



Research Article

ADOPTION OF ORGANIC FARMING PRACTICES AND CONSTRAINTS FACED IN ADOPTION BY THE FARMERS OF SURENDRANAGAR DISTRICT OF SAURASHTRA REGION IN GUJARAT STATE

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Abstract: Organic farming in India is being followed from old world. Organic agriculture in India has its roots in traditional agricultural practices that evolved in many villages and farming communities over the millennium. Gujarat has remained a leading state in adopting organic farming. Adoption of organic farming necessarily involves a sequence of steps that need to be followed by the growers and verified by certification and inspection agencies. Looking into this, Government of Gujarat established Gujarat Organic Products Certification Agency (GOPCA), a Gujarat state government certification body that carries out impartial third party inspection & certification in organic production and handling. To find out the level of adoption of organic farming practices and constraints faced by farmers in adoption of organic farming practices, respondents were selected from three talukas and 9 villages purposively. From each selected village, 10 farmers who were engaged in organic farming partially or fully were selected purposively. Thus sample size consisted of 90 respondents from 9 village covered under study. Most of the respondents had followed organic farming practices like land preparation, summer and winter ploughing, application of compost/ash and vermi-composting. Similarly cow urine for seed treatment, manual weeding was found practiced. None of the respondents found to be used bio herbicides. Majority respondents were utilized castor cake, neem cake, bio fertilizers like PSB, rhizobium culture and Azotobacter and groundnut cake as source of nutrients and were found to be used cow dung/urine as concentrated manures. None of the respondents were found to use bone meal or fish meal. They used bio agents and neem leaf extract and buttermilk to manage insect, pest and soil borne fungal disease in various crops. Majority of respondents expressed lack of assured marketing network of organically produces of organic farming (96.32 %), lack of information regarding organic farming(92.22 %), no government subsidy for organic farming cultivation (84.44%), high certification charges (78.89 %), no price premium in local market (72.22%), inadequate transport facility (75.56%) etc. Were major constraints they faced in adoption of organic farming practices.

Keywords: Organic farming, Adoption, Socio - economic characteristic and constraint

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Introduction

Organic farming in India is being followed from old world. According to Food and Agriculture Organization "Organic agriculture is a unique production management system which promotes and enhances agro-ecosystem health, including biological cycles, biodiversity and soil biological activity and this is accomplished by using on-farm agronomic, biological and mechanical methods in exclusion of all synthetic off-farm inputs". It is true that the increasing use of fertilizers under green revolution programme in India. But it has also caused adverse impact on soil, water and environment. Both the drinking and irrigation water well in large numbers have been found contaminated with nitrates. Excessive use of irrigation water causes these chemicals to change the alkaline or acidic nature of the soil [1]. The use of organic farming is regarded as the best solution to restore our natural resources and to safeguard our environment. It is a holistic production management system, which promotes and enhances agro eco-system health including bio-diversity, biological cycles and soil biological activities. The farming system emphasizes upon management practices wherein agronomic, biological and mechanical methods are used for sustainable production avoiding the use of synthetic materials. With increasing health consciousness and awareness for environment in peoples, organic farming system has been drawing attention all over the world. As a result, there is widespread organic movement. Demand for organic products, especially in developed countries has been increasing by leaps and bounds. Besides, it is also an alternative for safe agriculture with assured returns. Organic agriculture has developed rapidly worldwide during the last few

years and is now practiced in approximately 120 countries of the world. Its share of agricultural land and farms continues to grow. India has evolved a rich history of agricultural practices and continues to adopt technologies like biodynamic and other systems into its organic practices. India's organic farmers have been at the fore front of developing field based technologies ranging from vermi-composting to integrated livestock practices that facilitate their ability to improve soil fertility even in semi-arid or barren areas. Export market for organic sector was the main driver for the growth of organic sector in the country. India is best known as the exporter of organic tea and has carved a niche in the organic market for spices. There is also a good response for organic rice, coffee, cashew and oilseeds. Among the fruit crops mango, banana and orange are the main products. Organic products which were largely being exported are now finding place in the domestic market as well. Organic agriculture has grown from 15.8 million hectares to 37.2 million hectares worldwide and India rates fifth in the world for speed of uptake and this has occurred with some support from the Indian government. India ranks seventh in the world with 1.2 million hectares of certified organic agriculture which constitutes about 0.6 percent of India's total cultivable area. India has made considerable progress in organic farming with its National Standards of Organic Production (NSOP) and accreditation widely recognized, including by the European Commission (EC) and the United State Department of Agriculture (USDA). India's organic food market has capabilities to grow more than 25 percent annually to reach \$1.36 billion by 2020 [1].

Table-1 Distribution of respondents according to their extent of adoption about organic farming practices

SN	Practices	Organic farming practices	Frequency	Percentage
1	Land preparation	Winter ploughing	67	74.37
		Deep tillage	61	67.71
		Open furrow	42	46.67
		Summer ploughing	71	78.81
2	Application of organic manures	Application of FYMs	52	57.78
		Application of compost/Ash	64	71.11
		Use of vermi-compost	58	64.44
		Use of cotton seed cake/Press mud	18	20.00
3	Seed treatment	Water soaking	20	22.22
		Use of cow urine	55	61.11
		Use of milk	0	0.00
		Salt +Water	1	1.11
		Use of castor oil	45	50.00
		Use of bio fertilizer	40	44.44
4	Weed management	Trichoderma	48	53.33
		Hand weeding	82	91.11
		Ploughing/Tillage	69	76.67
		Mulching	15	16.67
5	Mulching	Bio herbicides	0	00
		Use of wheat straw /Bajara ear head	7	7.78
		Plastic mulching	11	12.22
		Dust mulching	13	14.44
6	Green manuring	Use of wheat straw /Bajara ear head	7	7.78
		Plastic mulching	11	12.22
		Dust mulching	13	14.44
		Dhaincha	2	2.22
		Lucerne	17	18.89
7	Application of oil cake	Clusterbean	3	3.33
		Cowpea	4	4.44
		Glyricedia	2	2.22
		Neem cake	18	20.00
8	Application of concentrated manures	Groundnut cake	21	23.33
		Castor cake	72	80.00
		Fish meal	0	0.00
9	Application of bio-fertilizer	Bone meal	0	0.00
		Cow dung/Urine	82	91.11
		Poultry manure	11	12.22
		<i>Rhizobium</i>	41	45.56
		<i>Mycorrhiza</i>	7	7.78
		<i>Azotobacter</i>	28	31.11
10	Application of bio-agents	<i>Azospirillum</i>	7	7.78
		BGA(Blue Green Algae)	13	14.44
		Phosphate Realizing Fungi	28	31.11
		Phosphate solubilizing bacteria	67	74.44
		<i>Azolla</i>	8	8.89
		Neem oil and powder	29	32.22
		Neemazal	6	6.67
		<i>Trichoderma</i>	54	60.00
		<i>Beauveria basiana</i>	55	61.11
		NPV	37	41.11
11	Application of bio-Insecticide	<i>Verticillium lecani</i>	3	3.33
		Lady bird beetle	5	5.56
		Use of neem leaves and seed extract	46	51.11
		Tobacco powder	8	8.89
		Lantana+Water	0	0.00
		Chillipowder+Neem oil	4	4.44
		Buttermilk	36	40.00
		Use of caliotropis	7	7.78
		Use of Ardusi	34	37.78
		Use of Cactus	29	32.22
		Use of Panchgvay	30	33.33
12	Mechanical cultivation	Use of Amrutpani	25	27.78
		Collection & destruction of affected plant	72	80.00
		Use of pheromone/light/lure	46	51.11
		Uprooting alternate host plant	12	13.33
		Collection and destruction of egg /larvae	46	51.11
		Use of bird purchases	13	14.44
13	Following crop rotation	Use of yellow stripes	38	42.22
		Groundnut + wheat	31	34.44
		Groundnut + Gram	16	17.78
		Cotton fellow	62	68.89

Table-2 Constraints faced by organic farming respondents in adoption of organic farming

SN	Constraints	Frequency	Percentage
A. Technical constraints			
1	Lack of information regarding organic farming	83	92.22
2	Lack of crop specific scientific recommendations	66	73.33
3	Lack of marketing information	67	74.44
4	Lack of knowledge about certification	77	85.56
5	Difficult to control disease, pest and weeds	55	61.11
6	Difficult in maintenance of livestock	43	47.78
7	Long transition period	52	57.78
8	Inadequate availability of organic inputs	59	65.56
B. Institutional constraints			
1	Difficult to convince family members	46	51.11
2	No Government subsidies for organic farming cultivation	76	84.44
3	Lack of consumer awareness	55	61.11
4	Lack of assured marketing network	67	74.44
5	Inadequate certification agencies	75	83.33
6	Process of certification is cumbersome and time consuming	67	74.44
7	Lack of Government support for training participation	62	68.89
8	Difficult to maintain farming records	53	58.89
C. Economic constraints			
1	Less yield in initial years	64	71.11
2	Require high investment during conversion period	58	64.44
3	High labour requirement	62	68.89
4	No price premium in local market	65	72.22
5	High certification charges	71	78.89
6	Costlier organic inputs	56	62.22
7	Needs frequent training	64	71.11
8	Time consuming practices	63	70.00
D. Situational constraints			
1	Small holding	68	75.56
2	Fragmented holding	32	35.56
3	Difficult to meet organic standard in our condition	61	67.78
4	Lack of faith of consumers in organic products	62	68.89
5	Inadequate transport facility	53	58.89
6	Negative attitude of neighboring farmers	41	45.56

Gujarat has remained a pioneer state in adopting organic farming. There are more than dozen groups and networks across the state working voluntarily for promotion, training and marketing of organic produce. Collective efforts of many organizations have led to growing consumer demand of organic food in domestic market. Agricultural universities of the state are now getting equipped with technologies and training facilities related to organic farming. Gujarat has pioneered some of the best promotional activities like seed festival, organic food festival and biennial conventions of organic farmers which are now followed by other organization at national level. Services of expert resource persons, trainers and movement organizers are available. In a positive action, government of Gujarat established Gujarat Organic Products Certification Agency (GOPCA) a certification body that perform impartial third party inspection & certification in organic production and handling. GOPCA works in accordance with the criteria lay down under the NPOP (National Program for Organic Production). Total geographical area of Gujarat state has an about 189.3 thousand sq.km. Land under organic management is only 0.5 percent found in Gujarat state. But still there is a huge gap in efforts being made by government and adoption of organic farming. It becomes necessary to carry out a study to observe and do effort to document the practices followed by farmers who adopted organic farming in the region. Looking into this, the study was empirically carried out with following specific objectives:

1. To assess the adoption level of farmers about organic farming practices.
2. To determine constraints in adoption of organic farming practices.

Materials and Methods

The present research study was conducted in jurisdiction of Krishi Vigyan Kendra, JAU, Nana kandhasar, Chotila, Surendranagar. Three talukas were selected purposively where organic farming is being practiced for conducting the present investigation. Three villages were further selected purposively from each selected taluka; where organic farming is being practiced and village-wise organic farmer's list was prepared. Then from each village, ten farmers were selected randomly.

Accordingly, 90 farmers were selected for the study purpose. An interview schedule was prepared to collect the required information as per the objectives of the study. For measurement of adoption, an interview schedule was developed and data were collected by personal interview method. The collected data quantified, categorized and tabulated. Analysis is carried out and interpretation is being carried out by using frequencies and percentages.

Result and Discussion

Distribution of respondents according to their extent of adoption about organic farming practices

Adoption of organic farming practices included different practices broadly which are followed by farmers under organic farming. These includes land preparation, application of organic manures, seed treatment, weed management, mulching, green manuring, application of oilcake, application of concentration manures, application of bio agents, application of bio fertilizers, application of bio insecticides, mechanical cultivation and follow of crop rotation etc. [Table-1] reveals that adoption of organic farming practices by respondents, in land preparation, 78.81 percent of respondent followed summer ploughing followed winter ploughing (74.37 %) and deep tillage (67.71%). Only 46.67 percent respondents had open furrow practiced. In case of adoption of application of organic manures, majority of respondents (71.11%) applied compost/ash for their organic farming field. 64.44 percent had used vermi-composting. Only 20 percent respondents had cotton seed cake or press mud for their organic farming. Most of the respondents were utilized cow urine for seed treatment (61.11%) followed by Trichoderma (53.33 %) and bio fertilizer (44.44%). In case of weed management in organic farming, 91.11 percent of the respondents had manually weeded the crop field followed by 76.67 percent who practiced ploughing for weed management. 16.67 percent respondents used mulching method for control of weeds. None of the respondents found to be used bio herbicides. Only 31.1 percent of respondents had practiced green manuring. 80 percent of the respondents were utilized castor cake followed by groundnut cake and neem cake

23.33 and 20.00 respectively. 91.11 percent of the respondents were found to be used cow dung/urine as concentrated manures. None of the respondents were found to use bone meal or fish meal. 74.44 percent of the respondent had used Phosphate solubilizing bacteria culture followed by 45.56 percent respondents who used rhizobium culture and 31.11 percent Azotobacter respectively. The findings of present study were in line with the findings of [2, 3, and 4]. Majority of respondents (61.11%) use *Beauveria bassiana* for biological control of insect pest followed by 60 percent respondents who used Trichoderma as bio agent to manage soil borne fungal disease. 51.11 percent respondents used neem leaf extract, 40 percent respondent used buttermilk for management of insect and pest in various crops. Constraints were broadly categorized into 4 major categories viz technical, institutional, economic and situational constraints. [Table-2] reveals that in case of technical constraints, lack of information regarding organic farming (92.22 %) and lack of knowledge about certification (85.56 %) were the most important constraints as perceived by the respondents. In this category, least important constraints were difficult in maintenance of livestock (47.78%) and long transition period (57.78%). Whereas in case of institutional constraints, no government subsidy for organic farming cultivation (84.44%) and inadequate certification agencies (83.33%), were the constraints majority perceived. While difficult to convince to family member (51.11%) was least important constraints. Similarly in case of economic constraints, high certification charges (78.89 %), no price premium in local market (72.22%) and less yield in initial years (71.11 %) were the constraints perceived by respondents. While required high investment during conversion period (64.44 %) and costlier organic inputs (62.22 %) were least felt constraints. In the situational constraints, Small holding (75.56%), Lack of faith of consumers in organic products (68.89 %) were most perceived constraints and negative attitude of neighbouring farmers (45.56%) and fragmented holding (35.56%) were the least perceived constraints.

Conclusion

This study reveals that in case of adoption of organic farming practices by respondents, majority of respondents adopted land preparation by Summer ploughing (78.81 percent), 71.11% applied compost/ash for their organic farming field. 64.44 percent had used vermi-composting. 61.11% utilized cow urine for seed treatment followed by Trichoderma (53.33 %). Most of the respondents (91.11%) had manually weeded the crop field. None of the respondents found to be used bio herbicides. This may be because of complexity and unawareness and lack of knowledge about bio-herbicides. Only 31.1 percent of respondents had practiced green manuring. 80 percent of the respondents were utilized castor cake. 91.11 percent of the respondents were found to be used cow dung/urine as concentrated manures. None of the respondents were found to use bone meal or fish meal which may be area of popularization among organic farming adopter. 74.44 percent of the respondent had used Phosphate solubilizing bacteria culture, 61.11 percent respondents were used *Beauveria bassiana* for biological control of insect pest followed by 60 percent respondents who used Trichoderma as bio agent to manage soil borne fungal disease. 51 percent respondents used neem leaf extract, 40 percent respondent used buttermilk for management of insect and pest in various crops.

Application of research: Study shows that there are a number of constraints impeding Indian farmers, especially small farm holders from adopting organic farming. Farmers' apprehension lies in non-availability of sufficient number of organic supplements, 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.

Research Category: Organic Farming

Abbreviations:

EC: European Commission

FAO: Food and Agriculture Organization

GOPCA: Gujarat Organic Products Certification Agency

NPOP: National Program for Organic Production

NSOP: National Standards of Organic Production

USDA: United State Department of Agriculture

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Study area / Sample Collection: Nana kandhasar, Chotila, Surendranagar

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