ADOPTION OF ORGANIC FARMING PRACTICES BY THE FARMERS OF SURENDRANAGAR DISTRICT OF SAURASHTRA REGION OF GUJARAT

M. S. Chandawat[1], B. C. Bochalya [2] and M.F. Bhoraniya[3]

1 Senior Scientist & Head, KVK, JAU, Surendranagar - 363520
2 Scientist (Ext. Edu.), KVK, JAU, Surendranagar - 363520
3 Scientist (Plant Pathology), KVK, JAU, Surendranagar - 363520
Email- drchandawat@rediffmail.com

ABSTRACT

Organic farming in India is being followed from ancient time. Organic agriculture in India has its roots in traditional agricultural practices that evolved in countless villages and farming communities over the millennium. Gujarat has remained a pioneer state in adopting organic farming. Adoption of organic agriculture necessarily involves a sequence of steps that need to be followed by the growers and verified by certification and inspection agencies. Looking into this, Govt. 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 know the socio economic and personal characteristics and adoption of organic farming practices by farmers of Surendranagar district, 90 respondents from three talukas and 9 villages were purposively selected. From each selected village, 10 farmers who were engaged in organic farming partially or fully were selected purposively. Thus sample size become the 90 from 9 village covered under study. The result shows that Majority of respondents were middle aged, primarily educated, had joint family with family size more than 5 and had 2 to 4 ha. land. They found cent per cent extension participation. Majority of respondents had marketed their organically produced product at village level followed by at district market avenues. Most of the respondents had followed organic farming practices like land preparation, summer and winter ploughing, application of compost/ash and vermicomposting. 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 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. Majority of the respondents used bio fertilizers like PSB, rhizobium culture and azotobactor and used bio agents and neem leaf extract and buttermilk to manage insect, pest and soil borne fungal disease in various crops. Only 31.08 per cent of respondents had practiced green manuring.

Keywords: *organic farming, adoption, socio - economic characteristics*

INTRODUCTION

Organic farming system in India is being followed from ancient time. According to FAO "Organic agriculture is a unique production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles 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, well above the safe level. Excessive use of irrigation water causes these chemicals to change the alkaline or acidic nature of the soil(N. C. Joshi, 2017).

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 concern for environment, 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 adapt 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 hactares 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 per cent of India's total cultivable area. India has made substantial 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 potential to grow more than 25 per cent annually to touch $1.36 billion by 2020(N. C. Joshi, 2017).

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 quipped 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 is now followed by other organization at national level. Services of expert resource persons, trainers and movement organizers are available.

In a positive step, Govt. of Gujarat established Gujarat Organic Products Certification Agency (GOPCA) a certification body that carries out impartial third party inspection & certification in organic production and handling. GOPCA works in accordance with the criteria laid down under the NPOP (National Program for Organic Production) 2005-Nov,2014.

Total geographical area of Gujarat State has an about 189.3 thousand sq.km. Land under organic management is only 0.5 per cent found in Gujarat state. But still there is a huge gap in efforts being made by govt 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:

OBJECTIVES

(a) To study the personal and socio-economic profile of farmers.

(b) To assess the adoption level of farmers about organic farming practices.

METHODOLOGY

The present research study was conducted in jurisdiction of Krishi Vigyan Kendra, JAU, 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, a 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, percentages.

RESULTS AND DISCUSSION

Personal and Socio - economic profile of the respondents:

The data pertaining to the selected background information of farmers have been presented in this section *i.e.* age, education, caste, family type, family size, family income, social participation, extension participation, size of land holdings, mass media exposures, no. of animals possesses *etc*.

Table -1 Distribution of respondents according to their personal socio - economic characteristics n = 90

Sr. No.	Categories		Frequency (*f*)	Percentage (%)
1	**Age**	Young Age (up to 35 years)	15	16.67
		Middle Age (36 to 50 years)	41	45.56
		Old Age (above 50 years)	34	37.78
2	**Education**	Illiterate	17	18.89
		Primary education	32	35.56
		High School education	23	25.56
		Higher Secondary education	14	15.56
		Graduate	03	03.33
		Post Graduate	01	01.11
3	**Caste**	General	49	54.44
		SC/ST	09	10.00
		OBC	32	35.56
4	**Type of Family**	Nuclear	42	46.67
		Joint	48	53.33
5	**Size of Family**	Less than 5	34	37.78
		5 and above	56	62.22
6	**Size of Land Holdings**	0-2 hectares	13	14.44
		2-4 hectares	51	56.67
		Above 4 hectares	26	28.89
7	**Social Participation**	Participates in different social institutes	52	57.78
		No participation	38	42.22
8	**Income of respondents**	₹ 25000 to 50000	21	23.33
		₹ 51000 to 100000	24	26.67
		₹ 100001 to 150000	15	16.67
		₹ 150001 to 200000	12	13.32
		₹ 200001 to above	18	20.00
9	**Extension Participation**	Participate in Extension Activities	90	100.00
		Not participation	00	0.00
10	**No. of Animal Possesses**	No animals	11	12.22
		1 to 5 animals	64	71.11
		6 to 10 animals	08	08.90
		11 to 15 animals	05	05.56
		15 and above animals	02	02.22

(1) Age: In the present study, farmers were categorized in the three age groups. Perusal of results of table shows that majority of the respondents (45.56%) were found in the middle age group of followed by 37.78 per cent above 50 years, there were only 16.67 per cent respondents in the age group of young.

(2) Education : Table 1 indicates that majority of respondents (35.56%) were having Primary Education followed by 25.56 per cent who were educated up to high schooling. 18.89 per cent were found illiterate, 15.56 per cent respondents were educated upto higher secondary. 3.33 per cent famers having up to graduate and 1.11 per cent respondents were post graduated.

(3) Caste: Table 1 reveals that majority of respondents (54.44%) were general, whereas 35.56 per cent of respondents were OBC, Only 10.00 per cent of respondents were from SC/ST caste.

(4) Family type: Table 1 shows that majority of respondents (53.33 %) were from joint family, while only 46.67 per cent from nuclear family.

(5) Family size: Table 1 shows that majority of respondents (62.22 %) had 5 and above member in their family, while only 37.78 per cent had less than five in their family.

(6) Size of Land Holding: Table 1 shows that majority of respondents (56.67%) possessed 2 to 4 ha land, followed by 28.89 per cent who were possessed above 4 ha land. 14.44 per cent had below 2 hectares land.

(7) Social participation: Table show that majority of respondents (57.78 %) were participated in different social institute while 42.22 per cent respondents had not participated in any social institutes.

(8) Income of respondents: Majority of respondents (26.67%) had income upto ₹ 51000.00 to 100000.00 followed by respondents (23.33 %) who had income upto ₹ 25000.00 to 50000.00. Whereas 20 % respondents had income above ₹ 200001.00

(9) Extension participation: Table 1. shows that all the cent per cent respondents (100 %) were participated in extension activities.

(10) No. of Animals possesses: Table 1 reveals that majority of respondents (71.11%) had animals up to 5, followed by 12.22 per cent who does not possessed animals. While 8.9 per cent had herd size between 6 to 10 animals. 2.22 per cent had more than 15 animals.

Mass media Exposure:

Table 2. Distribution of respondents according to their exposure towards mass media n=90

Sr. No.	Mass media exposure	Always	Occasionally	Never
1	Radio	13	53	24
2	Television	28	54	8
3	Newspaper	33	44	13
4	Printed literature	18	51	21
5	Agril. Exhibition	13	67	10
6	Demonstration	20	41	29

Table 2 reveals that in case of mass media exposure, most of the respondents had occasional exposure about Radio, television, news paper, printed literature, agriculture exhibition, demonstration etc.

Marketing avenues for organic product

Table 3 Distribution of respondents according to Marketing of Organic Produce n=90

Sr. No.	Categories of the Farmers	Frequency	Percent
1	At field immediately after harvest	02	02.22
2	At village	53	58.89
3	At taluka	10	11.11
4	At district/city	25	27.78
5	For export purpose	0	0.00

Table 3 shows that majority of respondents (58.89%) had marketed their organically produced product at village level while 27.78 per cent of the respondents had market their organically produced product at district /city level. None of the respondents found to be marketed his/her organically produced product for export.

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 is shown in Table 4.

Table 4 reveals that adoption of organic farming practices by respondents, in land preparation, 78.81 per cent of respondent followed summer ploughing followed winter ploughing(74.37 %). Only 46.67 per cent respondents had open furrow practiced.

Table : 4 Distribution of respondents according to their extent of adoption about organic farming practice : n = 90

Sr. No.	Technology	Organic farming practices	Frequency	Percent
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	00	0.00
		Salt +Water	01	01.11
		Use of Caster Oil	45	50.00
		Use of bio fertilizer	40	44.44
		Trichoderma	48	53.33
4	**Weed management**	Hand Weeding	82	91.11
		Ploughing/Tillage	69	76.67
		Mulching	15	16.67
		Bio herbicides	00	0.00
5	**Mulching**	Use of Wheat Straw /Bajara Ear head	07	07.78
		Plastic mulching	11	12.22
		Dust Mulching	13	14.44
6	**Green manuring**	Dhaincha	02	02.22
		Lucerne	17	18.89
		Clusterbean	03	03.33
		Cowpea	04	04.44
		Glyricedia	02	02.22
7	**Application of oil cake**	Neem cake	18	20.00
		Groundnut cake	21	23.33
		Castor cake	72	80.00
8	**Application of concentrated manures**	Fish meal	00	0.00
		Bone meal	00	0.00
		Cow dung/Urine	82	91.11
		Poultry manure	11	12.22
9	**Application of Bio-fertilizer**	Rhizobium	41	45.56
		Mycorrhiza	07	07.78
		Azotobactor	28	31.11
		Azospirillium	07	07.78
		BGA(Blue Green Algae)	13	14.44
		Phosphate Realizing Fungi	28	31.11
		Phospho bacteria	67	74.44
		Azolla	08	08.89

Sr. No.	Technology	Organic farming practices	Frequency	Percent
10	**Application of Bio-agents**	Neem oil and powder	29	32.22
		Neemazal	06	06.67
		Trichoderma	54	60.00
		Beauveria basiana	55	61.11
		NPV	37	41.11
		Verticillum lecani	03	03.33
		Lady bird beetle	05	05.56
11	**Application of Bio-Insecticide**	Use of neem leaves and seed extract	46	51.11
		Tobacco powder	08	08.89
		Lantana+Water	00	00.00
		Chilli powder+Neem oil	04	04.44
		Buttermilk	36	40.00
		Use of caliotropis	07	07.78
		Use of Ardusi	34	37.78
		Use of Cactus	29	32.22
		Use of Panchgvay	30	33.33
		Use of Amrutpani	25	27.78
12	**Mechanical Cultivation**	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
		Use of yellow stripes	38	42.22
13	**Following Crop Rotation**	Groundnut + wheat	31	34.44
		Groundnut + Gram	16	17.78
		Cotton fellow	62	68.89

In case of adoption of application of organic manures, majority of respondents(71.11%) applied compost/ ash for their organic farming field. 64.44 per cent had used vermicomposting. Only 20 per cent 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(50 %) and bio fertilizer(44.44%)

In case of weed management in organic farming, 91.11 per cent of the respondents had manually weeded the crop field followed by 76.67 per cent who practiced ploughing fro weed management. 16.67 per cent respondents used mulching method for control of weeds. None of the respondents found to be used bio herbicides.

Only 31.08 per cent of respondents had practiced green manuring. 80 per cent of the respondents were utilized castor cake followed by neem cake and groundnut cake 23.33 and 20.00 respectively. 91.11 per cent 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 per cent of the respondent had used PSB culture followed by 45.56 per cent respondents who used rhizobium culture and 31.11 per cent azotobactor respectively. The findings of present study were in line with the findings of Biswas et al. (1985), Katyal et al. (1994), Chaudhary *et al*., (2016) and Punia and Punia (1997).

Majority of respondents (61.11%) use *beauveria bassianan* for biological control of insect pest followed by 60 per cent respondents who used *trichoderma* as bio agent to manage soil borne fungal disease.

51 per cent respondents used neem leaf extract, 40 per cent respondent used buttermilk for management of insect and pest in various crops.

CONCLUSION

This study reveals that majority of respondents were belonged to middle age group(45.56%), had educated upto primary(35.56%), belonged to general caste(54.44%).

Majority respondent had joint family and family size above 5 possessed 2 to 4 ha. land (56.67%) and had participation in different social organizations. Majority of respondents (26.67%) were fall in the income group of ₹ 51000 to 100000. Cent per cent of the respondents were actively participate in various extension programme. Majority (71.11 %) had animals possession upto 1 to 5. They had occasional mass media exposure and had preferred to market their organically produced agricultural product.

In case of adoption of organic farming practices by respondents, majority of respondents adopted land preparation (78.81 per cent), 71.11% applied compost/ ash for their organic farming field. 64.44 per cent had used vermicomposting were found utilized cow urine for seed treatment(61.11%) followed by trichoderma(50 %). Most of the respondents (91.11%) had manually weeded the crop field. None of the respondents found to be used bio herbicides. This may because of complexity and unawareness and lack of knowledge about bio - herbicides. Only 31.08 per cent of respondents had practiced green manuring. 80 per cent of the respondents were utilized castor cake. 91.11 per cent 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 per cent of the respondent had used PSB culture, 61.11 per cent respondents were used *beauveria bassianan* for biological control of insect pest followed by 60 per cent respondents who used *trichoderma* as bio agent to manage soil borne fungal disease. 51 per cent respondents used neem leaf extract, 40 per cent respondent used buttermilk for management of insect and pest in various crops.

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