Indian Journal of Extension Education
Vol. 52, No. 1 & 2, 2016 (69-72)

Problems and Prospects of Organic Farming in Samastipur District, Bihar, India

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ABSTRACT

Bihar is one of the Indian states located in the east where agrarian distress is not a major problem. Crop yields have been mostly stagnant in the last decades, and coupled with increased input costs, this has led to reduced incomes and debts. There is an urgent need to study options to improve the sustainability of farming systems in the state which can lead to better livelihoods of the farmers. One of the strategy to stabilize agriculture in the state is possibly organic farming which is generally said to have less dependence on external inputs. Organic agriculture is one among the broad spectrum of production methods that are supportive of the environment. Purposive as well as simple random techniques were adopted for the study. For selection of district, block, village purposive sampling techniques was employed for selection of respondent. There are 135 families in the village Srichandpur Kothia which constitute the total population of the study. Out of 135 families, 100 farmers have been randomly selected for the study. The data using appropriate statistical tools was analysed taking the support of the package SPSS (Ver. 19). The main issue identified was regarding the problems of certification. There is no facility for farmers for organic products certification. Due to this problem farmers are not getting actual price of their produce. Also, the increased demand of food grains for the increasing population in the coming years would depend more on enhancing productivity through utilization of family labour and farm power per unit of land rather than expansion of area under cultivation which was mainly observed in the study. It is concluded that organic farming can be a sustainable farming practice in Bihar depending on regional conditions and the crops cultivated. Policies stimulating organic farming and certification should therefore consider the farmer's preferences for sustainable livelihoods.

Key words: Bihar, Organic farming, Problem, Policy, Certification.

INTRODUCTION

Increasing consciousness about conservation of environment as well as health hazards associated with agrochemicals and consumers' preference to safe and hazard-free food are the major factors that have led to the growing interest in alternate forms of agriculture in the world. Organic agriculture is one among the broad spectrum of production methods that are supportive of the environment. Organic agriculture is one among the broad spectrum of production methods that are supportive of the environment. Organic production systems are based on specific standards precisely formulated for food production and aim at achieving agro ecosystems, which are socially and ecologically sustainable. It is based on minimizing the use of external inputs through use of on-farm resources efficiently compared to industrial agriculture. Thus the use of synthetic fertilizers and pesticides is avoided. Organic farming Karthikeyan et. al. 2013 revealed that organic manures improve soil fertility, structure, texture, moisture, crop productivity besides reducing depending on other sources as these manures are available either in farmers' field. Rising energy costs have doubled the cost of many farm inputs and routine farming operations in a year in the developed countries, and both fuel and natural gas prices are projected to increase another 30 per cent to 50 per cent in 2006 (USCB, 2004-2005). Across the developing and developed countries alike, farmers are deeply worried over energy-driven increases in their production costs. In order to understand and explore the intricacies of organic farming over inorganic especially in case of potato, the present study was conducted to probe deeply into the enterprise associated with the organic farming. The present paper is based on a field based study to identify and analyse the problems and prospects of organic farming of potato in some selected areas of Samastipur district of Bihar. The study aims to help key players in the private and public sector to make informed decisions on whether to undergo farming through organic means. It covers the main issues related to production and marketing in case of potato. The specific aims of the study include documentation of socio-economic characteristic of organic farmers of selected area of Samastipur district;

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identification of constraints in the adoption of organic farming and to suggest possible interventions. In addition, defining strategy options for the development of the specific export organic sector.

The scope of the study is limited to organic farming, where the results suggest that conversion to organic farming can improve livelihoods of smallholders, while protecting natural resources. Income loss due to reduced yields in initial years of transition, however, constitutes a major hurdle, especially for poorer farmers (Eyhorn, *et. al,* 2007). It is thus important to support farmers in overcoming the obstacles of the conversion period from inorganic to organic farming.

METHODOLOGY

The study was conducted in the year 2013-2014 in a limited area engaged in organic farming in a village namely Srichandpur Kothia under Kothia Panchayat in the Samastipur district of Bihar, India. Entire investigation was based on the opinion expressed by the farmer themselves. Hence, the findings of the experiments can therefore be applicable only in such areas where similar type of conditions exists in respect of social, agro-economic factors and organic farming. Srichandpur Kothia village was under Kothia gram panchayat was selected purposively for study.

The main reason behind the selection of Kothia village was due to on-going project on organic farming there. This village is also credited to be the first organic village of Bihar. Purposive as well as simple random techniques were adopted for the study. For selection of district, block, village purposive sampling techniques was employed for selection of respondent.

There are 135 families in the village Srichandpur Kothia which constitute the total population of the study. Out of 135 families, 100 farmers have been randomly selected for the study. The data using appropriate statistical tools was analysed taking the support of the package SPSS (Ver. 19).

RESULTS AND DISCUSSION

A profile provides for cross-sectional information of a situation. Socio-economic status refers to the position of an individual with reference to various indicators of social and economic condition in a rural community. The socio-economic status has four items. The socio-economic status of selected respondent was calculated by adding the scores assigned to a category of each item.

Table 1. Socio-economic profile of selected respondents

Items.	Category	Frequency	Percentage (%)
Marital status(X_2)	Married	90	90
	Single	10	10
Education(X_3)	Illiterate	10	10
	Can read only	2	2
	Can read and write	10	10
	Primary	7	7
	Middle school	16	16
	High school	18	18
	Higher Secondary	22	22
	Graduate	11	11
	Post graduate	4	4
	Above	0	0
Family type(X_6)	Nuclear	16	16
	Joint	84	84
House type(X_7)	Homeless	0	0
	Hut	0	0
	Kutcha (Non-concrete)	22	22
	Mixed	40	40
	Pucca (Concrete)	38	38

Correlation coefficient between the dependent variables and independent variables

In the present study 25 independent variables (X1 to X25) have been correlated with dependent variables to find out whether there are relationship between dependent and independent variables. This is presented in following tables. In case of Y1 (yield of organic potato), all the variables Age (X1), Marital Status(X2), Education (X3), Family education status (X4), Family size (X5), Family type (X6), House type (X7), Material possession (X8), Farm power (X9), Cropping intensity (X10), Farm size(X11), Family income(Agril.)(X12a), Family income (Non-Agril.) (X12b), No. of animals (X13), Cultural practices(X14), Problems of organic farming(X15), Certification (X16), Marketing (X17), External agencies (X18), Consumer's responses(according to farmers) (X19), Adoption (X20), Attitude (X21), Quality (X22), Mass media exposure and social activity(X23), Training received (X24) and Problems in adoption (X25) are found to be non-significant. This may be due to similar agricultural practices used by all farmers because the whole village is under project area and all the farmers trained by same external agency for organic farming resulting in little variation among the yield from organic farming.

Table 2: Correlation coefficient between Yield [(inorganic)(Y2)] and independent variables.

Variables		Correlation coefficient(r)
		Y_2
(X_{11})	Farm size	0.21 **
(X_{20})	Adoption	0.18*
(X_7)	House type	0.22**
(X_{25})	Problems in adoption	-0.19*
(X_{14})	Cultural practices	0.20 **
(X_{20})	Adoption leadership	-0.18*
(X_7)	House type	-0.18*
(X_{17})	Marketing	0.17 *

*Significant at 10 per cent level of significance
**Significant at 5 per cent level of significance

From Table 2, it is found that the variables Farm size (X4) is having high positive significant correlation and Adoption (X20) is in positive significant correlation with Yield of potato in inorganic farming (Y2). It was found that farmers having higher land holding are getting more yield in case of inorganic farming because of better cultivation technique.

House type (X7) is in positive significant correlation with Net profit from organic farming of potato (Y3). The variable Problems in adoption (X25) is in negative significant correlation with Net profit from inorganic farming of potato (Y4). It was seen that farmers having problems in adoption are fetching less profit in inorganic farming because poor agricultural practices.

The variable Cultural practice (X14) is in positive significant correlation with total input cost of organic potato (Y5). The variable Adoption leadership (X20) is in negative significant correlation with the total input cost of organic potato (Y5). In this case, farmers adopting better agricultural practices are spending less on input cost of organic farming.

At the same time farmers having poor adoption behaviour are spending high on input cost of organic farming. Also, the variable House type (X7) is in negative significant correlation with total input cost of organic potato (Y6). All the respondents received same type, amount and support from a single government agency for implementing organic farming. The effects of maximum number of independent variables, therefore, came out as non-significant giving rise to the need for further analysis.

Table 3: Mean comparison of dependent variable before and after organic farming:

Variables	Mean value (q/bigha)	|t| value	Significance
Y_1(organic yield of potato)	110.15		
Y_2(inorganic yield of potato)	88.80	22.16	P<0.01
Y_3(profit from organic potato)	230.10		
Y_4(profit from inorganic potato)	180.20	25.92	P<0.01
Y_5(input cost of organic potato)	215.00		
Y_6(input cost of inorganic potato)	235.00	28.44	P<0.01

Here, results shows that shifting from inorganic to organic has resulted significant increase to both potato yield and profit at 1 per cent level of significance. At the same time input cost has reduced significantly.

Table 4: Path analysis for deriving direct, indirect and residual effect of antecedent variable on consequent variable Y3 (net profit in organic farming of potato) vs. the antecedent variables.

Component		Correlation	Direct effect	Total indirect effect	Substantial Indirect Effect		
					I	II	III
Age	X1	-0.049	-0.021	-0.028	0.05287 X_{20}	-0.03906 X_7	-0.02361 X_{19}
Marital status	X2	0.038	0.049	-0.011	0.02800 X_{23}	-0.02326 X_7	-0.02081 X_{19}
Education	X3	-0.034	-0.071	0.037	-0.03002 X_{19}	0.01666 X_4	0.01640 X_{24}
Family education	X4	0.003	0.025	-0.022	-0.04780 X_3	-0.02782 X_{19}	0.01636 X_2
Family size	X5	-0.033	-0.02	-0.013	-0.02739 X_{22}	0.02261 X_{19}	-0.01695 X_{17}
Family type	X6	-0.059	-0.091	0.032	0.03422 X_{19}	-0.01931 X_7	-0.01847 X_{17}
House type	X7	**0.224**	**0.219**	0.005	0.01088 X_{24}	-0.00892 X_{17}	0.00800 X_6
Material possession	X8	0.05	0.069	-0.019	-0.02863 X_{22}	0.02410 X_{20}	0.02001 X_{19}
Farm power	X9	0.035	0.09	-0.055	-0.03322 X_{19}	-0.01627 X_6	0.01415 X_{17}
Cropping intensity	X10	-0.013	0.046	-0.059	0.04523 X_{19}	-0.02982 X_{17}	-0.02884 X_{25}
Farm size	X11	0.044	-0.05	0.094	0.07312 X_{12a}	0.02215 X_{21}	0.01859 X_{14}
Agril. Income	X12a	0.106	0.087	0.019	-0.04205 X_{11}	-0.02127 X_{24}	0.01973 X_{25}
Other income	X12b	0.048	0.056	-0.008	0.01341 X_{19}	-0.01337 X_{12a}	-0.01213 X_3
No. of animal	X13	-0.019	-0.097	0.078	0.02633 X_{23}	0.02131 X_{14}	-0.01727 X_6
Cultural practices	X14	-0.035	-0.109	0.074	0.01905 X_{13}	0.01654 X_{22}	-0.01529 X_{12a}
Problems of O.F.	X15	0.068	-0.027	**0.095**	0.02135 X_{13}	0.02852 X_7	0.02482 X_{21}
Marketing	X17	0.101	0.127	-0.026	-0.02962 X_{19}	-0.01536 X_7	0.01270 X_{23}
External agencies	X18	0.063	0.052	0.011	-0.02141 X_{14}	0.02021 X_{19}	0.01650 X_{21}
Consumer's response	X19	0.128	0.2	-0.072	-0.02739 X_{22}	-0.01886 X_{17}	-0.01575 X_{24}
Adoption	X20	0.128	0.18	-0.052	-0.03299 X_{21}	-0.02581 X_{24}	0.01387 X_{22}
Attitude	X21	0.143	0.157	-0.014	-0.03776 X_{20}	-0.02728 X_{24}	0.01561 X_{19}
Quality	X22	0.113	0.178	-0.065	-0.03082 X_{19}	0.01916 X_{24}	-0.01104 X_8
Mass media	X23	-0.105	-0.104	-0.001	0.02459 X_{13}	-0.02322 X_{24}	0.02158 X_{20}
Training	X24	-0.101	-0.162	0.061	0.02859 X_{20}	-0.02639 X_{21}	0.02099 X_{22}
Problems	X25	0.007	0.089	-0.082	-0.03052 X_{24}	-0.02624 X_{21}	-0.02321 X_{19}
Residual effect=0.8857557							

X19 (Count of substantial indirect effect=15)

Table 4 represents the path analysis to explain the direct, indirect and residual effect of antecedent variables on consequent variables i.e. net profit in organic farming of potato (Y3) Results reveal that the variable house type (X7) exerts highest direct and problems of organic farming (X15) exerts highest indirect effect on total yield in inorganic farming of potato over the other 23 antecedent variables.

Constraints in adoption of organic farming

Several constraints were identified for non-adoption of organic farming in the study area. Among these, the constraints like high cost of organic inputs, insufficient market for organic products, low yield and little price advantage for organic product are found to be the major constraints. The other constraints identified is little consumer demand for organic products, inconvenience of using organic techniques, higher production risk, and unavailability of consolidated land suitable for organic farming. In regard to the relative importance of different constraints, it is found that socio-economic constraints is the main hurdle followed by infrastructural, technological and situational in the process of adoption of organic farming. Organic production is more labour-intensive than conventional production. On the one hand, this increased labour cost is one factor that makes organic food more expensive. On the other hand, the increased need for labour may be seen as an "employment dividend" of organic farming, providing more jobs per acre than conventional systems. Due to lack of human resources, substitute should be developed like development of machines and tools requiring less labour.

Strategy options for the development of the specific export organic sector

The provision by government of the appropriate support and regulatory environment to enhance sector growth in organic farming is the need of the hour. Establishment of national or regional organic standards and regulations and a reliable independent accreditation and control system to enforce those rules is needed for the rise of organic sector in relation to exports. One of the basic requirement is the availability of know-how on organic farming and organic inputs. Good post-harvest handling (e.g. cold storage), infrastructural facilities and logistics (including specialised airports) will enable the fresh produce to arrive in good condition in the country of destination. Since Bihar is well known for vegetable cultivation, special belts for export of cabbage, pointed gourd, cucurbitaceous vegetables and potato may be made use to boost the agricultural economy of the state.

CONCLUSION

The present investigation after thoroughly scanning the report of the result come with the conclusion that acceleration of growth in agricultural production to meet the increased demand of food grains for the increasing population in the coming years would depend more on enhancing productivity through utilization of family labour and farm power per unit of land rather than expansion of area under cultivation. The main outcome of the study came as lacking part on issues of certification. There is no facility for farmers for organic products certification. Due to this problem farmers are not getting actual price of their produce. Adequate policy interventions as suggested can lead the state to arise as a major in organic farming.

Paper received on : May 10, 2015
Accepted on : May 25 ,2015

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