest share (57%), followed by oilseeds (9%), cereals and millets (7%), plantation crops such as tea and coffee (6%), spices and condiments (5%), medicinal plants (5%), dry fruits (3%), sugar (3%), and other products.

Sustainable Farming Methods

The sustainable farming method is a significant role in the agriculture development in India. There are – crop rotation, Permaculture, Cover Crops, Soil Enrichment, Natural Pest Predators, Bio-intensive Integrated Pest Management, Poly-culture Farming, Agroforestry, Biodynamic Farming, and Better Water Management

❖ **Crop Rotation:** Crop rotation is one of the most powerful techniques of sustainable agriculture activity. It has main purpose is to avoid the consequences that come with planting the same crops in the same soil. It helps tackle pest problems, as many pests prefer specific crops. During rotation, farmers can plant certain crops, which replenish plant nutrients. These crops reduce the need for chemical fertilizers.

❖ **Permaculture:** Permaculture is a food production system with intention, design, and smart farming to reduce waste of resources and create increased production efficiency. Permaculture design techniques include growing grain without tillage, herb and plant spirals, hugelkultur garden beds, keyhole and mandala gardens, sheet mulching, each plant serving multiple purposes, and creating swales.

❖ **Cover Crops:** Many farmers choose to have crops planted in a field at all times and never leave it barren; this can cause unintended consequences. By planting cover crops, such as clover or oats, the farmer can achieve his goals of preventing soil erosion, suppressing the growth of weeds, and enhancing the quality of the soil. The use of cover crops also reduces the need for chemicals such as fertilizers.

❖ **Soil Enrichment:** Soil is a central component of agricultural ecosystems. Healthy soil is full of life, which can often be killed by the

overuse of pesticides. Good soils can increase yields as well as help create more robust crops. It is possible to maintain and enhance the quality of the soil in many ways.

- ❖ **Natural Pest Predators:** In order to maintain effective control over pests, it is important to view the farm as an ecosystem as opposed to a factory. Managing your farm so that it can harbor populations of these pest predators is effective as well as a sophisticated technique. The use of chemical pesticides can result in the indiscriminate killing of pest predators.
- ❖ **Bio-intensive Integrated Pest Management:** Integrated Pest Management (IPM) is an approach, which essentially relies on biological as opposed to chemical methods. IMP also emphasizes the importance of crop rotation to combat pest management.
- ❖ **Polyculture Farming:** This technique is similar to crop rotation that tries to mimic natural principles to achieve the best yields. It involves growing multiple crop species in one area. These species often complement each other and helps produce a greater diversity of products at one plot while fully utilizing available resources.
- ❖ **Agroforestry:** Agroforestry has become one of the powerful tools of farmers in dry regions with soils susceptible to desertification. It involves the growth of trees and shrubs amongst crops or grazing land, combining both agriculture and forestry practices for long-lasting, productive, and diverse land use when approached sustainably.
- ❖ **Biodynamic Farming:** Biodynamic farming incorporates ecological and holistic growing practices based on the philosophy of —anthroposophy. It focuses on the implementation of practices such as composting,

application of animal manure from farmed animals, cover cropping or rotating complementary crops for generating the necessary health and soil fertility for food production.

- ❖ **Better Water Management:** The first step in water management is the selection of the right crops. Local crops that are more adaptable to the weather conditions of the region are selected. Crops that do not demand too much water must be chosen for dry areas.

Organic Farming in Karnataka

Karnataka was one of the first states in India to establish a dedicated government policy for the organic farming sector. Through the implementation of its Organic Farming Policy, the state has taken significant strides toward the development and institutionalization of organic agriculture. In terms of certified organic area, Karnataka ranks fifth nationally, and third in terms of area under organic cultivation.

Organic farming is gaining increasing popularity in the state due to the growing awareness of the health and environmental benefits associated with organic products. These products are considered healthier, safer, and often command higher market premiums compared to conventionally produced alternatives. The approach emphasizes minimizing the use of off-farm inputs and instead encourages locally adapted farming systems that align with regional conditions. Karnataka promotes the use of agricultural, biological, and mechanical methods—as opposed to synthetic materials—to carry out farming operations, thereby aligning with the core principles of organic agriculture. These methods support human health, soil health, and environmental sustainability, making organic farming a viable and eco-friendly alternative to conventional

practices. Given the ecological benefits and the growing demand for sustainable agriculture, organic farming has increasingly attracted the attention of the Union Government in recent years, further reinforcing its importance at both the state and national levels..

Organic Farmers in Karnataka

Organic agriculture has always been a natural advantage, sustainable development and strength of India. Changes in global consumption patterns, consumer health awareness, and the growing importance of sustainability are now leading organic products locally, nationally, and internationally. Farmers in Karnataka felt the need to fight against high-yielding varieties and green revolution fertilizer pesticide package. Ultimately, they realized that the need for organic farming was the only solution to the problem and to return to traditional sustainable farming without compromising the ecosystem. Organic farming improves the agro-ecosystem, also improves the biological cycles and soil biological activities aimed at more production and profit. In Karnataka, there are more than 12,000 farmer's practice 100 per cent organic farming practices. About 1.1 million farmers practice at least 50 per cent organic farming sector.

Status of Organic Farming in Karnataka: Present Scenario

Karnataka was one of the first states in India to institute an official policy for organic farming, introducing its initial Organic Farming Policy in 2004. The policy was later revised in 2017; with an ambitious vision to convert 10 percent of the states total cultivable area approximately 121.7 lakh hectares to organic agriculture by the year 2022.

Table –1

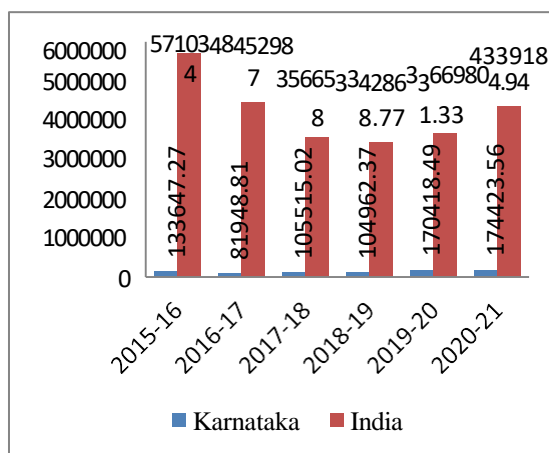
Total Area under Organic Certification Process in Karnataka from 2015-16 to 2020-21

(In ha)				
Year	Karnataka	AGR	India	AGR
2015-16	133647.27	-	5710384.00	-
2016-17	81948.81	38.68	4452987.00	22.02
2017-18	105515.02	28.76	3566538.00	19.91
2018-19	104962.37	-0.52	3428638.77	-3.87
2019-20	170418.49	62.36	3669801.33	7.03
2020-21	174423.56	2.35	4339184.94	18.24
CAGR (%)	10.59		-5.53	

Source: Government of India (2020), Ministry of Commerce and Industry, Agricultural and Processed Food Products Export Development Authority (APEDA) – 2020.

Graph –1

Area under Organic Certification Process in Karnataka



The table and graph above present the trends in the total area under the organic certification process in both India and the state of Karnataka during the period from 2015–16 to 2020–21. In Karnataka, the area under organic

certification was 133,647.27 hectares in 2015–16, which increased steadily to 174,423.56 hectares by 2020–21, indicating a positive growth trend. The Compound Annual Growth Rate (CAGR) for Karnataka during this period was calculated at 10.59 percent, reflecting consistent efforts in promoting organic agriculture within the state. In contrast, India recorded a total of 5,710,384.00 hectares under the organic certification process in 2015–16. However, this area declined to 3,669,801.33 hectares by 2019–20, before rising again to 4,339,184.94 hectares in 2020–21. Overall, the CAGR for India during this period was –5.53 percent, indicating a net decline in certified area over the six-year span, despite the partial recovery in the final year.

Key Recommendations

- ❖ The scale-up could start with rainfed areas, as they are already practicing low-resource agriculture, have low productivities, and primarily stand to gain from the transition.
- ❖ Restructure government support to farmers by aligning incentives towards resource conservation and by rewarding outcomes such as total farm productivity or enhanced ecosystem services rather than just outputs such as yields.
- ❖ Support rigorous evidence generation through long-term comparative assessments of conventional, resource-intensive agriculture on the one hand and sustainable agriculture on the other.
- ❖ Take steps to broaden the perspectives of stakeholders across the agriculture ecosystem and make them more open to alternative approaches.
- ❖ Extend short-term transition support to individuals liable to be adversely impacted by a large-scale transition to sustainable agriculture.

- ❖ Make sustainable agriculture visible by integrating data and information collection on sustainable agriculture practices and systems in the prevailing national and state-level agriculture data systems.

Conclusion Remarks

India possesses immense potential for the production of a wide variety of organic products, owing to its diverse agro-climatic conditions. In many regions, the traditional practices of organic farming—deeply rooted in cultural heritage—provide an additional advantage, offering a solid foundation for expanding organic agriculture. This creates promising opportunities for organic producers to cater to both the growing domestic market and the increasing demand in the export sector. Organic farming emerges as an efficient and sustainable agricultural approach that contributes significantly to environmental conservation. It ensures yield stability, enhances soil health, eliminates the risks associated with synthetic chemicals, and promotes the production of safe and healthy organic food. While various agricultural methods aim to address environmental concerns, organic farming stands out as a scientifically validated, eco-friendly practice capable of maintaining ecological balance in both agricultural and natural ecosystems.

Furthermore, organic agriculture is guided by four core principles: Health, Ecology, Fairness, and Care. These principles form the ethical and practical foundation of organic farming, ensuring that the approach aligns with the broader goals of sustainable development. By emphasizing environmental health, organic farming contributes to the reduction of soil, water, and air pollution, positioning itself as a natural and effective tool for environmental protection and long-term agricultural sustainability.

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