



Concept, Benefits, constraints and Status of organic farming in India - A review

Kavita Bhadu^{1*}, Rakesh Choudhary², Tanuja Poonia³, Payal Patidar⁴, K. M. Choudhary⁵ And S. K. Kakraliya⁶

¹PhD Scholar, Department of Agronomy, College of Agriculture, RVSKVV, Gwalior, Madhya Pradesh, India

²Agricultural Research Station, Agriculture University, Jodhpur, Rajasthan, India

³MSc Scholar, Department of Agronomy, SKNAU, Bikaner, Rajasthan, India

⁴PhD Scholar, Department of Horticulture, College of Agriculture, RVSKVV, Gwalior, Madhya Pradesh, India

⁵Assistant Research associate, BISA Ludhiana, Punjab, India

⁶Research Assistant, CSSRI, Karnal, Haryana, India

*Corresponding author e-mail: kavita.bhadu91@gmail.com

ABSTRACT

The imbalance and continuous use of chemical fertilizers has adverse effect on soil physical, chemical and biological properties thus affecting the sustainability of crop production, besides causing environmental pollution. In the process of finding an alternative to chemical agriculture, the organic agriculture is healthier not only to human and animals but also to environment, because they are produced without the use of synthetic inputs such as chemical fertilizers, pesticides and hormones etc. The principal method of organic farming includes crop rotation, green manures and composts, biological pest control and reduced tillage. Organic farming has been promoted as a way to reduce soil erosion and soil fertility degradation. organic farming is a tool for producing quality food and for ecological balance. The technologies of organic farming provide opportunities to produce quality food, improve soil health, better water quality, improve nutrient status, improve efficient use of resources, and benefit the environment. However, there are still constraints for adoption of organic farming, such as shortage of bio-mass, lack of marketing and distribution network for bio-fertilizers and bio-pesticides, Yield declines during conversion period, Inability to obtain a premium price for produce. The need to develop the policy frame and strategies is urgent to promote organic farming. This paper reviews the emerging concerns due to continuous adoption of conventional agriculture systems, Benefits of organic agriculture and the constraints of organic agriculture in India.

Key Words: *organic farming, quality food, ecological balance, sustainability*

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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 work force depending on agriculture and other allied activities [3].

In food production process, relative contribution of organic manures as a source of plant nutrients decrease and chemical fertilizers application increase substantially. With increase in cost of production inputs, inorganic fertilizers became more expensive. Another issue of great concern was the decline the sustainability of soil productivity due to multiple and intensive cropping systems. The scientists have realized that the 'Green Revolution' with high input use has reached a plateau and is now sustained with diminishing return of falling. The occurrence of multi-nutrient deficiencies and overall decline in the productive capacity of soil due to non-judicious fertilizer use, have been widely reported. Such concerns and problems posed by modern agriculture gave birth to new concepts in farming, such as OF, natural farming, biodynamic agriculture, do-nothing agriculture, ecofarming, etc.

Organic agriculture is healthier not only to human and animals but also to environment, because they are produced without the use of synthetic inputs such as chemical fertilizers, pesticides and hormones etc.

Among the means available to achieve sustainability in agricultural production, organic manures and biofertilizers play an important and key role because they exert beneficial effect on the soil physical, chemical and biological properties of soil for sustenance of soil quality and future agricultural productivity [15].

The principal method of organic farming includes crop rotation, green manures and composts, biological pest control and reduced tillage. Long term addition of organic materials to soil, results in increased organic matter, organic carbon content, crop productivity, soil biological activity and also quality of the produce [4]. Adverse effects of modern agricultural practices not only on the farm but also on the health of all living things. Organic farming is one of the widely used methods, which is thought of as the best alternative to avoid the ill effects of chemical farming. Organic farming has several advantages over the conventional one apart from the protection of both the environment and human health. Improved soil fertility, better water quality, prevention of soil erosion, generation of rural employment, etc. are some of them.

Organic cotton/eco-cotton/green cotton is the cotton grown without inorganic fertilizers, pesticides and defoliant and duly certified by a recognized certifying organization. India has tremendous potential to emerge as a world leader in organic cotton [19].

STATUS OF ORGANIC FARMING IN INDIA

As per the available statistics, India's rank in terms of World's Organic Agricultural land was 15 as per 2013 data (Source FIBL & IFOAM Year Book 2015). The total area under organic certification is 5.71 million Hectare (2015-16). This includes 26% cultivable area with 1.49 million Hectare and rest 74% (4.22 million Hectare) forest and wild area for collection of minor forest produces. In 2015, FIBL and IFOAM published a survey report in which a total of almost 2 million organic producers were reported. According to the data obtained, more than three quarters of the producers are located in developing and transition countries. Growth of organic area in India in detail is presented in table 1.

Table: 1 Growth of Organic Area in India [Area in Hectares]

Year	Organic Area (A)	Annual growth rate	Wild collection (B)	Annual growth rate	Total Organic Area (A+B)	Annual growth rate
2005	185937	----	2385963	----	2571900	----
2006	432259	132.48	2385963	0.00	2818222	9.58
2007	1030311	138.36	1769689	-25.83	2800000	-0.65
2008	1018000	-1.19	2781530	57.18	3799530	35.70
2009	1180000	15.91	3360000	20.80	4540000	19.49
2010	780000	-33.90	3650000	8.63	4430000	-2.42
2011	1084266	39.01	4477526	22.67	5561792	25.55
2012	500000	-53.89	4700000	4.97	5200000	-6.50
2013	510000	2.00	5180000	10.21	5690000	9.42

Source FIBL-AMI Organic data network survey 2000-2015

The country with the most producers is India (6,50,000), followed by Uganda (1,89,610) and Mexico (1,69,703). It should be noted that not all certifiers reported the number of producers; their number is probably higher than 2 million. The global organic food market size is of 63.8 billion USD (2013-14). India's total export of organic agricultural products in 2013-14 was of 220.47 million USD. It is important to mention that India's share in the global food market is less than a per cent and there is a huge potential to explore the new area. Status of Organic Certification in India is presented in table 2.

Table: 2 Status of Organic Certification in India :

Particulars	Status of Organic Certification in India	
	2004-05	2013-14
Area under organic certification :	2.5 m ha	4.72 m ha
Organic Certified Production:	0.12 m MT	1.24 m MT
Quantity Exported:	6472 MT	194087 MT
Value of Exports:	80-90 Crores Rupees	2428 Crores Rupees

Source: APEDA, 2015 and [2]

Production

India produced around 1.35 million MT (2015-16) of certified organic products which includes all varieties of food products namely Sugarcane, Oil Seeds, Cereals & Millets, Cotton, Pulses, Medicinal Plants, Tea, Fruits, Spices, Dry Fruits, Vegetables, Coffee etc. . The production is not limited to the edible sector but also produces organic cotton fiber, functional food products etc.

Among all the states, Madhya Pradesh has covered largest area under organic certification followed by Himachal Pradesh and Rajasthan.

Exports

The total volume of export during 2015-16 was 263687 MT. The organic food export realization was around 298 million USD. Organic products are exported to European Union, US, Canada, Switzerland, Korea, Australia, New Zealand, South East Asian countries, Middle East, South Africa etc. Export of Organic Products from India on volume (metric tons) and value (Rs. Crores) basis is presented in table 3.

Table: 3 Export of Organic Products from India:

Export volume in metric tons Export value in Rs. Crores

Year	Export volume	Percent Change	Export value	Percent Change
2002-03	4161	-----	619.6	-----
2003-04	6288	51.12	726.6	17.25
2004-05	8344	32.70	953.3	31.22
2005-06	7953	-4.69	1281.6	34.44
2006-07	NA	-----	NA	-----
2007-08	37533	371.94	498	-61.14
2008-09	44476	18.50	537	7.83
2009-10	58408	31.32	526	-2.05
2010-11	69837	19.57	699	32.89
2011-12	147800	111.64	1866.33	167.00
2012-13	165262.06	11.81	2106.81	12.89
2013-14	194088	17.44	2563.08	21.66

Source : *Lok Sabha Unstarred Question No. 5368, dated on 06.09.2011 & Lok Sabh Unstarred Question No. 6140, dated on 14.05.2012.** National centre for organic agriculture annual report 2002-03-2012-13 Oil seeds (50%) lead among the products exported followed by Processed food products (25%), Cereals & Millets (17%), Tea (2%), Pulses (2%), Spices (1%), Dry fruits (1%), and others.

NEED FOR ORGANIC FARMING IN INDIA

Modern agricultural farming practices employing irrational use of chemical inputs over the past four decades have resulted in 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, B. 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 [7].

The need for organic farming in India arises from the unsustainability of agriculture production and the damage caused to ecology through the conventional farming practices. The present system of agriculture which we call 'conventional' and practiced the world over evolved in the western nations as a product of their socio-economic environment which promoted an overriding quest for accumulation of wealth. This method of farming adopted by other countries is inherently self destructive and unsustainable.

The monoculture of high yielding seeds required external inputs of chemical fertilizers. The fertilizers also destroy soil organisms. They damage the rhizobia that fix nitrogen and other micro organisms that make phosphates available to plants. The long term effect was reduction of crop yields. The damaged soil was easily eroded by wind and water. The eroding soil needed use of continuously increasing quantities of fertilizers, much of which was washed/leached into surface and underground water sources.

The consumers are increasingly concerned about the quality of the products they consume and food safety has become a crucial requirement. Safety, quality and hygienic standards are increasingly being made strict. Another area to increase the consumer welfare is promotion of the eco-friendly methods in agriculture. No-till, or conservation agriculture, lower input approaches of integrated pest or nutrient management and organic farming are some of them. 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. There is no other farming method so clearly regulated by standards and rules as organic agriculture [7].

OBJECTIVES OF ORGANIC FARMING

According to the International Federation of Organic Agriculture Movement (IFOAM) the major objectives of OF include: (1) Production of high quality food in sufficient quantity in harmony with natural systems and cycles, (2) Enhancing biological cycles within the farming system involving microorganisms, soil flora and fauna, plants and animals, (3) Maintaining long-term soil fertility and genetic diversity of the production system and its surroundings including plant and wildlife, (4) Promoting healthy use with proper care of water resources and all life therein, (5) Creating harmonious balance between crop production and animal husbandry, and (6) Minimizing all forms of pollution [22].

BENEFITS OF ORGANIC FARMING

Although, there are several advantages of switching over to organic farming from conventional farming techniques. Here are some of the advantages that are relevant to Indian farming conditions.

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.

Low Investment:

The capital investment for organic farming is not so high as compared to the traditional chemical farming techniques. Also, there is not a need of any sophisticated techniques for the production of the organic fertilizers. Further, since organic fertilizers and pesticides can be produced locally, the yearly costs incurred by the farmer are also low.

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.

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.

Traditional knowledge:

The traditional knowledge that the farmers have can be exposed in organic farming so as to get fruitful outcomes in terms of successful methodologies in organic farming. . Further, in case of organic farming, small farmers are not dependent on those who provide chemical know-how.

A number of studies showed that under drought conditions, crops in organic agriculture systems produce significantly higher yields than conventional agriculture [13]. Addition of organic matter, a corner stone of organic farming practices, will not only improve the physical condition of these dry land soils, but also greatly improve their ability to supply balanced plant nutrients. In dry lands, there is over-exploitation of natural resources [17] mainly because of inappropriate production-enhancing technologies. Organic manures apart from containing NPK also contains small amount of trace elements especially boron, copper, iron, sulphur, zinc and fair quantity of growth promoting substances.

CONSTRAINTS FOR ADOPTION OF CONSERVATION AGRICULTURE

Organic farming have many benefits over conventional farming but still there are a number of problems encountered in adoption of organic farming. Some constraints are as follow :-

Lack of Awareness:

Many farmers in the country have only vague ideas about organic farming and its advantages as against the conventional farming methods.

Use of bio-fertilizers and bio pesticides requires awareness and willingness on the part of the farming community. Knowledge about the availability and usefulness of supplementary nutrients to enrich the

soil is also vital to increase productivity. Attention on the application of composts/organic manure is also lacking. The organic matter is spread during the months when the right moisture level is absent on the soil. The whole manure turns into wastes in the process. The required operation is of course labour intensive and costly, but it is necessary to obtain the desired results.

Shortage of Bio-mass:

Many experts and well informed farmers are not sure whether all the nutrients with the required quantities can be made available by the organic materials. Even if this problem can be surmounted, they are of the view that the available organic matter is not simply enough to meet the requirements.

Marketing Problems of Organic Inputs:

Bio-fertilizers and bio-pesticides are yet to become popular in the country. There is a lack of marketing and distribution network for them because the retailers are not interested to deal in these products, as the demand is low. The erratic supplies and the low level of awareness of the cultivators also add to the problem.

Higher margins of profit for chemical fertilizers and pesticides for retailing, heavy advertisement campaigns by the manufacturers and dealers are other major problems affecting the markets for organic inputs in India.

Output Marketing Problems:

It is found that before the beginning of the cultivation of organic crops, their marketability and that too at a premium over the conventional produce has to be assured. Inability to obtain a premium price, at least during the period required to achieve the productivity levels of the conventional crop will be a setback.

It was found that the farmers of organic wheat in Rajasthan got lower prices than those of the conventional wheat [16].

Reduced tillage constraints

The decomposition of crop residues, which have high carbon to nitrogen ratios, can lead to short term nitrogen immobilization because of increased biological activity by organisms that lock up nitrogen in their bodies [18]. Tilling allows the incorporation of the residues, which speeds up the decomposition process, which allows the nutrients to be available to plants for the next cropping season. Without fertilizer minimum tillage may lead to nutrient immobility causing farmers to experience reduced yields [8].

One of the primary motivations for tillage is weed control [21]; reduced tillage greatly increases weed pressure [1].

Minimum tillage without herbicides faces the challenge of controlling perennial weeds [20] because of the need to remove their deep roots.

Rotation constraints

Farmers are also hesitant to plant legumes in the permanent planting basins because of the spacing [1].

The key challenges for crop rotation are the lack of a reliable markets for many leguminous crops and the shortage of improved legume seeds [1, 9].

Low Yields:

Yield declines during initial two-three year of conversion from conventional to organic. Once the farm is established organic, the yield enhances and the cost of production declines [11]. In many cases the farmers experience some loss in yields on discarding synthetic inputs on conversion of their farming method from conventional to organic.

Restoration of full biological activity in terms of growth of beneficial insect populations, nitrogen fixation from legumes, pest suppression and fertility problems will take some time and the reduction in the yield rates is the result in the interregnum. It may also be possible that it will take years to make organic production possible on the farm.

CONCLUSION

Heavy agricultural reliance on synthetic chemical fertilizers and pesticides is having serious impacts on public health and the environment [12]. The ill effects of the conventional farming system are felt in India in terms of the unsustainability of agricultural production, environmental degradation, health and sanitation problems, etc. Organic agriculture is gaining momentum as an alternative method to the modern system. Integrated pest and nutrient management systems and certified organic agriculture can reduce reliance on agro-chemical inputs as well as make agriculture environmentally and economically sound. However, there are a number of constraints impeding Indian farmers, from adopting OF. Farmer's fear lies in non-availability of sufficient amount of organic inputs, bio-fertilizers and local market for organic produce. Additionally, lack of access to guidelines, certification and input cost coupled with capital-driven regulation by contracting firms strongly discourage small farm holders who constitute

over 70% of farming community in India. There is a need for a comprehensive framework that integrates OF with bottom up responses, technology diffusion with reciprocal knowledge flow from farmer's institution and their local resources and innovation.

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