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Organic vis-à-vis Natural Farming - Relevance to Indian Scenario

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Abstract

In recent times, agriculture has become the center of all the life-changing arguments related to the environment, water, biodiversity etc., that collectively determine the future of our planet. The use of high amount of chemical inputs (agrochemicals etc.) is often required to enhance the agricultural productivity to feed the increasing population. But slowly this is leading to deterioration of the agricultural ecosystem and increase in the cost of production. Organic and natural farming can solve the issue to a significant extent by minimizing the over-dependence of high input agriculture, harnessing the natural resources to a large extent and maintaining the agricultural ecosystem. The present article deals with components, environmental advantage and socio-economic benefits of organic vis-à-vis natural farming, as compared to conventional and chemical-based farming. The other policy level interventions and India's current status on natural farming was also discussed.

1. Introduction

The concept of organic farming is not new, rather it has been practiced since ancient times in India. But with ever-increasing population and visualizing the instant benefit of chemical fertilizers towards crop productivity, farmers get inclined for adopting chemical fertilizers as nutrient sources and many new generation pesticides for managing the insect-pest infestation. It was indeed required in our national perspective few decades back, especially during successful implementation of green revolution technologies. But over the years, the intensification of agriculture led to several soil and environment-related problems like reduction of soil carbon, nutrient imbalance, release of GHGs (greenhouse gases), etc. Hence it is the high time to rethink, if there is need of transformation or redesigning to maintain a balance between the production level and environmental health. Both organic farming and natural farming work in a way that is harmonious to the environment and can achieve sustainability in future days.

2. Organic Agriculture and Natural Farming: An overview

There may be no simple answer for 'what is organic farming or

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natural farming'. These concepts evolved both in spatial and temporal dimensions. Organic farming, though evolved and practiced since ancient times, but,now again became a modern practice of farming. Natural farming, on the other hand, may be considered as a subset of Ecological Farming. Organic farming follows the principles and logic of a natural entities, in which elements such as plant, soil, animals and other creatures, the farmer and the surroundings are interconnected to each other. "Natural Farming" refers to a method of farming that rely upon the production of crops and animals together to impart synergistic effects to the best possible extent from different sector of the system, relying on easily available "ingredients" to produce crop treatments on-farm, and microbes or mycorrhizae to build fertility of the soil.

A modified approach of natural farming termed as 'Zero budget natural farming' (ZBNF) emphasizes on using"*jiwamrita*" to stimulate microbial activity to make nutrients available to plants and give protection from pathogens using a microbial inoculum; "*beejamrita*" to protect young roots from fungal and soil-borne diseases using another microbial culture; production of stabilized soil organic matter and conservation of topsoil by mulching i.e. "*acchadana*"; and soil aeration "*whapasha*" by improving soil structure and reducing tillage.

'Biodynamic agriculture' is a farming approach that aims to treat the farm as a living system which interacts with the environment, to build healthy, living soil and to produce food that nourishes and vitalizes and helps to develop mankind. The basic principle of biodynamics is to prepare life-giving compost out of dead matter. The methods are derived from the teachings of Rudolf Stainer and subsequent practitioners.

The goal of organic agriculture is to contribute to the enhancement of sustainability. According to the International Federation of Organic Agriculture Movement (IFOAM), which is the global organization for organic agriculture elaborated the aim and scope of organic farming are to:

• Improve and maintain the long-term soil fertility;

• Use renewable resources in locally organized agricultural systems as far as possible;

• In-situ mobilization of organic matter and nutrient elements locally;

• Allow livestock to express their innate behavior;

• Avoid any kind of pollution to maintain genetic diversity;

• Allow optimum returns to the producer; and

• Produce sufficient qualitative food which is acceptable socially and economically.

3. Natural Farming – History, Rationale and Present Status in India

Organic farming had been performed in India since long ago. Entire agriculture was relying upon using organic practices, where the nutrient source, plant protection etc. were obtained from plant and animal products. India witnessed severe food scarcity, due to the demand from huge population of the country and several natural calamities during 1950s and 1960s. As a result, food grains were imported from other countries. To achieve food security, the then government had to emphasize on tolargely increase the food production in India. Hence the concept of 'Green Revolution' emerged and it was the government's most important program in the 1960s to achieve country's food security.As time passed, high dependence on agro-inputs especially synthetic fertilizers and pesticides had shown its darker side. The soil fertility depleted due to injudicious use of fertilizers and crop productivity reached a stagnation. Subsequently the incidence of insect pests and diseases were becoming resistant resulting into huge application of agro-chemicals. Due to increased cost of farming, farmers are losing interest in the farming as a whole. Although, discussions on re-introduction of organic farming started during 1980s, the modern practice of organic farming was taken pace in India with the unveiling of the National Programme for Organic Production (NPOP) in the year 2000. Both farmers and consumers are now gradually showing interest to organic farming and organic food products, respectively. Some distinct differences and long-term benefit for protecting environment brought by organic and natural farming has been elaborated as compared to chemical-based conventional farming (Table 1).

Experts point out that the modern and scientific practice of organic farming is still at a nascent stage in India. As released in December, 2021 by the Ministry of Agriculture & Farmers Welfare, New Delhi, presently organic farming is practiced in an area of 38.09 lakh hectares in India which includes 26.57 lakh hectares under National Program for Organic Production (NPOP), 6.19 lakh hectares under Paramparagat Krishi Vikas Yojana (PKVY), 4.09 lakh hectare under Bhartiya Prakritik

Table 1: Comparative advantages of organic and natural farming over modern chemical farming (modified from Das et al., 2020)

Parameters	Organic and natural farming	Chemical farming
1. Source of nutrients as supplemental to soil fertility	Organic farming: Use of natural/organic manures, crop rotation and use of green manure improves soil fertility and quality. Natural farming: It is a chemical-free traditional farming method. It integrates crops, trees and livestock with functional biodiversity, and rather termed as agroecology based diversified farming system.	Use of unbalanced chemical fertilizers leads to over exploitation of soil nutrients which deteriorate the soil fertility and quality
2. Soil microbial enrichment	Use of organic source of nutrients maintain the soil microbial activity and diversity	The microbial activity and diversity may get hampered due to continuous use of fertilizers, pesticides and other agrochemicals.
3. Harmonization with environment	Organic farming works with the proper coordination with the environments, so more sustainable approach. It exploits the synergies that exist in a natural eco-system	It uses chemical inputs to increase the productivity and may lead to soil and water environment, hence it may not be sustainable.
4. Betterment of soil Properties	Use of manure (source of organic carbon) develops better soil structure and reduced the soil compaction and erosion.	Over exploitation leads to soil structure deterioration and increases soil erosion.
5. Nutrient use efficiency and pollution risk	It provides the essential nutrients slowly, which may synchronize with the crop demand, hence reduces the chance of nutrient losses and adverse effects on climate change or global warming.	Use of high amount of chemical fertilizers leads to soil and water pollution. They are related to the climate change and global warming.
6. Quality of food crops	The food product grown through organic and natural farming are safe and better quality	It may carry residues of pesticides due to use of plenty of agrochemicals.
7. Cost effectiveness	Organic inputs are locally available and less costly microbial cultures; however, labour/ operational cost may be higher.	Large use of fertilizers and pesticides increases the farming cost.

Krishi Padhati (Natural Farming), and 1.23 lakh hectare under Namami Gange Programme. Sikkim is the only Indian state which has adopted fully organic cultivation so far. The other top prioritized states are: Madhya Pradesh, Rajasthan and Maharashtra, which accounted for about half the area under organic cultivation. Gujarat government has announced to make the tribal district of Dang (covering around 53,000 hectares) a 100% natural farming district. Organic Farming has also been supported by other central and states' schemes viz. Mission for Integrated Development of Horticulture (MIDH) and Rashtriya Krishi Vikas Yojana (RKVY), Network Project on Organic Farming (NPOF) under Indian Council of Agricultural Research (ICAR).

Union Finance Minister, Smt. Nirmala Sitharaman gave a special emphasis on chemical-free natural farming to build a self-reliant India during her latest Budget speech 2022 in the Lok Sabha, and announced that the government would focus on farmers' lands in 5-km wide corridors along the river Ganga and throughout the country to promote natural farming. In a recent meeting in Jan 2022, the Union Agriculture Minister also declared that both Center and States should promote organic and natural farming to reduce production cost and increase income of the farmers, and also emphasized that States should provide better market for organic products.

4. Yield Challenges of Natural Farming

Several studies including large scale statistical analysis showed lower yields from organic system. Since yields are lower under organic compared to conventional method, requirement of arable land is more to produce the same amount of agricultural output. More extensive production is not a sustainable option to reduce the environmental impact of agriculture on the ecology. Further small and marginal farm holders may face challenges in adopting organic farming practices as the whole farm approach is necessary for successful implementation. In a strict sense 'Natural farming differs from traditional organic farming, such that it avoids to provide nutrients needed for crop growth using animal manures, but emphasizes to change the functioning of the soil/crop system so that nutrients become available to plants without applying external inputs'. It is assumed that the soil already contains all nutrients needed for plant growth, and when the microbial inoculation is applied to the soil that helps in releasing these nutrients from the soil itself. If the supply of nitrogen in an agricultural system was only provided by stimulating release from the topsoil, there would be an associated loss of soil organic matter; and there would be huge loss of organic matter within a definite time span. Such a degradation would result to reduced crop yields, reduced resilience to droughts and increased rates of erosion, thus causing a significant decline in crop production in India. Therefore, there is a growing concern that natural farming might have a negative impact on farmers' income and food security in India.

5. Social Impact in Relation to Organic Farming

The interest in organic farming is mainly revolves around the positive effects on the environment and ensuing sustainability for a longer run. However, uncertainties are there about the associated socio-economic Impacts towards employment due to decline in total volume of crop production. However, organic farming has the capacity to provide positive outcomes not only environmental point of view but also in social grounds like new job opportunities,income generation and rural development. Replacing synthetic chemicals in organic agriculture supposed to resulted in higher demand for labour than in conventional agriculture and therefore, may improve rural employment and also to run small farm entrepreneurship by the young and educated youths. Employment opportunity also lies in small and large scale organic food products industries. Further, organic farming and integrated farming also represent real opportunities on several levels, contributing to rural economies through sustainable and holistic development of rural livelihood. New employment opportunities may be escalated in organic based farming, processing and related services, and these are already evident in the growth of the organic sector. In addition to tackling environmental pollution and low-input dependent agriculture, these farming systems can bring benefits both to the economy and the social cohesion of rural areas.

To promote organic and natural farming, farmers are provided financial assistance of Rs. 31000 ha^{-1} for 3 years under PKVY and Rs. 32500 ha^{-1} for 3 years under MOVCDNER (Mission Organic Value Chain Development in North East Region) for procuring organic inputs such as organic manure, bio-fertilizers, compost/ vermicompost, bio-pesticides, botanical extracts etc. and seeds. In addition to above, support is also provided for group/ Farmers Producers Organization (FPO) formation, training, certification, value addition and marketing of their organic produce (Anonymous, 2021). For organic certification and marketing, individual and small organic farmers' groups (5 to 50 farmers) may also get registered with State Agriculture Department and nearby Regional Council (RC)of Participatory Guarantee System- India (PGS-India) to certify their farm as organic farm products under PGS certification system. Assistance of Rs. 2700 ha^{-1} for 3 years is provided for PGS Certification, and this cost of certification is directly reimbursed to Regional Council of PGS- India (Anonymous, 2021).

6. Conclusion

Organic farming holds a great potential to solve some of the environmental problems. With low or no cost for inputs, the benefit: cost (B:C) ratio increases, but, the option of locally available inputs should be open to the farmers. Marketability and consumer preference are the important criteria of organic farming's success in present and future days. Maintaining environmental sustainability has become more relevant now-a-days and gets equal importance with increasing productivity, can be achieved by organic and natural farming.

7. Future Prospects

Future efforts may be directed to focus on diversification

of existing system involving high value crops. The organic states have shown a great potential of this practice. For success of the organic farming, farmer's awareness in terms of whole farm organic concept to be developed along with cluster approach to follow which also helps in addressing the typical problems associated with adoption of organic farming such as disease-pest management and market reach of the produce. Comparative advantage in terms of profitability and suitability to the local agro-climatic conditions need to be ensured when conversion to organic farming involves shifting to a particular crop or variety (Eyhorn et al., 2018). However, shifting to organic practice may result in higher farm income when it takes along with producing high-value crops like spices, fruits and vegetables for domestic markets. But a true organic cultivation system needs to be closely monitored for standards and certification procedure if required further.

8. References

Anonymous, 2021. Promotion of organic farming. Posted on 7th Dec 2021 by PIB Delhi. Press Information Bureau, Ministry of Agriculture & Farmers Welfare, Govt. of India.

Das, S., Chatterjee, A., Pal, T.K., 2020. Organic farming in India: a vision towards a healthy nation. Food Quality and Safety 4, 69–76. doi:10.1093/fqsafe/fyaa018.

Eyhorn, F., Van den Berg, M., Decock, C., Maat, H., Srivastava, A., 2018. Does organic farming provide a viable alternative for smallholder rice farmers in India? Sustainability 10(12), 4424. https://doi.org/10.3390/su10124424.