Journal Crop and Weed, 11(1):124-127(2015)

Analysing the factors contributing towards technological gap of scientific rice cultivation in west Garo Hills district of Meghalaya

B. R. MARAK AND A. K. BANDYOPADHYAY

Department of Agricultural Extension, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur-741252, Nadia, West Bengal

Received: 17-02-2015, Revised: 28-04-2015, Accepted: 03-05-2015

ABSTRACT

The study was undertaken in Tikirkilla block and Selsella block of West Garo Hills district, Meghalaya, during April 2012 to June 2012, to identify and measure the technological gap in scientific rice cultivation, and to determine the different factors influencing farmers' technological gap in scientific rice cultivation. Purposive and simple random sampling methods were followed to select the respondents in the study area. Total hundred respondents were selected to represent the sample for the study. The data were collected with the help of semi- structured interview schedule through personal interview method. The collected data were processed into the statistical tools like frequency, percentage, ranking, correlation and regression analyses. The outcome of the study reported that variables namely education, family size, material possession, market orientation and personal localite had shown the significant regressional effect on technological gap. Further, the study highlighted that 87 per cent of the farmers in the area of study had medium technological gap and 13 per cent of the farmers had low technological gap in the recommended package of practices in rice cultivation.

Keywords: Education, market orientation, package of practice, rice cultivation, technological gap

The economy of Meghalaya is basically agrarian and plays a predominant role in the state's economy. Since, 70% of the state's population depends on agriculture, employment and income generation also depend on agricultural developmental activities to a great extent. Pattern of land holdings and the myriad land tenure systems, extensive practice of "Jhum cultivation", other traditional agricultural practices including aspects of production for consumption rather than creating marketable surpluses for profitable returns, high cost of inputs and production are some of the realistic dimensions of agriculture in Meghalaya. Despite the challenges, agriculture in the state is slowly and steadily showing a decent progress. Like the other north-eastern states rice is the staple food of Meghalaya. Among the foodgrain, rice is the main crop and it occupied about 82.40% of the area and 86.42% of the total production in Meghalaya. About 76000 hectares (40.50%) of the total area under rice were estimated to be under HYV (MAP, 2006). West Garo Hills occupy 46620 ha of rice with the total production of 97079 MT (District Statistical Handbook, West Garo Hills, 2010-11). However, the productivity of rice in the region is comparatively low. Lahiri and Das (2010) found that productivity data of Garo Hills is not satisfactory and it is mainly due to the lack of proper technical knowhow in field of modern agriculture. This also restricts the adoption of modern practices of agriculture. Government and non-government organizations such as State Department of Agriculture, KVK etc have taken up various programmes to improve rice cultivation in different parts of the region. Training and demonstration programmes have been organised frequently for imparting scientific rice cultivation in various parts of West Garo Hills district. In this view, the study was designed with the specific objectives to identify and measure the technological gap in scientific rice cultivation, and to determine the relationship of socio-economic, socio-psychological and extension communication variables with farmers' technological gap in scientific rice cultivation.

Email: bkho15zooleye@gmail.com

MATERIALS AND METHODS

The study was conducted in West Garo Hills district in Meghalaya. The blocks namely Tikirkilla and Selsella were selected purposively for the study. Five villages under Tikirkilla block namely Bogadol, Jugirjhar, Kodomsali, Kamari and Pedaldoba, and five villages under Selsella block namely Haldibari, Kalpara, Paham, Shyamnagar and Rangmalgre were selected through simple random sampling method. Finally, ten farmers were selected from each village, using simple random sampling method thereby making a total of 100 farmers as the sample respondents.

The data were collected through personal interview method with the help of semi-structured interview schedule. After reviewing various literatures, the study was formulated with technological gap as the dependent variable, and the variables such as age, caste, education, category of farmers, family type, family size, material possession, social participation, market orientation,

production orientation, risk orientation, mass media exposure, personal cosmopoliteness and personal localite as independent variables. The dependent variable technological gap had been measured as the difference between the recommended package of practices and the extent of adoption of the recommended package of practices. For quantifying the technological gap of the respondents, one score was assigned to right answer and zero for the wrong answer in respect of each item of every question with respect to recommended package of practices.

RESULTS AND DISCUSSION

Identification of technological gap

Table 1, shows the ranking of practice wise technological gap in the recommended package of practices in rice cultivation. Ranking was done on the basis of frequency and percentage obtained on different recommended rice cultivation practices.

Table 1: Practice wise technological gap of 100 respondents in rice cultivation.

Practice	Frequency	Percentage	Rank
Improved variety	0	0	XIII
Sowing time	8	8	XII
Seed rate	23	23	IX
Seed treatment	98	98	I
Time of transplanting	29	29	VIII
Spacing	35	35	VII
N-fertilizer application	70	70	V
P-fertilizer application	76	76	IV
K-fertilizer application	81	81	III
Irrigation	19	19	X
Weeding	46	46	VI
Plant protection	90	90	II
Harvesting time	14	14	XI

Out of 100 selected farmers, the study showed technological gap with 98 per cent of the farmers in 'Seed treatment', 90 per cent in 'Plant protection', 81 per cent in 'K-fertilizer application', 76 per cent in 'P-application', 70 per cent in 'N-application', 46 per cent in 'Weeding', 35 per cent in 'Spacing', 29 per cent in 'Time of transplanting', 23 per cent in 'Seed rate', 19 per cent in 'Irrigation', 14 per cent in 'Harvesting time', 12 per cent in 'Sowing time' and no gap was identified in the use of 'Improved variety'. Accordingly, 'Seed treatment' occupied the highest rank in terms of technological gap followed by 'Plant protection', 'K-fertilizer application', 'P-application', 'N-application', 'Weeding', 'Spacing', 'Time of transplanting', 'Seed rate', 'Irrigation', Harvesting time', 'Sowing time' and 'Improved variety' respectively. It was observed that gap in seed rate and spacing is mainly due to over adoption.

Further the respondents were categorised into 'No technological gap', 'Low technological gap', 'Medium technological gap' and 'High technological gap'. Then the respondents were identified on the basis of their extent of technological gap as shown in table 2. It indicates that 87 per cent of the farmers in the area of study have medium technological gap and 13 percent of the farmers have low technological gap in the recommended package of practices in rice cultivation.

Table 2 : Distribution of farmers on the basis of their extent of technological gap

Category	% Technological gap	Frequency	Percentage
No gap	0	0	0
Low gap	1-20	13	13
Medium gap	21-80	87	87
High gap	81-100	0	0

Relationship between technological gap and some socio-economic, socio-psychological and extension communication variables

Table 3 shows that the selected socio-economic variables namely; caste, education, category of farmer, family type, family size, material possession and social participation had negatively significant correlation with the technological gap at 1 per cent level. However Roy and Bandyopadhyay (2014) reported in their study that these similar variables had positively significant correlation with the adoption behaviour of aromatic rice. It was evident from socio-economic variables that most of the tribal farmers had higher technological gap as compared to general caste although they are majority in the region. Technological gap was found more in farmers with lesser education level. An increase in category of farmers from marginal to large farmers causes decrease in technological gap as the farmers with larger farm size are more economically self reliable. It is also observed that joint family with larger family size had lower technological gap as compared to nuclear family. Material possession is negatively correlated with technological gap as the farmers possessing more agricultural implements had lower technological gap comparatively. Further, technological gap is found lower with the increase in farmers' level of social participation. On the other hand, socio-psychological variables such as market orientation, production orientation and risk orientation had negatively

significant correlation with technological gap at 1 per cent level. It implies that with the increase in these socio-psychological variables there is a decrease in technological gap in rice cultivation. Finally, it is observed that technological gap had a negatively significant correlation with extension communication variables such as mass media exposure, personal cosmopoliteness and personal localiteness at 1 per cent level.

Table 3 : Correlation co-efficient of technological gap with selected independent variables

Independent variables	Co-efficient correlation
Age	-0.203
Caste	-0.449**
Education	-0.739**
Category of farmer	-0.711**
Family type	-0.603**
Family size	-0.635**
Material possession	-0.817**
Social participation	-0.759**
Market orientation	-0.912**
Production orientation	-0.865**
Risk orientation	-0.696**
Mass media exposure	-0.798**
Personal cosmopoliteness	-0.833**
Personal localite	-0.839**

Note:Correlation is significant at 0.01 level of probability (two-tail test)*

Determination of factors influencing farmers' technological gap in rice cultivation

Table 4 presents the multiple regression analysis of technological gap with 14 predictor variables. It implies the regression effect of the individual predictor variables on the predicted variable in the presence of other predictor variables. The analysis suggests that the variables namely; education, family size, market orientation and personal localite had a substantial effect on the technological gap at 1 per cent level of significance whereas material possession showed significant regression at 5 per cent. Patel and Padheria (2010) reported that education and family size have negative effect on the technological gap of the farmers growing safflower. Similarly, Kar *et al.* (2003) observed that material possession and market orientation had a negative and significant association with technological gap among the potato growers in West Bengal. The partial regression co-efficient 'b' refers to one unit change of the particular variable help towards the change of predicted variable to the tune of each and every corresponding partial regression co-efficient in presence of the other predictor variables. Thus the unit change in education, family size, material possession, market orientation and personal localite and contribute a change in technological gap in recommended practices of rice technology by -0.159, -0.158, 0.277, -0.429 and -0.227 respectively. The 'β X R' value indicates the percentile contribution of the particular variables in presence of other predictor variables in characterising the predicted one. Major contributing variables in characterising the consequent variable, *i.e*, technological gap in recommended rice cultivation are market orientation (43.63%) followed by material possession (25.21%), personal localite (21.22%), education (13.12%) and family size (11.22%) respectively. The R^2 value being 0.89 indicates that all the causal variables put together, the amount of variation

Table 4: Value of regression analysis of predicted variable with predictor variables

Variables	Partial 'b' values	Standard error 'b'	Standard partial 'b' values	T values for 'b'	β X R
Age	-0.068	0.065	-0.043	1.060	0.973
Caste	-0.476	0.374	-0.054	1.274	2.719
Education	-1.562	0.556	-0.159	2.810**	13.124
Category of farmer	-0.380	1.024	-0.025	0.371	1.951
Family type	1.365	1.112	0.074	1.228	-4.965
Family size	-3.205	1.036	-0.158	3.094**	11.220
Material possession	1.367	0.622	0.277	2.200*	-25.217
Social participation	-0.931	0.515	-0.131	1.809	11.103
Market orientation	-2.140	0.621	-0.429	3.446**	43.634
Production orientation	-0.616	0.408	-0.131	1.509	12.594
Risk orientation	-0.050	0.138	-0.021	0.364	1.639
Mass media exposure	0.199	0.517	0.036	0.386	-3.187
Personal cosmopoliteness	-1.026	0.648	-0.142	1.584	13.188
Personal localite	-1.026	0.673	-0.227	2.840**	21.225

Note:Significant at 0.05 level of probability ; **Significant at 0.01 level of probability; $R^2 = 0.8968$; $F = 52.74$***

in the consequent variable is to the tune of 89 per cent and its F value is 52.74, which is which is significant at both 1% and 5% level.

There is an ample scope for increasing the productivity of rice in Meghalaya with proper generation and transfer of improved technologies and identifying areas of technological gap and minimizing those gaps through proper extension approaches. Keeping in view of the technological gap identified in the study, efforts should be made by the change agent system to spread awareness among the farmers about the recent technologies in rice cultivation. Rice is cultivated in Meghalaya mostly for the purpose of own consumption and very few farmers cultivate for sale. Therefore improvement and expansion of proper market system would motivate and encourage the farmers in the hilly regions of Meghalaya to improve their production of rice not only for own consumption but as well as for sale in the market. Regular capacity building and training programmes would help the farmers in minimizing the technological gap, and also enable the farmers to update their knowledge and skills regarding rice cultivation technology. Further there is a need to enhance the scientific method of rice cultivation through introduction of need based and location specific agricultural development technology by giving emphasis to the development in the infrastructure facilities of the area. These can be achieved by identifying areas of technological gap and minimizing those gaps through proper extension approaches.

REFERENCE

MAP. 2006. Meghalaya Agriculture Profile, Directorate of Agriculture. Government of Meghalaya, India.

District Statistical Handbook, 2010-11. Department of Economics and Statistics West Garo Hills, Tura.

Kar, S., Bandyopadhyay, A.K. and Goswami, K.K. 2003. Technological gap in potato cultivation in some selected areas of Hooghly district. *J. Interacad.* **7:** 461-65.

Lahiri, B. and Das, P. 2010. Role of *Nokma* (Village Headman) in Agriculture of West Garo Hills, Meghalaya. *J. Exten. Educ.*. **15:**72-82.

Nanda, A., Mondal, B. and Majumder, G. 2011. Adoption behaviour of guava (*Psidium guajava* L.) growers in relation to scientific cultivation of guava. *J. Crop Weed*, **7:**116-19.

Patel, Y. V. and Padheria, L. M. M. 2010. Extent of technological gap and its relationship with situational, personal, socio-economic, psychological and communication characteristics of safflower growers. *Indian Res. J. Ext. Edu.*. **10:**93-98.

Roy, D. And Bandyopadhyay, A.K. 2014. Factors contributing towards aromatic rice production technology in Nadia district of West Bengal. *J. Crop Weed*, **7:**166-69.