**Organic farming: A way to sustainable agriculture**

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Agriculture is the most basic human activity and includes both the cultivation of plants and the domestication of animals. Agricultural land is thus the world's most basic and diverse resource, upon which the world's population feeds and must be fed. The exact beginnings of agriculture are not known, but as the human population developed, fishing and hunting became more important as a means of supplementing the shortage in the fields, and the search for food never ended. It was obvious that food production was necessary if people were to live long and secure lives. It is obvious that the importance of agriculture grew out of this argument. Agriculture accounts for a significant portion of the household economy worldwide. People rely on agriculture to feed their families, earn a living, and start a business, no matter how small (Dorosh and Thurlow, 2016; Abhilash et al., 2021)

In today's world, the growing population in all sectors poses a critical challenge to the sustainable development of our environment. The agricultural system is also affected by pollution. Modern farming methods (such as the use of pesticides, synthetic fertilizers, etc. to maximize crop yields) disrupt the soil's nutrient balance and reduce soil fertility. Organic farming is an environmentally friendly, animal and plant-based organic resource that enriches nutrients needed for crops. Organic farming is an efficient and promising agricultural approach to environmental sustainability because it provides yield stability, improves soil health, does not cause environmental problems, provides organic food, and reduces the use of synthetic fertilizers.

Organic farming systems can provide agronomic and environmental benefits through structural changes and tactical management of agricultural systems. Organic farming has advantages for both developed countries (environmental protection, biodiversity enhancement, reduced energy use and CO2 emissions) and developing countries like India (sustainable resource use, increased crop yields without over-reliance on expensive external inputs, environment and biodiversity protection, and so on). It reduces human and animal health hazards by reducing the level of residues in the product. It helps in keeping agricultural production at a sustainable level. It reduces the cost of agricultural production and also improves the soil health.

Organic agriculture does not harm our ecosystem. With the arrival of green and the golden revolution, India became self-reliant and a significant producer of various crops. Output-oriented technologies like HYV seeds, new fertilizers, pesticides, etc were also introduced. Sustainable development is defined as economic development conducted without depletion of natural resources. Fundamentally, organic farming is closely related to sustainable development. Organic agriculture is helping us to restore the ecological balance.

The production systems and the policies along with the institutions that determine the regulations are inadequate. Healthy ecosystems and sustainable management of land, water, and natural resources while ensuring world food security must be developed with sustainable agriculture. It should ensure profitability, a healthy environment and social and economic growth and also meet the needs of present and future generations for its products and services. A global transition to sustainable food and agriculture will require significant improvements in the efficiency of resource use, environmental protection, and systems resilience.

**Organic Agriculture in India**

In India civil society organizations joined the movement for its potential in sustaining the soil health, preventing contamination in surface and ground water aquifers and ensuring safe and healthy food. To support the export prospects, Ministry of Commerce launched the “National 11 Programme on Organic Production” (NPOP) defining the National Standards for Organic Production (NSOP) and the procedure for accreditation and certification in 2000. India now has 30 accredited certification agencies for facilitating the certification to growers.

For area expansion and technology transfer, Ministry of Agriculture launched a National Project on Promotion of Organic Farming (NPOF-DAC) and earmarked funds for setting up of organic and biological input production units, vermicompost production units and for organic adoption and certification under various schemes such as NHM, NMSA and RKVY. To empower farmers through participation in certification process and to make the certification affordable for domestic and local markets, Ministry of Agriculture has also launched a farmer group centric organic guarantee system under PGS-India programme. To augment the research needs ICAR launched a Network Project on Organic Farming (NPOF, ICAR) under Project Directorate of Farming System Research with 20 collaborating centre across the country. Organic package of practice for some important crops have been developed under the project

**Smart Farming Technologies for Sustainable Agricultural Development**

Farmers to react There have been several revolutions in agriculture, starting from the domestication of animals and plants a few thousand years ago to the systematic use of crop rotations and other enhancements in farming practices or the “green revolution” with systematic breeding and the widespread use of human-made fertilizers and pesticides a few decades ago. Farming practices have now been eased with robotic vehicles like mechanical weeding, application of fertilizer, or harvesting of fruits. Aerial vehicles have been developed with auto flight control along with ultra-lightweight and powerful snapshot cameras that can be used to calculate biomass development and check the fertilization status of crops, opening the field for farm management advice. Cattle herd management based on remote-sensing signals and sensors or actuators attached to the livestock can be done through virtual fence technologies.

**Smart Farming**

Smart farming refers to farm management using modern IT technologies to increase the quantity and quality of products while reducing the human labor required for farming. The driving force of smart farming is IoT, which connects intelligent machines and sensors integrated on farms to make farming processes data-driven and data-enabled. IoT (Internet of Things) refers to the data that can be drawn from things and transmitted it over the internet. IoT devices can fasten the farming process by installing them on a farm, where collecting and processing of data can be done in a repetitive cycle. It enables quickly to issues and changes in weather conditions.

**Indian Perspective In India**

Organic Agriculture is being viewed as two-dimensional opportunity offering:

• Growing Export and Domestic Markets

• Important livelihood option for small and resource poor farmers with low input cost with greater sustainability and quality food production.

• It offer a low cost farming system for better livelihood to farmers in rain-fed marginal land areas organic agriculture also holds the last hope to the farmers in the so-called farmer suicide zones of India Government Vision

1. No intention to convert country into organic

2. Identified organic zones to take development programmes

3. To bring about 10 million ha under certified organic by the 2020

4. Create a nitch market for organic products

**Strategies**

1. Paramparagat Krishi Vikas Yojana (PKVY)

Paramparagat Krishi Vikas Yojana promotes cluster based organic farming with PGS (Participatory Guarantee System) 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 percent (Rs. 31,000) is given as incentive to a farmer towards organic inputs.

1. **Mission Organic Value Chain Development for North Eastern Region (MOVCDNER)**

The scheme promotes third party certified organic farming of niche crops of north east region through Farmer Producer Organisations (FPOs) with focus on exports.

• Farmers are given assistance of Rs 25,000 per hectare for three years for organic inputs including organic manure and bio-fertilisers among other inputs.

• Support for formation of FPOs, capacity building, post-harvest infrastructure up to Rs 2 crore are also provided in the scheme

1. **Capital Investment Subsidy Scheme (CISS) under Soil Health Management Scheme**

Under this scheme, 100 percent assistance is provided to state government, government agencies for setting up of mechanised fruit and vegetable market waste, agro waste compost production unit up to a maximum limit of Rs 190 lakh per unit (3000 Total Per Annum TPA capacity).

• Similarly, for individuals and private agencies assistance up to 33 percent of cost limit to Rs 63 lakh per unit as capital investment is provided.

1. **National Mission on Oilseeds and Oil Palm (NMOOP)**

Under the Mission, financial assistance at 50 percent subsidy to the tune of Rs. 300 per hectare is being provided for different components including bio-fertilisers, supply of Rhizobium culture, Phosphate Solubilising Bacteria (PSB), Zinc Solubilising Bacteria (ZSB), Azatobacter, Mycorrhiza and vermi compost.

1. **National Food Security Mission (NFSM) Regulatory Mechanism For Export:**

Notified by Ministry of Commerce as NPOP. It is in operation since 2002 For Domestic: A framework is being worked out and is likely to be notified under the Agricultural Produce Grading and Marking Act on the similar lines of NPOP

**Conclusion**

Organic farming is a system of agricultural production based on the use of natural processes and resources with no chemicals (e.g. fertilizers or pesticides) or genetically modified organisms (GMOs) are used in order to obtain healthier and more nutritious food while protecting soil fertility, preventing the spread of pests and respecting the environment. It is a system that, instead of using agricultural inputs, carries out specific practices depending on the characteristics of **ecosystem.**

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