

A Brief Study on Organic Farming

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ABSTRACT: *Organic farming, via sustainable agriculture, satisfies not only the current generation's food needs in an environmentally responsible manner, but also the needs of future generations, while also preserving our environment. Pesticides and fertilizers used in modern agriculture have had a negative impact on the environment, affecting soil fertility, water hardness, insect resistance, genetic variation in plants, and an increase in toxic residue through the food chain and animal feed, leading to an increase in health problems and environmental degradation. Plants get macronutrients and micronutrients from organic farming, which also enhances the soil's physical, chemical, and biological properties.*

KEYWORDS: *Farming, Food Chain, Organic Farming, Modern Agriculture, Sustainable Agriculture.*

1. INTRODUCTION

Organic agriculture is quickly expanding, with at least 170 nations already producing commercial organic food. In India, there were 43.1 million hectares of organic agricultural land, including conversion areas, and 2 million organic agricultural producers. Asia has the highest proportion of organic farmers (36%), followed by Africa (29%), and Europe (29%). In view of current advances in organic farming, this chapter tries to bring together several problems. It examines the history of organic farming and the current state of organic farming in the United States and India. The literature study uncovered many important problems in organic farming, including yield loss while converting to organic farming, soil fertility improvement, animal integration, certification, ecology, marketing, and policy support. Organic farming is a comprehensive production management approach that supports and improves the health of the agro-ecosystem, including biodiversity, biological cycles, and soil biological activity. It stresses the use of on-farm management techniques above off-farm inputs, recognizing that regional circumstances need regionally tailored solutions. This is done by utilizing agronomic, biological, and mechanical techniques to satisfy any particular function within the system, rather than synthetic components[1]–[3].

Its entrance into the policymaking arena, its admission into the anonymous global market, and the turning of organic goods into commodities are all significant challenges today. There has also been a considerable increase in worldwide awareness of environmental preservation and food quality assurance during the past two decades. Organic agriculture is now being accepted by the public after almost a century of research and offers tremendous potential economically, socially, and ecologically. While there is a line of thinking that runs from the beginning to the present, the contemporary organic movement is very different from its origins. In addition to the founders' concerns for good soil, healthy food, and healthy people, it now prioritizes environmental sustainability[4]–[6].

1.1 Organic Farming:

According to the USDA study team on organic farming, “organic farming is a system that avoids or largely excludes the use of synthetic inputs (such as fertilizers, pesticides, hormones, feed additives, etc.) and relies on crop rotations, crop residues, animal manures, offfarm organic waste, mineral grade rock additives, and biological system of nutrient mobi” to the greatest extent possible.

1.2 Organic Agriculture in India:

Organic farming has expanded several times since the January 1994 "Sevagram Declaration" for the development of organic agriculture in India, and a variety of efforts at the government and non-government levels have given it a solid direction. While the National Program on Organic Production (NPOP) established the legal framework, the National Project on Organic Agricultural (NPOF) outlined the marketing strategy and provided the essential assistance for certified organic farming area growth. There was no institutional structure for assessing organically certified area prior to the adoption of the NPOP in 2001 and the establishment of an accreditation procedure for certification organizations. According to preliminary estimates from 2003-04, about 42,000 hectares of farmed land were certified organic. By 2012, India has certified more than 11.2 million

hectares of land. While roughly 1.4 million hectares of this was cultivable land, the remaining 8 million ha was forest land for wild gathering[7]–[10].

In a growing nation like India, agriculture is critical. Apart from meeting the food needs of India's increasing population, it also contributes to the country's economic development. From 1960 to 2000, the adoption of Green Revolution technologies improved a broad variety of agricultural crop output per hectare, resulting in a 12-13 percent rise in food supply in developing nations.

1.3 Components of Organic Farming:

Biological nitrogen fixation, crop rotation, crop wastes, biopesticides, and biogas slurry are all important aspects of organic farming. Vermicomposting has become a key component of organic farming, since it is extremely successful at improving soil fertility and crop development in a long-term manner.

The following are some of the elements of organic farming:-

1. *Crop rotation*: In order to practice sustainable agriculture, crops on the same area should be rotated every two years or more to preserve soil fertility and manage insects, weeds, and diseases. The use of legumes in rotation, for example, increases soil fertility.
2. *Crop Residue*: India has a lot of potential for utilizing crop leftovers and cereal and pulse straw to recycle nutrients in organic farming. Inoculating agricultural wastes with fungal species improves soil physico-chemical characteristics and crop yields.
3. *Organic manure*: Organic manure is produced using biological methods (plant, animal and human residues). Organic manure aids crop development by enhancing humic substance absorption and indirectly increasing soil productivity by increasing the availability of main and minor plant nutrients via soil microbes.
 - a. *Bulky organic manure*: Compost, FYM, and green manure are examples of bulky organic manure, which contain less nutrients than concentrated organic manure.
 - *FYM*: FYM stands for Farm Yard Manure, which is a well-decomposed mixture of dung, urine, farm trash, and residual materials (roughages or fodder).
 - *Compost*: Anaerobic decomposition may transform large amounts of waste material (vegetable waste, weeds, stubble, bhusa, sugarcane trash, sewage sludge, animal waste, human and industrial waste) into compost manure. Compost may be used in the same manner as FYM and is suitable for a variety of soils and crops.
 - *Green Manuring*: Green manuring is the process of ploughing and incorporating undecomposed green plant tissues into the soil to improve the physical structure and fertility of the soil. Green manure (legume crop) adds organic matter and nitrogen to the soil. Sun hemp (*Crotalaria juncea*), Dhaincha (*Sesbania aculeata*), Cowpea, Cluster Bean, Senji (*Melilotus parviflor*, *Vigna sinensis*), Berseem (*Trifolium alexandrium*), and other green manure crops are often utilized.
 - b. *Concentrated Organic Manure*: Oilcakes, bone meal, omega fats, meat meal, and horn and hoof meal (concentrated organic manures) are organic in nature and contain a greater proportion of essential plant nutrients such as nitrogen, phosphorus, and potassium than bulky organic manures.
4. *Waste*:
 - Industrial waste: Byproducts from the manufacturing process, such as wasted wash and coir waste, may be utilized as manure.
 - Municipal and Sewage waste: This makes up a significant portion of organic waste.
5. *Biofertilizers*:

Biofertilizers are microorganisms capable of improving soil fertility, for example, by fixing atmospheric nitrogen and using mycorrhizal fungi and phosphate solubilizers. They are an environmentally benign and long-term method of boosting soil fertility. Biofertilizers include biological nitrogen-fixing organisms that aid in the establishment and development of agricultural plants and trees, as well as the creation of biomass and grain yields.

Types of Biofertilizers:

There are two types of bio-fertilizers:

a. Symbiotic Nitrogen-fixation:

Rhizobium: Rhizobium Bacteria fix atmospheric nitrogen in the roots of leguminous plants and produce root nodules, which look like tumors. It is a commonly used biofertilizer that may fix 100-300 kg of nitrogen per hectare in a single crop season.

- b. *Asymbiotic N-fixation:* Blue Green Algae, Azolla, Azotobacter, Mycorrhizae, and Azospirillum thrive on decaying soil organic matter and fix atmospheric nitrogen in a suitable soil medium.
 - *Azotobacter:* Azotobacter helps vegetables, millets, grains, sugarcane, and cotton grow better. Nitrogen, antifungal, antibacterial chemicals, siderophores, and hormones are all produced by the organism.
 - *Azospirillum:* Azospirillum helps oats, barley, maize, sorghum, forage crops, and pearl millet grow better. By colonizing root zones, it fixes nitrogen.
 - *Blue Green Algae:* Blue-green algae decrease soil alkalinity and are beneficial to rice farming and land restoration.
 - *Azolla:* Azolla is a little floating fern that harbors anabaena, a blue-green algae frequently seen in shallow fresh water bodies and low land areas. They work together to fix nitrogen.
 - *Mycorrhizae:* A symbiotic relationship between fungus and the roots of Vascular plants is known as mycorrhizae. This aids in boosting phosphorus absorption and improving plant development.
 - *Bio-pesticide:* Biopesticides are plant-based insecticides that contain alkaloids, phenolic, terpenoids, and other secondary compounds. They have biological effects on insects, fungi, and nematodes, changing their behavior and physiology. Pyrethrum, Nicotine, Neem, Margosa, Rotenone, and other pesticides are well-known.
 - *Vermicompost:* Vermicompost is an organic manure or compost made by earthworms, which dwell in the soil and consume organic materials before excreting it in digested form. They're high in macro and micronutrients, vitamins, growth hormones, and immobilized microflora, all of which are important for plant development.

1.4 Market for organically grown food:

Concerns about excessive amounts of fatty fats, sugars, salt, and additives and pesticide residues in meals, as well as the dangers of additives and pesticide residues, have fueled demand for health foods, especially organic foods. Furthermore, the environmental harm caused by current farming methods, particularly agrochemicals, is becoming more widely recognized. At the same time, food surpluses, particularly in Europe, have encouraged organic farming, which has low yield levels and therefore reduces supply. Despite the fact that the aforementioned reasons have contributed to the development of the organic food industry, it's worth noting that there have been no significant organic food marketing efforts. The media, on the other hand, has been generally friendly to organic farming, which has somewhat compensated for the absence of product promotion through commercial advertising channels. Marketing ideas must be important in this environment, but they cannot completely dominate. As a result, effective organic farming requires careful attention to marketing.

People are becoming more concerned of the quality of their food and the environmental consequences of misuse of chemicals in agriculture, which has resulted in an increase in demand for organic goods over time. They also believe that if organic goods have a well-defined marketing channel and a guaranteed premium price, the likelihood of expanding the organic agricultural area is greater. When asked what methods might be used to promote organic farming, the following suggestions were made:

- Enhance your marketing channels.
- Ensure that organic goods are sold at a premium price.
- Maintain a steady supply of organic manure.
- Form groups that promote organic agriculture.

2. DISCUSSION

Organic farming is an agricultural method that emphasizes crop rotation and companion planting while using organic fertilizers such as compost manure, green manure, and bone meal. It began in the early twentieth century as a response to rapidly changing agricultural methods. Organic farming utilizes fewer pesticides, lowers soil erosion, reduces nitrate leaching into groundwater and surface water, and recycles animal waste back into the farm as compared to conventional agriculture. These advantages are offset by increased consumer food prices and usually poorer yields. Compost, natural mineral powders, and green manure are all used extensively in organic farming to organically feed the soil. Crop rotation, intercropping, and minimum tillage are other methods used in organic farming to enhance soil fertility, structure, and water holding capacity.

3. CONCLUSION

Agriculture, often known as farming, is the process of simplifying nature's food webs and redirecting energy for human planting and animal consumption. Organic farming is an agricultural method that emphasizes ecologically, socially, and economically sustainable food and fiber products. Organic farming utilizes fewer pesticides, lowers soil erosion, reduces nitrate leaching into groundwater and surface water, and recycles animal waste back into the farm as compared to conventional agriculture. These advantages are offset by increased consumer food prices and usually poorer yields. As people become more conscious of the negative effects of chemicals on their health, soil, and environment, inorganic farming is giving way to organic farming. India, with its varied agro-climatic conditions, has a lot of potential for organic farming, and it produces a lot of organic goods. Organic farming in India is hampered by high prices for organic goods and a lack of effective marketing activities within local markets.

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