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**Policy paper**

## Organic farming

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Organic farming (ecological farming or biological farming or organic agriculture) is an agricultural system that strictly prohibits the use of pesticides or chemical fertilizers and encourages the use of manures, bio-pesticides, and all other ecological materials.

### Agriculture's history & the decline of traditional farming:

Agriculture has its roots in the Indus Valley, which is one of the most fertile regions on the Indian subcontinent. The farming had been practiced until the early 20<sup>th</sup> century most traditionally without causing any effect to the soil. Along with this, when one traces various ancient Indian texts such as the Holy Vedas, Vrishayurveda, Krishisastra, and Mrugavurveda, one can understand that respect for nature resides in the soul of indigenous people. Where, forests have been venerated and trees are adored. This has all been written so that future generations could love Mother Nature and allow themselves in maintaining the ecological balance and not disrupting the nature's work.

Before independence, numerous famines devastated the situation from bad to worst. Food shortage was common during World War II. A lethal type of famine spread starvation throughout the country, particularly in Bengal and Bihar. Similar situations occurred in Maharashtra, Bihar, Rajasthan, and many other places. With the increase in population, These traditional methods could not cope up with the demand.

It was during the "Green Revolution" in the late 1960s, India received the key to overcoming the food shortage by introducing various chemical methods led by prominent agricultural scientist Dr. M. S. Swaminathan. This led to India's transition from an importer to a food-exporting nation. This has become the desired outcome of the introduction of chemical fertilizers and pesticides. The success of this period caused farmers to rely too much on chemicals. This started feeding a billion people, but at the expense of the environment. Today, India ranks 12<sup>th</sup> in the world in terms of inorganic pesticide usage and third in Asia, behind China and Turkey. According to the PPQS GOI Report, however, despite researchers' cautions, the usage of chemical fertilizers expanded from a tiny amount that was introduced during the Green Revolution to 59669 MT in 2018-19 and 58720 MT (technical grade) the year before to July 2022. This transitioned from regular pesticide use to an unhealthy reliance on these chemicals. Out of fear of losing their entire harvest, farmers continued to apply these deadly poisons to their crops. This causes severe environmental losses and has a negative impact on both farmers' and consumers' health.

### Causes of unpopularity of organic farming in Indian community

1) POORER YIELD, HIGHER PRODUCTION COST, AND THUS HIGHER SELLING PRICE: On average, organic farming provides between 60 and 75% of the yield of conventional agriculture, along with an increase in labour cost. This discourages farmers from transitioning to organic farming. This effected on the price of organic products, taking them out of reach for the majority of the middle-class population and only available to the wealthy.

2) LESS DEMAND: The organic product industry has grown in recent times (especially post-pandemic). But the trend seen is that most of the produce is exported rather than used domestically. Between 2019-20 and 2021-22, a total of 1,978,460.38 million metric tonnes of organic products valued at \$2,480.24 million were exported. If domestic consumption is observed a negligible result is shown. Currently, it hardly accounts for only 1% of total production. Then, It is limited to consumers in urban areas only where people are more health-conscious and

concerned. This shows only the aware population is aiming at the use of organic products, and the rest are still consuming the slow poison.

3) LESS SHELF LIFE: Organic products are in high demand in the United States, the United Kingdom, and the France. Producers would rather export than sell at a lower price in the domestic market, where product spoilage is a risk and sales may fall short.

### Why organic farming?

**Health benefits:** When we talk about the health benefits of consuming organic products, just check the life expectancy of organic product-consuming countries and observe the difference.

- A high level of antioxidants is found in certain organic foods, which help strengthen our immune system and further contribute to better overall health. The reduction in fertilizers and pesticides in organic foods may also be good for healthier, clearer skin.
- Intake of organic products reduces the risk of cancer, neurological, and reproductive diseases, which are prevalent due to excessive chemical pesticide use as well as consumption of chemical-based products.
- The farmer's health is not compromised, as there are enormous negative effects of the pesticides and fertilizers on the sprayer, from respiratory to neurological ones. All these hazards can be prevented.

**Environmental benefits:** Organic farming works at the grass-root level, preserving the reproductive and regenerative capacity of the soil. Plant nutrition and sound soil stewardship produce nutritious food rich in vitality that has resistance to diseases.

- The microbial health of the soil used in organic farming is appreciable. Both the soil-based biodiversity and the soil quality are preserved. This soil also has a high water-retention capacity. Whereas under conventional farming, there is a huge loss in soil quality.
- Water contamination is prevented. The flow of rainwater will sweep into the groundwater without any chemical agent.
- Using crop rotation method, one can prevent nitrogen losses to the atmosphere, preserving the quality of the air. The release of harmful gases like methane, nitrous oxide, and carbon dioxide which are responsible for global warming can be reduced.

### Other benefits:

- Organic farming is economical to the farmers as the cost of fertilizers and pesticides is reduced, but the drawback is less productive.
- Genetically modified crops are not used.
- The use of synthetic pesticides constitutes one of the greatest threats to bees and other pollinators. Glyphosate and neonicotinoids are particularly destructive to certain groups of pollinators that are totally prevented in the case of organic agriculture.
- Organic farm soils are known to produce components that are higher in antioxidants, vitamin E, and omega-3 fatty acids. Higher levels of micronutrients and minerals are found in foods produced by organic agriculture.

### Importance of animals & micro-organisms in organic farming

The animals are essential pillar of organic farming. When taking into account the following, this can be justified:

- Animal waste, such as cow dung work as manure takes the place of artificial fertilizers and enriches the soil's nutritional needs, making the land ideal for farming.
- Ruminants such as cattle and sheep play a very important role in agricultural systems as they process legume-based forage crops. They are the backbone of organic agricultural production due to their ability to fix atmospheric nitrogen. In organic crop rotation, one-third of the crop must be legumes to get enough nitrogen. In practice, this means that organic livestock production must be ruminant-based. Monogastric animals also support agro ecosystems by providing useful services such as biological weed control and pest control.
- Vermicompost: The action of worms like red wigglers, white worms, and other earthworms on the mixture of decomposing food or vegetable waste, bedding materials produce vermicompost. This vermiculite boosts water retention, enhances soil aeration, and enriches the soil with microorganisms.
- Blue-green algae (BGA), Rhizobium, Azotobacter, Azospirillum, and other bacteria that fix nitrogen improve the soil's nitrogen level and meet the needs of plants.

### The principles of organic farming

Organic farming contains four principles, these are:

- **PRINCIPLE OF HEALTH:** Organic agriculture supports and improves the health of soil, plants, animals, humans, and the planet as a whole and indivisible.
- **PRINCIPLE OF ECOLOGY:** Organic farming emulates and supports living ecological systems and cycles. Organic farming works in harmony with Earth's biodiversity.
- **PRINCIPLE OF FAIRNESS:** Organic farming is based on connections that guarantee fairness concerning the shared environment and opportunities for life. This principle emphasizes the importance of conducting human interactions in organic agriculture in a way that provides equity for all stakeholders, including farmers, employees, processors, distributors, merchants, and consumers.
- **PRINCIPLE OF CARE:** Organic farming is a living and dynamic system that complies with internal and external requirements and conditions. According to this principle, prudence and responsibility are the main concerns when it comes to managing, developing, and making technological choices in organic farming.

### **Types of organic farming**

Organic farming consists of two types:

1. **PURE ORGANIC FARMING:** Using manures and bio-pesticides is part of the technique which completely shuns the use of pesticides and inorganic chemicals.
2. **INTEGRATED ORGANIC FARMING:** Nutrient management is used in conjunction with integrated pest management. Crop development from natural resources produces complete nutritional value, which prevents pests and weeds from infesting crops and plants.

### **Basic methods of organic farming**

Organic farming is practiced in the following ways:

- **CROP DIVERSITY:** Crop diversity is the biological foundation for food production and food security and contributes to economic development. Increasing the diversity of a given crop in a farmer's field improves the chances that the crop will cope better with insects, diseases, or environmental hazards. An acceptable range of crop diversity allows growers to take over practices that cover them against different hazards and pitfalls and give them with a kind of insurance.
- **CROP ROTATION:** Crop rotation is a technique for ensuring that no single crop is planted in the same location for two or more consecutive years by moving it to a different area of the agricultural land. Crop rotation helps to maintain soil quality and nutrient concentration while also keeping soil-borne pests at bay. When a single crop is planted in the same location year after year, the soil structure gradually deteriorates as the nutrients are used up. After a few years, the soil becomes unhealthy and deficient in those nutrients. Simultaneously, insect pests that feed on a single crop and spend their larval stage in the soil multiply as long as their food source are available. The pests then evolve every year as their population grows.
- **PEST CONTROL IN BIOLOGICAL WAY:** There are many eco-friendly plant-based and microbial bio-pesticides now available in the market. Bio-pesticide consumption is limited to 8% in India. For sustainable agricultural development and protection of the environment against the adverse effects of chemical pesticides, the formulation and use of bio-pesticides should be encouraged.
- **SOIL MANAGEMENT:** Crop rotation, reduced tillage, cover cropping, and compost application are all methods used in organic farming to improve soil fertility. Crop rotation and green manure aid in the supply of nitrogen to legumes, which obtain it from the atmosphere via symbiosis with rhizobial bacteria. Green manure here refers to dying plants that are uprooted and stuffed into the soil to make them act as nutrients for the soil. It can be grown in two ways: as green manure crops or by gathering green leaves (along with twigs) from dead plants.
- **COMPOST:** Compost farming converts raw organic residues into humus-like material via microorganism activity. Mature compost is biologically stable, free of odors, and less bulky than raw organic waste. Weed seeds and plant pathogens in organic residues can be reduced or eliminated through composting.
- **WEED MANAGEMENT:** Organic farming encourages the growth of natural microorganisms that inhibit the growth and germination of common weeds. Mulching and mowing or cutting are the two most common weed management techniques.
- **CONTROL OVER OTHER ORGANISMS:** In the agricultural field, both beneficial and harmful organisms have an impact on the environment. This can be controlled by using Bio-herbicides and Bio-pesticides. Also, proper sanitization of the entire farm must be maintained to control other organisms.

- **LIVESTOCK:** Domestic animals are used in organic farming to increase agricultural sustainability. There is no better place to get fresh air and good exercise for pets than an agricultural farm. Organic agriculture advocates the use of domestic animals to boost the sustainability of the organic farm, just as animals were used as labour in the past for ploughing.

### **Conclusion**

From this, we can draw the following conclusions:

- ✓ According to certification from the Participatory Guarantee System and the National Programme for Organic Production (NPOP), 59.12 lakh hectares of land in India are being used for organic farming (PGS). According to a report released by the Research Institute of Organic Agriculture (FiBL) and the International Federation of Organic Agriculture Movements (IFOAM) Statistics 2022, India ranks fourth globally in terms of certified areas. But still, farmers are moving away from organic agriculture as there is a subsequent difference in production between conventional farming and organic farming. Substantial financial support from governments (central, state, and lower-level agencies) in the form of subsidies is essential to promote organic farming so that more and more farmers start practicing it.
- ✓ A robust campaign to highlight the advantages of organic agriculture over the conventional system is essential to increase awareness among farmers and consumers.
- ✓ The growth of the organic product market is essential for boosting domestic sales. The country's supply of organic products does not keep up with consumer demand, and the slow expansion of organic farming has been attributed to insufficient connections between the two.
- ✓ Sikkim has achieved the remarkable feat of converting its entire cultivable land (more than 75,000 ha) to organic certification in 2016. This trend is being followed by Meghalaya, and other states.

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