



RESEARCH PAPER

Sustainable agriculture through organic farming in India

Rajkaranbir Singh

College of Agriculture, Punjab Agricultural University, Ludhiana (Punjab) India

Abstract : Organic products are grown under a system of agriculture without the use of chemical fertilizers and pesticides with an environmentally and socially responsible approach. Organic agriculture is developing rapidly and today 186 countries produce organic food commercially. Currently, only 1.5 percent of the world's agricultural land is farmed organically. The status of organic farming in India is bestowed with lot of potential to produce all varieties of organic products due to its various agro climatic regions. In several parts of the country, the inherited tradition of organic farming is an added advantage. This holds promise for the organic producers to tap the market which is growing steadily in the domestic market related to the export market. India ranks 9th in terms of World's organic agricultural land and 1st in terms of total number of producers. The popularity of organic food is growing dramatically as consumer seeks the organic foods that are thought to be healthier and safer. As per the Ministry of Agriculture and Farmers' Welfare (MoAFW), 2.78 million ha was covered under organic farming in India which is about 2 per cent of the 140.1 million ha net sown area in the country. Of this, 1.94 million ha (70%) area is under National Project on Organic Farming NPOP, 0.59 million ha (21.5%) under Paramparagat Krishi Vikas Yojana (PKVY), 0.07 million ha (2.6 %) under Mission Organic Value Chain Development for North East Region (MOVCDNER) and 0.17 million ha (6.1%) under state schemes or non-schemes. The certified organic production for all crop categories stood at 2.6 million metric tons.in 2018-19. Sugar crops (sugarcane), oilseeds, cereals and millets, fiber crops, pulses, medicinal, herbal and aromatic plants, and spices/condiments are the highest produced organic commodities in India. However, the Indian organic food industry is curtailed by multiple challenges including reduced farm production per hectare, a general apprehension among farmers to forego the use of chemical fertilizers and pesticides and higher storage and transportation costs due to the lack of preservatives required for long-term storage. The states should step up their action in a concerted way to promote organic and natural farming. States can play an instrumental role in helping farmers sell their organic and natural produce by developing organic value chains, procuring organic produce and helping farmers get remunerative prices.

Key Words : Clusters, Diversity, Genetic variability, Quality, Tomato

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INTRODUCTION

Modern agricultural farming practices, along with irrational use of chemical inputs over the past four decades have resulted in not only loss of natural habitat

balance and soil health but have also caused many hazards like soil erosion, decreased groundwater level, soil salinization, pollution due to fertilizers and pesticides, ill effects on environment, reduced food quality and increased the cost of cultivation, rendering the farmer

poorer year by year Traditional Indian agriculture witnessed the use of basic organic techniques, where fertilizers, pesticides, etc, were obtained from plant and animal sources. During 1950s and 1960s, due to rapidly growing population and natural calamities took a turn to drastically increase food production. It is definitely true that India had witnessed a tremendous growth in agricultural production in the era of 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 The Green Revolution marked with expansion of agricultural land, use of hybrid seeds, chemical fertilizers and pesticides drove our country in 1990 to again become an exporter of food grains. In due course of time however, the lands started losing fertility and demanding larger fertilizers use. Pests became immune requiring stronger pesticides. It is in this context that alternative farm techniques and strategies for growing crops ought to be found in the larger interest. The principle of organic cultivation is attracting farmers world over due to its various advantages over modern agricultural practices. Organic products are grown under a system of agriculture without the use of chemical fertilizers and pesticides with an environmentally and socially responsible approach. This is a method of farming that works at grass root level preserving the reproductive and regenerative capacity of the soil, good plant nutrition, and sound soil management, produces nutritious food rich in vitality which has resistance to diseases. According to the International Federation of Organic Agriculture Movement, the major objectives of organic farming 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.

Organic farms although yield, on an average 10-15% less than conventional farms, the lower yields are

balanced by lower input costs and higher margins (Pandey and Singh, 2012). Due to increased cost of farming couples with environmental and health issues, farmers in India are gradually shifting back to organic farming. Consumers are now willing to pay higher premium for the healthy organic food as the consumers get healthy foods with better palatability and taste and nutritive values and the farmers are indirectly benefited from healthy soils and farm production environment. In the backdrop of this, the present paper has examined the status, issues and prospects in Indian organic farming, highlighting its potential in the country.

MATERIAL AND METHODS

Status of organic farming:

World Scenario:

Organic farming is on the rise across the globe and today atleast 186 countries produce organic food commercially. Currently, only 1.5 percent of the world's agricultural land is farmed organically. A total of 71.5 million hectares were under organic agricultural management worldwide at the end of 2018. Australia has the largest area farmed organically with 35.7 million hectares, followed by Argentina with 3.6 million hectares and China with 3.1 million hectares. There were almost 2.8 million organic producers world wide. Over 90 percent of the producers are Asia, Africa and Europe. The country with most organic producers is India (1,149,000), followed by Uganda (210,000) and Ethiopia (204,000). India accounts for 2.71 percent of the world and 29.64 percent of Asia's organic area (Willer *et al*, 2020). Currently, India has become the largest organic producer in the globe and ranked ninth having 1.94 million ha of organic agriculture land in the world in 2018.

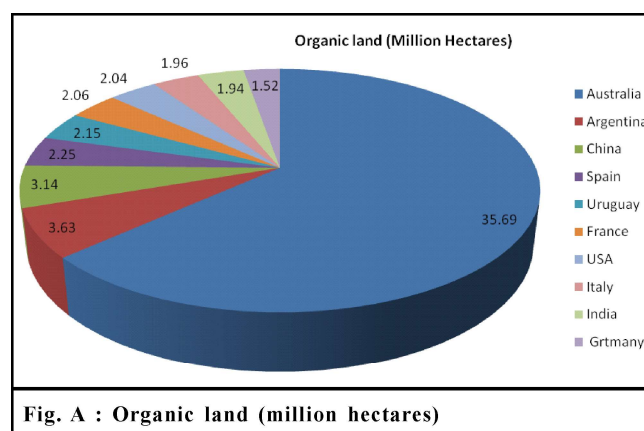


Fig. A : Organic land (million hectares)

RESULTS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

Organic Farming in India:

As per the Ministry of Agriculture and Farmers' Welfare (MoAFW), 2.78 million ha was covered under organic farming in India in 2019 which was about 2 per cent of the 140.1 million hectare net sown area in the country. Of this, 1.94 million ha was under National Programme for Organic Production (NPOP), 0.59 million ha under Paramparagat Krishi Vikas Yojana (PKVY), 0.07 million ha under Mission Organic Value Chain Development for North East Region (MOVCDNER) and 0.17 million ha under state schemes or non-schemes.

This means that 70 per cent area was under NPOP, 21.5 per cent was part of PKVY, 2.6 per cent was with MOVCDNER and 6.1 per cent was part of state schemes or not part of any scheme (Table 1).

The area under organic cultivation is concentrated in few states only. Madhya Pradesh tops the list with over 27 percent of India's total organic area and in the state it has 4.9 percent of organic area as the percent of net sown area. Rajasthan has 12.60 percent of India's total organic area followed by Maharashtra (10.22%), Andhra Pradesh (5.81%). Uttarakhand (4.60%), Odisha (4.24%), Karnataka (3.99%), Gujarat (3.70%), Uttar Pradesh (2.84%), Sikkim (2.70%) and others (22.65%). These ten states accounted for 80 percent of the total area under organic cultivation. Sikkim is the state with 100 percent of its net sown area under organic cultivation.

The production of organic products is presented in

Table 1 : Area under organic farming in major states of India, 2019

Sr. No.	States/ Union Territory	Total organic area (000 ³ ha)	Organic area as % of net sown area of that state/union territory (%)	Organic Area				
				NPOP		PKVY (%)	MOVCDNER (%)	State schemes/non-schemes(%)
				NPOP (%)	In conversion (%)			
1.	Madhya Pradesh	756 (27.02)	4.9	50.2	38.9	10.1	0.0	0.7
2.	Rajasthan	350 (12.60)	2.0	31.5	32.5	35.2	0.0	0.7
3.	Maharashtra	284 (10.22)	1.6	55.7	32.7	8.9	0.0	2.7
4.	Andhra Pradesh	144 (5.81)	2.3	9.5	13.0	73.4	0.0	4.1
5.	Uttarakhand	128 (4.60)	18.2	15.7	13.0	70.2	0.0	1.1
6.	Odisha	118 (4.24)	2.6	62.0	19.2	17.6	0.0	1.2
7.	Karnataka	111 (3.99)	1.1	51.2	23.4	9.8	0.0	15.6
8.	Gujarat	103 (3.70)	1.0	58.2	32.5	1.9	0.0	7.3
9.	Uttar Pradesh	79 (2.84)	0.5	56.6	22.8	15.7	0.0	5.0
10.	Sikkim	155 (2.70)	100.0	47.6	1.4	1.9	8.0	41.1
11.	Others	629 (22.65)	1.5	10.3	19.4	33.6	0.0	36.6
	Total (India)	2777 (100)	-	39.5	30.3	21.5	2.6	6.1

Source: Khurana and Kumar , 2020

Table 2 : Organic production in major organic states of India, 2018-19 (MT)

State	Organic production	In Conversion	Total
Maharashtra	858735	2241	860976
Madhya Pradesh	738878	8	738886
Karnataka	365848	4729	370577
Uttar Pradesh	142512	0	142512
Rajasthan	134611	2	134613
Odisha	88948	1	88949
Gujarat	66106	0	66106
Assam	38457	0	38457
Jammu & Kashmir	33879	19	33879
Uttarakhand	29602	0	29602
Others	101514	1297	102811
Total	25.99089	8296	2607385

Source- GOI, 2019

Table 2. Maharashtra was the largest producer of organic products in the year 2018-19 with the production of 8.60 lakh metric tones. followed by Madhya Pradesh (7.38 lakh metric tones, Karnataka (3.65 lakh metric tones) and Uttar Pradesh(1.45 lakh metric tones). In the year 2018-19, certified organic production for all the crop categories stood at 2.60 million metric tones. The top ten states (Table 2) together accounted for 92 percent of the country's organic production.

The production of major commodities in organic production presented in Table 3 reveals that sugar crops, oilseeds , cereals and millets, fibre crops, pulses, medicinal /herbal / aromatic plants and spices and condiments are the highest produced organic commodities in India. Sugar crops top the list (9.91 lakh metric tones) in total organic products produced in the country in 2018-19.

Future prospects of organic cultivation:

India is bestowed with lot of potential to produce all varieties of organic products due to its agro-climatic

regions. In several parts of the country, the inherited tradition of organic farming is an added advantage. This holds promise for the organic producers to tap the market which is growing steadily in the domestic market related to the export market. The demand for organically grown produce is increasing as people are becoming more aware now about the safety and quality of food. Organic cultivation has an immense prospect of income generation too. It is shown in Table 5 that consumption of organic products is increasing in India. Consumption of health and wellness products has increased at the rate of 8.50 percent per annum during 2015-2019 while organic packaged food and beverages' consumption has increased at the rate of 12 percent per annum. E- commerce companies like Big –Basket, Amazon India, Jaivik Haat and Nourish Organics among others are emerging as alternate channels for creating brand awareness and increasing sales of organic products.

Export of organic products:

The increasing demand for organic produce has

Crop Category	Organic	In Conversion	Total
Sugar crops	984730	6910	991640
Oil Seeds	727148	8	727156
Fibre Crops	312945	888	313833
Cereals and Millets	269547	187	269734
Pulses	71875	0	71875
Plantation Crops (tea/coffee/coconut)	61321	224	61544
Spices and Condiments	56208	45	56253
Medicinal/Herbal/Aromatic Plants	48424	1	48425
Fruits	35813	2	35815
Flowers	11016	0	11016
Dry fruits	8834	30	8864
Vegetables	7134	1	7135
Miscellaneous	1964	0	1964
Fodder seeds/Crops	1851	0	1851
Tuber crop	289	0	289
Total Certified production	2599099	8297	2607396

Source- GOI, 2019

Category	2015	2016	2017	2018	2019	CAGR(%) (2015- 2019)
Health and wellness products consumption	10678	12279	14200	15526	16848	8.50
Organic packaged food and beverages consumption	38.6	46.3	54.6	61.6	69.0	12
Organic packaged food consumption	6.7	7.8	9.2	10.2	11.1	9
Organic beverages consumption	32.0	38.5	45.3	51.4	57.9	13

Source: USDA, 2020

Table 5 : Export of Organic Products from India by Market Destination, 2018-19

Country	Country wise Export during 2018-19	
	Volume (MT)	Total Value (USD)
United States	334113	429705430
European Union	155255	223117745
Canada	101943	68602268
Switzerland	6199	9888235
Australia	2131	7468130
Japan	751	2397738
New Zealand	1978	2125925
Israel	3070	1865450
Vietnam	3186	1679401
Lebanon	681	1633755
Others	4783	9014585
Total	614089	757498662

created new export opportunities and many developing countries have started to tap lucrative export markets for organic produce. Exports of organic products from India to market destination is presented in Table 5. During 2018-19, the total exports of organic products from India were of 757.4 million dollars. The United States was the biggest importer of Indian organic products with total value of 429.70 million dollars.. Other major importers were European Union, Canada, Switzerland, Australia etc. Top organic products exported were oilseeds, cereals and millets, tea and coffee, spices and condiments.

Barriers in the growth of organic and natural farming:

The Indian organic movement is far from being a mass movement even 15 years after the national organic farming policy. Chemical-free farming is still struggling to be part of mainstream agriculture interventions.

Reasons for reluctant adoption of organic or natural farming practices by the farmers:

- Inclination towards chemical farming
- No proper knowledge of organic and/or natural approaches
- Faithlessness in organic and/or natural practices and doubt of low yield
- Inability to bear yield losses
- Fear of support and risk coverage during change to organic cultivation
- Lack of established marketing channels or green markets and suspicion of assured market offering remunerative prices

- Un-availability of quality organic inputs like seeds, bio-inputs and technology
- Fear of insect - pest attack
- Cumbersome procedure of certification involving extensive paper work
- More labour-intensive and time consuming
- Higher storage and transportation costs due to the lack of preservatives required for long-term storage

Reasons for not buying organic or natural foods by the consumers:

- High price of Organic products— consumers not ready or cannot afford to pay higher prices
- Organic produce not easily available and accessible everywhere
- Always doubt among the consumers about the credibility of organic food in market, i.e. whether produce is fake organic
- Lack of awareness regarding health linkages
- Lack of awareness on linkages of organic and/or natural farming with sustainability, environment etc.

Measures for driving change:

- To promote organic farming in the country, government should encourage the organic growers by providing some incentives to them.
- They also should get support by linking them with domestic as well as export markets and by providing minimum support prices to their products.
- The process of organic certification should be made simpler so as to reach many small and marginal farmers in the country.
- Use of organic and bio-fertilizers should be promoted instead of chemical fertilizers
- A nation-wide programme should be developed to drive the change towards organic and natural farming
- Build rigorous scientific data on the benefits of organic and natural farming
- Agriculture extension system to be enabled to lead and support the transition on the ground
- The states should step up their action in a concerted way to promote organic and natural farming done by providing organic seeds, bio-inputs, capacity building of farmers and providing market linkages.
- States can play an instrumental role in helping farmers sell their organic and natural produce by developing organic value chains, procuring organic produce and helping farmers get remunerative prices.

Conclusion:

The popularity of organic food is growing dramatically as consumer seeks the organic foods that are thought to be healthier and safer. The organic farming process is more eco-friendly than conventional farming. Organic farming keeps soil healthy and maintains environment integrity thereby, promoting the health of consumers. Moreover, the organic produce market is now the fastest growing market all over the world including India. Organic agriculture promotes the health of consumers of a nation, the ecological health of a nation, and the economic growth of a nation by income generation holistically. India, at present, is the world's largest organic producers (Willer *et al*, 2020) and with this vision, we can conclude that encouraging organic farming in India can build a nutritionally, ecologically, and economically healthy nation in near future.

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