

Research Article

Study of agro - socio - economic characteristics and marketing problems faced by organic *vis-à-vis* inorganic growers in Indian Punjab

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SUMMARY : In this study, to accomplish the various objectives of the study, the primary level data/information was required. Based on the concentration of organic growers/acreage, one block from each district namely, Nabha from Patiala and Kotkapura from Faridkot district were selected for the field survey in Punjab, 2008-09. The organic growers were found scattered over a number of villages in these blocks. A random sample of 85 organic growers, spreading over about 30 villages were taken. Besides, 75 inorganic growers were also randomly chosen from the area that formed controlled group for comparison purpose in the study. The study has, therefore, been based on the total sample of 160 farmers (85 organic growers and 75 inorganic growers) in Patiala and Faridkot districts in all. This paper focused on the agro-socio- economic characteristics and marketing aspects of organic *vis-à-vis* inorganic growers in Indian Punjab.

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Organic growers,
Inorganic growers,
Marketing

BACKGROUND AND OBJECTIVES

Realizing well the importance of organic farming in the state, the Punjab Government has decided to set up a special and independent council of organic farming in Punjab to focus on the issue. Now, the farmers are being persuaded to switch over to the age-old organic farming and phase out the consumption of chemical fertilizers. Organic farming is gradually picking-up in Punjab with more and more farmers joining the sustainable stream. Several civil society groups have started the organic farming across the state by involving farmers either as individual or as a group. The Punjab Agro Export Corporation has taken a lead in this by initiating an export - oriented project. Punjab Agro appointed the consultants for this project and as per claims they are working with more than 1200 farmers covering near 8000 acres of land

(Malekar, 2010). Apart from this, large numbers of farmers are converting their farms to organic by their own or in collaboration with some private company or religious institution. On the other side, showrooms or corners for the sale of organic produce are also coming up in major towns. The general awareness is also spreading by the virtue of debate on health and ecological crisis in Punjab courtesy the pro-active role of media. Ultimately a combination of measures leading to an increase in agricultural productivity, production of safe foods, reduction in poverty and vulnerability and existence of the distribution of food grains at affordable prices and its efficiency working through the involvement of the poor and vulnerable that can help ensure food security in this vast country need to be addressed.

However, there is no pertinent research work done and knowledge available on various

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agro-socio-economic aspects of organic farming / produce with regard to, status, yield potential, marketing and profitability to the farmers etc. in the state. Therefore, it is of paramount importance to conduct an intensive study in this regard. The present study has, therefore, been an comprehensive attempt in this direction. The specific objectives of the study were:

-To study the agro- socio- economic characteristics of organic growers *vis a vis* inorganic growers in Punjab, to study marketing channels used by organic growers to sell their organic wheat and rice crops in Punjab and to study the suggestions given by organic growers to strengthen the organic farming system in Punjab.

RESOURCES AND METHODS

Though, it was intended to cover whole of Punjab, yet

the study pertains basically to Patiala and Faridkot districts of Punjab where more number of organic growers were found during field investigations. To accomplish the various objectives of the study, the primary level data/information was required. Based on the concentration of organic growers/ acreage, one block from each district namely, Nabha from Patiala and Kotkapura from Faridkot district were selected for the field survey. A complete list of organic growers in these sampled blocks of Patiala and Faridkot districts was prepared in consultation with extension specialists/key informants in the area. The organic growers were found scattered over a number of villages in these blocks. A random sample of 85 organic growers, spreading over about 30 villages were taken. Besides, 75 inorganic growers were also randomly chosen from the area that formed controlled group for comparison purpose in the study. The study has, therefore,

Table A : Details of the selected sample under different villages of the study area (2008-09)(Number)

Sr.No	Districts	Blocks	Villages	Selected growers		
				Organic	Inorganic	Total
1.	Patiala	Nabha	Kalar Majri	2	-	2
			Sahouli	3	-	3
			Mallewal	1	-	1
			Mungu	3	-	3
			Ghaniwal Kalan	3	-	3
			Ghaniwal khurd	1	-	1
			Mandourh	2	-	2
			Dhangerha	1	-	1
			Pedani	5	-	5
			Palia Khurd	11	-	11
			Nanoki	4	-	4
			Chehal Singh	1	-	1
			Bhari panechan	1	-	1
			Akalgarh	1	-	1
			Bodhan	1	-	1
			Fathepur	1	-	1
			Halla	1	-	1
			Daisal	1	-	1
			Dargerhi	2	-	2
			Khanourha	12	-	12
Kalsana	3	-	3			
Ditupur	5	-	5			
Lout	1	-	1			
Allowal	2	-	2			
Kansaha Kalan	3	-	3			
Ajnoudha kalan	4	-	5			
2.	Faridkot	Kotkapura	Chaina	10	-	10
3.	Patiala	Nabha	Chahal	-	17	17
			Kalsana	-	20	20
			Khanourha	-	20	20
4.	Faridkot	Kotkapura	Chaina	-	18	18
Total			85	75	160	

been based on the total sample of 160 farmers (85 organic growers and 75 inorganic growers) in Patiala and Faridkot districts in all. This is demonstrated in Table A.

Two sample t- tests:

For test of difference of two population means:

For samples t-test for difference of two populations means is used, where t is given by :

$$t = \frac{(\bar{X}_1 - \bar{X}_2) - E(\bar{X}_1 - \bar{X}_2)}{SE(\bar{X}_1 - \bar{X}_2)} \dots\dots\dots(1)$$

or two independent samples of size n_1 and n_2

$$= \frac{(\bar{X}_1 - \bar{X}_2) - E(\mu_1 - \mu_2)}{SE(\bar{X}_1 - \bar{X}_2)}$$

Null hypothesis (H_0): $\mu_1 = \mu_2$ or $\mu_1 - \mu_2 = 0$
 Alternative hypothesis (H_1): $\mu_1 \neq \mu_2$ or $\mu_1 - \mu_2 \neq 0$
 Under H_0 , if $\mu_1 = \mu_2$, the statistic t becomes

$$t_{cal} = \frac{(\bar{X}_1 - \bar{X}_2)}{SE(\bar{X}_1 - \bar{X}_2)} \dots\dots\dots(2)$$

where, $SE(\bar{X}_1 - \bar{X}_2) = \sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$
 $= \sqrt{2\left(\frac{1}{n_1} + \frac{1}{n_2}\right)} = \sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$

Under the assumption that variances are equal

We have $\frac{1}{n_1} = \frac{1}{n_2} = \frac{1}{2}$

and α^2 is estimated by s^2 (the pooled sample variance) and is given by

$$s^2 = \frac{1}{(n_1+n_2-2)} \left[(n_1-1)s_1^2 + (n_2-1)s_2^2 \right]$$

and $s_1^2 = \frac{1}{(n_1-1)} \sum_{i=1}^{n_1} (X_{1i} - \bar{X}_1)^2$ and

$$= \frac{1}{(n_2-1)} \sum_{j=1}^{n_2} (X_{2j} - \bar{X}_2)^2$$

So, under the null hypothesis $H_0 = \mu_1 = \mu_2$ or $\mu_1 - \mu_2 = 0$

$$t_{n_1+n_2-2, df} = \frac{(\bar{X}_1 - \bar{X}_2)}{\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \dots\dots\dots(3)$$

Level of significance :

α % level of significance will be used where $\mu = 0.10, 0.05$ and 0.1 are commonly used value. However, α can take any value between 0 and 1.

Interpretation of results :

If $|t_{cal} n_1+n_2-2, df| \leq t_{n_1+n_2-2, df}$, we do not reject H_0 . Otherwise H_0 is rejected. Hence, inferences will be drawn as per the rejection or not rejection of the null hypothesis.

OBSERVATIONS AND ANALYSIS

The results of the present study as well as relevant discussions have been presented under following sub heads:

Agro-socio-economic characteristics of sample farmers:

The various characteristics of sample growers including household composition, educational/occupational status, land details, cropping pattern have been analyzed in this paper under the following categories.

Household composition :

Family size :

The family composition of the sample organic/inorganic growers in Punjab has been demonstrated in Table 1, which showed that the average family size was little higher in sample organic growers (6.5) as compared to sample inorganic growers category (6.0), The per cent of family size (up to 4 persons) of sample organic growers was found to be less as compared to sample inorganic growers. Similarly, the percentage of family size (above 6 persons) of sample organic growers was higher as compared to sample inorganic growers, which supports the tendency that sample organic growers had higher family size in comparison to sample inorganic growers. The table further indicated that the family size of sample organic growers was in the family size category of 5-6 persons *i.e.* 49.42 per cent, second maximum percentage of family size was in the category of above 6 persons *i.e.* 31.76 per cent and third maximum percentage of family size was in the category of up to 4 persons *i.e.* 18.82 per cent. Similarly, the family size of sample in-organic growers was maximum in the category of 5-6 persons *i.e.* 42.67 per cent, followed by category of above 6 persons *i.e.* 30.66 per cent and of up to 4 persons *i.e.* 26.67 per cent.

Table 1: Family size of sample growers in Punjab (2008-09)

Family size (person)	Organic growers	Inorganic growers	Overall
Up to 4	16 (18.82)	20 (26.67)	36 (22.50)
5 – 6	42 (49.42)	32 (42.67)	74 (46.25)
Above 6	27 (31.76)	23 (30.66)	50 (31.25)
Total	85 (100)	75 (100)	160 (100)
Avg. family size	6.5**	6**	6.25

Figures in the parentheses indicate percentage to total, **two sample t-tests significant at 1 per cent probability level

Age wise distribution :

The age wise distribution of sample organic and

inorganic growers has been displayed in Table 2. The percentage of sample organic growers in the younger age group (up to 40 years) was higher as compared to sample inorganic growers. Similarly, the sample organic growers in the age group of above 50 years was found to be less as compared to sample inorganic growers, which support the tendency of young farmers to adopt the new farming systems to some extent. The table indicated that 38.82 per cent of the sample organic growers were in the age group of up to 40 years as compared to 28 per cent sample inorganic growers. The percentages of sample organic growers and sample inorganic growers was almost similar in the age group 41-50 *i.e.* 23-24 per cent. The percentage of sample growers in the age group of above 50 years was less *i.e.* 37.65 per cent for organic growers as compared to 48.00 per cent of sample inorganic growers. The percentage of total sample growers was maximum in the age group of above 50 years *i.e.* 42.50 per cent, second maximum percentage of total sample growers was in the age group of up to 40 years *i.e.* 33.75 per cent and third maximum percentage of total sample growers was in the age group 41-50 years *i.e.* 23.75 per cent. The average age of organic growers was found to be 48.92 years as against 52.32 years in case of inorganic growers. The difference in age of organic and inorganic growers was found significant at 1 per cent probability level.

Table 2 : Age wise distribution of sample growers in Punjab (2008-09)

Age (years)	Organic growers	Inorganic growers	Overall
Up to 40	33 (38.82)	21 (28.00)	54 (33.75)
41-50	20 (23.53)	18 (24.00)	38 (23.75)
Above 50	32 (37.65)	36 (48.00)	68 (42.50)
Total	85 (100)	75 (100)	160 (100)
Average age (years)	48.92**	52.32**	50.52

Figures in the parentheses indicate percentage to total, ** two sample t-tests significant at 1 per cent probability level (two-tailed)

Educational status :

Education of farmers is also considered as one of the determinants for adoption of new farming system/technology in agriculture. To study this, category-wise analysis of education level was carried out and the same has been presented in Table 3. Education up to level of senior secondary and above among sample organic growers was 31.77 per cent against only 20 per cent in sample inorganic growers. The analysis indicates that sample organic growers families were relatively better literate as compared to their counter parts *i.e.* sample inorganic growers. Maximum percentage of the education of the total sample growers was in the category of up to 8 standard *i.e.* 41.25 per cent. The analysis shows that the literacy was marginally higher among sample organic growers as compared to sample inorganic growers.

Table 3 : Education level of sample growers in Punjab (2008-09)

Education standard	Organic growers	Inorganic growers	Overall
Up to VIII	33 (38.82)	33 (44.00)	66 (41.25)
VIII-X	25 (29.41)	27 (36.00)	52 (32.50)
XI-XII	15 (17.65)	10 (13.33)	25 (15.63)
Above XII	12 (14.12)	5 (6.67)	17 (10.62)
Total	85 (100)	75 (100)	160 (100)
Avg. education year	9.06**	8.21**	8.64

Figures in the parentheses indicate percentage to total, ** two sample t-tests significant at 1 per cent probability level (two-tailed)

Occupational and income status :

Annual income :

The occupational/income status of both sampled organic as well as inorganic growers have been studied and presented in Table 4. The major component of the income (95%) of sample organic grower was coming from farm and livestock sector and about 4 per cent was from service and business sector and 1 per cent from pension. Similarly, the major percentage of the income (87%) of sample inorganic growers was coming from farm and livestock sector and about 6 per cent was coming from agricultural and non- agricultural labour and 3 per cent was coming from business. The source of income was less diversified in sample organic growers as compared to sample inorganic growers. So, this indicates that organic farming generally adopted by those farmers whose main income source was agriculture sector. The total annual income of (Rs. 600000) of organic growers was significantly higher than corresponding in case of (Rs. 480000) of the inorganic growers.

Table 4 : Annual income and its composition of sample growers in Punjab (2008-09)

Particulars	Organic growers	Inorganic growers
Household (number)	85	75
Total annual income (Rs./Household)	6,00,000**	4,80,000**
Farm and livestock (%)	95	87
Agricultural labour (%)	0	3
Non-agricultural labour (%)	0	3
Service (%)	2	4
Business (%)	2	3
Pensions (%)	1	0

** Two sample t-tests significant at 1 per cent probability level (two-tailed)

Land details :

The information regarding the land details of sample organic growers and inorganic growers is given in Table 5, which indicates that the average land leased out by the sample organic households was only 0.84 acres and the average land leased in was about 0.61 acres. The total land ownership

was about 10.84 acres and total land cultivated was about 10.61 acres for the sample organic households. The land leased out and leased in was about 0.75 acres and 0.55 acres for sample inorganic households, which was less as compared to the sample organic households. So, more number of sample organic growers engaged in leased out and leased in of the land as compared to the sample inorganic growers. Total ownership of the land was 10.84 acres and total cultivated land was 10.61 acres for sample organic households. Similarly, total ownership of the land was 10.21 acres and total cultivated land was 10.01 acres for sample inorganic growers and the land leased out was more as compared to the land leased in for the total sample growers. The average value of the land was more in sample organic growers as compared to sample inorganic growers. It was about Rs. 20 lakh /acre for organic households and was about Rs.18.69 lakh/acre for sample inorganic growers. This difference was because less percentage of the organic households represented to the Faridkot district in relation to the inorganic households and value of the land was less in Faridkot district in comparison to the Patiala district. The overall operational holding size of 10.61 acres and 10.01 acres for organic and inorganic growers was not found significantly different from each other.

Table 5 : Land details of selected sample households in Punjab (2008-09) (Acre)

Particulars	Organic growers	Inorganic growers
Operational holding	10.61(NS)	10.01(NS)
Land leased out	0.84	0.75
Land leased in	0.61	0.55
Total land ownership	10.84	10.21
Value of the land (Rs. lakh/acre)	20	18.69

NS= Two sample t-tests not significant at 1 per cent or 5 per cent level of probability level (two-tailed)

Ownership of agricultural machinery :

The ownership of the agricultural machinery per farm by the sample organic growers and sample inorganic growers as set out in Table 6 indicates that the sample organic growers were more equipped with farm machinery than sample inorganic growers. The present value of agricultural machinery owned per farm was more in sample organic growers (Rs. 4,12,371 /farm) as compared to Rs. 348403/farm in case of sample inorganic growers. The average number of agricultural machinery like tractor, bullock cart, disc plough, disc harrow, leveler and other type of machinery etc. was found marginally less in sample organic growers as compared to sample inorganic growers. The average number of tube wells was more in sample organic growers as compared to sample inorganic

growers. The overall present value of farm machinery owned by organic growers was significantly higher than the inorganic growers.

Table 6 : Farm machinery owned by the sample households in Punjab (2008-09)

Machinery	Organic growers		Inorganic growers	
	Number	Present value (Rs.)	Number	Present value (Rs.)
Tractor	39 (0.52)	250100	45 (0.53)	200223
Tube well	100 (1.33)	100220	85 (1.00)	90000
Bullock horse cart	15 (0.20)	10030	23 (0.27)	15025
Disc plough	39 (0.52)	15015	45 (0.53)	14125
Disc harrow	39 (0.52)	12000	45 (0.53)	10000
Leveler (wooden)	39 (0.52)	5006	45 (0.53)	4030
Other(s)	10 (0.13)	20000	18 (0.21)	15000
Total	-	412371**	-	348403**

Figure in parenthesis indicate the average number of machinery possessed, **two sample t-tests significant at 1 per cent probability level (two-tailed)

Livestock assets :

The livestock assets of sample organic growers were more in comparison to the sample in-organic growers, which is demonstrated in Table 7. This difference was only because organic growers need more FYM for organic farming in comparison to inorganic growers. The major observation was that now sample organic growers had one indigenous cow, because they think that urine of indigenous cow is very good for organic farming in comparison to X-bred cow.

Table 7 : Major livestock's maintained by sample growers in Punjab, (2008-09) (Number)

Livestock	Organic growers	Inorganic growers
Cow	3.50	3.43
Buffaloes	1.22	0.59

Source of irrigation :

Table 8 indicated that main source of irrigation was tube well for sample organic growers as well as sample inorganic growers. The 75 per cent and 70 per cent of the irrigation came from tube well for sample organic growers and sample inorganic grower, respectively. The organic growers were more equipped in terms of tube well/ pump sets as compared to sample inorganic growers.

Table 8 : Source of irrigation on sample households in Punjab (2008-09) (Per cent irrigation)

Source of irrigation	Organic growers	Inorganic growers
Tube well	75	70
Canal	30	25
Total	100	100

Cropping pattern :

Besides studying land holding size, an attempt was made

to study whether any difference existed in cropping pattern of two groups of sample growers. Cropping pattern of the sample organic growers and sample inorganic growers has been presented in Table 9. The perusal of the table shows that paddy and wheat were the main crops in *Kharif* and *Rabi* seasons, respectively in both groups of growers. In both season (2008-09), area under paddy and wheat was about 81 and 85 per cent of the total operational area for sample organic growers. Similarly the area under paddy and wheat was about 89 per cent and 91 per cent of the total operational area for sample inorganic growers. The 5.37 per cent of the total operational area in *Kharif* season of sample organic growers was under fodders, followed by cotton and sugarcane (4.71% each) and vegetable (3.97%). Similarly the total operational area distributed during the *Kharif* season, 2008-09 among sample inorganic growers was about 4.50 per cent under fodder crop, followed by vegetables (3.80%) and cotton (1.80%). Similarly, during the *Rabi* season, 2008-09, about 4.71 per cent of the total operational area remained engaged under sugarcane for the sample organic growers followed by fodder (4.24%) and vegetables (5.09%). Similarly, during *Rabi* season, 2008-09, about 4.20 per cent of the total operational area was under fodder crop for sample inorganic growers, followed by vegetables (4.10%). The percentage of the total operational area under fodder, sugarcane and vegetables and cotton was more in sample organic growers as compared to sample inorganic growers.

Table 9 : Cropping patterns of the sample organic and inorganic growers in Punjab (2008-09) (Acr)

Crops	Organic growers	Inorganic growers
<i>Kharif</i>		
Paddy	8.62 (81.24)	9.00 (89.90)
Cotton	0.50 (4.71)	0.18 (1.80)
Sugarcane	0.50 (4.71)	0.00 (0)
Fodder crops	0.57 (5.37)	0.45 (4.50)
Vegetable crops	0.42 (3.97)	0.38 (3.80)
<i>Rabi</i>		
Wheat	9.12 (85.96)	9.18 (91.70)
Sugarcane	0.50 (4.71)	0.00 (0)
Fodder crops	0.45 (4.24)	0.42 (4.20)
Vegetable crops	0.54 (5.09)	0.41 (4.10)

Figures in the parentheses indicate percentage to total

Area under organic and inorganic crops on sample organic households :

The area under organic farming was about 26.95 per cent of the total operational area in *Kharif* as well as *Rabi* season for the sample organic growers (Table 10). The major percentage of the organic area was under wheat and paddy crop, which accounted for 15.02 per cent of the total

operational area for sample organic growers. During, 2008-09, in *Kharif* season the average area under paddy crop was 1.37 acre followed by fodders (0.57 acre), sugarcane (0.50 acre) and vegetables (0.42 acre). Similarly, during *Rabi* season 2008-09, the average area under wheat was about 1.37 acre, followed by vegetables (0.54 acre), sugarcane (0.5 acre) and fodder (0.45 acre) . The area under other organic crops was about in between 3-5 per cent to the total operational area for each of the following crops *i.e.* fodder, sugarcane and vegetables of *Rabi* as well as *Kharif* season varied between 3-5 per cent of total operational area for sample organic growers.

Table 10 : Area under organic and in-organic crops on sample organic growers in Punjab (2008-09) (Acre)

Crops	Organic area	Inorganic area	Total
<i>Kharif</i>			
Paddy	1.37 (15.89)	7.25 (84.11)	8.62 (100)
Sugarcane	0.50 (100)	-	0.5 (100)
Cotton	-	0.5 (100)	0.5 (100)
Fodder crops	0.57 (100)	-	0.57 (100)
Vegetable crops	0.42 (100)	-	0.42 (100)
Total	2.86 (26.95)	7.75 (73.05)	10.61 (100)
<i>Rabi</i>			
Wheat	1.37 (15.03)	7.75 (84.97)	9.12 (100)
Sugarcane	0.5 (100)	-	0.5 (100)
Fodder	0.45 (100)	-	0.45 (100)
Vegetable	0.54 (100)	-	0.54 (100)
Total	2.86 (26.95)	7.75 (73.05)	10.61 (100)

Figures in the parentheses indicate percentage to total

Crop varietal distribution :

The crop varietal distribution for both organic as well inorganic wheat and paddy crops was studied and indicated in Table 11. The per cent area under different varieties for organic wheat was maximum under PBW 343 (40%) for sample organic growers followed by Bansi (30%), C-306 (20%) and others (10%). Similarly, the percentage of area under different varieties of organic paddy was highest under Pusa 44 (60%) for sample organic growers, followed by Pusa1121 (30%) and others (10%). Similarly, the per

Table 11 : Commonly used varieties for organic and inorganic crops by the sample organic growers in Punjab (2008-09)

Crops	Organic crops		Inorganic crops	
	Varieties	% Organic area	Varieties	% Inorganic area
Wheat	PBW 343	40	PBW 343	75
	C-306	20	-	-
	Bansi	30	-	-
	Other	10	Other	25
	Pusa 44	60	Pusa 44	80
Paddy	Pusa 1121	30	-	-
	Other	10	Other	20

cent area under different varieties of inorganic wheat was maximum under PBW 343 (75%) for the sample organic growers, followed by others (25%). Similarly, the percentage of area under different varieties of inorganic paddy was maximum under Pusa 44 (80%), followed by other varieties (20%). More varietal biodiversity has been observed for organic cultivation of both paddy and wheat crops as compared to inorganic cultivation.

Training status :

Trainings are of immense use to successful conduct the innovative enterprise(s). In view of this, status of training acquired by the sample organic growers have been investigated and the same has been shown in Table 12. The table revealed that all the organic farmers were trained to organize various organic cultivation related operations through informally. Around six per cent sample organic growers also acquired training from the formal sources. Hence, the sample organic growers acquired training either formal (State Agricultural University) or informal sources (NGO'S).

Table 12: Training (s) acquired by sample growers in Punjab (2008-09)

Training	Organic growers	Inorganic growers	Source (s)
Formal	7 (8.24)	3 (4.00)	P.A.U.
Informal	85 (100)	0 (0)	NGO and farmer to farmer

Figures in the parentheses indicate percentage to total

Yield of organic crops:

The average yield of organic wheat and paddy was about 10 (q/acre) and 24 (q/acre) during 2006-07 to 2008-09 as demonstrated in Table 13. The yield increased to 11 (q/acre) and 24 (q/acre) for organic wheat and paddy during 2007-08 and further increased to 12.4 (q/acre) and 25.8 (q/acre) during 2008-09. The increase was about 2.4q /acre in wheat and increase was about 1.8 q/acre in paddy during the period of

Table 13 : Average yield of organic paddy and wheat on sample growers in Punjab (2008-09) (q/acre)

Particulars	Yield			Average yield
	2008-09	2007-08	2006-07	
Wheat	12.4	11	10	11.13
Paddy	25.8	24	24	24.60

last three years (2006-07 to 2008-09). This suggests that organic farming has big scope in respect to yield enhancement. So proper training and research is required to develop this venture.

Difference in yield for organic and inorganic crops :

The difference in the yield of inorganic paddy and organic paddy was 4.5 q/acre, which is demonstrated in Table 14 and it implies that organic paddy has lesser yields as compared to inorganic paddy. Similarly the difference between the yield of inorganic wheat and organic wheat was about 6.7 quintal and it implies that organic wheat has also much lesser yields in comparison to inorganic wheat. The major reason for the yield difference in wheat was due to varieties difference of inorganic wheat and organic wheat, because major percentage of the organic growers adopted indigenous varieties for wheat. The table further indicated that the organic that organic paddy and wheat yielded around 15 per cent and 34 per cent lesser yield as compared to their inorganic counterpart. The yield difference was found to be highly significant.

Table 14 : Difference in yield for organic and inorganic crops in sample growers in Punjab (2008-09)(q/acre)

Particulars	Paddy	Wheat
Organic	25.8**	12.4**
Inorganic	30.3**	19.7**
Difference in yield	-4.5	-6.7
% Decline in yield for organic crops	14.85	34.01

**Two sample t-tests significant at 1 per cent probability level (two-tailed)

Disposal pattern of organic and inorganic crops produced by sample producers :

Around 99.52 per cent of the total produce of inorganic paddy was sold in the market by sample inorganic growers, whereas 95.79 per cent of the inorganic wheat was sold in the market by sample organic growers, which is demonstrated in Table 15. On the contrary to it about 54.75 and 95.70 per cent of the organic wheat and paddy produce was sold in the market by organic growers. This difference showed because for home consumption only organic was used by the organic growers. The 100 per cent of the inorganic paddy and in-organic wheat was sold in market by organic growers. So this was the additional benefit for the organic growers in terms of nutritional

Table 15 : Disposal pattern of organic and inorganic paddy and wheat crops by sample growers in Punjab (2008-09) (quintal)

Particulars	Organic growers		Inorganic growers		Organic growers		Inorganic growers
	Organic paddy	Inorganic paddy	Inorganic paddy	Inorganic paddy	Organic wheat	Inorganic wheat	Inorganic wheat
Production	3004.61 (100)	18487.30 (100)	20452.50 (100)	1443.98 (100)	12845.30 (100)	13563.43 (100)	
Home consumption	129.18 (4.30)	0	98.84 (0.48)	653.4 (45.25)	0	571.63 (4.21)	
Sale	2875.43 (95.70)	18487.3.0 (100)	20353.66 (99.52)	790.58 (54.75)	12845.30 (100)	12991.80 (95.79)	

Figures in the parentheses indicate percentage to total

value of the organic wheat and organic paddy.

Marketing :

Marketing was the main problem for its mass adoption, because most of the quantity sold to the consumer in the lean season and for this purpose storage was required. Now, farmers can store this small quantity and look after their small quantity in the storage. Here one thing is necessary to mention, that those produce that sold after 1 month of harvesting considered as lean season. Because most of the produce of wheat and paddy sold within one month of harvesting. So, this is the main reason that farmers not adopted organic farming on mass area. Now demand is higher for organic produce, that's why NGOs want that more area should come under organic farming by the adoption of more number of farmers in small percentage of the total cultivated area or mass adoption of marginal farmers. Thus, this farming system is not sustainable on mass area. Now less organic produce is available in the market but its demand is more for the upper strata of the people, so this is the one reason that they fetch good prices for their organic produce. But if farmers convert all the conventional area of wheat and paddy to organic farming then its supply will more in comparison to the demand and by this the farmers will not get higher price for their produce. Because 30 per cent of the people live below poverty line and it will not possible for them to purchase this produce at higher price.

Three channels generally used in the study area to reach the produce to the consumer for organic wheat and organic paddy as shown below and it indicated that channel -2 is the major channel and about more than 75 per cent of the organic wheat and organic paddy produce reached to the ultimate consumer through this channel. About 10-20 per cent of the organic wheat and organic paddy produce reached to the distant market through channel-3 and only 5 per cent of the total produce of organic wheat and organic paddy reached to the ultimate consumer through channel -1. This clearly indicated that NGO play important role for marketing the produce to the consumer. So, govt. agency should also take initiative to help the organic farmers regarding the marketing of the produce. This is demonstrated in Table 16.

Table 16 : Share of different marketing channels in disposal of the produce to the different market of Punjab (2008-09) (per cent of produce)

Channels	Market	Paddy	Wheat
Producer – consumer	Local market	5	5
Producer-NGO-consumer	Local market	75	85
Producer-NGO-consumer	Distant market	20	10

Marketing channels used for organic product wheat :

- Channel-1-Producer - consumer
- Channel-2 -Producer- NGO-Consumer

Channel -3 Producer- NGO-Consumers

Marketing channels used for organic product paddy :

- Channel-1 Producer-Consumer
- Channel-2 Producer-NGO-Consumer
- Channel-3 Producer-NGO-Consumer

Suggestions given by organic growers :

The Table 17 indicated that the majority of the farmers suggested that farmer cooperative should be required for the availability of organic inputs. Majority of the farmers said that assured market should be required for its marketing at higher prices. Now, the demand for organic inputs was easily available, but when more area will come under organic farming then its availability must be the problem for the farmer. Majority of the farmers said that certification of the produce should be required at free of cost .Now farmers are assisted by NGO's, so they faced no problem.

Table 17: Suggestion by the farmers in Punjab (2008-09)

Particulars	Response of majority farmers
Seed	Certified seed required for at cheaper rates
Organic inputs	Farmer cooperative required for its availability
Sale of organic products	Assured market required
Availability of organic inputs	Now available
About certificating	Free of cost required
About knowledge of organic farming	Extension required
Govt. support/ private support	Not much, NGOS are working in this field

Conclusion :

The organic growers were comparatively younger in age which supports the tendency of young farmer to adopt new farming system. The literacy was marginally higher among organic growers. Organic farming was adopted by those farmers whose main income source was agriculture. The overall operational size of organic as well as inorganic was not found to be significantly different in the study area. The study further highlighted that the sample organic growers were better equipped in terms of farm power machinery and livestock than sample inorganic growers. The cropping pattern was dominated by wheat and paddy for both organic as well inorganic sample growers. Out of the total operational holding about one fourth has been put under organic cultivation by the organic sample growers. More biodiversity has been observed for organic cultivation of both paddy and wheat as compared to inorganic cultivation. Most of the organic growers were trained by NGOS for the successful conduct of the innovative farming approach. Though organic farming has been viewed more eco friendly yet the yield losses as been reported 15 per cent and 34 per cent in case of organic paddy and wheat as compared inorganic ones.

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