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Organic vs. Inorganic Production and Marketing of Okra in Western Maharashtra – An Economic Analysis

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ABSTRACT: *Thirteen farmers producing organic okra during the season 2012-13 were selected from Pargaon (Daund) and Niphad. Besides this, one sample of organic okra was also selected from the organic farm, college of Agriculture, Pune. The total cost estimated was highest at Niphad (Rs. 2, 67, 861.07) for producing the organic okra. However, for inorganic okra, the cost was Rs. 2, 52,496.82 per hectare. The Pargaon organic unit was more profitable with B: C ratio of 1.79. The productivity of okra was highest (169.09 Q.) for inorganic cultivation. The average per quintal cost of organic okra was Rs. 65.50, Rs. 106.49 and Rs. 123.14 for Agriculture College, Pune, Pargaon and Niphad unit.*

The producer's share in consumer's rupee was more than 98 per cent for okra in Agriculture College, Pune organic unit. The majority of the farmers (89 per cent) reported low demand for organic produce was major constraints in organic farming.

The present study suggests switching over to organic farming. Producers of organic vegetables are not finding market for their produce. Hence consumer awareness about health consciousness and the quality of products produced from organic farming should be increased, so that producer will get good price for the organic produce.

Key words: *Organic certification, Organic farming, Organic and inorganic okra.*

JEL Classification: *D24, M31, Q10, Q12, Q50.*

INTRODUCTION

Organic farming is a system of farming system which primarily aimed at cultivating the land and raising crop in such a way, as to keep the soil alive and in good health by the use of organic waste. Organic farming is a system which avoids or largely excludes the use of synthetic inputs.

Thus a natural balance needs to be maintained at all cost for existence of life and properly. Thus, organic farming prohibits the use of harmful chemicals and promotes the use of renewable organic resources to maintain the soil productivity and to control the crop diseases and pests (Government of India, 2001 [1]).

The findings of several studies indicate that excessive use of chemical fertilizers results in degradation of soil, water and environmental resources (Ghosh 2003 [2], Pachauri and Sridharan 1998 [3], Singh *et al*., 1987 [4]). On the other hand, the organic farming had beneficial effects on human health, sustainability of soil, water, and environmental resources and crop yields in the long run (Blaise 2006 [5], Gareau 2004 [6], Rahudkar and Phate 1992 [7], Rajendran *et al*., 2000 [8], Singh and Swarup 2000 [9], Thakur and Sharma 2005 [10]). It is recognized that the results of these studies are valuable to understand the benefits of various practices followed under organic farming.

By international standards, conversion of a chemical farm into an organic farm will take three years and during the first two years, the farmer may incur a loss in farming production (Wyss, 2004 [11]). In this context, present research project was undertaken for further research on **"Organic vs. Inorganic Production and Marketing of Okra in Western Maharashtra - An economic analysis"** with the following specific objectives.

Objectives:

1. To examine the nature of use of organic inputs for okra production.
2. To estimate the resource use levels, costs and returns of selected organic and inorganic okra.

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3. To study the marketing method, channels and costs involved in marketing of selected organic and inorganic okra.
4. To study the constraints in production and marketing of selected organic and inorganic okra.

METHODOLOGY

The list of farmers producing organic okra was obtained from the Maharashtra Organic Farming Federation (MOFF) Pune. The farmers producing organic okra and completed all the production activities during the season 2012-13 were selected. Besides this, the samples of organic okra were also selected from the organic farm, college of Agriculture, Pune. The data on cost of cultivation and marketing was collected by personal interview with specially designed questionnaire. Samples selected from organic as well as inorganic farming are represented in Table 1.

Table 1
No. of samples selected

		No. of samples		
Sr. No.	*Name of organic farms*	*Organic*	*Inorganic*	*Total*
1	College of Agriculture, Pune	1	1	2
2	Navnirman Nayas, Pargaon, Daund	3	3	6
3	Yuva Mitra Agril. Produce Sangh, Niphad	10	10	20
4	**Total**	**14**	**14**	**28**

RESULTS

Soil status

The soil status is required for getting the certificate of organic farming. The information on soil status was available **only from organic unit of College of Agriculture, Pune.** The organic farming unit was started at college of of Agriculture Pune during the year 2012-13 on 9.56 ha.

The Incorporation of organic matter into soil improves its structure and enhances its micro-porosity, leading to improved moisture-retention capacity. (The same results were found by Kumar and Tripathi, 1990[12], as discussed earlier, Rahudkar and Phate (1992) [7] had observed that irrigation requirement was reduced by 45 per cent in organic farming than the chemical method.

The soil status of the college farm is as below:

pH = 8.36	K = 376.32 Kg/ha
EC = 0.14 %	$CaCO_3$ = 11.50 %
OC = 0.45 %	Fe = 0.32 ppm
N = 125.44 Kg/ha	Mn = 4.41 ppm
P = 20.99 Kg/ha	Zn = 4.04 ppm
	Cu = 6.51 ppm

Organic Certificate

The organic certificate is essential for marketing of the agricultural produce as an organic produce. There are two agencies viz; ii) National Organic Certificate Agency (NOCA) and ii) Intertake company private

Table 2
Nature and extent of organic input use in okra

(Per ha)

		Pargaon		*Niphad*		*AC Pune*	
Sr. No.	*Particulars*	*Quantity*	*Cost*	*Quantity*	*Cost*	*Quantity*	*Cost*
A.	***Bio-fertilizers/Micronutrients***						
1	Planto (Kg)	92.59	2962.96	236.84	7578.95	0.00	0.00
2	Nimboli pend (Kg)	185.19	1666.67	0.00	0.00	0.00	0.00
3	Jivamrut (lit)	3.70	555.56	14.21	2131.58	0.00	0.00
4	Vermi-compost (Kg)	0.00	0.00	0.00	0.00	550.00	**5000.00**
B.	***Bio-pesticide***						
1	$S_1 N_1 P_1$ organic (lit)	0.00	0.00	0.00	0.00	18.00	**9090.91**
2	Dashparni arka (lit)	51.85	**2592.59**	25.26	1263.16	0.00	0.00
3	Nimboli arka (lit)	37.04	1296.30	3.16	157.89	50.00	1818.18
4	Butter milk (lit)	18.52	277.78	0.00	0.00	0.00	0.00
5	Biokiller (ml)	925.93	2222.22	394.74	947.37	0.00	0.00
6	Humic (ml)	0.00	0.00	1526.32	1831.58	0.00	0.00
7	Karanj oil (ml)	0.00	0.00	526.32	2210.53	0.00	0.00
8	Nimandra (ml)	0.00	0.00	631.58	1894.74	0.00	0.00
9	All Clear (ml)	0.00	0.00	1421.05	2842.11	0.00	0.00
10	Taba	0.00	0.00	0.00	0.00	500.00	**4545.46**

Table 3
Per hectare cost of cultivation of okra

(Rs./ha)

		Organic			
Sr. No.	*Cost items*	*Pargaon*	*Niphad*	*A.C, Pune*	*Inorganic*
1	Hired human labour	**Cost**	**Cost**	**Cost**	**Cost**
	a. Male	208.33 (0.08)	6236.84 (2.33)	13636.36 (10.87)	11171.43 (4.42)
	b. Female	40740.74 (16.13)	42394.74 (15.83)	42727.27 (34.05)	33148.57 (13.13)
2	Bullock power	6296.30 (2.49)	6578.95 (2.46)	0.00 (0.00)	8742.86 (3.46)
3	Machine Power	8814.81 (3.49)	12789.47 (4.77)	8363.64 (6.67)	6114.29 (2.42)
4	Seed	9333.33 (3.70)	10500.00 (3.92)	2272.73 (1.81)	8574.86 (3.40)
5	Manures	25925.93 (10.26)	26526.32 (9.90)	14000.00 (11.16)	6857.14 (2.72)
6	Irrigation charges	12070.30 (4.78)	10960.42 (4.09)	4090.91 (3.26)	11440.35 (4.53)
7	Fertilizer (Kg) NPK	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	17842.86 (7.07)
8	Bio-fertilizers / Micronutrients				
	1. Planto	2962.96 (1.17)	7578.95 (2.83)	–	–
	2. Nimboli pend	1666.67 (0.66)	–	–	–
	3. S.N.P.	–	–	9090.91 (7.25)	–
	4. Vermi-compost	–	–	5000.00 (3.99)	–
	Total	**4629.63 (1.83)**	**7578.95 (2.83)**	**14090.91 (11.24)**	**–**
9	Plant protection charges	35262.29 (13.97)			
	1. Jivamrut	555.56 (0.22)	2131.58 (0.80)	–	–
	2. Dashparni	2592.59 (1.03)	1263.16 (0.47)	–	–
	3. Nimboli arka	1296.30 (0.51)	157.89 (0.06)	1818.18 (1.45)	–
	4. Butter milk	277.78 (0.11)	0.00 (0.00)	–	–
	5. Biokiller	2222.22 (0.88)	947.37 (0.35)	–	–
	6. Humic	–	1831.58 (0.68)	–	–
	7. Karanj oil	–	2210.53 (0.83)	–	–
	8. Nimandra (ml)	–	1894.74 (0.71)	–	–
	9. All Clear (ml)	–	2842.11 (1.06)	–	–
	10. Taba	–	–	4545.46 (3.62)	–
	Total	**6944.44 (2.75)**	**13278.95 (4.96)**	**6363.64 (5.07)**	**35262.29 (13.97)**
10	Incidental charges	830.20 (0.33)	775.98 (0.29)	227.27 (0.18)	905.67 (0.36)
11	Repairs on farm implements	345.40 (0.14)	485.63 (0.18)	363.64 (0.29)	234.69 (0.09)
12	Insurance premium	–	–	–	–
13	**Working capital**	**116139.42 (45.98)**	**138106.24 (51.56)**	**106136.36 (84.59)**	**140295.00 (55.56)**
14	Interest on working capital @ 6 %	6968.37 (2.76)	8286.37 (3.09)	6368.18 (5.08)	8417.70 (3.33)
15	Depreciation on farm implements	8320.80 (3.29)	7849.56 (2.93)	1136.36 (0.91)	7987.91 (3.16)
16	Land revenue & other taxes	52.30 (0.02)	63.64 (0.02)	72.72 (0.06)	47.97 (0.02)
17	**Cost-'A' Rs. (13 to 17)**	**131480.88 (52.05)**	**154305.81 (57.61)**	**113713.63 (90.63)**	**156748.58 (62.08)**
18	Rental value of land	75133.53 (29.75)	63203.90 (23.60)	11073.95 (8.83)	54906.74 (21.75)
19	Interest on fixed capital @ 10 %	26330.20 (10.42)	31084.64 (11.60)	681.81 (0.54)	24645.78 (9.76)
20	**Cost – 'B' (17 + 18 + 19)**	**232944.62 (92.22)**	**248594.36 (92.81)**	**125469.38 (100.00)**	**236301.10 (93.59)**
21	Family labour				
	a. Male	10069.44 (3.99)	12542.76 (4.68)	–	8410.71 (3.33)
	b. Female	9571.11 (3.79)	6723.95 (2.51)	–	7785.00 (3.08)
22	**Cost – 'C' (20 + 21)**	**252585.17 (100.00)**	**267861.07 (100.00)**	**125469.38 (100.00)**	**252496.82 (100.00)**
23	Output				
24	Main Produce. (Q)	128.89	151.84	16.72	169.09
25	Rate/Q	3500.00	2500.00	4000.00	1950.00
26	Gross value (Rs)	451115.00	379605.26	66880.00	329728.29
27	**Per qtl.cost (Rs/Q)**	**1959.70**	**1764.08**	**7504.15**	**1493.26**

(Figures in the parenthesis indicates the percentage to the total cost)

Ltd. for issuing the organic certificate. The Organic certificate agencies provide the certificate for 3 years consequently as a conversion Ist, IInd and IIIrd year (free from Agro-chemicals). After 3 years farmers can get the certificate of organic farm. The college of of Agriculture, Pune obtained the Ist year organic farm certificate from NOCA agency.

Although certification helps in receiving premium prices, it is both complicated and expensive (Bhattacharya and Chakraborty, 2005 [13]; Das and Biswas, 2002 [14]). The area certified under organic crops in India has grown from 1,711 hectares to 1,180,000 ha. during the decade 2001-2011 (Paull, 2011 [15]). However the proportion of the area under organic crops is only 0.6% of the total agricultural land (Willer, Lernoud & Kilcher, 2013 [16]). India is now a world leader in organic agriculture, following the recent uptake of organic agriculture, and is now number five in the World on the basis of certified organic hectares (as discussed earlier Paull, 2011 [15]).

Nature and extent of use of organic inputs

The nature and extent of use and its cost involved in organic cultivation of okra is presented in Table 2.

The maximum per hectare cost involved was in the use of $S_1 N_1 P_1$ (Rs. 9090.91) followed by planto (kg) (Rs. 7578.95) vermi-compost (Rs. 5000), Taba (Rs. 4545.46) and dashparni arka (Rs. 2592.59) for cultivation of organic Okra. It was observed that the farmers used different types of organic inputs for cultivation of brinjal. The same results were found by Singh etal (as discussed earlier 1987 [4]).

Cost of cultivation

The detailed cost of cultivation of okra at different organic unit (Pargaon, Niphad and Agricultural College, Pune) and inorganic unit has estimated and presented in Table 3.

It is revealed from the table that the total cost estimated was highest (Rs. 2, 67, 861.07) at Niphad for producing the one hectare organic okra and was followed by organic farm okra at pargaon (Rs. 2,52, 585.17) and organic okra at Agricultural college, Pune (Rs. 1,25, 469.38). However, for inorganic okra the cost was Rs. 2, 52,496.82. The increase in price of inputs in inorganic farming has inflated the cost of cultivation and had reduced the profitability (Sen and Bhatia 2004 [17]).

Among the different item of paid out cost, the human labour, manures, irrigation charges, seed and machine were the major cost items to the total cost for pargaon organic okra unit contributing 54 per cent to the total cost. For organic okra, at Niphad human labour, manure, bio-pesticides, machine and seed contributes 49 per cent of the total cost of cultivation. Whereas, human labour, bio-fertilizers, manures, machine and bio-pesticides were the major item of cost contributing 79 per cent of the total cost for organic okra unit at College of Agriculture Pune.

However, for producing one hectare of inorganic okra, human labour, plant protection, chemical fertilizers, irrigation and bullock labour were major items of cost contributing 53 per cent of the total cost of cultivation. It is interesting to note that the per hectare expenditure on plant protection was 3 to 6 fold more in inorganic unit than organic unit under study.

Among the organic unit, the per quintal cost was highest (Rs.7504.15) for organic unit at College of Agriculture Pune than that of Pargaon (Rs.1959.70) and Niphad unit (Rs.1764.08).It was mainly due to the productivity diffences among the different organic units. The per hectare yield was lowest of organic okra unit at College of Agriculture Pune.

Costs, returns and profitability of organic and inorganic okra

The costs, returns and profitability of organic and inorganic for okra are presented in Table 4.

Table 4
Cost and returns of organic and inorganic Okra

Sr.		*Organic*			
No.	*Particulars*	*Pargaon*	*Niphad*	*A.C. Pune*	*Inorganic*
1	Total cost (Rs/ha)	2,52,585.17	2,67,861.07	1,25,469.38	2,52,496.82
2	Main produce (Q/ha)	128.89	151.84	16.72	169.09
3	Rate of main produce (Rs/Q)	3500	2500	4000	1950
4	**Gross returns**	**4,51,115**	**3,79,605.26**	**66,880**	**3,29,728.29**
5	Net profit	1,98,529.83	1,11,744.19	- 58,589.38	77,231.47
6	**B:C ratio**	**1.79**	**1.42**	**0.53**	**1.31**
7	**Per quintal cost (Rs/Q)**	**1959.70**	**1764.08**	**7504.15**	**1493.29**

It is noted from the table that organic okra of Pargaon organic unit was more profitability with B: C ratio of 1.79 than that of than inorganic okra (1.31) cultivation also. The findings are in conformity with the study conducted by Bharadwaj *et al.* (2000[18]) and Mallikarjun Patil (2008[19]). The productivity of okra was highest (169.09 Q) for inorganic cultivation. The productivity of okra at organic unit of Niphad was (151.84 Q), Pargaon unit (128.89 Q) and Agricultural College, Pune organic unit (16.72 Q).

Serious doubts have been raised about the ability of organic farming in attaining the productivity levels achieved under the conventional agriculture (as discussed earlier Bhattacharyya and Chakraborty [13], 2005; Das and Biswas, 2002 [14]). It has been noted that the change from conventional intensive farming to organic farming reduces the yields, at least during the initial years (IFAD, 2005 [20]; as discussed elsewhere Rajendran *et al*., 2000 [8]) and sometimes have also given higher yields than conventional methods (Thakur and Sharma 2005 [10]).

Marketing cost

The marketing cost of okra of various organic units is presented in Table 5. It is revealed from the table that the average per quintal cost of organic Okra was Rs. 65.50, Rs. 106.49 and Rs. 123.14 for Agriculture College, Pune, Pargaon and Niphad unit. Grading charges were the major items of cost for Okra contributing 79 per cent to the total marketing cost in Agriculture College, Pune organic unit. The same results were found by Naik *et al*., (2012 [21]).

Table 5
Marketing cost of organic okra in various organic unit

(Per Q)

Sr.		*Organic Okra*		
No.	*Cost items*	*AC, Pune*	*Pargaon*	*Niphad*
1	Quantity Sold	1.84	34.80	130
2	Grading Charges	51.92 (79.27)	31.03 (29.14)	32.31 (26.24)
3	Parking	5.43 (8.29)	10.49 (9.85)	14.61 (11.86)
4	Transport	8.15 (12.44)	54.29 (51.00)	69.23 (56.22)
5	Commission	0.00 (0.00)	5.06 (4.75)	6.54 (5.31)
6	Hamali	0.00 (0.00)	5.60 (5.26)	0.45 (0.36)
	Total Marketing Cost	**65.50 (100.00)**	**106.49 (100.00)**	**123.14 (100.00)**

Market margin and price spread of organic okra

The information regarding the market margin and price spread of okra for different organic unit is presented in Table 6.

The marketing channels observed in three organic unit is as below:

i) A.C.,Pune Producer - Consumer

ii) Pargaon Producer - Sangh - Consumer

iii) Niphad Procducer - Sangh - Consumer

The producer share in consumer rupee was more than 98 per cent for okra in Agriculture College, Pune organic unit. The Pargaon and Niphad organic unit sold organic okra to Pune market through their sangh. The producer share in consumer rupee was near about 50 per cent for okra in both Pargaon and Nipahd unit.

Table 6
Marketing margins and price spread of organic okra

(Rs./Q)

Sr.		*Organic Okra*		
No.	*Cost items*	*AC, Pune*	*Pargaon*	*Niphad*
1	Net Price received by the producer	3934.5 (98.36)	3394.00 (56.57)	2376.86 (47.54)
2	Market Expenses incurred by the producer	65.5 (1.64)	106.00 (1.77)	123.14 (2.46)
3	Gross Price received by the producer	4000 (100.00)	3500 (58.33)	2500 (50.00)
4	Wholesaler	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
5	Expenses incurred by Wholesalers	0.00 (0.00)	2395 (39.92)	2355 (47.10)
6	Margin of Wholesaler	0.00 (0.00)	105 (1.75)	145 (2.90)
7	Price received by the Wholesaler	0.00 (0.00)	6000 (100.00)	5000 (100.00)
8	Commission Agent	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
9	Expenses incurred by Commission Agent	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
10	Margin of Commission Agent	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
11	Price received by the Commission Agent	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
12	Retailer	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
13	Expenses incurred by the Retailer	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
14	Margin of Retailer	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
15	Price received by the Retailer	0.00 (0.00)	0.00 (0.00)	0.00(0.00)
16	**Price paid by consumer**	**4000 (100.00)**	**6000 (100.00)**	**5000 (100.00)**

It was due to higher expenses incurred by the sangh in both the unit.The sangh in both units not only do the marketing activity but also they advertise, publish their organic produce, find out the organic consumers, train to the members of the sangh etc.

Constraints in the production of organic okra

The constraints viz; technical, economical, administrative, marketing and general encountered by sample farmers is presented in Table 7.

The data presented in Table 7 indicated that majority of the farmers (89 per cent) reported that low demand for organic produce was major constraints in organic farming and was followed by complicated and expensive procedure of issuing organic certificate (83.33 per cent), limited availability of vermicompost (72 per cent), high cost of vermicompost (66.67 per cent) and inadequate knowledge about bio-pesticides (55.56 per cent).

Table 7
Constraints in the production of organic okra

Sr. No.	Constraint	Overall N= 18	%
1	**Technical**		
	i Risk of low productivity in initial stage	7	38.89
	ii Complexity in the use of input	9	50.00
	iii Difficulty in obtaining the recommended levels of nutrients	8	44.44
	iv Inadequate knowledge about Amrutpani, vermicompost, biofertilizers, biopesticides and bio-medicine	10	55.56
	v Lack of knowledge to utilize organic waste	8	44.44
2	**Economical**		
	i High cost of vermicompost, biofertilizers, biopsticides and bio-medicines	12	66.67
	ii High rates of vermiculture for compost formation	10	55.56
	iii Relatively no higher/ higher price for organically produced vegetables	6	33.33
3	**Administrative**		
	i Complicated and expensive procedure of issuing certificate	15	83.33
	ii Lengthy process of inspection of organically producing vegetables	9	50.00
	iii Certifying agency is not operated in the area	5	27.78
	iv Freedom should be there for price fixation	2	11.11
4	**General**		
	i Limited availability of vermicompost	13	72.22
	ii Availability of cattle dung is steadily decreasing	7	38.89
	iii No separate/separate consumer preference for organically produced vegetables	4	22.22
	iv Consumers are not health conscious	2	11.11
5	**Marketing**		
	i Low demand for organic produce	16	88.89
	ii Markets for organic produce are not well established	11	61.11
	iii There is no MSP Mechanism for organic produced Agril. Produce	8	44.44
	iv Weak Marketing Channels/No Defined channels established	14	77.78
	v Others	0	0.00

CONCLUSIONS

1. The per hectare cost involved for organic input was maximum in the use of vermicompost and was followed by $S_1N_1P_1$ and planto.
2. The productivity of inorganic okra was comparatively more than that of organic okra. However the organic farms were profitable than that of inorganic farms due to higher prices realized for output.
3. Producers share in consumer rupees was only nearabout 50 per cent for marketing of organic vegetables. The main reason for that were high expenses incurred by the sangh for production and marketing activities.
4. The major problems faced by the organic okra growers were low demand for organic vegetables, complicated and expensive procedures of issuing organic certificate, limited and high cost of vermicompost etc.

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