Environment & Ecology 27 (4) : 1625—1627, 2009
 ISSN 0970-0420

Correlates of Productivity of Field Crop in Sikkim

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Abstract

Maize and potato are the main important crops among several food crops in Sikkim. The average yield of maize (1554.50 kg/ha) and potato (4,440 kg/ha) in the state is lower than the all India production level of 1953 kg/ha 17,021 kg/ha. The present study was conducted in the Gyalsing West district to investigate the level of productivity of major field crops such as maize and potato and their relevance with agro-economic, socio-psychological and extension communication characteristics of farmers. Study revealed that, socio-economic status, cropping intensity, farm mechanization, level of organic manure used, annual income, operational land holdings, family size, education, innovation proneness, economic motivation, participation in training, contact with extension staff, mass media exposure, source of information and supervision of crop production were found to be correlated with the level of productivity of maize and potato.

Key words : Level of productivity, Field crops, Predictors.

In a predominantly agricultural country like India, agricultural production holds the key to the peace, progress and prosperity of the nation. While the population and the demand for agricultural productions are increasing rapidly, the scope of bringing more land under cultivation is receding fast. Thus, increasing production per unit of available land is the only answer to the problem. For this, it is necessary that the factors associated with productivity of crops are to be found out so that rational action for increasing agricultural productivity could be initiated. Sikkim is a small hilly state having area of 7,096 square kilometer. The population of the whole state is 5.6 lakhs. Agriculture is the largest sector economic activity in Sikkim, about 60% of the population depends on it. The majority of farmers are medium, small and marginal farmers in the state and they are contributing the major role in agricultural production. The farming system in the state is terrace farming and shifting cultivation. Maize is the largest grown cereal crop in the state. The total area under maize crop is 36.70 thousand hectare with a production of 57.05 thousand tones and average yield is 1,554.50 kg/ha. Potato is also grown in large amount in the state. It is grown in both *rabi* and *kharif* seasons. The total area under potato cultivation in the state is 7.47 thousand hectare with production of 33.14 thousand tones and average yield is 4,440 kg/ha (2003-2004). The average yield of maize and potato in the state is lower than the all India production level of 1,953 kg/ha (2006-2007) and 17,021 kg/ha (2002) respectively. It is therefore, high time to pay attention to farming through systematic studies about the occupational growth of farmers and examine whether the farmers have response as per expectation with regard to the acceptance and application to the scientific production technologies and techniques in their farming systems. Further, the study takes into account of only two main important crops namely maize and potato crops thereby earning other food crops. The present study was made to find out the degree of productivity achieved by cultivating maize and potato growers ; to find out the various relationships between casuals variables viz. agro economic, socio-psychological extension communication with the level of productivity and to find out the factors having bearing on the productivity of field crops maize and potato. The factors selected for the studies were socio-economic status, cropping intensity, farm mechanization, level of use of organic manure, annual income, operational land holding, age education, family size, innovation proneness, economic motivation, risk orientation, participation in training, contact with extension staffs, mass media,

Table 1. Correlation coefficient of crop productivity (maize + potato) with selected characteristics of farmers. N = 150. *Significant value of r at 0.05 level = 0.195. **Significant value of r at 0.1 level =0.254.

	Variables	Correlation coefficient (r) of maize+potato
Agro-Economic		
X_1	Socio-economic status	0.518**
X_2	Crop intensity	0.173^{NS}
X_3	Farm mechanization	0.419**
X_4	Level of organic manure used	0.515**
X_5	Annual income	0.594**
X_6	Operational land holding	0.703**
Socio-Psychological		
X_7	Age	0.036^{NS}
X_8	Family size	0.355**
X_9	Education	0.396**
X_{10}	Innovation proneness	0.553**
X_{11}	Economic motivation	0.402**
X_{12}	Risk orientation	– 0.043^{NS}
Extension-Communication		
X_{13}	Participation in training	0.443**
X_{14}	Contact with extension staff	0.567**
X_{15}	Mass-media exposure	0.564**
X_{16}	Source of information	0.503**
X_{17}	Supervision of crop production	0.230**

sources of exposure, information and supervision of crop production.

Methods

There are four districts in Sikkim, i.e. Gangtok, Namchi, Gyalsing, and Mangan. Gyalsing West district was selected purposively for the study since it was not possible to conduct an intensive study in the entire state within the limited time and resources, at the disposal of the investigation being native of the Gyalsing west district.

In Gyalsing West district, there are fifty one blocks, of which ten development blocks were selected randomly for the present study and one Panchayat from each selected development blocks was selected randomly for the present study.

From the record maintained at the block and Panchayat levels, the respondents were selected at random on the basis of proportion to number of non-scholars in the village. Thus a list of 298 farms following maize and potato cultivation was selected from which, following a systematic random sampling method, 10 respondents were finally selected. One village from each ten Panchayat of each ten development blocks were selected randomly. The numbers of villages thus selected were ten.

Table 2. Regression analysis on productivity of crop and 14 predictors. *Significant at 0.05 level ; **Significant at 0.01 level ; $R^2 = 0.692$; $F = 21.619$.

Characteristics	Beta	Regression coefficient	Std error (SE)	t value of b
Agro-Economics				
X_1 Socio-economic status	0.144	44.472	26.403	1.684
X_3 Farm mechanization	0.024	3.528	12.634	0.279
X_4 Level of organic manure used	-0.055	- 6.998	11.662	0.600
X_5 Annual income	- 0.249	- 19.851	8.356	2.376*
X_6 Operational land holding	0.681	578.177	100.179	5.771**
Socio-Psychological				
X_8 Family size	- 0.069	- 33.824	28.471	1.188
X_9 Education	0.028	15.309	58.437	0.262
X_{10} Innovation proneness	0.153	145.771	91.762	1.589
X_{11} Economic motivation	- 0.082	- 50.136	45.327	1.106
Extension-Communication				
X_{13} Participation in training	-0.038	- 73.209	125.813	0.582
X_{14} Contact with extension staff	0.196	97.420	50.450	1.931
X_{15} Mass-media exposure	0.086	38.590	45.189	0.854
X_{16} Source of information	0.155	68.407	44.469	1.538
X_{17} Supervision of crop production	- 0.042	- 13.946	21.889	0.637

Results and Discussion

Table 1 presents the coefficient of correlation between crop productivity and 17 other agro-economic, socio-psychological and extension communication variables. Out of the 17 variables, it was found that the variable socio-economic status (X_1), crop intensity (X_2), farm mechanization (X_3), level of organic manure used (X_4), annual income (X_5), and operational land holding (X_6), were positively and significantly correlated with the crop productivity of maize and potato for agro-economic characteristics. It was also found that all the variables family size (X_8), education (X_9), innovation proneness (X_{10}), economic motivation (X_{11}), were positively and significantly correlated with productivity of crops except age (X_7) and risk orientation (X_{12}) in socio-psychological characteristics. Further, in the extension communication characteristics, all the variables participation in training (X_{13}), contact with extension staff (X_{14}), mass-media exposure (X_{15}), source of information (X_{16}) and supervision of crop production were correlated positively and significantly with the productivity of crops.

It indicates that higher level of socio-economic status, farm mechanization, organic manure used, annual income, and operational land holding enhances the use of inputs and farm machines for saving the labor and reducing the cost of production lead to change and innovativeness. These findings were supported by Adhikari (2004).

It indicates that large size family was aware of the more production to meet the family requirement and self sufficiency and higher the level of education, innovation proneness and economic motivation, the productivity was higher. This might be due to the reason that higher level of education, more aware of new idea and better the motivation of farmer towards economy more is the aspiration for better production on farm. These findings were supported by Goshwami (1994) and Choudhuri (1968).

This indicates that higher participation in training, contact with extension staff and more information hunting makes them more change and exposure to farm information leading to improve knowledge and skill and more supervision to crop production thereby increase the crop productivity.

These findings are similar to those of Chattopadhyay (1981) and Rudra (2005).

Table 2 presents the regression analysis between productivity of crop and 14 other agro-economic, socio-psychology and extension communication predictors. Out of 17 independent variables, 14 independent variables were taken for regression analyses which were significantly correlated with crop productivity. Among 14 predictors, annual income and operational land holding presents an integrated association and relation with productivity of crops. Higher annual income and larger operational land holding size are unique inputs of improved farm productivity.

Further, with the unit change of annual income and operational land holding index the respective changes as reflected at productivity level at twin of 0.249 and 0.681 units. The R^2 being 0.692, it was to resolve that all variables put together, the value 69.2% of variation in the predicted variable was justified. These findings were also supported by Sagar and Ray (1984).

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