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Profitability, Potential and Progress of Organic Onion Production: Evidences from Nalanda District of Bihar

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ABSTRACT

Organic farming is growing at a faster rate. To undertake the challenges of food grain production and food security, conventional agriculture advocates call for the continuing or higher use of chemical fertilizers and synthetic pesticides. However, the continuous use and higher reliance on these inputs has led to declining Total Factor Productivity (TFP) and unsustainable agriculture. Organic farming offers a solution for sustainable agricultural as well as the reduction in the cost of production during long run. Growing Per Capita Income and health consciousness has provided a new market for differentiated products viz. organic products. The present study was conducted to examine the economics, progress of adoption of organic onion production and potential of organic onion production in increasing income and employment in comparison to conventional farming. Study is based on 60 organic onion producers and 60 non-organic onion producers from Nalanda District of Bihar. The total cost of cultivation of organic and conventional onion per hectare was worked out to be ₹ 86868 and ₹ 83516, respectively. The net income per hectare was ₹ 175392 and ₹ 156484 respectively. It was found that organic farmers are earning a gross income of 9.2 percent more compared to the conventional farmers of onion. Organic farming is generally more profitable in terms of gross returns than conventional farming, irrespective of the more cost of cultivation of crop. Area under organic onion production is growing at the rate 10 percent on year to year basis and at a compound growth rate of 10 percent. Findings revealed that organic onion production has potential to increase income by 9 percent and employment by 18 percent.

Keywords: Organic farming, Differentiated Products, Total Factor Productivity

Market segmentation is the process of dividing a broad consumer or business market, normally consisting of existing and potential customers, into sub-groups of consumers (known as segments) based on some type of shared characteristics. A market segment comprises of individuals who think on the same lines and have similar interests. Product differentiation has become a powerful strategies for the firms to compete in the market and exploit the existing opportunities based on the purchasing power of consumers. Successful product differentiation creates a competitive advantage for the product's seller, as customers view these products as being unique or superior. Organic farm products is also based on the principle of differentiated products. Presently there are three types of organic producers in India – traditional organic growers who grow for their subsistence needs, commercial farmers who have surplus and export their produce through different channels, and private companies which either have their own farms or organise large conversion programmes with growers (Yussef and Willer, 2003).

For quality assurance the country has internationally acclaimed certification process in place for export, import and domestic markets. National Programme on Organic Production (NPOP) defines the regulatory mechanism and is regulated under two

different acts for export and domestic markets. NPOP notified under Foreign Trade Development and Regulation Act (FTDR) looks after the export requirement. The NPOP notified under this act has already been granted equivalence by European Union and Sweden. USDA has also accepted the conformity assessment system of NPOP. Due to this, the product certified by any Indian accredited certification agency under NPOP can be exported to Europe, Sweden and USA without the requirement of re-certification. To look after the requirement of import and domestic market the same NPOP has been notified under Agriculture Produce Grading, Marking and Certification Act (APGMC).

Regulatory body of NPOP under FTDR act is Agricultural and Processed Foods Export Development Authority (APEDA) under Ministry of Commerce and of NPOP under APGMC act is Agricultural Marketing Advisor (AMA) under Ministry of Agriculture. Accreditation of Certification and Inspection Agencies is being granted by a common National Accreditation Body (NAB) (National Project on Organic farming Deptt. of Agriculture and Cooperation, Govt. of India). Certified organic farming in the modern sense as understood in developed countries is only around 15 years old in India. The 1990's saw a vigorous growth of two branches in the organic movement in India.

Organic farming systems have attracted increasing attention over the last one decade because they are perceived to offer some solutions to the problems currently besetting the agricultural sector. Organic farming has the potential to provide benefits in terms of environmental protection, conservation of nonrenewable resources and improved food quality. Countries like Europe have recognized and responded to these potential benefits by encouraging farmers to adopt organic farming practices, either directly through financial incentives or indirectly through support for research, extension and marketing initiatives. As a consequence, the organic sector throughout Europe expanded rapidly (24% of world's organic land).

But, in the developing countries like India, the share is around 2 per cent only (included certified and wildlife). However, there is considerable latent interest among farmers in conversion to organic farming in India. But, some farmers are reluctant to convert because of the perceived high costs and risks involved. Those who have converted are earning equal incomes to their conventional counterparts, if premium markets exist for organic produce.

Organic farming was practiced in India since thousands of years. The great Indian civilization thrived on organic farming and was one of the most prosperous countries in the world, till the British ruled it. In traditional India, the entire agriculture was practiced using organic techniques, where the fertilizers, pesticides, etc., were obtained from plant and animal products. In this scenario, little studies are available to educate the farmers on the benefits of organic farming especially on cost and returns and, efficiency fronts over conventional farming. Hence this study focuses mainly on the issues like economics and efficiency of organic farming vis-à-vis conventional farming in Bihar. Organic farming was the backbone of the Indian economy. Therefore, the present study was taken up with the general objective to study the economics, adoption and income and employment potential of organic farming as compared to conventional farming.

METHODOLOGY

Data and Source: Nalanda districts of Bihar having the largest organic producer was purposively selected. Total sample consists of 60 organic farmers and 60 Conventional farmers were selected randomly from the list of farmers prepared purposively from four villages of two purposively selected blocks of Nalanda district. So, the ultimate sample of the study became 120 farmers. Secondary data pertained to 2009-2014 and primary data was collected from the period of 2013-14.

Analytical Framework

1. Economic viability was estimated by modern cost concepts of CACP (Cost A1, Cost A2, …… Cost C3)
2. Extent of adoption of organic farming is measured by simple and compound growth rate:

   (a) Simple growth rate

   Linear equation

   $Y = a + bx$

Where, Y = Dependent variable

a = Constant

b = Regression coefficient

x = Independent variable

SGR = b / y × 100

(b) Compound growth rate

$y_t = ab^t$ … (1)

Where, y_t = land area in hectare

t = year

a and b = parameters to be estimated

Logarithmic transformation of equation

$\log y_t = \log a + t\log b + \log u_t$ …(2)

equation (2) is estimated by ordinary least square technique (OLS) compound growth rate (g) is then estimated by the identity given in equation in (3)

$$g = \left(\hat{b} - 1\right) \times 100 \quad \ldots(3)$$

Where, g = estimated compound growth rate in percent per year, and

$$\hat{b} = anti \log b$$

3. Income Measures

Net income = Gross return – Cost C3

RESULTS AND DISCUSSION

Economics of organic and conventional farming

Cost of cultivation for organic and conventional onion was given in table 1. The total cost of cultivation i.e. cost C3 was estimated to be ₹ 86868 and 83516 for organic and conventional onion, respectively. It was evident from table that the cost A1 i.e. direct cost involved in onion cultivation was ₹ 66458 for organic and ₹ 64206 for conventional field. In the study area leased-in land farmers was not considered so cost A2 was equal to cost A1. In the analysis cost B1 was ₹ 67151 and 64899 for organic and conventional field respectively. Cost B2 contributed ₹ 77151 and ₹ 74899 to the Cost C3 for organic and conventional onion, respectively. Cost C1, C2 and C3 was ₹ 68971, ₹ 78971and ₹ 86868 for organic and for conventional it was ₹ 65924, ₹ 75924 and ₹ 83517, respectively.

Analysis of return in organic and conventional onion cultivation was presented in table 1. It could be seen from table, that the average yield of organic onion was found to be 180 qtls and in conventional 200 qtls/ha. The gross income from organic onion was calculated to be ₹ 262260 and from conventional onion it was found to be ₹ 240000/ha. Therefore, it inferred from the table that farmer got ₹ 22260.00/ha more in case of organic onion than from conventional onion cultivation. The cost of production of organic onion was calculated as ₹ 483/qtls and for conventional onion it was ₹ 417/qtls. From table found out that if invest rupees one to produce organic onion then get rupees 3.01 in return of its sale while in case of conventional grower can get rupees 2.87.

Table 1: Cost and returns of onion as per CACP method

Sl. No.	Particulars	Values (₹/ha)	
A	**Costs**	**Organic**	**Conventional**
I	CostA1	66458	64206
II	CostA2	66458	64206
III	CostB1	67151	64899
IV	CostB2	77151	74899
V	CostC1	68971	65924
VI	CostC2	78971	75924
VII	CostC3	86868	83516
B	Yield (qt/ha)	180	200
C	Price (₹/qt)	1457	1200
D	Gross Return (₹/ha)	262260	240000
E	Net Income	175392	156484
F	Cost of production at Cost C3 (₹/qt)	483	418
G	B:C	3.01	2.87

Costs and returns in both organic and conventional farming

The costs and returns for the sample farms in onion cultivation were worked out and the results were given in Table 2. It could be seen from Table that the total cost of cultivation (Cost A1) of onion was higher for organic farmers and it was 3.50 percent over conventional farmers. The share of variable cost was high for both organic and conventional farmers with 87.11 percent and 86.66 percent respectively. Net income were found in organic and conventional farming ₹ 195802 and ₹ 175794, respectively, though its yield was less as compared to conventional onion, because of high price premium. Net income was higher for organic farmers than conventional farmers by 11.38 percent due.

Table 2: CostA1 in Onion cultivation (in ₹/ha)

Sl. No.	Particulars	Organic	Conventional
1	Fixed Cost	8562	8562
2	Variable Cost	57895	55643
3	Cost of Cultivation (CostA1)	66458	64206
4	Gross Income	262260	240000
	Net Income	195802	175794

Extent of adoption of organic onion farming

2009 witnessed several major developments in the field of standards and regulations. The new EU regulation on organic production came into force as well as the Canadian organic standard. Furthermore, the Australian domestic organic standard was implemented. Canada and the U.S. concluded the world's first fully reciprocal agreement between regulated organic systems, and the EU introduced procedures for approving certification bodies from outside the EU. It is expected that these developments will ease trade in organic products and foster the future growth of the sector. The simple and compound growth rates of organic farming in regards to certified area was 6 percent and 7 percent, respectively in India. These were 50 percent and 77 percent, respectively in case of Bihar. The SGR in certified organic area were very small in both India and Bihar. Similarly, CGR in certified organic area showed negative percent (Table 3).There was considerable latent interest among farmers in conversion to organic farming. However, some farmers are reluctant to convert because of the perceived high costs and risks involved in organic farming.

Table 3 : Annual growth rate of certified organic area in Bihar and India (period 2009-10 to 2013-14)

Particulars	SGR	CGR
India	6	7
Bihar	50	77

Potential of Increasing in income and employment through organic

The economic viability as well as the profitability of organic farms can be judged by studying the net farm income. It was calculated by subtracting cost of cultivation per hectare from the value of gross production per hectare. Table 4, provides result on net farm income between organic and conventional farming system (i.e. net organic farms income – net conventional farms income). It was evident from the estimation of comparative economics of crop cultivation between organic and conventional system that gross as well as net farm income for the crops in organic area was higher than conventional area. The net farm income per hectare in organic area was 12% for onion. The net farm income was higher for both organic crop than conventional crop. The higher net income in organic farms was the outcomes of higher price premium irrespective of higher cost of cultivation. The return per unit quantity (1quintal) of onion was 25% higher on organic farms than conventional farms. This was happened due to higher price premium of organic crop in the area. In the light of the above discussion it may be concluded that net farm income as well as net profit was primarily the result of price premium per unit of production.

Potentiality of employment is one of the important indicators of organic farming and its impact on rural poverty. Availability of sustainable employment is crucial for livelihood of rural poor. One of the important benefits of adoption of organic farming is the generation of employment opportunities on a continuing basis every year through intensification of farm operation practices. So, an attempt has been undertaken here to estimate the additional on farm employment (total of hired human labour and family labour) on account of organic and conventional farm area separately with respect to rupees per hectare of operated land. In the study areas, requirement of total human labour including family labour in terms of rupees shows significant rise in organic farm than conventional. The comparison reveals that additional on-farm employment in the organic farms household were regular issue in compare to conventional farm households. The relevant data with respect to differential labour payment are furnished to table 4 as difference of human labour in rupees per hectare.

Table 4 suggests that requirement of human labour in rupees per hectare for all the organic farms were higher than conventional farms. The employment opportunity in the organic farms over conventional farms, has been created 18% on onion farm area.

Table 4: Potential of Increasing income and employment on organic farms

Crop	Increase in Net Income				Increase in Human Employment	
	Increase over conventional method				Increase over conventional method	
	₹/ha	%	₹/qt	%	₹/ha	%
Onion	18909	12	192	25	1549	18

India produces about 3500 Million tones of waste biomass annually comes from urban and industrial sources, agriculture and domestic wastes are the main sources of organic material and their use for productivity is important for both economical and environmental reasons. There are several methods have been adopted to prepare organic manure from agro-waste. Vermicomposting is one of the important method converts wastes to wealth by using earthworms. With the help of vermiculture organic wastes like kitchen wastes, cattle dung, industrial wastes can be used to prepare organic fertilizer. Vermiculture is a very easy method can be done by women and children. The castings of earthworms form aggregates in the soil that are resistant to erosion. Creates low skill jobs at local level. Raw material for vermiculture is easily available from farmers. No need of more money (Waste management *biotech,* 2012).

The Nadep method of compost manufacture can also provide the basis of a rural development scheme which will not only employ idle labour in the manufacture of a socially useful product but would also enhance incomes as the compost produced has a ready demand among farmers. Vermiculture have also enhanced the lives of poor in India and have generated self-employment opportunities for the unemployed. It has become good source of livelihood for weaker section.

Policy measures based on the findings of the study

- In order to promote organic farming, supply of organic manures should be ensured at affordable price.
- As organic farming should be promoted along with vermicomposting/NADEP.
- Market segementation through premium price should be emphasized.

CONCLUSION

The overall net returns from organic onion was found to be ₹ 175392 and from conventional it was ₹ 156484 so there was difference of ₹ 18909 in net returns from organic than conventional onion cultivation. The cost of production of organic onion was calculated as ₹ 483/qtls and for conventional onion it was ₹ 418/qtls. Table revealed that the investment of rupees one to produce organic onion farmers got rupees 3.01 in return, while in case of conventional grower got rupees 2.87.

Normally, farmers grew onion in kharif season as commercial venture. The cost of cultivation was higher in organic than conventional onion areas. It was estimated at ₹ 66458 /ha and ₹ 64206 /ha in organic and conventional farm area respectively. The higher cost of organic manures, hired human labour and bio-pp materials were the reason behind the higher cost of cultivation of organic onion. Requirement of human labour in rupees per hectare for all the organic farms were higher than conventional farms. The employment opportunity in the organic farms over conventional farms, has been created 18% on onion farm area. This indicated that organic onion was more profitable than conventional onion. Thus, the estimation suggested that organic farming is undoubtedly viable in nature and may be continued with some special as well as specific attention.

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