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Extent of Adoption and Constraints in Boro Rice Cultivation Faced by the Farmers in Darbhanga District of Bihar

Satya Narayan Prasad[1] and A.K. Choudhary[2]

ABSTRACT

This study was carried out in the Biraul, Kusheshwarsthan and Ghanshyampur blocks of Darbhanga district of Bihar. The productivity of boro rice is heavily dependence upon the adoption of different components of technology in the field condition. Therefore, it will be of strategic relevance to periodically assess the adoption behaviour of boro rice in Biraul, Kusheshwarsthan and Ghanshyampur block of Darbhanga district which have immense potentiality for boosting the rice production. The study revealed that the extent of adoption of different components of boro rice technology were highest in the area of land preparation (70.00%) followed by transplanting of seedling (46.66%) and lowest in plant protection measures (11.66%). Out of seven selected variables undertaken in the study, six variables were found to be highly correlated with extent of adoption. But multiple regression analysis indicated that the variables education was the main potential predictor of extent of adoption. The variables education and annual income had independence and direct influence on the extent of adoption of boro rice production technology. The variable age of farmers had negatively and significantly contributed with extent of adoption of boro rice production technology. It means that young farmers were good adopter of new farm technology than aged one. Major constraints associated with non adoption of boro rice production technology were lack of regular and effective training (87.50%) followed by high cost of cultivation (83.33%) and non-availability of credits (81.66%).

Boro, a Bengali term originated from the Sanskrit word "Boro" refers to a special rice cultivation in low land pockets during November-May taking advantage of the residual water in field after harvest of Kharif paddy, longer moisture retentively of the soil and surface water stored in the nearby ditches. In Bihar, major sites for boro cultivation are the low lying belt of North-eastern (Darbhanga, Madhubani, Saharasa, Katihar) and north-western (East and West Champaran district) parts of Bihar where rain water accumulates and remain stagnated beyond October-November.

Seedlings of boro rice are grown in October-November and transplanted in January-February. The crop matures in April or May depending upon management practices. The average yield of boro rice is round 7 to 8 t/ha. It may not be possible for scientists or extension workers to raise the farmers yield to be the levels of research station yield in the long run. But, it is desirable to increase the productivity at least to the levels of the demonstration yields.

As a step towards narrowing down the yield gap between yields of farmers and demonstrations there is a need to get the empirical evidence as to the levels of adoption of various recommended boro rice cultivation practices and constraints involved in the adoption process of improved cultivation practices of boro rice. In view of the above reasons the present study of the extent of adoption and constraints analysis was carried out.

METHODOLOGY

The present study conducted in Darbhanga district of Bihar state in the during the year 2005-06. In Darbhanga district, Biraul, Kusheshwarsthan and Ghanshyampur blocks were selected purposively based on the extent of area under boto rice cultivation. A cluster

[1] Research Scholar, Extension Education, R.A.U. Pusa, Samastipur (Bihar)
[2] University Professor, Department of Extension Education, R.A.U., Pusa, Samastipur (Bihar)

of six villages namely; Paghari, Phakirna, Beri, Sultanpur, Ganaun and Pali were randomly selected for the study from Biraul, Kusheshwarsthan and Ghanshyampur blocks respectively which have larger are under boro rice cultivation.

Twenty per cent respondents were selected by random sampling technique and finally total 120 respondents were selected for the study.

The adoption level of the respondents with respect to improved recommended cultivation practices of boro rice and constraints faced in the cultivation of boro rice were taken for the study. The information was collected through personal interview using a pretested schedule. The collected data were analysed using percentage, frequencies.

RESULTS AND DISCUSSION

The results presented in Table 1 indicated that 50.83 per cent of the respondents belonged to medium level of adoption category and this might be due to the medium to high knowledge possessed by majority of the respondents. Since knowledge limits the action of the individuals as it is basic pre-requisite in making a decision to either adopt or reject a practice.

Tabel 1: Frequency distribution of farmers on the basis of the extent of adoption of boro rie production technology (N=120)

Category	Frequency	Percentage
Low (up to 16)	44	36.66
Medium (17-33)	61	50.83
High (34-50)	15	12.51

Table 2 indicates that level of adoption of the farmers in different components of boro rice production technology was highest in the area of land preparation. This one was followed by transplanting of seedling, nursery raising techniques, fertilizer management, seed treatment with fungicides, use of cold tolerant HYV's use of weedicides, water management and plant protection measures, respectively.

Table 2: Level of adoption of the farmers in different components of boro ride production technology (N=120)

S. No.	Components	Frequency	Per cent	Rank
1.	Use of cold tolerant HYVs	41	34.16	VI
2.	Land preparation	84	70.00	I
3.	Seed treatment with	31	25.80	V
4.	Nursery raising techni-	49	40.83	III
5.	Transplanting of seedlings	56	46.66	I
6.	Fertilizer management	41	34.16	IV
7.	Water management	17	14.16	VIII
8.	Use of weedicides	18	15.00	VII
9.	Plant protection measures	14	11.66	IX

The results are presented in Table 3 indicated that education, annual income, cropping intensity, risk orientation, and economic motivation were positively and significant correlated with the extent of adoption of boro rice production technology. However, age of respondents had negative but significant relationship with extent of adoption. Size of holding was not statistically significantly correlated with extent of adoption of boro rice production technology.

Table 3: Correlation coefficient of independent variables with extent of adoption

Variable	Value of correlation coefficient (r) with extent of adoption (Y)
X_1 Age	-0.775**
X_2 Education	0.880**
X_3 Size of holding	0.205 NS
X_4 Annual income	0.793**
X_5 Cropping intensity	0.483**
X_6 Risk orientation	0.549**
X_7 Economic motivation	0.628**

**Significant at 0.01 level of probability
NS=Non-significant

Multiple regression analysis

Multiple regression analysis was carried out to know the predictive value of the independent variables in contributing to variation the extent of adoption. Extent of adoption of influenced not only by any one of the dependent variables but also all of them as part of the system.The selected seven independent variables were studied to fit into the regression models. The findings of the analysis are presented in Table-4.

Table 4. Regression coefficient of extent of adoption (Y) with socio-economic characteristics of boro rice growers

Variables		Regression coefficient (b-value)	Standard Error	Calculated t-value	Rank order
X_1	Age	-0.3565	0.0769	-4.636**	VII
X2	Education	3.9707	0.5304	7.486**	I
X3	Size of holding	0.0697	0.2636	0.264	V
X4	Annual income	0.9531	0.4313	2.150*	II
X5	Cropping intensity	0.0163	0.0252	00..645	IV
X6	Risk orientation	0.0392	0.2762	0.143	VI
X7	Economic motivation	0.3295	0.3888	0.846	III

Table 4 depicts the results of regression analysis administered to isolate the prediction potentialities and the amount of variability to be explained by them towards the extent to adoption. At a glace over the beta coefficient and their corresponding t-values indicates varying level of contribution of variables under study. While variable age was found to be contributed negatively and significantly towards to the extent of adoption and two variables neamely, education and annual income were found to be positive and significant contribution towards extent of adoption. The remaining four variables which were fitted to regression analysis did not yield any tangible effect because all the t-values were found to be statistically non-significant. The findings emerged here provide enough ground to capitalize the gains for furthering the level of adoption by picking the thread of findings. When data were pur to multiple regression analysis for asserting R-square value, then it was notices that they are cumulatively responsible for accounting 88.40 per cent variability towards dependent variables.

The results presented in Table 5 indicated that explore the various constraints associated with non-adoption of recommended boro rice production technology along with the farmers perceptions.

The results and finding of the present investigation are being discussed here as:

i. Psychological constraints

A perusal of Table 5 indicates the various psychological constraints and rank pattern experienced by the farmers for non-adoption of boro rice production technology. Out of four constraints perceived by them, first rank was assigned to the constraints perceived by the farmers in order of their importance in descending order were lack of motivation, lack of co-operation by fellow farmers and lack of consumer awareness of uses of boro rice respectively.

Table 5: Phychological constraints as perceived by the respondents

	Categories	Frequency	Percent	Frequency response in different rank I	II	III	Total rank score	Rank
A.	**Psychological constraints**							
1.	Lack of motivation	78	65.00	25	12	41	140	II
2.	Lack of coopration by fellow farmers	64	53.33	17	12	35	110	III
3.	Lack of consumer awareness of uses of boro rice	53	44.16	15	11	27	94	IV
4.	Inferior taste and keeping quality of boro rice	90	75.00	30	31	90	181	I

ii. Technological constraints

Table 6 revealed the six technological constraints experienced by farmers in respect of non-adoption of boro rice production technology. Lack of adequate knowledge about nursery rainsing technology by Dapog method (87.50%) was ranked first by the farmers. The second rank was assigned to the constraints difficulty in getting HYVs of boro rice (83.3%). The order constraints in descending order of importance were shortage of labour at the time of transplanting, weeding and harvesting (65.83%), lack of knowledge for effective weedcides (60.83%) and lack of knowledge about fertilizer management. Lack of irrigation facilities was also important constraints although it was ranked sixth by the farmers.

This findings is in conformity with the findings of Ray (1976), Singh (1988), Kumar (1995), Sharma (1997), Sone *et al*. (2000) and Ankulwar *et al*.(2000).

Table 6: Technological constraints as perceived by the respondents

	Categories	Frequency	Percent	Frequency response in different rank I	II	III	Total rank score	Rank
1.	Lack of adequate knowledge about nursery raising technology	105	87.50	37	22	46	201	I
2.	Difficulty in getting HYVs of boro rice	100	83.33	34	18	48	186	II
3.	Lack of knowledge about fertilizer management	61	50.83	16	12	33	105	V
4.	Lack of irrigation facilities	54	45.00	11	8	35	84	VI
5.	Lack of knowledge for effective weedicides	73	60.83	21	15	37	130	IV
6.	Shortage of labour at the time of transplanting weeding and harvesting	79	65.83	25	15	39	144	III

iii. Economic constraints

A perusal of data presented in Table 7 revealed four different economic constraints experienced by farmers for non-adoption boro rice production technology. The first rank was assigned to the contraints, lack of knowledge of increasing yield through better management (87.50%). The second rank was given to the high cost of cultivation (83.33%). The third rank was assigned to the constraints, non availability of credit (81.66%). Less profit due to low price of boro rice was assigned last rank by the farmers although it was also an important constraints perceived by them.

This findings is in agreement with the findings of Tantary and Nanda (1991), Singh and Gill (1993), Kumar (1995), Samy (1998) and Nayak (2000).

Table 7. Economics constraints as perceived by the respondents

	Categories	Frequency	Percent	Frequency response in different rank I	II	III	Total rank score	Rank
1.	High cost of cultivation	100	83.33	34	19	47	187	II
2.	Non availability of credit	89	81.66	31	21	46	18	III
3.	Less profit due to low price of boro rice	90	75.00	21	23	46	155	IV
4.	Lack of knowledge of increasing yield through better management	105	87.50	37	21	47	200	I

iv. Extension constraints

Table 8 revealed the three extension constraints experienced by farmers in respect of boro rice production technology. Lack of regular and effective training for up grading the know how and skill related to boro rice cultivation (87.50%) was ranked first by the farmers. The second rank was assigned to the constraint, availability of limited literature on boro rice cultivation (65.00%) and irregular visit of extention expers (58.33%) was also an important constraints although it was ranked third by the farmers. Effective training programmes should be organised for upgrading of knowledge and skill of farmers and useful literature related with the cultivation of boro rice should be made available to the farmers. The farmers should be qualified with "know how" and "do how" of boro rice rice production technology.

This findings is in line with the findings of Singh and Gill (1993), Sivanaryanan and Reddy (1993), Khan (1998) and Ankulwar *et al.* (2001).

Table 8. Extension constraints as perceived by the respondents

	Categories	Frequency	Percent	Frequency response in different rank			Total rank score	Rank
				I	II	III		
1.	Irregular visit of extension worker	70	58.33	19	15	46	133	III
2.	Availability of limited literature on boro rice cultivation	78	65.00	27	11	40	143	II
3.	Lack of regular and effective training for upgrading the know how and skill related to boro rice cultivation	105	87.50	37	24	44	203	I

CONCLUSION

Majority of the respondents belonged to medium adoption category and this might be due to the medium to high knowledge possessed by majority of the respondens.

The extent of adopton of farmers in different components of boro rice production technology was highest in the area of land preparation (70.00%) followed by transplanting of seedling (46.66%) and lowest in plant protection measures. (11.66%).

The relationship between age and extent of adoption of the farmers towards boro rice production technology had found to be negatively and significantly correlated.

Out of seven independent variable under study only two variables viz., education and annual income were positively and significantly contributed towards extent of adoption of boro rice production technology.

The variables age was found to be negatively and significantly contributed towards the extent of adoption of boro rice production technology.

The variables size of holding, economic motivation and risk orientation were also found to contribute positively towards the extent of adoption but the beta coefficients were not found statistically significant.

Majority constraints associated with non adoption of boro rice production technology were lack of regular and effective training for upgrading to know how and skill related to boro rice cultivation (87.50%) followed by high cost of cultivation (83.33%) and non availability of credits (81.66%).

Therefore, extension efforts must be directed to make sure to eradicate the problem of boro rice farmers.

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