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# Organic Farming for Sustainable Agriculture

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## Abstract
Organic farming is environmentally benign since it fully forgoes the use of synthetic agrochemicals and artificial fertilizers. Utilizing organic manures, such as FYM, Poultry manure, composts, green manures, oil-free cakes, etc., increases the number and activity of soil microorganisms, which enhances the health and fertility of the soil. Because organic food items are healthier and more nutrient-dense, both demand and price are rising steadily in the market. Thus, organic farming can help small farmers' economies.

**Keywords:** Organic manures, Eco-friendly practices, Sustainable agriculture

## Introduction
In 187 countries, organic farming is practiced, and at least 3.1 million farmers used organic practices to manage 72.3 million hectares of agricultural land. More than 106 billion euros were spent on organic food and drink worldwide in 2019. A thorough review of current changes in international organic agriculture is provided in the 22nd edition of the globe of organic Agriculture, which is published by the research of organic agriculture FiBL and IFOAM- Organics International. ( FiBL 2021; Helga Willer). Using more chemical fertilizers, insecticides, pesticides, fungicides, weedicides, and other chemicals to increase food grain production has established customary in agriculture during the past few decades, regardless of the effects on the environment and public health. The world's largest area currently claimed to be covered by organic formation is stated in Asia at up to 36 percent, with Africa and Europe at up to 29 and 17 percent, respectively. (Kumar et al., 2017). The rising customer preference for organic food grains and vegetables to minimize health risks and preserve the environment is the cause of the sudden surge in organic production. (Seufert et al., 2017) Because they contain less pesticide residues, consumers in industrialized and rich nations view organic food items as safe and beneficial to their health. (Fank and Kennedy, 2016; Michael and David Tilman, 2017). weedicides, growth regulators, sewage sludge and genetically modified. Different agricultural practices such as green manuring, rotating crops and cover cropping results quality food grains production, improved micro-organism count and soil health. By breaking down plant waste, organic farming replenishes the soil's nutrients and controls insect pest infestations naturally. Chemical fertilizers, herbicides, insecticides, and other agricultural chemicals are not allowed in organic farming. Legume green manure, farmyard manure, compost made from crop remnants, vermicompost, organic animal waste, and oil-free cakes are all used in organic crop production. Nenna and Ugwumba (2014). Enhanced soil organic matter causes beneficial changes in the physical

qualities of the soil, such as increased water holding capacity, porosity for optimal gas exchange, and decreased bulk density, all of which lower the danger of soil erosion. (Mamaril et al., 2009; Irfan et al., 2016).

## The four principles of organic agriculture are as follows

**Principle of health:** Organic Agriculture should sustain and increase the health of soil, plants, animals, people, and planet as one and indivisible. This idea emphasizes the fact that ecosystem health and the health of persons and communities are interdependent; healthy soils result in healthy crops, which in turn promote the health of both people and animals. Wholeness and integrity of living systems are indicators of health. It involves maintaining one's physical, mental, social, and ecological well-being in addition to the absence of disease. Key aspects of health include regeneration, resilience, and immunity.

**Principle of ecology:** Based on living ecological systems and cycles, organic agriculture should cooperate with them, imitate them, and support them. These fundamental principles underpin organic farming in dynamic ecological systems. It states that production is to be based on ecological processes, and recycling. Nourishment and well-being are attained through the ecology of the unique industrial environment. For instance, this is the living soil in the case of crops, the farm ecosystem in the case of animals, and the aquatic environment in the case of fish and other marine life.

**Principle of fairness:** Relationships that assure fairness for the shared environment and possibilities in life should be the foundation of organic agriculture.Equity, respect, justice, and stewardship of the common planet, both among people and in their interactions with other living things, are characteristics of fairness.

**Principle of care:** To safeguard the health and welfare of present and future generations as well as the environment, organic agriculture should be managed cautiously and responsibly.

## Statistics of organic Farming

- From 11.83 lakh hectares in 2014 to 29.17 lakh ha in 2020, there would be more than double that amount of cultivable land used for organic farming.
- The establishment of state-specific organic trademarks, a growth in the local supply, and exports of organic produce from the northeast region were all results of organic promotion operations throughout time.
- India ranks ninth in the world in terms of certified agricultural land with 1.94 million ha, according to statistics 2020 from the International Federation of Organic Agriculture Movements (IFOAM) and Research Institute of Organic Agriculture (FiBL) (2018-19).

## Status of other countries (area under organic certification)

- China (3rd position)-3.14 million hectares
- USA (7th position)-2 million hectare
- India (9th position)-1.94 million hectares
- Brazil (12th position)-1.18 million hectares

In the past, Indian farmers engaged in environmentally responsible farming, but after the revolution, they began using agrochemicals excessively. Agriculture with high inputs has a negative impact on the environment, animals, and people. The current agrarian crisis, the deterioration of natural resources, the loss of agro-biodiversity, and the changing climate have made matters worse, raising concerns about the sustainability of this sort of agriculture.

## Assistance Provided by Different Government Schemes

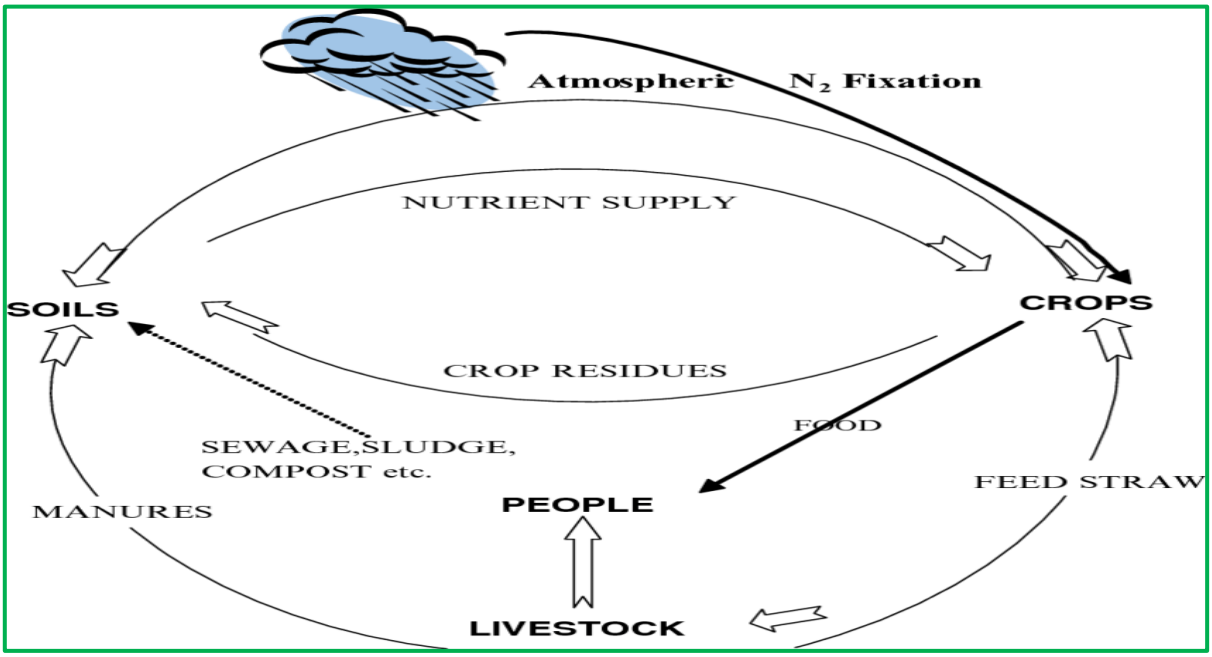
- Paramparagat Krishi Vikas Yojana (PKVY): The scheme promotes cluster based organic farming with PGS certification. Cluster formation, training, certification and marketing

are supported under the scheme. Assistance of Rs.50,000 per ha/ 3 years is provided out of which 62% i.e., Rs. 31,000 is given as an incentive to a farmer towards organic inputs.

- Mission Organic Value Chain Development for Northeastern Region (MOVCDNER): The scheme promotes 3rd party certified organic farming of niche crops of the northeast region through farmers producer organizations (FPOs) with focus on exports. Farmers are given assistance of Rs 25000/ ha/ 3 years for organic inputs including organic manure and biofertilizers etc. Support for the formation of FPOs, capacity building, post-harvest infrastructure up to Rs 2 crores are also provided in the scheme.
- Capital Investment Subsidy Scheme (CISS) under Soil Health Management Scheme: 100% assistance is provided to state government/ government agencies for setting up of mechanized fruit/ vegetable market waste/ agro waste compost production unit up to a maximum limit of Rs.190 lakh/ unit (3000 Total Per Annum TPA capacity). Similarly, for individuals/ private agencies assistance up to 33% of cost limit to Rs 63 lakh/ unit as capital investment is provided.
- National Mission on Oilseeds and Oil Palm (NMOOP): Financial assistance at 50% subsidy to the tune of Rs. 300/- per ha is being provided for different components including bio-fertilizers, supply of rhizobium culture/ phosphate solubilizing bacteria (PSB)/ zinc solubilizing bacteria (ZSB)/ azotobacter/ mycorrhiza and vermicompost.
- National Food Security Mission (NFSM): Financial assistance is provided for promotion of bio-fertilizer (rhizobium/ PSB) at 50% of the cost limited to Rs.300 per ha.

## Obtaining organic manures from

Bulky organic manures and concentrated organic manures are two different categories of organic manures. Plants, animals, and other organic wastes, as well as the tissues of green plants, are the sources of bulky organic manure. Additionally, these can be fully decomposed animal, plant, and other organic residues like farmyard manure (FYM), vermicompost, compost from farm and town residues, poultry manure, night soil, sewage, and sludge. Leguminous crops used for green manuring, including sun hemp, mung, cowpea, guar, Sanji, and berseem, as well as non-leguminous crops like bhang, jowar, maize, and sunflower, are grown for a set amount of time before being ploughed into the soil and incorporated, primarily to add nutrients and organic matter. The term "green manure" refers to organic manure that hasn't decomposed and is formed from living plant tissues. Concentrated organic manures are made from oil-free cakes such as mustard cake, soybean cake, blood meal, bone



meal, meat meal, fish manure, horn and hoof meal, wool wastes, and others. They are organic in nature and contain higher percentages of major plant nutrients like N, P2O5, and K2O than bulky organic manures. Additionally, there are some cakes that are inedible to cattle, such as those made from mahua, neem, castor, cotton, Karanji, safflower, and jatropha oil, as well as edible cakes made from coconut, cotton, and safflower seed (decorated), mustard, groundnut, linseed, sesame, and other seeds free of oil. (Timsina, J., 2018).

**Effects on the environment:** Organic farming has an indirect impact on the environment and biodiversity by reducing the use of agrochemicals and inorganic fertilisers while increasing the use of organic manures and crop rotation. Up to 30% more increased biodiversity on organic forms has been documented by (Tuck et al., 2014; Hardman et al., 2016). Compared to conventionally managed farms, fully organic farms showed greater levels of species richness (30–34%), organism abundance (up to 50%), and species evenness (Bengtsson et al., 2005; Tuck et al., 2014; Crowder et al., 2010). Compared to conventional farms, organic farms consume 10–70% less energy and emit up to 39% less greenhouse emissions and 14–31% less nitrous oxide per unit of land. (Gomiero et al., 2008; Mondelaers et al., 2009; Tuomisto et al., 2012). Organic farms are also reported to have less nutrient leaching than conventional farms, with nitrate levels 30-31% lower, ammonia levels 18% lower, and phosphorus levels lower. (Mondelaers et al., 2009; Tuomisto et al., 2012). Organic farms have been found to have high soil organic matter (up to 7%), more soil microorganisms, and increased soil microbial activity (Tuomisto et al., 2012; Lori et al., 2017).

**Impact on community health:** Due to the detrimental effects of conventionally produced food utilizing agrochemicals and fertilizers, which cause different health issues and environmental disturbances, demand for organic food items is rising among customers on a daily basis. Regarding the concerns of consumers, food produced organically is safer and healthier than food produced using chemicals and fertilizers. (Funk and Kennedy, 2016). According to (Baranski et al., 2014). Organically grown food has higher concentrations of antioxidants, reduced pesticide residues, and less cadmium (Cd). The risk of health hazards from water pollution, soil pollution, and air pollution brought on by soil erosion, emission of particulate matter, and oxides of N, C, and S is reduced when the use of agrochemicals such as insecticides, pesticides, herbicides, and chemical fertilizers is prohibited in organic agriculture (Lorenz and Lal, 2016).

## Prospects

1. Organic forming will help marginal farms' economies.
2. Makes cast more productive in agriculture.
3. Agriculture's long-term sustainability
4. Will lessen reliance on toxic fertilizers and agrochemicals
5. By incorporating organic nutrients, it improves soil health.
6. Will help to preserve biodiversity
7. Will lessen air, water, and soil pollution.
8. Will aid in reducing water usage.
9. Will fully employ renewable energy sources possible.
10. Will meet the market's demand for organic food goods.

## Summary

Farmyard manure application increases spikelet fertility and grain yield of lowland rice on phosphorus-deficient and cool-climate conditions in Madagascar highlands. Higher antioxidant and lower cadmium concentrations and lower incidence of pesticide residues in organically grown crops are found in organic crops.

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