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Status, importance, prospects, and vision of organic farming in India

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ABSTRACT

India produces a large variety of food crops including cereals, pulses, and oilseeds. In the name of increased productivity, indiscriminate application of an enormous quantity of chemical fertilizers is being followed keeping the health factor at bay. Hence an alternative method of farming is of urgent need which could satisfy the needs of increased food production as well as providing security against any potential health problem. Organic farming has been proved as a solution to both of these problems. Also since the need for the pre-requisites for organic farming is less as compared to chemical farming, therefore, in a country like India where the agriculture is highly influenced by the vagaries of various biotic and abiotic factors, organic farming is capable enough to provide economic security to the mediocre farmers as well. However, with the policies implemented by the government of India to encourage organic farming regarding the commencement, implementation and the marketing of organic food products as well as the increasing demand of the organic products in the domestic as well as international market, there is ample scope for organic food industries to expand and generate revenue for strengthening the Indian economy.

Keywords— Organic farming, Organic food industry, Sustainable development, Conventional farming

1. INTRODUCTION

With agriculture as the backbone of the Indian economy supported by the fact that nearly 67% of our population and 55% of the total workforce depending on agriculture and other allied activities (Chandrashekar, 2010), agriculture meets the threshold for satisfying the needs of India's enhancing population. It has been estimated that for India to achieve a double-digit GDP growth rate, agricultural growth of around 4% or more is required (Chandrashekar, 2010). Despite having such a potential for striving to the needs of the ever increasing population growth, agriculture is facing various constraints such as fragmentation of landholding, low productivity and conversion of agricultural land to non-agricultural uses.

It is definitely true that India had witnessed tremendous growth in agricultural production in the era of the green revolution. The technologies involved during the inception of green revolution supported by policies and further propelled by agrochemicals, machinery, and irrigation were the main driving forces for the enhanced agricultural production and productivity. Despite the fact that the food security of India was definitely addressed by these technologies, an important setback was that the farmers using these technologies were still had to depend upon the purchased inputs. With manufacturing of fertilizers and pesticides as the two major inputs of Green Revolution (GR) technologies, an important point of consideration was the need for fossil fuels and/or expensive energy which are associated with serious environmental and health problems. This fact further got the attention of the world when the Intergovernmental Panel on Climate Change (IPCC) found that agriculture as practiced today (conventional agriculture, modern agriculture or GR agriculture) accounts for about one fifth of the anthropogenic greenhouse effect, producing about 50 per cent and 70 per cent, respectively of the overall anthropogenic methane and nitrogen oxides emissions (Reddy, 2010).

Modern agricultural farming practices employing irrational use of chemical inputs over the past four decades have resulted in a loss of natural habitat balance and soil health. Apart from this, hazards like soil erosion, decreased groundwater level, soil salinization, pollution due to fertilizers and pesticides, genetic erosion, ill effects on environment, reduced food quality and increased the cost of cultivation are the other serious manifestations that are associated with the irrational use of chemical inputs (Ram, 2003). As a result, farmers do not find agriculture a viable proposition anymore and those who are still practicing it are committing suicides in case of any natural calamity added to these woes (Deshpande, 2002). Other factors adding to this crisis are the substantially high price of factory-made external inputs and the government's slow withdrawal of investment as well as market

interventions and more significantly, shifting of subsistence farming (mainly with homegrown inputs) to commercial farming (largely with purchased inputs). In other words, local indigenous farm techniques have been wiped out and replaced by the modern techniques, resulting in an unviable and unsustainable farm enterprise. Eventually, the need for alternative farm techniques and strategies for growing crops were considered as an alternative of utmost importance. It is due to many advantages of organic farming over the modern agricultural practices that are drawing the attention of farmers across the globe. Essentially, it is a farming system encompassing supportive biological processes without the intervention of inorganic remedies such as chemicals or biotechnological interventions like genetically modified organisms. Organic agriculture is productive and sustainable (Reganold *et al.*, 1993; Letourneau and Goldstein, 2001; Mader *et al.*, 2002). As a result, many state-supported agencies, non-governmental organizations (NGOs) and individuals are practicing methodologies with organic methods of food production.

The most popularly accepted definition of organic farming is: 'Organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity (Reddy, 2010). It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems (Reddy, 2010). This is accomplished by using wherever possible, agronomic, biological and mechanical methods, as opposed to using synthetic materials, to fulfill any specific function within the system (FAO, 1999; Reddy, 2010). On the contrary, the 'conventional farming' refers to a production system employing a wide range of pre- and post-plant tillage practices (e.g. plough, disc plant, and cultivator), synthetic fertilizers and pesticides. This is characterized by a high degree of crop specialization. On the other hand, organic farming characterized by a diversity of crops.

In this review, stress is being laid to have an outlook on various issues relating to organic farming in the light of recent developments at different levels across India with respect to the developmental strategies implemented throughout the world. Also, future prospects, as well as the constraints in the further development of organic farming, have been discussed.

2. ORGANIC FARMING

The approach towards global food security has been a matter of grave concern around the world. To have a better, efficient and holistic approach towards global food security, the concept of biosafety is being implemented at different levels. Also, the marketing of food is also a matter of consideration as the production of food is also determined by the vagaries of temperature as well as the various marketing constraints at the national level as well as international level. But, nowadays, stress is being laid on the appearance and the quantity of food rather than the intrinsic quality and vitality of the food grains. Pesticides and other fertilizers that are being used at the time of crop development are being found in the food. In addition to this, the reduced quality of food has led to an increase in various diseases, mainly various forms of cancer and various diseases relating to weakened body immunity.

As far as the impact of commercialization of agriculture on the environment is concerned, this commercialization has been found to have a negative impact on the environment. The use of pesticides has led to a sort of enhanced biomagnified chemical build up in even our bodies starting from water, air, crop and animals at different levels of this biomagnification. One of the factors that could not be neglected is "eutrophication" which is caused due to an enormous use of nitrogenous fertilizers during crop production leading to a reduction in available oxygen in the water. In severe cases, it may also lead to an algal bloom. An interesting fact is that the fertilizers have a short-term effect on productivity but on the contrary have a long-term negative effect on the environment where they remain for years after leaching and running off, contaminating groundwater and water bodies. On the other hand, the use of hybrid seeds in addition to the practice of monoculture has led to a severe threat to local and indigenous varieties which are on the verge of extinction of their germplasm if the causing factors continue for the upcoming years. With these outcomes, an important question that arises in our mind is how far we can go for the sake of the so-called "productivity".

In the name of meeting the needs of the ever increasing population growth, we have taken a wrong turn of unsustainability. The outcomes being various horrible like committing of suicides by the farmers in growing numbers with every passing year; the pesticides contaminated water bottles and aerated beverages; increased biomagnified pesticide levels in our bodies and an undernourished Indian scenario. Despite the rosy picture painted by various agro-chemical and seed companies supported by various policies proposed by the government, a shocking part is that millions of the people are still underfed. Not only they are underfed but the food that they eat has a tremendous potential of killing them. Then the point that comes into our mind is that to which vision we should stick or we should approach so as to get rid of this horrible situation.

Another important worldwide negative impact on the farming communities' in spite of the so-called "increased productivity" is a downturn in their agricultural fortunes. The only beneficiaries being the agrochemical companies, seed companies, various multinational companies and the other political big shots who are directly or indirectly involved in the trading of the food grains were just unaware of the existing situation that exists in reality.

This is where organic farming comes into play. Organic farming has the potential to take care of these problems in an efficient manner. The dual advantage being the positive effects on the environment on one hand as well as to make the farmer self-sufficient as far as his requirements regarding agro- inputs are concerned and that too at a reduced price.

3. MAIN PRINCIPLE OF ORGANIC FARMING

The main principles of organic farming are as follows:

- To work as much as possible within a closed system, and draw upon local resources.
- To maintain the long-term fertility of soils.
- To avoid all forms of pollution that may result from agricultural techniques.

- To produce foodstuffs of high nutritional quality and sufficient quantity.
- To reduce the use of fossil energy in agricultural practice to a minimum.
- To give livestock conditions of life that confirm to their physiological need.
- To make it possible for agricultural producers to earn living through their work and develop their potentialities as a human being.

The main pillars of organic farming are:

- Organic threshold standards
- Reliable mechanisms regarding certification and regulatory affairs
- Technology packages
- Efficient and feasible market network.

4. ROLE OF ORGANIC FARMING IN INDIAN RURAL ECONOMY

The role of organic farming in Indian rural economy can be emphasized and leveraged so as to cope up with the problem regarding the ever-increasing problem of food security in India. With a substantial increase in the industrialization of rural lands, there has been a crisis for farmland. Further, with the hangover regarding the Malthus theory of population growth and limited resource availability, food sufficiency has been the concern of utmost importance. Furthermore, the excessive and indiscriminate use of plant growth inhibitor, pesticides, and fertilizers for faster growth of agricultural produce is causing a detrimental effect on human health and the environment as a whole. Therefore, the idea of the implementation of organic farming is a good alternative to arrest the problem. The process of organic farming involves using naturally occurring and decomposable matter for growth and providing resistance to different crops in a direct or an indirect manner against different pathogens.

It is not that organic farming was not practiced in earlier days. The use of naturally occurring matters for increased productivity, disease resistance, and pest control was always in use, since time in memorial. The concept of organic farming has been given special relevance in Rigveda. The use of many natural products and by-products like cakes, cow dungs, neem leaves, turmeric etc is still practiced in India to ward off pests and have the potential to be used as preservatives. The use of chemical fertilizer for increased productivity started in the late 1850s.

The main reasons why organic farming should be encouraged in India rural economy are as follows:

- Organic fertilizers are completely safe and do not include the production of harmful compounds as intermediates.
- Organic fertilizers are in generally consumed in a much less quantity as compared to the chemical fertilizers.
- Moreover, chemical fertilizers require huge quantities of water to activate its molecules whereas these conditions are not a pre-requisite in case of organic fertilizers.
- Furthermore, chemical fertilizers always have an adverse effect either on the farm produce or on the environment which is long- lasting.
- Chemical fertilizers always have the potential to react with the chemicals used to get rid of various pests and diseases and producing harmful chemical compounds as an outcome of the cumulative action of the combination. But this situation is ward off in case of organic fertilizers.

5. ORGANIC FARMING IN INDIA

The renewed interest in organic farming in India is mainly due to three main reasons, reduction in agricultural yield in certain areas as a result of excessive and indiscriminate use of chemical inputs, decreased soil fertility and concern regarding the environment.

The 10th Five-Year Plan encouraged the promotion of organic farming using organic wastes, and integrated pest management (IPM) and integrated nutrient management (INM) practices (GOI, 2001). Even the 9th Five-Year Plan had emphasized the promotion of organic produce in plantation crops, spices and condiments using organic and bio-inputs for the protection of environment and promotion of sustainable agriculture. Presently, many states and private agencies are involved in the promotion of organic farming in India, these also include several ministries and government departments at both central and state levels.

The Government of India has also launched the National Programme for Organic Production (NPOP) in the year 2001. The NPOP standards for production and accreditation system have been recognized by the European Commission and Switzerland as equivalent to their country standards. Similarly, the United States Department of Agriculture (USDA) has recognized NPOP conformity assessment procedures of accreditation as equivalent to those in the US. With these recognitions, the Indian organic products duly certified by the accredited certification bodies of India are accepted by the importing countries (Reddy, 2010).

Currently, India ranks 33rd in terms of total land under organic cultivation and 88th in agricultural land under organic crops to a total farming area. According to the Agricultural and Processed Food Product Export Development Authority (APEDA), the cultivated land under certification is around 2.8 Million hectares (2007-08), which includes one million hectares under cultivation and the rest is under forest area (wild collection). An estimated 69 Million hectares, however, is traditionally cultivated without using chemical fertilizers and could be eligible for certification under the current practices, or with small modifications. Certifying these farms remains a challenge, however, as many of these farms are small holdings (nearly 60% of all farms in India are less than one ha). Smallholders and resource-poor farmers may not be able to afford the cost of certification, they are illiterate and unable to maintain necessary records or maybe using indigenous cultivation systems not recognized in organic certification systems. These farms mainly produce for home consumption and supply to the local markets in case of irregular surpluses. Such barriers pose difficulties for farms to reap the potential benefits of organic certification (Reddy, 2010). The percentage of area under organic farming in the total cultivated area of different countries of the world in the year 2004 has been provided in Table 1.

Table 1: Percentage of area under organic farming in the total cultivated area of different countries of the world in 2004

Country	Percentage of area under organic farming
USA	0.23
UK	4.22
Germany	4.10
Argentina	1.70
Austria	8.40
Australia	2.20
Japan	0.10
Switzerland	7.94
South Africa	0.05
Italy	3.70
India	0.03
Pakistan	0.08
Sri Lanka	0.05

Source: SOEL Survey (2004) (Reddy, 2010)

India produced around 5,85,970 Million tonnes (Table 2) of certified organic products including all varieties of food products. India exported 86 items in the year in 2007- 08 — the total volume being 37533 Million tonnes. The export realization was around the US \$ 100.4 million, registering a 30 percent growth over the previous year. Organic products are mainly exported to EU, US, Australia, Canada, Japan, Switzerland, South Africa, and the Middle East countries. Cotton leads among the products exported (16,503 Million tonnes) (Reddy, 2010)

Table 2. The status of organic production in India: 2006-2007

Total area under certified organic cultivation	2.8 Million hectares
Total production	585970 Million Tonnes
Total quantity exported	19456 Million Tonnes
Value of total export	Rs 30124 lakh
Number of farmers	141904

Source: GOI (2008b) and Reddy (2010).

The states of Uttarakhand and Sikkim have declared their states as ‘organic states’. In Maharashtra, since 2003, about 5 lakh hectare area has been under organic farming (of the 1.8 crore hectares of cultivable land in the state). In Gujarat, organic production of chickoo, banana, and coconut is being encouraged both from profit as well as yield point of view. In Karnataka, the area under non certified organic farming (4750 hectares) was substantially high as a comparison to ha land was under certified organic farming (1513 hectares). The reasons behind this transition of shifting towards organic farming are sustained soil fertility, reduced cost of cultivation, higher quality of produce, sustained yields, easy availability of farm inputs and reduced attacks of pest and diseases. Apart from this, the government of Karnataka had released a state organic farming policy in 2004 for encouraging organic farming. In fact, most of the northeastern states are also encouraging organic farming. In Nagaland, the 3000-hectare area is under organic farming. Also, States like Rajasthan, Tamil Nadu, Kerala, Madhya Pradesh, Himachal Pradesh, and Gujarat are promoting organic farming vigorously.

Various farmers’ organizations have been established in different states for the marketing of organic products. For example, the establishment of the ‘Chetana’ in three states: Andhra Pradesh (Asifabad and Karimnagar), Maharashtra (Vidarbha, Akola, and Yavatmal) and Tamil Nadu (Dindigul and Tuticorn). However, there are indeed some constraints being faced by the farmers for transforming their conventional farming system into an organic farming system. Lanting (2007) has identified some of the problems as follows: Non-payment of a premium price for these products because they are in the transition stage, lack of storage facility, with cash paid (preferably 70% of the crop value) for the stored products. Here the urgency for the assistance from the government as a helping hand is of utmost importance for overcoming the barriers faced due to the transition from conventional farming to organic farming.

However, some workers have argued that organic farming is only meant for resource-rich farmers. As per them, the scope of coverage and social relevance of organic farming is also limited. However, Sanghi (2007) proposed the concept of ecological farming whose main objectives are the maintenance of high productivity, reduction in production cost and enhancement in self-reliance. It caters to both resource-poor and the resource-rich farmers. As per him, there are four main steps in the concept of ecological farming : the first being the adoption of non-chemical pest management methods; the second is to focus on selling pesticide-free produce in the local market; the third is establishment of community-managed seed banks; and finally, the fourth step is to adopt non-chemical methods of nutrient management. According to Sanghi, there is a great scope for its revival by utilizing the incentives of labour under the National Rural Employment Guarantee Act (NREGA).

6. MAJOR ADVANTAGES OF ORGANIC FARMING AS PER INDIAN RURAL ECONOMY

Although, there are several advantages of switching over to organic farming from conventional farming techniques, yet all the advantages may not be feasible considering the Indian rural economy. Eventually, it is mandatory to throw some light on the advantages that are really feasible enough to be considered as advantages for Indian farming conditions. Here are some of the advantages that are relevant in this regard.

- (a) **High Premium:** Since the organic food is norm whose ally priced 20 - 30% higher than conventional food, there is ample scope for a mediocre farmer whose income is just sufficient to feed his/her family with one meal to get a high premium so that he has a chance to flourish.
- (b) **Low investment:** The capital investment for organic farming is not so high as compared to traditional chemical farming techniques. Also, there is not a need for any sophisticated techniques for the production of organic fertilizers. Further, since organic fertilizers and pesticides can be produced locally, the yearly costs incurred by the farmer are also low.
- Since agriculture is highly influenced by various external factors like climate, pests, diseases, and also depends on the various climatic factors like rain, therefore, in cases of natural calamity, pest or disease attack, and irregular rainfall, when there is a crop failure, small farmers practicing organic farming have to suffer less as their investments are low.
- (c) **Less dependence on money lenders:** Suicides committed by the farmers due to an enormous debt are widely known in India. Since chemical inputs, which are too expensive are not required in organic farming, therefore farmers are not dependent on money lenders. As a result, crop failure does not force the farmer to take an extreme step.
- (d) **Synergy with life forms:** Organic farming involves synergy with various plant and animal life forms. Small farmers are able to understand this synergy easily and hence find it easy to implement them.
- (e) **Traditional knowledge:** The traditional knowledge that the farmers have can be exposed to organic farming so as to get fruitful outcomes in terms of successful methodologies in organic farming. Further, in the case of organic farming, small farmers are not dependent on those who provide chemical know-how.

7. TREND OF ORGANIC FOOD CONSUMPTION AND EXPORT IN INDIA

There is a misconception among masses that organic food is just a superficial concept and it is meant only for the sake of developed countries. And even if India is striving hard to emphasize on it, yet the major part of the organic food is meant just for export. However, this is not true. Though 50% of the organic food production in India is targeted towards exports, there are many who look towards organic food for domestic consumption.

The main factor that was stopping the masses towards the consumption of organic food was the concern for the health of children. Also, organic food is priced over 25% more than conventional food in India. But now since organic food has been declared as completely safe for domestic consumption, many parents are willing to pay this higher premium due to the perceived health benefits of organic food.

The increase in organic food consumption in India is evident from the fact that many organic food stores are mushrooming in India. Today organic food is an essential part of many retail food stores and restaurants. The pattern of organic food consumption in India is much different than in developed countries. However, the Indian organic food consumer needs education. There are many consumers who are unaware of the difference between natural and organic food. Many people purchase products labeled as Natural thinking that they are Organic. Furthermore, consumers are not aware of the certification system. Since certification is not compulsory for domestic retail in India, many fake organic products are available in the market.

As far as consumption of organic food export is concerned, Organic food exports from India are increasing with more farmers shifting to organic farming. India has now become a leading supplier of organic herbs, organic spices, organic basmati rice, etc. The exports amount to more than 53% of the organic food produced in India at present which is substantially high when compared to the export of organic food earlier during the year 2003-04 being only 6 - 7% of the total agricultural produce in India (Food Processing Market in India, 2005). The export performance of different organic foods in India is given in Table 3.

Table 3: Export performance of organic food products from India

S. no.	Organic Food	Sales (tons)
1	Tea	3000
2	Coffee	550
3	Spices	700
4	Rice	2500
5	Wheat	1150
6	Pulses	300
7	Oilseeds	100
8	Fruits and vegetables	1800
9	Cashew Nut	375
10	Cotton	1200
11	Herbal Products	250
Total		11,295

It may, however, be noticed that even though the cost the production of the prerequisites of organic farming is low, yet the cost during the initial transition from chemical farming to organic farming is quite high. Currently, most of the organic farmers in India are still in the transition phase and hence their costs are still high. As these farmers continue with organic farming, the production

costs are expected to reduce, making India as one of the most important producers of organic food. Presently, organic food products exported from India include the following:

- Organic Cereals: Wheat, rice, maize or corn.
- Organic Pulses: Red gram, black gram.
- Organic Fruits: Banana, mango, orange, pineapple, passion fruit, cashew nut, walnut.
- Organic Oil Seeds and Oils: Soybean, sunflower, mustard, cottonseed, groundnut, castor.
- Organic Vegetables: Brinjal, garlic, potato, tomato, onion.
- Organic Herbs and Spices: Chili, peppermint, cardamom, turmeric, black pepper, white pepper, Amla, tamarind, ginger, vanilla, clove, cinnamon, nutmeg, mace.
- Others: Jaggery, sugar, tea, coffee, cotton, textiles.

8. CONCLUSIONS

Organic farming perceptions are quite divergent. But there is a strong consensus on its eco-friendly nature and inherent ability to protect human health. Also, many studies have revealed that organic agriculture is productive and sustainable. Organic food production costs are higher in the developed countries as organic farming is labor intensive and labor is costly in these countries. But in a country like India, where labor is quite abundant and relatively cheap, organic farming is a great potential solution to the problem caused by the chemical farming method to the environment and the health of the mankind. Efforts have been made by the government of India on an overall basis to encourage organic farming. Even different organizations have been set up for the marketing of the produce of organic farming. The increasing demand for the organic food products in the developed countries as well as the policies adopted by the government of India to encourage the exports of the organic agri- products are the driving factors responsible for the uprising of the Indian organic food industries which have the potential to strengthen the Indian economy as well as the health standards of the Indian masses.

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