

Factors contributing towards adoption of aromatic rice production technology in Nadia district of West Bengal

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ABSTRACT

Scented or aromatic rice is nature's gift to the Indian sub-continent and human kind at large. Compare to other classes of rice, aromatic rice is highly demanded and get better premium price in global market due to its pleasant aroma, superfine long slender grains with delicate curvature, remarkable linear elongation and excellent flaky soft texture on cooking. The concerned two agricultural university of West Bengal (Bidhan Chandra Krishi Viswavidyalaya and Uttar Banga Krishi Viswavidyalaya) have introduced the high yielding varieties of aromatic rice to the farming community with modern package of practices for betterment and popularization of aromatic rice through different Central and State sponsored projects. Accordingly farmers are showing very kin interest about the cultivation of aromatic rice and most of the farmers have already adopted the different varieties of aromatic rice. Keeping in view the vast potential and importance of aromatic rice cultivation to the state's revenue in the broader sense and the impact of practice on improving the social life of the farmer, the study was under taken. The main objective of the study was to estimate the factors contributing towards the adoption of aromatic rice production technology. Two blocks from Nadia district of West Bengal were purposively selected for this study. The work was conducted with the dependent variable adoption behaviour and 22 independent variables categorised in three different factors viz socio-economic factors, socio-psychological factors and extension communication factors. For the study 150 respondents were selected purposively for interview in the year 2013. Data were collected through well structured interview schedule and analyzed by co-efficient of correlation and multiple regression analysis. Family type, family size, education, area under aromatic rice cultivation, land, farm power, material possession, annual income, attitude towards aromatic rice cultivation, knowledge level, market orientation, risk orientation, economic motivation, innovation proneness, personal cosmopolite were positively significant with the adoption behaviour of aromatic rice growers. From Regression analysis, the R^2 value indicates that all the casual variables put together could explain 72.10% variation in the consequent variable. Natural hazards are found to be the greatest problem perceived by the respondents.

Keywords: Adoption, aromatic rice, production technology

Scented or aromatic rice is nature's gift to the Indian sub-continent and human kind at large. Compare to other classes of rice, aromatic rice is highly demanded and get better premium price in global market due to its pleasant aroma, superfine long slender grains with delicate curvature, remarkable linear elongation and excellent flaky soft texture on cooking. However, at present, only 12-15 indigenous aromatic rice varieties (IARVs) are being cultivated in some scattered pockets of different districts in West Bengal in an unorganized manner (Adhikari *et al.*, 2011 and 2013). There is a market of aromatic rice not only in West Bengal but also throughout the India. Due to their smell, taste and high demand aromatic rice has got an extra importance in the economy of India. As a post-effect of globalization India is now exporting aromatic rice in the different countries viz. Middle East countries, the USA, the UK, Australia and Canada and other countries including South Africa and at present the farmers are getting attractive price from those of particular varieties.

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In this context the Government of India side by side the concerned State Department have taken the different programmes for popularization of aromatic rice cultivation in the different district of West Bengal. As a result of different extension programmes (campaigns, demonstration etc.) by the Agricultural Universities and the State Agricultural Department of West Bengal, the farmers are now showing very kin interest about the cultivation of aromatic rice and most of the farmers have already adopted the different varieties of aromatic rice in the different districts.

Although the production of aromatic rice per unit area is lower than the ordinary rice but the farmers are getting more price than ordinary rice and there is assured market of their produce in the state, only for this reason the farmers are showing interest regarding the cultivation of aromatic rice and the area under aromatic rice is increasing day by day. The number of farmers and area under cultivation under technical supervision of RKVY Project increased from 78 to 534 farmers as well as from 134 to 866 bighas of land, respectively during the period from 2009 to

2011(Anon., 2012). Adoption of system of rice intensification practices in cultivation of aromatic rice improves their production as well as their economic condition. It contributes in saving environment and sustainable crop production. The scented rice performed better in most of the evaluating traits like grain yield, straw yield and number of effective tillers per hill, test weight and number of filled grains per panicle in 25 x 25 cm spacing and 2-3 seedlings per hill (Thawait *et al.*, 2014).

In such a research climate the present paper has tried to identify the factors contributing towards the adoption of aromatic rice production technology in West Bengal.

MATERIALS AND METHODS

Two blocks under the subdivision of Kalyani, Nadia District of West Bengal namely Chakdaha (consists of 17 gram panchayats) and Haringhata (consists of 10 gram panchayats) were purposively selected for the study. From these two blocks one gram panchayat from each block was then purposively selected (where aromatic rice cultivation is highly adopted) namely Routari (Chakdaha block) and Fatepur (Haringhata block). And finally from this two gram panchayats one village from each i.e. Maheswarpur (Routari Gram Panchayat) and Panchkahoniya (Fatepur Gram Panchayat) were selected. From these two villages 150 (75 from each) progressive aromatic rice growers, who were cultivating aromatic rice in their own field or having tenancy status were finally selected purposively as respondents for the study.

Adoption behaviour of aromatic rice grower was considered as dependent variable and other variables were categorised in three different factors namely socio-economic factor which includes the variable age, caste, family type, family size, education, area under cultivation, land holding, house type, farm power, material possession, socio-psychological factor includes the variable annual income, social participation, attitude towards aromatic rice cultivation, knowledge level, market orientation, production orientation, risk orientation, economic motivation, innovation proneness and extension communication factor includes the variable mass media exposure, personal cosmopolite and personal localite were taken as independent variables in this study.

Data were collected by interviewing the respondents personally with the help of a well

structured pre-tested interview schedule. Correlation co-efficient analysis and multiple regression analysis were applied for interpretation of the result.

RESULTS AND DISCUSSION

From the correlation analysis, it was found that the age (X_1) of the respondent was negatively and significantly correlated with the adoption behaviour of the aromatic rice growers (Table 1). This reflects that the younger generation of the farmers were interested in growing aromatic rice in their field more than the older farmers. The other 15 independent variables i.e. family type (X_3), family size (X_4), education (X_5), area under aromatic rice cultivation (X_6), land (X_7), farm power (X_8), material possession (X_{10}), annual income (X_{11}), attitude towards aromatic rice cultivation (X_{13}), knowledge level (X_{14}), market orientation (X_{15}), risk orientation (X_{17}), economic motivation (X_{18}), innovation proneness (X_{19}), personal cosmopolite (X_{21}) were positively and significantly associated with the adoption behaviour of aromatic rice growers. Thus it can be inferred that the respondents with higher degree of these variables are more interested in adoption of aromatic rice in their field situation.

This finding supports the findings of Mote and Wadnerkar (2009), Ghoshal *et al.* (2010), Mehta and Sonawane (2012), Sharma *et al.* (2012).

The general idea behind the stepwise regression procedure is that we build our regression model from a set of candidate predictor variables by entering and removing predictors - in a stepwise manner. From table 2 it was found that the independent variables (predictor) area under cultivation (X_6), family size (X_4) and land holding (X_7) had been retained after eliminating the other trivial variables in the preceding steps.

The table- 2 depicted that the variable area under cultivation (X_6) recorded highest regression effect on the extent of adoption having the $\hat{\alpha}$ value of 0.860. Thus it had a positive effect on the adoption level. It was also observable that a unit change in this variable had contributed 20.953 unit changes in the adoption level which is also the highest contribution of all. The variable family size (X_4) also had a positive effect on adoption exhibiting the $\hat{\alpha}$ value of 0.120. A unit change in this variable had contributed 1.575 unit changes in the adoption level.

On the other hand the variable land holding (X_7) recorded the regression effect on the extent of

adoption having the \hat{a} value of -0.178, thus representing a negative effect on the adoption level and with the unit change in this variable had contributed 1.645 unit changes (negatively).

Here the R^2 value being 0.721, it is to infer that the 3 variables together explain 72.10% variation embedded with the predicted variable of adoption of aromatic rice production technology.

Table 1: Correlation Co-efficient between adoption behaviour of aromatic rice cultivars and rest 22 independent variables

Variables	'r' value (Pearson)
Socio-Economic Factors	
Age (X_1)	-0.227*
Caste (X_2)	-0.083
Family type (X_3)	0.286 **
Family size (X_4)	0.322**
Education (X_5)	0.390**
Area under cultivation (X_6)	0.824**
Land (X_7)	0.424**
House (X_8)	0.146
Farm power (X_9)	0.416**
Material possession (X_{10})	0.426**
Socio-psychological factors	
Annual income (X_{11})	0.300**
Social participation (X_{12})	0.185
Attitude towards aromatic rice cultivation (X_{13})	0.318**
Knowledge level (X_{14})	0.288**
Market orientation (X_{15})	0.245*
Production orientation (X_{16})	0.219
Risk orientation (X_{17})	0.348**
Economic motivation (X_{18})	0.288**
Innovation proneness (X_{19})	0.283**
Extension communication factors	
Mass media exposure (X_{20})	0.146
Personal cosmopolite (X_{21})	0.314**
Personal localite (X_{22})	0.015

Table 2: Stepwise multiple regression analysis of the adoption behaviour (Y) with the other 22 variables

Variables	Unstandardized Co-efficient		Standardized Co-efficient	
	'b' value	Standard error of 'b'	\hat{A}	't' value
Adoption (Y) (constant)	58.32	2.028		28.750
Area under cultivation (X_6)	20.953	1.458	0.860	14.367**
Family size (X_4)	1.575	0.733	0.120	2.148*
Land holding (X_7)	-1.645	0.537	-0.178	-3.064**

Note: *, ** significant at 5% and 1% level of significance, respectively, $R^2=0.7210$

Adoption process is a complex, multifaceted and polymorphous while we keep on contemplating its qualitative expansion through the domain of behavioural disposition, especially for the farming community. The expression of effectual discourses that is attitude and motivation has been attuned to a complex parametric disposition consisting of resources, institution, organization, market etc. The other non-parametric disposition has been the discrete psychological disposition and its acquisition to technology adoption the key content of the study. The present study has been resultants through an estimation of variable interaction and its factorial configuration. It can be concluded from the study that, area under cultivation (X_6) as a resource is still a unique characteristic to impact on adoption process. Family size, as a tiny social echelon has characterised the process of adopting aromatic rice. Total land holding as a resource endowment has been catalytic and characteristic with the process of adoption especially in aromatic rice. The income is still, as a factor, having high degree of companionship to characterise the adoption vis-a-vis socialization process.

Any adoption process is basically a heterophylic exposition of socio economic and technological interaction which has been networked in the current study. The adoption process as studied under this heuristic research has been not that unique so far to estimate the process as unique with aromatic rice. So, scopes are there to identify and elucidate whether adoption process of aromatic rice can present a unique process over the gross generalization occurring in the general adoption behaviour.

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