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## RESEARCH ARTICLE

## A Comparative Assessment of Adoption Behaviour of Tribal and Non-tribal Rice growers in Assam

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## ABSTRACT

*Rice (Oryza sativa L.) is the principal diet of majority of the population. A large portion of rural community of Assam depends on rice farming for their livelihood. Baksa district of Assam has enormous potentiality in rice production. Although the district is being blessed with favourable agro climatic conditions, yet the advantages could not be harnessed in terms of yield. To meet the growing demands of rice, one best possible route is to adopt improved technology in HYV rice. As a good number of tribal farmers are prevalent in the district, therefore the study attempts to explore the adoption behaviour of tribal and non-tribal rice farmers along with the associated factors in the adoption process. A total of 160 respondents (104 non-tribal and 56 tribal farmers) were selected as the final sample by proportionate random sampling method. The findings showed that above seventy percent of farmers had overall medium adoption level. However, a total of (73.13%) of non-tribal and only 51.78 per cent tribal farmers exhibited medium level of adoption. The “t value” was found to be non-significant. Overall age, family size, operational land holding, training exposure, social participation, economic motivation and scientific orientation of the farmers had a positive and significant association with the extent of adoption in case of HYVs. Further, these significant and nearly significant variables were taken for Tobit analysis to see the influence of these factors on extent of adoption of HYVs, where only training exposure showed a positive and significant contribution towards adoption of HYVs.*

**Key words:** Adoption behaviour; High yielding variety; Rice.

Rice (*Oryza sativa L.*) occupies a prominent place among the produced agricultural crops in the world with a production of 756 million tons covering an area of 161.77 million ha during 2019. Asia produces 85% of total rice grains, out of which 50% is contributed only by China and India (Wallach, 2022). Rice is the predominant and is widely grown crop in India. It is the principal diet for majority of the population of our country. Rice production is vital to the economy of India. India witnessed a maximum crop area under rice which was 30.81 million ha during 1950-51 that rose to 43.86 million ha in 2014-15 and presently it is approximately 45 million ha. India occupies second position in the production of rice next to China and is the leading exporter in the world. The production rose to 120 million tons in 2020-21 from 53.6 million tons in 1980 (Statista, 2022).

Assam, a North Eastern state of India is blessed

by bountiful nature that favours the growth and development of agriculture in the region. The state economy is largely an agrarian economy as about 86% population is rural and 75% of them are either directly or indirectly depend on farming (ASRLM, 2017). Agriculture continues to be the primary sector in Assam that contributes 29.12% to State gross domestic product during 2019-20 (MOSPI, 2021). Rice is the predominant crop of Assam that covers a gross cropped area of 2.54 million ha out of 4.16 million ha yielding 96 percent of total food grains of the State” (Das, 2021). Although volume of rice production in Assam was 4.98 million metric tons during 2020 as compared to 4.01 metric tons in 2009 (Statista, 2022), yet there is tremendous potentiality to enhance the production provided the recommended rice cultivation practices are being adopted by rice farmers. Thus, the farming community should show their readiness in

the adoption process of rice improved technology. Adoption is derived from a *Latin* word 'adoptare' which means to choose, to take up, to accept formally. Adoption is basically a psychological process that involves decision making on the part of the farmers regarding an innovation.

The farming community is characterized by tribal and non-tribal farmers in Assam. Tribal community being engaged in agriculture since ages is envisaged to enhance agricultural production in tribal areas (Kisar, 2009). But it is usually seen that the farmers feel comfortable with their own traditional technology and tribal farming community are more prone to it. It can be assumed that there are some distinct differences in socio-cultural values of the tribal and non-tribal farmers which may have resulted in disparity in the adoption process of high yielding varieties of rice between these two groups of farming community though living in the same area and in proximity. Therefore, it was found imperative on the part of researcher to confine the study with the specific objectives viz. to assess the extent of adoption of HYV rice by tribal and non-tribal rice farmers and to ascertain the association between the adoption and selected independent variables.

## METHODOLOGY

Out of the total thirty-five districts of Assam, Baksa district was selected purposively due to the large concentration of tribal rice growers along with non-tribal farmers. Moreover, it is one of the important rice growing pockets in the State. Eight villages were selected randomly and by following the proportionate random sampling procedure, one hundred and four (104) non-tribal and fifty-six (56) tribal farmers were selected. Thus, a total of one hundred sixty (N=160) respondents that comprises of both Tribal (*Bodo, Kachari, Rabha etc.*) and non-tribal rice growers constituted the final sample of the study. The data was collected by personal interview method during the year 2018. The research study contained one dependent variable viz. extent of adoption of HYV rice along with thirteen independent variables. Extent of adoption was measured in terms of specific practices used as per recommendation of Assam Agricultural University, Jorhat. A three-point continuum scale was used as 'fully', 'partially' or 'not at all' with a score of 2,1,0 respectively. If a farmer was found to adopt a given practice as per recommendation, it was considered as 'full adoption' and assigned a score of

2. A deviation from the recommended practice was considered as 'partial adoption' assigned a score of 1. Farmers who did not follow the recommended practice at all was considered as 'no adoption' and assigned a score of 0. The extent of adoption was calculated for 43 selected paddy cultivation practices as recommended by Assam Agricultural University and Department of Agriculture, Govt. of Assam. The total score obtained by a respondent was calculated by adding the adoption scores for all the practices followed by the respondent. A research schedule consisting of both open-ended and semi-structured questions was prepared for the collection of data. The collected data were properly tabulated and analyzed with the following statistical techniques i.e., Frequency Distribution, Percentage, Mean, Standard Deviation, Chi square and Tobit analysis.

## RESULTS AND DISCUSSION

*Extent of adoption of HYV rice (Total farmers):* It is evident from the Table 1 that the majority (73.13%) of the respondents had medium level of extent of adoption, followed by 16.87 per cent of the respondents having low level of extent of adoption of HYVs paddy cultivation practices in the sample when considered as total. Moreover, only 10.00 per cent of the respondents

**Table1. Distribution of respondents on extent of adoption of HYV paddy cultivation practices**

Component	No.	%
<i>Total farmers (N=160)</i>		
Low (Below 26.24)	27	16.87
Medium (26.24 to 41.30)	117	73.13
High (Above 41.30)	16	10.00
Total	160	100.00
Mean	33.77	
S.D.	7.52	
<i>Non- tribal (n<sub>1</sub>=104)</i>		
Low (Below 29.14)	12	11.53
Medium (29.14 to 41.96)	76	73.07
High (Above 41.96)	16	15.38
Mean	35.55	
S. D	6.41	
<i>Tribal (n<sub>2</sub>=56)</i>		
Low (Below 22.11)	12	21.43
Medium (22.11 to 38.81)	29	51.78
High (Above 38.81)	15	26.79
Mean	30.46	
S. D	8.34	
t-value	0.15 <sup>NS</sup>	

**Table 2. Association of extent of adoption of HYVs and socio, psychological and situational variables of the farmers**

Category	$\chi^2$ Value		
	Non-tribal	Tribal	Total
Age	8.80*	1.81	4.69*
Education level	1.88	1.90	3.23
Types of family	0.89	1.49	2.46
Family Size	3.57	2.03	4.92*
Operational land holding	0.87	4.48*	1.48
Annual income	0.43	0.31	0.57
Occupational status	2.54	0.44	1.24
Training exposure	4.59*	0.67	6.04*
Mass media exposure	0.51	0.11	2.03
Extension contact	0.71	0.46	2.77
Social Participation	3.65	6.53*	6.46*
Economic motivation	0.28	0.80	4.51*
Scientific orientation	4.04	5.90*	9.70*

\*Shows level of significance at 0.05 probability

**Table 3. Influence of socio-economic status on extent of adoption of HYVs using Tobit analysis**

Component	Coefficient	t-value
<i>Total farmers</i>		
Age	0.035	1.218
Size of family	-0.169	-1.641
Training exposure	1.159	2.650*
Social Participation	0.553	1.389
Economic motivation	0.039	0.233
Scientific orientation	0.089	0.508
<i>Non-tribal farmers</i>		
Age	-0.015	-0.470
Training exposure	0.880	1.770
Social Participation	0.772	1.474
<i>Tribal farmers</i>		
Operational land holding	-0.053	-0.080
Social Participation	0.561	0.941
Scientific orientation	-0.314	-1.414

\*Shows level of significance at 0.05 probability

exhibited high level of extent of adoption of HYV paddy cultivation practices. (Singh *et al.*, 2010), (Singh and Varshney, 2011), (Saikia, 2016) and (Lalthamawii *et al.*, 2022) also reported that majority of the farmers were having medium level of adoption. However, the study contradicted with the findings of (Hussain *et al.*, 2009) and (Kumbhare, 2011) that more than forty five percent and sixty percent farmers respectively showed high extent of technology adoption in paddy.

*Extent of adoption of HYV rice (Non-Tribal and Tribal):* Further it was found from Table 1 that amongst the non-tribal group, 73.07 percent of the respondents had

medium level of extent of adoption followed by 16.87 per cent having low level of extent of adoption and only 10.00 per cent were in high level of extent of adoption. In case of tribal respondents, 51.78 per cent had medium level of extent of adoption followed by 26.79 per cent having high level of extent of adoption and only 21.43 per cent having low level of extent of adoption.

All the tribal, non-tribal and total farmers' groups had been found in medium level of extent of adoption. But the findings also indicate that there were differences in the average adoption scores between tribal and non-tribal farmer. This means that though the tribal farmers are adopting HYVs practices, but the total practices adopted are probably less than the number of practices adopted by the non-tribal farmers. The "t value" (0.15) between tribal and non-tribal farmers is non-significant.

*Association of extent of adoption and socio, psychological and situational variables of the farmer :* It is observed from the Table 2 above that age (4.69\*), family size (4.92\*), training exposure (6.04\*), social participation (6.46\*), economic motivation (4.51\*) and scientific orientation (9.70\*) are associated with extent of adoption of HYVs, the  $\chi^2$  values being significant at  $p=0.05$  when both the tribal and non-tribal farmers were considered together.

In case of non-tribal farmers as a separate sample age (8.80\*) and training exposure (4.59\*) showed the significant association while operational land holding (4.48\*), social participation (6.53\*) and scientific orientation (5.90\*) of tribal farmers exhibited significant association with extent of adoption of HYVs. The finding is in conformity with the finding of (Tiwari *et al.*, 2007) as it was reported that operational land holding, social participation and scientific orientation exhibited a significant role in the adoption behaviour of farmers. The study conducted by (Ghimire *et al.*, 2015) also revealed similar finding that farm size could explain probable significant influence in the probability adoption

For knowing the influence of the socio-economic status on extent of adoption of HYVs, the researcher had taken further initiative of conducting the Tobit Analysis for the significant variables and nearly significant variables.

The Table 3 depicts that training exposure (2.650\*) had positive influence on extent of adoption of HYVs. This means that, if trainings received by the farmers are more, then the rate of adoption of HYVs will be more. It is probably training adds to their

knowledge, skills and also helps in development of a positive attitude towards cultivation of HYVs. Though family size has a negative effect on extent of adoption of HYVs but it was not significant. The table depicts that none of the independent variables are found to be significant in case of non-tribal farmers. And none of the independent variables are significant in case of tribal farmers.

## CONCLUSION

The rural community of Assam at large is dependent on rice for sustainable socio- economic growth. Rice cultivation has also been an important culture and a regular affair among the tribal population for more than thousand years enriching their culture integrity. Enhancing the rice production is essential which can be met by welcoming the improved rice production technologies. But in this regard, the study revealed a gloomy picture as majority of the rice growers belonged to medium level of adoption category and very less portion exhibited high adoption level. Moreover, the differences in adoption behaviour were observed in between non- tribal and tribal farmers as the adoption level was found to be less in case of tribal farmers. Certain socio- personal attributes such as age, family size, operational land holding, training exposure, social participation, economic motivation and scientific orientation were associated in influencing adoption behaviour of the farmers. Research and development should be oriented towards farmers' preferences and thrust should be made to develop technology by taking into account profile characteristics of the farmers. Government departments and other stakeholders should take appropriate steps to introduce and expedite the adoption process by mobilising the importance of improved rice production technologies.

## CONFLICTS OF INTEREST

The authors have no conflicts of interest.

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