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Sustainable Agriculture- Turning to Organic Farming

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ABSTRACT

Agriculture and related industries are vital to the growth of the nation's economy. A large portion of India's population is employed in agriculture, either directly or indirectly. Farmers are switching to organic farming, which is a natural and environmentally benign manner of production, these days. High-quality food can be produced through organic farming without negatively impacting the environment or the health of the land. In order to meet the demands of the global market for organic production, it is necessary to select appropriate crops and products on a regional basis. Due to its obligations to ensure food and nutritional security, the region as a whole cannot afford to switch to organic food at this time. This will lead to wealth and peace in the area as well as plenty of job opportunities. People who work in sustainable agriculture have a shared interest in controlling pollution levels, promoting soil health, using the least amount of water, and growing the local economy. Therefore, the paper emphasises the significance of organic farming and the agriculture sector's sustainable growth.

Keywords: Agriculture, organic farming, sustainable growth

INTRODUCTION

Sufficient food production to feed India's expanding population has proven to be the country's biggest difficulty. Thus, irrigation water, fertilisers, or insecticides are infused with high-yielding cultivars. In addition to helping the nation create a food surplus, this combination of high-yielding production technologies has raised issues with soil health, environmental pollution, pesticide toxicity, and the sustainability of agricultural production. As a result, scientists and policymakers are revaluating farming methods that depended more on biological inputs than on the extensive use of chemical pesticides and fertilisers. Although organic farming can provide high-quality food without negatively impacting the environment or the health of the soil, it is unclear if large-scale organic farming would be able to meet India's enormous population need. India is the producer of all types of certified organic products, including cereals, fruits, oilseeds, honey, tea, spices, coffee, pulses, basmati rice, and their value-added products. Cotton, clothing, cosmetics, body care, functional food, and other items are examples of non-edible organic products. A review of these organic crop and product production is conducted in light of sustainable agriculture.

THE ORGANIC MOVEMENT IN INDIA

The work of Howard, who developed and conceptualised the majority of the viewpoints ultimately adopted by individuals involved in this movement, is credited with giving rise to the organic movement in India. Organic farming is a production method that avoids using synthetic fertilisers, growth regulators, pesticides, or additives for animal feed, or at least uses them sparingly. Sustainability in the social, environmental, and economic spheres are the main objectives of organic farming.

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Maintaining nutrient levels, encouraging soil biological activity, careful mechanical intervention, nitrogen self-sufficiency through legume use and biological nitrogen fixation, efficient recycling of organic materials, including crop residues, livestock wastes, and weeds, and using crop rotations as the main method of controlling diseases and pests, diversity, natural predators, organic manuring, and resistant varieties are some of the essential features.

In order to minimise the time between the input of NPK and its departure from the soil, tremendous emphasis is placed on maintaining the fertility of the soil by returning all wastes to it, primarily through compost. Many countries are currently under pressure from a burgeoning population to use pesticides and fertilisers to increase farm output in order to meet their ever-increasing food demand..However, excessive and extended use of chemicals has led to pollution of the environment and health risks for people and soil. Therefore, farmers in wealthy nations are being urged to convert their current farms to organic farming.

The public's willingness to pay for the more expensive product and health consciousness are the main elements influencing the demand for organic food among consumers. Organic product buyers are typically well-educated, health-conscious, and wealthy. Their inclination towards organic products is fuelled by high consumer demand, a substantial price premium, and environmental concerns. Organic farming is becoming more popular among conventional growers due to these unnoticed advantages. Government policies in Europe seek to promote the organic industry through consumer education, subsidies, and support in the form of marketing, teaching, and research. India has been practicing agriculture for over 4,000 years, and organic farming is very much ingrained in this nation. Farmers in the Vedic era had a basic understanding of soil fertility, seed selection, plant protection, sowing seasons, and the sustainability of crops in various environments, as stated in Arthashastra. Because the farmers in ancient India followed the principles of nature, the soil remained fertile for comparatively longer periods of time.

RELATIONSHIP BETWEEN SUSTAINABLE DEVELOPMENT AND ORGANIC FARMING

Organic agriculture does now not damage our ecosystem. With the advent of inexperienced and the golden revolution, India have become self-reliant and a substantial manufacturer of numerous plants. Output-oriented technology like HYV seeds, new fertilizers, insecticides, and many others have been additionally introduced. Sustainable improvement is described as financial improvement conducted without depletion of natural sources. Fundamentally, organic farming is intently related to sustainable development. We can restore the balance of nature with the support of natural agriculture.

ORGANIC FRAM MANAGEMENT

Since the foundation of organic farming is a healthy, living soil, great attention must be paid to crop residue management, efficient crop rotation, appropriate cropping patterns, etc. This guarantees maximum output while preventing fertility loss. Furthermore, organic systems honour the local natural ecosystem, which includes the local flora and fauna, native animals, and weather. Understanding the region and the fundamental needs is one of the first steps in organic farming; after that, long-term strategies need to be addressed. Among the issues the nation is dealing with are:

- Poor soil health due to loss of organic matter and soil microbes.
- Increased temperature
- Reduced water supply
- Costly high inputs as opposed to lower returns.

In order to solve the issues listed above, a productive, long-lasting, and economical system needs to be created. The first few aspects to consider about when formulating a strategy are:

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- **Rainwater harvesting** considering that the sole sources of irrigation in organic farming are the seasonal rains, nearby ponds, lakes, and wells, rainwater gathering is a crucial component inthe farming process. As a result, farming ponds, percolation tanks, and cultivation in slopes or bunds must be done.

- **Enriching the soil** Realizing that soil is a living thing, it needs to be maximally enriched. Reintroducing crop leftovers, livestock dung and all other biological waste back into the field is the best course of action in this situation. Each biological waste removed from the field needs to be replenished. Put differently, every nutrient, trash, and resource that comes from the field has accountability. Mineral grade rock phosphate and lime are added directly or by composting in the event of nutrient-deficient soils. It is necessary to utilise bio-fertilizers, compost, bio-nutrients, etc. Artificial nutrients, synthetic fertilisers, and the like are strictly forbidden.

Controlling the temperature the rising temperatures and negative impacts of global warming, this is a crucial point to ponder. In order to shield the soil from heat, it must be kept covered. On the bunds, bushes and trees have to be planted.

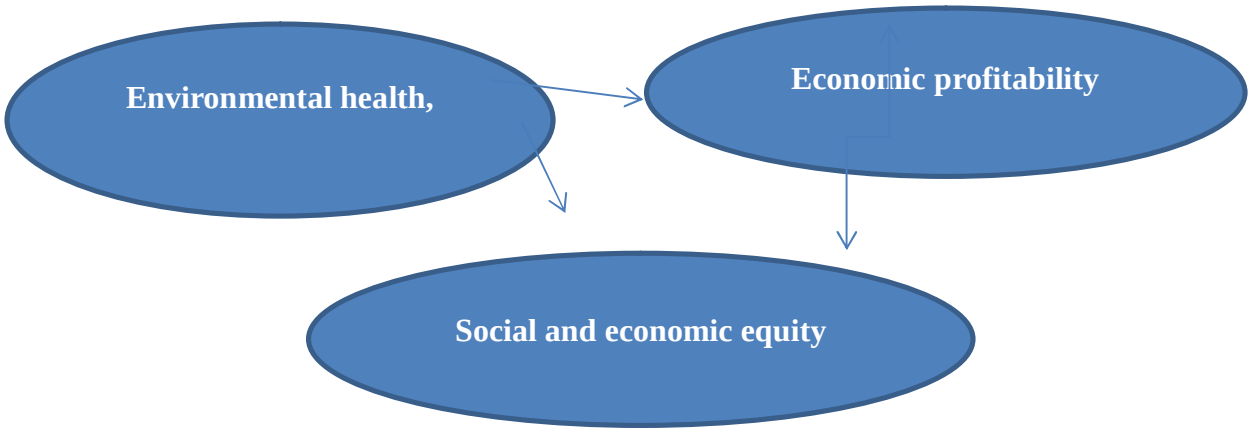
Preserving Natural Environments Controlling Temperature Given the rising temperatures and negative impacts of global warming, this is a crucial point to ponder. In order to shield the soil from heat, it must be kept covered. The bunds need to be covered with plants and trees

Making the Most of Solar Power and Other Renewable Resources It is necessary to use environmentally friendly and renewable energy sources, such as solar energy and biogas. Generators and pumps operated by bullocks are employed for machinery. Crop rotation must be used to successfully schedule crop planting throughout the year.

Preserving Natural Habitat: The use of pesticides and other similar man-made agents must not destroy or interfere with the natural habitat.

Animal Integration: Due to their essential role in maintaining the soil's health, animals are crucial to farm management. Poultry droppings and cow dung make excellent starting materials for organic manure.

IMPACT OF INTEGRATION OF SUSTAINABLE AGRICULTURE



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The fundamental principle of sustainability is that our ability to satisfy current needs must not come at the expense of the ability of future generations to satisfy their own. The following constitutes the fundamental strategy for organic farming in a sustainable environment (Yadav, 2017):

- Improvement and maintenance of the natural landscape and agro-ecosystem.
- Avoidance of overexploitation and pollution of natural resources.
- Minimization of the consumption of non-renewable energy resources.
- Exploitation synergies that exist in a natural ecosystem.
- Maintenance and improve soil health by stimulating activity or soil organic manures and avoid harming them with pesticides.
- Optimum economic returns, with a safe, secure, and healthy working environment.
- Acknowledgement of the virtues of indigenous know-how and traditional farming system

ENVIRONMENTAL BENEFITS OF ORGANIC AGRICULTURE

Long-term sustainability. Many of the environmental changes that are seen are long-term and develop gradually over time. The medium- and long-term effects of agricultural operations on the agro-ecosystem are taken into account in organic agriculture. In order to avoid soil fertility issues or pest difficulties, it attempts to produce food while establishing an ecological balance. Organic farming adopts a preventative strategy as opposed to responding to issues as they arise.

Soil: Organic approaches revolve around soil building techniques such crop rotations, intercropping, symbiotic relationships, cover crops, organic fertilisers, and low tillage. They improve soil formation and structure and create more stable systems by promoting the fauna and flora of the soil. This in turn makes up for not using mineral fertilisers by increasing the cycling of nutrients and energy and improving the soil's capacity to retain water and nutrients. Controlling soil erosion is another major function of these management strategies.

In order to preserve and improve soil productivity, the amount of time the soil is exposed to erosive pressures is reduced, soil biodiversity is raised, and nutrient losses are minimised. Although farm-derived renewable resources typically balance out crop nutrient export, organic soils may occasionally need to be supplemented with potassium, phosphate, calcium, magnesium, and trace elements from outside sources.

Water: Groundwater channel pollution from synthetic pesticides and fertilisers is a significant issue in many agricultural areas. Since their usage is forbidden in organic farming, they are substituted by organic fertilisers (such as compost, animal dung, and green manure) and increased biodiversity (in terms of permanent vegetation and cultivated species), which improves soil structure and water infiltration. Increased nutrient retention in well-managed organic systems significantly lowers the danger of groundwater contamination. Organic agriculture is strongly recommended as a restorative approach in certain locations where pollution is a genuine concern

Climate change and air quality. Because organic agriculture uses less agrochemical, which must be produced using large amounts of fossil fuel, it uses less non-renewable energy. Because organic farming may trap carbon in the soil, it helps to mitigate the greenhouse effect and global warming. The return of carbon to the soil is enhanced by many of the management techniques used in organic agriculture, such as minimum tillage, reintroducing crop residues to the soil, using cover crops and rotations, and integrating nitrogen-fixing legumes more deeply. This increases productivity and promotes carbon storage.

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The diversity of life. At every level, organic farmers are both protectors and consumers of biodiversity. Because they are more resilient to climatic stress and have higher disease resistance, traditional and adapted seeds and breeds are chosen at the gene level. Diverse plant and animal combinations maximise the cycling of nutrients and energy for agricultural production at the species level. At the ecosystem level, animal habitats are created through the preservation of natural regions inside and around organic fields and the lack of chemical inputs. In the past few years, there has been a notable surge in the quantity of research on organic farming and biodiversity. According to a recent study reporting on a meta-analysis of 766 scientific papers, organic farming outperforms other agricultural systems in terms of biodiversity production.

Genetically modified. It is forbidden to employ genetically modified organisms (GMOs) in organic food systems at any point in the handling, processing, or production process. Since there is still much to learn about the possible effects of genetically modified organisms on the environment and human health, organic agriculture is opting to promote natural biodiversity as a safeguard. Therefore, the organic label offers reassurance that GMOs were not purposefully employed in the processing or production of the organic goods. Since most nations do not yet have laws requiring the labelling of GMOs in food goods, this is something that cannot be ensured in conventional products.

Environmental services. The way organic farming affects natural resources encourages agro-ecosystem interactions that are essential to agricultural output and environmental preservation. Predation, pollination, habitats, waste recycling, carbon sequestration, soil stabilisation, nutrient cycling, and soil formation and conditioning are among the ecological services obtained. By choosing organic products, consumers support a less damaging agriculture system with their purchasing power. The unstated consequences of farming on the ecosystem concerning natural resources

CONCLUSION

The food generated through organic farming is safer and more nutrient-dense. Due to consumer demand for what they perceive to be safer and healthier options, organic food is becoming incredibly popular. Thus, food safety from farm to plate may be ensured by eating organic food. Compared to conventional farming, organic farming is more environmentally friendly. Organic farming improves consumer health by preserving the purity of the environment and the health of the soil. Furthermore, the global market for organic products, which includes India, is currently expanding at the quickest rate. By generating income holistically, organic agriculture supports a country's consumers' health, its ecological health, and its economic development. Given that India currently produces more organic food than any other country in the world (Willer and Lernoud, 2019), we can draw the conclusion that promoting organic farming in India will soon result in a nation that is economically, ecologically, and nutritionally sound

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