

ORGANIC FARMING FOR SUSTAINABLE ENVIRONMENT

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Any activity that causes deterioration of environment, will definitely impact productivity of crops and health of humans. Organic Farming is a system that is based on the four basic principles of health, ecology, fairness, and care for humans as well as ecosystems. Crop diversification, livestock management, and manuring helps in protection of natural resources along with the biodiversity. Low use of non-renewable energy helps in reduced emission of greenhouse gases (GHGs). Nitrate leaching is considerably low in organic system, thus groundwater pollution is prevented.

With the beginning of Green Revolution in Indian Agriculture in 1965-66, the fertilizer consumption got a huge momentum for sustaining the needs of burgeoning population. Consequently, we reached our targets and became self-sufficient in food grain production. However, the hazards of the intensive agricultural system are threatening as they drastically affect the ecological balance. Thus, we started thinking towards organic farming (OF) systems approach which was existing earlier (ancient time) in our society. The International Federation of Organic Agriculture Movements (IFOAM) is an international organization which regulates the standards of OF and strengthens the organic movement globally in its full diversity by uniting and assisting more than 120 countries about the organic vision of the world. According to IFOAM, "Organic Agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships



and a good quality of life for all involved". The essence of OF can be viewed as a suitable tool for promoting sustainability in agricultural production.

Sustainable intensification is the process of supplying safe and nutritious food per unit of input, meeting our needs without compromising the ability of future generation to meet their own requirement or needs. Besides other benefits of OF, the system also guarantees the production of healthy foods. This is an important issue because according to the estimates of Food and Agriculture Organization (FAO) in 2015, about 795 million people in the world are still undernourished, i.e., one in nine people. In India, undernutrition and obesity (overnutrition) are the major dual nutrition burdens at present. Recently, Indian Government has approved setting up of National Nutrition Mission (NNM) to overcome the nutrition related problems in the country. Growing concern of food and environmental issues in conventional agricultural system has led to the generation of eco-friendly approaches of farming system, commonly known as OF system. This system includes:

- a) Biological farming.
- b) Nature farming.
- c) Regenerative agriculture.
- d) Alternate agriculture.
- e) Permaculture.
- f) Low input sustainable agriculture

Concept:

This production management system largely promotes the use of organic materials or on-farm resources (crop residues, animal manures, green manures, on and off farm wastes, growth regulators, biofertilizers, biopesticides, etc.), and

discourages the use of synthetic off-farm inputs (fertilizers, fungicides, herbicides, pesticides, etc.) for maintaining the balance of nature without polluting soil, water, and air to obtain yield for a longer time. It integrates site specific agronomic, biological, and mechanical methods to foster cycling of resources and enhance agro-ecosystem health.

Aims:

- Exclusion of agrochemicals.
- Maintenance of natural balance.
- Production of nutritious food.
- Enhancement of rural livelihoods with profitable OF.
- Conservation of soil and water resources.
- Systematic raising of livestock along with crop production .
- Conservation or enhancement of biodiversity and eco-system services.
- Prevention of pollution.
- Reduction in use of fossil fuel energy in agriculture.
- Development of more sustainable and productive agricultural system.

Components of Organic Farming:

- Crop and Soil Management:** The system aims in enhancing the organic matter levels in soil to maintain the long term fertility of soil. In this component, we give stress in selection of variety, timely sowing, crop rotation, green manuring, intercropping with legumes, etc.
- Nutrient Management:** This is dealt with the use of organic materials such as farmyard manure, compost, vermicompost, crop residues, green manures, and cover crops. Crop rotation and biofertilizers are also included for their key role in nutrient cycling.
- Plant Protection:** Insects, pathogens, and other pests are controlled by primarily relying on crop rotations, natural predators, resistant varieties, diversity, and tillage. Thereafter, botanical, thermal, and chemical interventions are applied as a last resort under restricted conditions.
- Livestock Management:** Livestock are reared by keeping full attention to their evolutionary adaptations, behavioral needs, and welfare issues (nutrition, shelter, breeding, etc.).

- Soil and Water Conservation:** Run off which erodes the soil can be prevented by contour cultivation, contour bunding, terracing, grassing the waterways, etc. *In situ* water conservation techniques like broad bed and furrow system, ridge and furrow system, inter-row water harvesting, inter-plot water harvesting, scooping, etc. can be adopted in dryland areas.

Selection of crop is very important in farming to serve many purposes like pigeonpea and moth bean are drought resistant legumes, forage, and cover crops. These can be grown in arid and semi-arid regions to earn maximum benefits. They can be used for combating soil erosion problems and recycling the nutrients.

Importance of Organic Farming:

Day-by-day, the challenges of agricultural activities are increasing, viz., increased cost of cultivation, water scarcity, availability of labours, etc. Under such conditions if we continue to practice the conventional farming system, then this may aggravate the socio-economic condition along with ecological damages. Therefore, we need to adopt a holistic approach and assess its potential benefits as compared to the intensive farming practices or conventional farming. Figure 1 describes the superiority of OF in different areas. Agricultural system has a greater role to play in the development process of a country, whether in generating employment, mitigating climate change, or in improving nutrition and health. This depends on our wise selection or adoption of smart agricultural methods.

Any activity that causes deterioration of environment, will definitely impact productivity of crops and health of humans. OF is a system that is based on the four basic principles of health, ecology, fairness, and care for humans as well as ecosystems. Crop diversification, livestock management, and manuring helps in protection of natural resources along with the biodiversity. Low use of non-renewable energy helps in reduced emission of greenhouse gases (GHGs). Nitrate leaching is considerably low in organic system, thus groundwater pollution is prevented. The biological activity of soil is enhanced with the addition of organics, and this also helps in maintaining long term fertility of soil.

With reduction of costly external inputs, the production cost also reduces. The risk of main

crop failure is minimized by diversification, agro-forestry, crop rotation, and intercropping. Farmers get high price of organic products, and get access to organic markets. The purchasing power is enhanced.

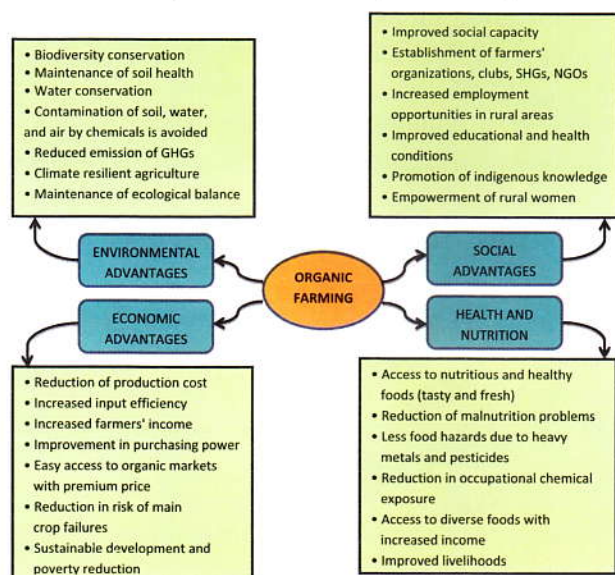
As farmer gets access to credits, technologies, and markets, his socio-economic condition improves. Further, he is also supported by organizations like non-governmental organizations (NGOs), farmers clubs, self-help groups (SHGs), etc. He can avail the money round the year. Women play a key role in agricultural activities. Their contribution has gained special attention. Women Farmer's Day will be celebrated on 15th October. New policies and schemes for women centric activities have been taken by Indian Government for mainstreaming women in agriculture. Diversification (crops, livestock) in OF will generate employment opportunities and rural women empowerment.

In OF, farmers are less exposed to chemicals. Organic foods are nutritious, tasty, and fresh. In most cases, these products are higher in vitamin C, antioxidant, etc. content. They are known for their quality and safety issues. The living standard of the farmer increases with continuation of OF practices.

Limitations of Organic Farming:

- Time taking process.
- Initially low yields are observed.
- Easy availability of chemicals.

Figure 1: Merits of Organic Farming



- Requirement of large organic inputs.
- Low availability of quality inputs.
- Marketing facilities are less.
- Certification process.
- Research facilities are less.
- Training facilities for farmers are less.

Organizations and Government Schemes/ Initiatives promoting Organic Farming:

- **National Organic Farming Research Institute, Gangtok, Sikkim:** This is a research institute recently established for promoting research and education and conducting training on organic production systems, especially in the North East Hills Region of India.
- **National Centre of Organic Farming, Ghaziabad, Uttar Pradesh:** This centrally run institute and its six Regional Centres at Bangalore, Bhubaneswar, Panchkula, Imphal, Jabalpur, and Nagpur has been established for implementing a Centrally Sponsored Scheme (CSS), i.e., National Project on Organic Farming.
- **Participatory Guarantee System (PGS):** A participatory approach for the stakeholders (producers, consumers, retailers, traders and others such as NGOs, Societies/Gram panchayats/ State/Central Government organizations/agencies/farmers, etc.,) to assess, inspect, and verify the production practices of each other and take decision on organic certification (PGS-Green and PGS-Organic). The system focuses on assurance of quality at local levels, and is a platform for the participators to build trust, social networks, and exchange knowledge to continue the integrity and movement of organic.
- **Paramparagat Krishi Vikas Yojana:** This is an expanded component of Soil Health Management (SHM) of a major CSS, National Mission of Sustainable Agriculture (NMSA), launched in 2015. The latest technologies of OF are disseminated in villages among youths and farmers by cluster method and PGS certification.

Organic Farming in Indian Economy:

The agriculture sector continues to be vulnerable with fluctuating growth rate due to

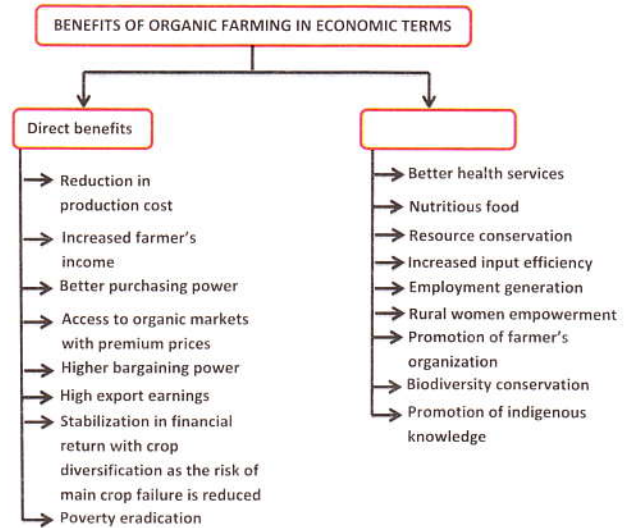
uncertainty of rainfall and raising of temperature (climate change). Therefore, OF has great potential for addressing these issues.

Sikkim is India's first fully organic state. The north eastern states are practicing organic agriculture. In other states, some certified organic farms are run by different agencies. Many developing countries have adopted OF due to its higher profitability leading to sustainable development. The system can directly and indirectly improve the economic conditions of the farmers (Figure 2). Small-scale farmers can also derive economic advantages from it. As they are poor in resources, they are unable to invest in external inputs and energy, and hence substitute these with locally available organic inputs. If the family members are working on subsistence farms, the labor cost also decreases. They sell the organic products and get good economic returns. The income levels of the farmers are increased. OF practices also serve as a low-risk strategy for the farmers as the failure of main crop due to weather vulnerabilities are tackled with crop diversification, intercropping, crop rotation, and agro-forestry. Certified organic foods, viz., basmati rice, cereals, pulses, oilseeds, fruits, tea, coffee, spices, honey, herbal medicines, and their value-added products are produced and available in India. Non-edible products in the organic list include cotton, garments, cosmetics, body care products, and similar products. The demands of organic foods and products are high in foreign, so high export earnings are achievable under this process.

Indirectly, the OF system can provide some economic advantages. With increase in income levels of farmers, their socio-economic conditions improve. The social capacity enhances, and they afford better education for their children. Establishment of SHGs, NGOs, etc. help in easy availability of credits, certification process, etc. Thus, the social capital is increased, and the system also empowers rural youth and women with employment opportunities. Women have more bargaining power, and they also participate in decision making process.

OF aims to work with natural systems, which leads to promotion of indigenous technical knowledge and transfer of knowledge from generation to generation. This helps in preservation of cultural practices and crop varieties. Wild varieties are heritage in the list of germplasm because they

Figure 2: Economic Profitability of Organic Farming



are depleting very fast. The health of farmer is maintained by cultivating organic practices and having nutritious foods. Thus, the living standard of the farmers are increased with OF practices.

Conclusion:

Organification is the need of the hour to resolve the challenges of agriculture. Low economic returns in the initial stage restrain farmers to adopt OF practices. But this indicates the lack of knowledge about the merits of OF among farmers. Government agencies and schemes should try to fill this gap by giving demonstrations of the techniques of OF to make the farming community expert in the alternative methods of the conventional farming. The system requires good managerial skills to handle all the components in right way to harness maximum benefits of OF. Therefore, the managers of farms also need trainings to enhance the sustainable utilization of resources. More research should be conducted for validation of organic methods in field, as India has huge potential for organic crop production.

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