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Yield gap of most widely adopted AAU recommended *sali* rice variety in Assam

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ABSTRACT

*A study was conducted in districts of Karimganj, Lakhimpur and Jorhat of Assam to assess the extent of yield gap of most widely adopted AAU recommended rice variety in the state. A purposive sampling technique was followed and statistical methods such as percentage, frequency, mean and ranking was used for analysing the data. Data were collected through personal interview method during the period of 2010-11. A total of 360 respondents were interviewed with the help of the structured schedule. The highest yield gap in the study area was obtained in the year 2006-07 (- 10.44 q/ha) followed by 2008-09 (- 8.16 q/ha) and 2007-08 (- 7.56 q/ha). The yield gap in the year 2006-07 was increased by the poor yield obtained throughout the sample villages of Jorhat. The yield of most adopted recommended HYV "Ranjit" had positive and significant correlation with economic motivation (r = 0.4151**), scientific orientation (r = 0.2703**) and training exposure on rice (r = 0.2159*). The regression coefficients of educational level (b = - 4.0284**), number of family members engaged in farm activities (b = - 2.8938*) and economic motivation (b = 5.8606**) were found to be significant with the yield of most adopted HYV "Ranjit".*

Key words: *correlation, regression coefficient, most adopted recommended rice variety*

Rice occupies about two-third of the total cropped area in the state of Assam. Although Assam produced 39.98 lakh Metric Tons (MTs) of rice in 2000-01, its production came down in the following years due to various climatic reasons. Compared to 2007-08, Assam could bring seven percent more land under rice cultivation in 2008-09. During 2007-08, the state could produce 33.20 lakh MTs of rice with an area of 23.24 lakh hectares of land under paddy cultivation. Among the rice producing states of the country, Assam occupied ninth position in 2008-09, producing 40.70 lakh MTs of rice in total which is the highest production for Assam. Out of this, Sali contributed 29.24 lakh MTs followed by Boro (7.71 lakh MTs) and Ahu (3.74 lakh MTs). Total area under rice was 24.84 lakh hectares during 2008-09 (Ahmed *et al.* 2010). After the establishment of AAU in 1969, breeding programs were guided by modern plant type concept which resulted in the development of several rice varieties with high yield potential and other desirable traits. The Assam Agricultural University has developed many location specific technologies and released several noteworthy varieties especially in case of rice, which is the primary crop in Assam. In State Agricultural Universities (SAU's), a major share of the university budget is spent on research.

Singh (1992) reported that high technological gap existed in adoption of recommended technology in various field crops. Varietal attributes like ease of threshing, cooking and swelling quality are significant determinants of adoption (Adesina and Seidi 1995). Also, labor availability, farm size, contact with extension services, market-oriented production, credit availability

and gender are the most common farm and farmer-specific attributes that influence adoption or non-adoption (Adesina and Zinnah 1993).

The average productivity of rice in Assam is much lower than the national level (Barah *et al*. 2001). A mere increase of 50 kg rice/ha in Assam can lead to a total estimated income of more than Rs.125 crores to the state from around 25 lakh ha of rice. This is possible when technology is most appropriate to the farmers' situation and needs, and technology dissemination processes are quicker and more efficient. In this regard, this study was carried out to observe the yield gap of mostly adopted AAU recommended rice variety 'Ranjit' in the farmer's field.

The study was carried out in the districts of Karimganj, Lakhimpur and Jorhat. These districts were purposively selected as Jorhat and Karimganj basically have rice research stations. Lakhimpur was also selected along with the other two districts as it conducts research on deepwater rice. The number of farmers interviewed in each of the districts was 120, taking the total sample size to 360 farmers. The data in the present study were collected directly from the farmers with the help of the structured schedule, through personal interview method. The statistical techniques used are frequency, percentage, mean and rank.

In Assam, 4 types of rice are grown exclusively around the year. They are Sali, Ahu, Boro and Bao. These rice varieties are also known as 'Winter', 'Autumn', 'Summer' and 'Deep water rice', respectively. It was seen that 'Ranjit' was the most widely adopted AAU recommended 'Sali' HYV among all other rice varieties in the study area. In order to find out the yield gap of 'Ranjit,' the technical yield of this variety was taken into account. The technical yield of this variety was subtracted from the actual yields to obtain the yield gap.

Data revealed that the highest yield gap in the study area was obtained in the year 2006-07 (- 10.44 q/ha) followed by 2008-09 (- 8.16 q/ha) and 2007-08 (- 7.56 q/ha) (Table 1). The yield gap in the year 2006-07 was increased by the poor yield obtained throughout the sampled villages of Jorhat. The trend from 2006-07 to 2008-09 is similar in Karimganj district but the other two districts were poles apart. While, Jorhat showed a very noteworthy increasing trend, Lakhimpur on the other hand showed a decreasing trend. When asked, the respondents of Jorhat district claimed that they faced water shortage at critical periods, which resulted in uneven flowering and subsequently it led to a pest attack, which drastically decreased their yields. Whereas, the respondents of Lakhimpur district said that a major part of the 'Ranjit' crop in 2008-09 was killed by floods in many areas. Although, the yields were a bit erratic throughout the years and districts it was seen that several villages of the study area were able to post positive yield gaps in certain years. This shows that these areas are capable of surpassing the technical yield of 'Ranjit' variety if the right weather conditions prevail.

Data revealed that yield of most adopted recommended HYV "Ranjit" had positive and significant correlation with 'economic motivation' (r = 0.4151**), 'scientific orientation' (r = 0.2703**) and 'training exposure' on rice (r = 0.2159*) (Table 2). This means that as the 'economic motivation' or 'scientific orientation' or 'training exposure' on rice increased the yield of recommended HYV "Ranjit" also increased. The reason behind this may be the fact that a farmer with higher training exposure on rice crop is bound to go for modern procedures in an accurate way as he would possess sharper skills and keener sense regarding cultivation of rice crop which in turn would give him higher yields. Also, farmers with higher economic motivation or scientific orientation generally are more inclined to get higher yields as he tends to be eager to

Table 1. Yield gap in relation to the most widely adopted variety in Assam

Name of Village	2006-07			2007-08			2008-09		
	Actual Yield	Technical Yield	Yield Gap	Actual Yield	Technical Yield	Yield Gap	Actual Yield	Technical Yield	Yield Gap
Karimganj	55.42	60	-4.58	54.81	60	-5.19	55.44	60	-4.56
Lakhimpur	51.09	60	-8.91	50.24	60	-9.76	46.51	60	-13.49
Jorhat	42.17	60	-17.83	52.28	60	-7.72	53.57	60	-6.43
Overall	49.56	60	-10.44	52.44	60	-7.56	51.84	60	-8.16

Variety : Ranjit (Technical Yield = 60 quintals/hectare)

Table 2. Correlation coefficients of yield of most adopted HYV "Ranjit" with socioeconomic parameters of the respondents

Sl. No.	Socio-economic parameters	'r' value Overall
1.	Age	0.1189
2.	Educational level	-0.1999*
3.	Family Size	0.1713
4.	Family member engaged in Farm Activities	-0.1068
5.	Social participation	0.0503
6.	Types of house	0.1685
7.	Main occupation	-0.0030
8.	Information sources used	-0.0430
9.	Operational land holding	0.0013
10.	Total Annual Income	0.0582
11.	Training exposure	0.2159*
12.	Economic motivation	0.4151**
13.	Scientific orientation	0.2703**

*Significant at 0.05 level probability **Significant at 0.01 level probability

try out new innovations and scientific techniques. Similar findings were also reported by Tiwari *et al.* (2007) and Saikia (2012).

Data revealed that the regression coefficients of 'educational level' (b = - 4.0284**), 'number of family members engaged in farm activities' (b = - 2.8938*) and 'economic motivation' (b = 5.8606**) were found to be significant (Table 3). Therefore, these three parameters can be termed as good predictors of yield of most adopted HYV "Ranjit". The value of coefficient of multiple determination (R^2) value being 0.38204 indicated that the socio-economic parameters jointly contributed 38.20 per cent towards variation in yield of most adopted HYV "Ranjit". The F value (F= 4.01841**) was also found to be significant. This indicates the significant effectiveness of these socio-economic parameters in predicting the yield of most adopted HYV "Ranjit" when all of them were functioning jointly.

The yield gap study between the actual obtained yields and the technical yield of the most adopted AAU recommended HYV showed that in some villages, the technical yield was surpassed by the actual yields obtained by the respondents. This shows that these areas are capable of surpassing the technical yield of 'Ranjit' variety if the right weather conditions prevail. The correlation study indicates that the 'economic motivation', 'scientific orientation' and 'training exposure on rice' increased the yield of recommended HYV "Ranjit". The regression analysis indicates the significant effectiveness of the socio-economic parameters in predicting the yield of most adopted HYV "Ranjit" when all of them were functioning jointly.

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Table 3. Multiple Regression of yield of most adopted HYV "Ranjit" with socio economic parameters

Variables	R^2	Adjusted R^2	F value	b value	t value
Age	0.38204	0.28696	4.01841**	0.0728	0.52323
Educational level				-4.0284**	-2.70884
Family Size				3.9122	1.30653
Family Members Engaged in Farm Activities				-2.8938*	-2.31132
Social participation				0.9689	0.60638
Types of house				2.6986	1.25172
Main occupation				-2.1618	-0.58830
Information sources used				-1.8675	-1.15370
Operational land holding				0.7172	0.34648
Total Annual Income				0.0002	0.06067
Training exposure				-0.0147	-0.01211
Economic motivation				5.8606**	3.62362
Scientific orientation				0.5005	0.33437

*Significant at 0.05 level probability**Significant at 0.01 level probability

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