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Organic Farming in India: To Nutrify Nation

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Organic agriculture is a holistic system of production management that promotes and improves the health of the agro-ecosystem, including biodiversity, biological cycles, and biological activity of the soil, is essential. Organic farming responds to the increasing demand for natural goods from consumers and at the same time enables environmental conservation in the sense of sustainable rural development. It is a development technique that prohibits the use of synthetically compounded fertilizers, pesticides, growth regulators, genetically modified organisms and food additives for livestock or largely excludes them. Usage of crop residues, animal manures, legumes, green manures, off-farm organic waste, biofertilizers, mechanical agriculture, mineral bearing rocks and aspects of biological control to preserve soil fertility and tilth to provide plant nutrients and control insects, weeds and other pests depend to the full extent possible on organic farming systems.

Advantages of organic farming:

1. Better Nutrition: Organic food is much richer in nutrients compared to conventionally grown food.

2. Helps us Stay Healthy: There are no additives in organic foods. This is because, at every point of the food-growing process, organic farmers do not use pesticides like their commercial counter parts. Natural farming methods that do not affect people and the environment are used by organic farmers. These foods keep at bay risky diseases such as cancer and diabetes.

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3. Free of Residues: Agrochemicals are not being used in organic farming. Studies reveal that diseases such as cancer have fallen prey to a large portion of the population fed on toxic substances used in conventional agriculture. As these chemicals are not being used in organic farming so the organically grown items are also residue free.

4. Organic Foods Are Highly Authenticated: In order for any product to qualify as organic food, quality tests must be carried out and the manufacturing process rigorously investigated. Foreign markets are covered by the same law. For consumers, this is a huge victory because they are having genuine organic foods. These quality controls and studies root out quacks who instead, try to benefit from the organic food label by supplying commercially generated foods.

5. Enhanced Taste: In many cases organic food tastes better than other foods. The sugar content of organically grown fruits and vegetables adds extra flavour to them.

6. Organic Farming Methods are Eco-friendly: Chemicals have been used in commercial farms to penetrate the soil and seriously contaminate it and surrounding bodies of water. This phenomenon is all influenced by plant life, animals and humans. These harsh chemicals are not used in organic farming, so the ecosystem remains safe.

7. Longer Shelf–life: In their cellular structure, organic plants have greater metabolic and structural integrity than traditional crops. This allows organic food to be processed for a longer time. Organic farming is favoured as it fights non-toxic pests and weeds, requires less production input costs and maintains the ecological balance while encouraging biological diversity and environmental conservation.

Principles of Organic Farming:

i) Principle of health

ii) Principle of care

iii) Principle of ecology

iv) Principle of fairness

Nutrient management in organic farming:

It is important to work constantly in organic farming to create a healthy soil that is rich inorganic matter and has all the nutrients the plants need. Multiple processes, viz., use of green manure, adding manures and biofertilizers etc. to build up soil fertility. Not only can these organic sources add various nutrients to the soil, but they also help prevent weeds and raise soil organic matter to feed soil microorganisms. Soil erosion can be prevented with high organic matter, retains water better and thus needs less irrigation. It is also possible to add some natural minerals which are needed by the plants to develop and improve the quality of the soil. Soil additives such as lime are applied to change the pH balance of the soil.

1. Organic manures: The nutrient content of widely available and applied farm yard manure (FYM) and vermicomposting etc. is typically low, so high application rates are required to meet the requirements for crop nutrients. However the availability of organic manures is not adequate for crop requirements in many developing countries including India, partly because of its extensive use of cattle dung in energy production. In order to improve the organic matter content of the soil, green manuring with sesbania, cowpea, green gram etc. is quiet productive.

2. Bacterial and fungal biofertilizers:

The largest contribution 67.3% of all sources of N fixation is the biological fixation of nitrogen on the surface of the earth. Bacterial and fungal biofertilizers may be used in various crops as a part of organic farming.

Rhizobium: The effectiveness of bacteria that fix symbiotic Nitrogen. It has been well known for Rhizobium, Bradyrhizobium, Sinorhizobium, Azorhizobium, and Mesorhizobium etc. There is a global spread of these bacteria infecting legumes. Depending on the host plant species and bacterial strains, these rhizobia have a N_2-fixing capacity of up to 450 kg N ha^{-1}. Seeds may be coated with carrier-based inoculants for the introduction of bacterial strains into the soil.

Azotobacter: Without any symbiosis, N_2 fixing free-living bacteria can fix atmospheric nitrogen in cereal crops. These free living bacteria are as follows: *Azotobacter* sp., *Acetobacterdiazotrophicus* and *Herbaspirillum* spp. for various cereal crops. They also increase germination and vigour in young plants in addition to fixing nitrogen, resulting in

improved crop standing. 15-20 kg/ha of nitrogen per year can be fixed. *Azotobacter* sp. can also biologically regulate the plant's nematode diseases.

Blue green algae (BGA): In both the hydrosphere and xerosphere, BGA are the pioneer colonizers. These species have been found to synthesize 0.8 x 1011 tons of organic matter, representing around 40% of the total organic matter on this planet that is synthesized annually. The largest, most abundant and widely distributed community of microscopic prokaryotic organisms performing oxygen photosynthesis is BGA. The importance of BGA abundance has been well recognized in Indian rice soils.

Azolla: The nitrogen fixing BGA Anabaena azollae is hosted by a floating water fern 'Azolla.' For rice production, this biofertilizer is used. The plant of Azolla has a floating, branched stem, deeply bilobed leaves and true roots entering the water body. On the stem, the leaves are arranged alternately. There is a dorsal and ventral lobe of each leaf. The fleshy dorsal lobe is air-exposed and contains chlorophyll. In ditches and in polluted water, it grows well. Approximately 20 and 18 percent increase in rice yields were recorded in India and China, respectively due to Azolla application.

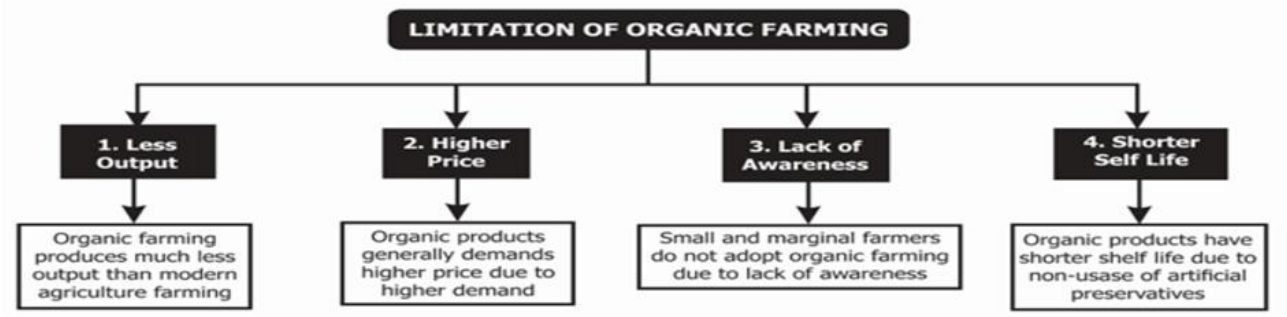
Insect pest management: In organic farming, the existence of pests is expected in advance and the planting schedules and positions are changed as much as possible to prevent significant problems with pests. Building a population of beneficial insects whose larvae feed off the eggs of pests is the key strategy to combat harmful pests. The secret to creating a population of beneficial insects is to create borders (host crops) around fields planted with flowering plant blends that are especially liked by the beneficial insects. The host crops serve as their home base and attract more beneficial insects over time, then occasionally beneficial insects are released into the fields. The use of natural or other organically permitted insecticides such as neem pesticides is carried out when faced with a pest outbreak that cannot be controlled by beneficial insects.

Diseases management in organic farming:

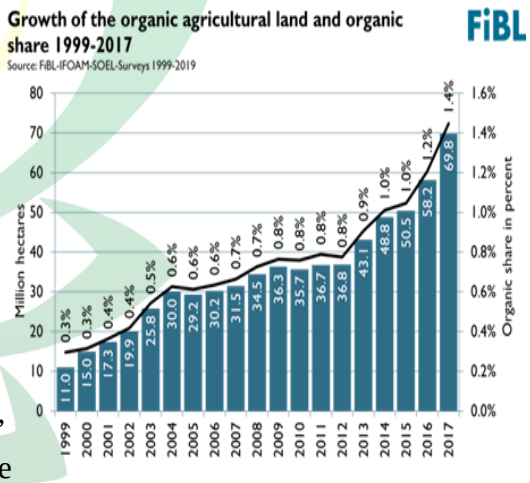
In organic and low input production systems, plant diseases are major constraints on reductions in crop yield and quality. Proper crop fertility management by balanced macro and micronutrient supply and crop rotation adoption has been shown to increase crop resistance to

some diseases. Thus, fertile soil that is alive with beneficial species is one of the greatest benefits of organic farming. Such stable microbes, fungi and bacteria hold in check the damaging bacteria and fungi that cause disease.

Limitations and implications of Organic farming:



Status of Organic Farming in India: Production, Popularity, and Economic Growth: Asia accounts for the highest (40 percent) of the world's organic production and India accounts for the largest number (8,35,000) of organic producers. With just 41,000 hectares of organic land comprising just 0.03 percent of the total cultivated area, the growth of organic farming in India was very dawdling. During 2002, the output of organic farming in India was approximately 14,000 tons, of which 85 percent was exported from India.



Most significant obstacle considered in India's development of organic farming was the lack of firm decision-making in government policies to encourage organic farming. In addition to this, India has had many major disadvantages, including lack of knowledge, lack of good marketing policies, lack of biomass, inadequate farming infrastructure, high farm input costs, inadequate marketing of organic inputs, ineffective agricultural policies, lack of financial support, inability to meet export demand, lack of quality manual. A variety of programs and schemes for improving organic farming in the country have recently been initiated by the Government of India. The most important of these are viz., The Paramparagat Krishi Vikas Yojana, Organic Value Chain Development in North Eastern Region Scheme, Rashtriya Krishi Vikas Yojana, The mission for Integrated

Development of Horticulture (a. National Horticulture Mission, b. Horticulture Mission for North East and Himalayan states, c. National Bamboo Mission, d. National Horticulture Board, e. Coconut Development Board, f. Central Institute for Horticulture, Nagaland), National Programme for Organic Production, National Project on Organic Farming and National Mission for Sustainable Agriculture. Gujarat, Kerala, Karnataka, Uttarakhand, Sikkim, Rajasthan, Maharashtra, Tamil Nadu, Madhya Pradesh, and Himachal Pradesh are the major Indian states involved in organic farming. As per the Agricultural and Processed Food Products Export Development Authority and the report of the Research Institute of Organic Agriculture, India ranked 8th in relation to organic farmland and 88th in the ratio of organic crops to agricultural property. However, substantial growth has been observed in India in the organic sector in recent decades.

Future Prospects of Organic Farming in India: India is a country dependent on agriculture with 67% of its population and 55% of its workers relying on agriculture and related activities. Agriculture serves the basic needs of the fastest-growing population of India, accounting for 30 percent of total revenue. Organic farming has been found to be India's ancestral tradition that has been practiced over the millennium in countless rural and farming societies. Even in developing countries such as India, the demand for organically grown produce is higher, because people are now more conscious of food safety and quality, and organic practices have a huge effect on the soil health that are devoid of chemical pesticides. Organic farming also has an enormous prospect of producing profits. India is a nation with a conventional method of concrete cultivation, indigenious farmers, large dry lands, and the nominal usage of chemical fertilizers and pesticides. Hence, traditional Indian farmers possess a deep insight that will be successful in strengthening organic production and subsequent economic growth in India. The innovation in organic farming is very commendable. Organic agriculture holistically promotes the wellbeing of a nation's customers, a nation's ecological health, and a nation's economic development through producing profits. India is currently the largest organic producer in the world and we can conclude with this vision that promoting organic farming in India can create a nation that is nutritionally, ecologically and economically sustainable in the near future.