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Preference of farmers between a set of selected indigenous and high yielding varieties of rice (*Oryza sativa L.*) in Assam

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Abstract

Assam Agricultural University is putting its innovative efforts to provide the best rice cultivars for the farmers of the country. Many high yielding varieties of rice have been released by the University till date with the motive of increasing the production and productivity of rice in the state. But it has been reported by many researchers that the traditional varieties are still cultivated by the farmers in a large scale in comparison to the High Yielding Varieties of rice. Therefore, it was found necessary to know the farmers' preference of the HYVs over the traditional varieties of rice. The four major agro-ecological situation of Jorhat district were selected purposively for the present study. A total of 120 numbers of respondents was considered as the final sample of the study. To find out the preference of the rice varieties, matrix ranking was carried out with the participation of the farmers. The study revealed that the area under the HYVs was less in comparison to the traditional varieties of rice in the district and it was also revealed that traditional varieties were preferred by the farmers for Ahu, Sali and Bao rice in AES-I & AES-II and although the high yielding varieties were most preferred in AES III & AES IV, but the score range against each criteria of rice was found to be less. Therefore, the government and research wings should take initiatives for refinement of the HYVs and take initiatives to aware the farming community about the benefits of HYVs.

Keywords: Indigenous variety, high yielding variety, agro-ecological situations, farmer's preference, matrix ranking

Introduction

The hilly terraced fields from Kashmir to Assam are idyllically suited for rice farming, with age old hill irrigational conveniences. Rice is an important and highly consumed crop in Assam, which is grown in an area of more than 25 lakh hectares under different agro-ecological situations. The state's rice production during the year 2021-22 was reported to be 52.89 lakh metric tonnes (Statista, 2022) [7]. Modern cultivars continue to replace thousands of traditional cultivars. But despite this, there are also some comments from many scientists in many forums that not more than 30% of the technology developed have found to be used in the farmers' field. Moreover, the production of the crop has dangerously slipped down in the subsequent years due to a number of reasons ranging from a drought like situation to devastating floods. In order to increase the productivity, it is necessary to cultivate High Yielding Varieties of rice on a large scale. But previous studies have reported that the farmers of the state are still continuing the age-old traditional varieties of rice. A study conducted in Karbi Anglong district of Assam concluded that *Maireng*, a traditional rice variety was preferred over the High Yielding Variety named *Ranjit* by the farmers. Assam Agricultural University (AAU) has developed many locations specific varieties. But all these varieties have not been able to grab the attention of the farmers which is a matter of concern for the concerned authorities. Keeping in view of the above facts, the paper attempts to assess the preference of farmers between indigenous and high yielding varieties of rice.

Materials and Methods

The present study was conducted in the Jorhat district of Assam during the year 2021-23. All the four AES (Humid Alluvial Flood Prone, Char Area, Humid Alluvial Flood Free and High Land) were selected for the study so that it gives a clear picture of the rice varieties (both indigenous and HYV) grown under different AES and the farmers' preferences thereof. From the major blocks of each AES, one rice growing village was selected randomly with a total of 4 villages. Thirty rice growers from each village under each AES were selected randomly with a final sample of 120 respondents.

Farmers' preference refers to their choice of rice varieties (both indigenous and HYVs) on the basis of certain attributes. In order to identify farmers' preference of rice varieties, a PRA tool namely matrix ranking was performed with a group of 30 respondents under each AES. Prior to this, Village Mapping was done to assess the existing cropping patterns and the resources availability of the villages. In Village Mapping exercise, the farmers drew their own village map in consultation with one another on a chart paper and the entire process was facilitated by the investigator. After that PRA exercise, matrix ranking was conducted where farmers pointed out some of the criteria of rice and on the basis of their choice, marks were assigned. A catalogue of the prominent HYVs of rice released by AAU that were cultivated by the respondents along with few traditional varieties was kept before them. A list of rice attributes such as yield, market price, fertilizer efficiency, maximum tillering, flood and stress tolerance, duration, disease and pest tolerance etc, were sorted out by the respondents and against each attribute under each type of rice variety, scores were assigned based on their preferences. Scores ranged from 1 to 10 i.e. from lowest to highest respectively and lastly, individual score of each criteria for a particular variety was sum up to get the final score. The final score will reflect the trend of preferences by the farmers. After examining the overall score, ranking was done.

Suppose, five attributes of rice (a1, a2, a3, a4 and a5) against two rice varieties (r1 and r2) were indicated by a group of 30 respondents during the PRA exercise. Now, we have to assess which rice variety among these two is preferred the most by the farmers. For this, matrix ranking was followed and the process was facilitated by researcher. After proper discussion among the respondents, they started assigning individual scores (1-10) against each attributes of these two rice varieties. To get final score of each rice variety, all individual scores gained against

each attribute will be added as:

Total score of r1 = Scores gained (a1 + a2 + a3 + a4 + a5)

Similarly, for r2 rice variety also, total score may be calculated. If total score of r1 is higher than r2, it reveals that the rice variety (r1) is being mostly preferred by the respondents over r2 rice variety. Accordingly, rank 1 and rank 2 will be assigned to r1 and r2 rice varieties respectively. This is depicted in the form of a matrix table as hereunder:

Rice varieties attributes	r1 (1-10 score)	r2 (1-10 score)
a1		
a2		
a3		
a4		
a5		
Total score		

Results and Discussion

Farmers' preference of rice varieties in AES I

The matrix ranking was conducted only to know farmers' choice in *sali*, *ahu* and *bao* rice varieties. The results of the activity have been presented in the tabular form in Table 1 a. It showed the rank wise distribution of the *Sali* rice varieties according to certain traits provided by the farmers in AES I. It was evident from the table that only *Ranjit* was the AAU released HYV of rice which was cultivated by the farmers in AES-I and it was ranked 2nd by the farmers. On the other hand, the traditional variety *Horujahingiya* got the 1st position during the activity for which it was the most preferred variety in AES-I. The study conducted by Khan *et al.* (1999 & 2000) [5] also reported similar findings that most of the farmers go for cultivation of traditional varieties. Both the varieties scored equal for certain attributes like "right growing duration", and "fine grains". Therefore, it is a matter of concern that apart from so many *Sali* rice varieties that had been released by the University, only *Ranjit* was cultivated by the farmers that ranked the second position by the respondents. Therefore, it was necessary to refine the variety by considering the attributes. The reason behind such findings might also be due to the farmers' lack of knowledge about the scientific cultivation practices of the HYVs or due to non-availability of inputs. Therefore, timely supply of HYVs and imparting training in the cultivation practices of such varieties was also recommended to the concerned authorities.

Table 1a: Matrix ranking of *sali* rice (both indigenous and HYVs) in AES-I

Varieties attributes	Horujahangia	Ranjit	Solpona	Borjahangia	Bakhanti
Yield	7	9	6	8	4
Market Price	6	7	6	6	5
Fertilizer Efficiency	10	2	8	7	9
Right growing duration	8	8	7	6	5
Maximum tillering	7	9	6	8	5
Less Milling loss	5	6	7	3	4
Storage	7	8	8	5	6
Fine Grains	6	9	8	3	5
Flood tolerance	8	7	5	4	6
Stress tolerance	7	7	5	6	7
Yield stability	8	7	4	9	6
Pest tolerance	6	6	5	4	5
Total	86 (1 st)	85 (2 nd)	75 (3 rd)	69 (4 th)	67 (5 th)

N.B: Scoring done in 1-10 scale, where '1' denotes the lowest and '10' denotes the highest score

Similarly, the matrix ranking was conducted for the *bae* rice varieties as shown in Table 1b. The widely grown traditional *bae* rice varieties were *Rongabao*, *Tulsibao*, *Negeribao* and *Amonabao*. Among all these varieties *Rongabao* ranked 1st

which was followed by *Tulsi* (2nd), *Panindra* (3rd), *Amona* (4th) and lastly *Negeribao* (5th). It was observed that only one HYV i.e., *Panindra* was cultivated in the area under study which ranked 3rd position.

Table 1b: Matrix ranking of *bae* rice (both traditional and HYV) in AES -I

Varieties attributes	Rongabao	Tulsibao	Panindra	Amonabao	Negeribao
Yield	7	7	5	4	4
Market Price	5	5	4	5	6
Fertilizer Efficiency	10	9	10	8	8
Rightgrowing duration	7	7	8	9	6
Maximum tillering	5	6	6	4	5
Less Milling loss	8	7	5	7	6
Longer Storage	8	6	7	7	8
Standing capacity	9	9	8	8	7
Pest tolerance	6	4	6	6	5
Disease tolerance	5	4	5	4	6
Total	70 (1 st)	66 (2 nd)	64 (3 rd)	62 (4 th)	61 (5 th)

N.B: Scoring done in 1-10 scale, where '1' denotes the lowest and '10' denotes the highest score

Therefore, efforts should be made to refine this variety so that it incorporates all the attributes preferred by the farmers and it may thrive well in any ecological situation. The scientists may also develop new HYVs of rice to overcome the shortcomings of already developed varieties.

The farmers of this AES also cultivated *ahu* rice among which *Herkua*, *Kulaguni*, *Bengena* were traditional varieties and *Lachit* was the only HYV which was cultivated by only few farmers of the village. With the help of the farmers, the matrix ranking for the *ahu* rice varieties was conducted against certain attributes provided by them. The same has been depicted in Table 1c.

Table 1c: Matrix ranking of *ahu* rice (both HYVs and traditional) in AES -I

Varieties attributes	Kulaguni	Lachit	Bengena	Herkua
Yield	9	8	7	6
Market Price	6	6	5	5
Fertilizer Efficiency	9	6	8	9
Right growing duration	8	8	6	7
Maximum tillering	8	7	7	5
Less Milling loss	7	9	8	6
Storage	8	7	9	7
Fine Grains	7	3	5	4
Stress tolerance	6	5	6	8
Tolerant to water logging	4	4	5	6
Yield stability	5	9	8	7
Pest tolerance	7	6	5	4
Total	84 (1 st)	80 (2 nd)	79 (3 rd)	74 (4 th)

N.B: Scoring done in 1-10 scale, where '1' denotes the lowest and '10' denotes the highest score

It was clear from the table 1.c that the traditional variety *Kulaguni* (1st) was preferred the most by the farmers and it was followed by *Lachit* (2nd), *Bengena* (3rd) and *Herkua* (4th). The above results clearly indicated that in case of *ahu* rice, the farmers preferred the traditional varieties over the HYVs. Therefore, it can be assumed that although the HYVs had been developed by AAU, yet there are few attributes which were

necessary to be incorporated or refined for better results in the farmers' field. Hence, measures were to be taken to refine the varieties to bring more area under HYVs.

Farmers' preference of rice varieties in AES II

From AES II, among the HYVs of *sali* rice, *Ranjit* was cultivated by most of them and the rest cultivated only the traditional varieties such as *Huagmoni*, *Solpona*, *Borjahingiya* etc. It was evident from Table 2.a that *Solpona* (1st) was the most preferred rice variety followed by *Ranjit* (2nd), *Huagmoni* (3rd) and *Borjahingiya* (4th).

Table 2a: Matrix ranking of *sali* rice (both HYVs and traditional) in AES -II

Varieties characteristics	Solpona	Ranjit	Huagmoni	Borjahingia
Yield	8	9	8	7
Market Price	6	7	6	4
Fertilizer Efficiency	9	3	10	8
Right growing duration	7	8	8	7
Maximum tillering	8	8	7	6
Stress tolerance	6	7	6	8
Grain size	6	7	5	3
Taste	9	6	7	5
Pest tolerance	5	5	4	6
Disease tolerance	4	6	4	5
Total	68 (1 st)	66 (2 nd)	65 (3 rd)	59 (4 th)

N.B: Scoring done in 1-10 scale, where '1' denotes the lowest and '10' denotes the highest score

It was seen that certain attributes like (fertilizer efficiency, pests and disease tolerance, taste) in growing HYV of rice were not satisfactory. Hence the variety need to be improved by incorporating those attributes

Regarding preferences of *ahu* rice varieties, Table 2.b revealed that the farmers gave their first preference to the traditional variety *Herkhua* (1st) which was followed by *Kulaguni* (2nd), *Bahmuri* (3rd) and the last preference was given to the HYV, *Lachit* (4th).

Table 2b: Matrix ranking of *ahu* rice (both HYVs and traditional) in AES –II

Varieties characteristics	Herkhua	Kulaguni	Bahmuri	Lachit
Yield	7	6	6	6
Market Price	6	6	5	6
Fertilizer Efficiency	9	9	9	5
Right growing duration	7	8	6	7
Maximum tillering	4	6	7	7
Stress tolerance	7	5	6	6
Grain quality	6	5	6	2
Taste	7	7	6	6
Disease tolerance	5	5	4	5
Pest tolerance	5	4	5	5
Total	63 (1 st)	61 (2 nd)	60 (3 rd)	55 (4 th)

N.B: Scoring done in 1-10 scale, where '1' denotes the lowest and '10' denotes the highest score

It was observed from the findings that the scores obtained against some of the attributes (as mentioned in the Table 2.b) in case of *Lachit* were very less as compared to the scores obtained by the traditional variety *Herkhua*. Many HYVs of *ahu* rice had been released by AAU to get better results by the farmers, but the results obtained were quite disappointing. This might be due to lack of awareness about cultivation practices or non-suitability of those varieties in the AES. Therefore, root cause needs to be found out and accordingly measures to be taken for the acceptance of more HYVs by farmers and reap the benefit.

Farmers' preference of rice varieties in AES III: As the

farmers of AES III cultivated only *sali* rice, therefore, the matrix ranking was conducted for the *sali* varieties (both HYV and traditional). As revealed in Table 3, it was found that HYV *Ranjit* was preferred the most by the farmers which were followed by *Mahsuri* (2nd), *Manohar Sali* (3rd) and *Prasad Bhog* (4th). It was observed that the farmers preferred the HYVs over the traditional varieties in the village which was a good sign. These findings are in line with the findings of Chauhan *et al.* (2011) [3] who reported that after successful introduction of HYVs of the paddy, the entire Tapi district of Gujarat has twisted an interest to espouse HYVs in paddy as a replacement for conventional varieties.

Table 3: Matrix ranking of *sali* rice (both HYVs and traditional) in AES –III

Varieties attributes	Ranjit	Mashuri	ManoharSali	Prasad Bhog
Yield	8	7	8	7
Market Price	8	8	6	7
Low input requirement	5	6	6	6
Easy harvesting	8	7	7	7
Maximum tillering	8	7	6	6
Drought tolerance	7	6	6	5
Maximum water holding capacity	8	5	6	6
Cooking qualities	8	8	7	6
Pest tolerance	6	5	5	5
Disease tolerance	7	6	5	4
Total	73 (1 st)	65(2 nd)	62 (3 rd)	59 (4 th)

N.B: Scoring done in 1-10 scale, where '1' denotes the lowest and '10' denotes the highest score

Farmers' preference of rice varieties in AES IV

The farmers of AES IV cultivated only *sali* rice and the land remained fallow till the next rice growing season. Among the *Sali* rice varieties they cultivated the traditional varieties such as *Solpona*, *Manohar Sali*, *Betguti* etc. and HYVs such as *Ranjit* and *Mahsuri*. It was observed in Table 4, that the most preferred

variety was *Ranjit* (1st) followed by *Mahsuri* (2nd), *Manohar Sali* (3rd), *Solpona* (4th) and *Betguti* (5th). It was observed that both 1st and the 2nd rank were obtained by the HYVs. Borthakur *et al.* (2014) [2] and Rahman *et al.* (2022) [6] also reported similar findings that most of the farmers prefer HYV rice over local variety.

Table 4: Matrix ranking of *Sali* rice (both HYV and traditional) in AES –IV

Varieties characteristics	Ranjit	Mahsuri	Manohar Sali	Solpona	Betguti
Yield	9	8	7	7	6
Market Price	9	8	6	6	5
Fertilizer Efficiency	4	5	6	6	6
Right growing duration	8	8	7	7	6
Maximum tillering	8	8	6	7	5
Drought tolerance	7	6	6	6	4
Water holding capacity	7	5	6	6	5
Taste	9	8	6	6	7
Pest tolerance	6	5	6	5	5
Disease tolerance	6	6	5	4	5
Total	73 (1 st)	67 (2 nd)	61(3 rd)	60 (4 th)	54(5 th)

(n=30)

N.B: Scoring done in 1-10 scale, where '1' denotes the lowest and '10' denotes the highest score

The findings revealed that the farmers of the village mostly preferred the HYVs. The variety *Ranjit* got the highest scores in case of the attributes like “yield” (9), “market price” (9), “right growing duration” (8), “maximum tillering ability” (8), “taste” (9), “water holding capacity” (7) and “disease tolerance” (6). The study conducted by Banshidhar *et al.* (2014) ^[1] also reported similar findings that most of the farmers prefers HYV wheat over local variety for high yield. Similarly for the variety *Mahsuri*, the scores obtained against the attributes ranged from 5-8 which is a matter of concern. Therefore, those attributes need to be incorporated. At the same time the farmers were to be inspired for sustain cultivation of the HYVs and to try some other HYVs. Introducing more situation specific HYVs of rice to the farmers and imparting training regarding the scientific cultivation practices, may also increase the spread of the HYVs in the district.

Conclusion

Every year a huge budget is spent on research to develop the improved varieties of rice. A success in the effort will surely add an additional tone of paddy/ha in the state. In the study it was revealed that traditional varieties were preferred by the farmers for *Ahu*, *Sali* and *Bao* rice in AES-I & AES-II and similarly it was observed in AES III& IV that the most preferred variety was the high yielding variety released by AAU.

Policy Implications

Majority of the farmers mentioned that they are not growing HYV of rice due to various reasons. Therefore, it is a matter of concern as the HYVs are not preferred by the farmers. Refinement of the HYVs is found necessary in this regard. Farmers should be trained up to acquire more knowledge regarding the high yielding varieties and the scientific method of cultivating the crops. Government and research wings should take initiatives to aware the farming community about the benefits of HYVs.

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Conflict of Interest

The authors of the paper declare no conflicts of interest.

References

1. Banshidhar, Bhati AS, Sharma SK. Varietal Evaluation of Wheat through On Farm Testing. *Guj. J Ext. Edu.* 2014;25(1):108-109.
2. Borthakur S, Mishra P, Bortamuly D. Farmers' Preference of Rice Varieties based on Varietal Attributes Recommended by Assam Agricultural University, Jorhat. *J Acad Ind Res (JAIR)*. 2014;10(2):556-558.
3. Chauhan NM, Patel AP. Revolutionary change in paddy production through Effective TOT in tribal belt. *Guj. J Ext Edu.* 2011;22(1):59-62.
4. Hakmosa B. Setting research priorities on the agricultural sector for the hilly districts of Assam: An exploratory study. M.Sc. (Agri.) Thesis (Unpublished). Assam Agricultural University, Jorhat, Assam, India; 2011.
5. Khan MA, Chauhan JK, Sharma ML, Sharma PN, Tiwari RK. Disparities in Rice Farming Technology among Tribal and Non-tribal Farming Communities of Chhattisgarh. *Guj. J Ext. Edu.* 1999 & 2000; X & XI:24-31.
6. Rahman MM, Connor JD. The effect of high-yielding variety on rice yield, farm income and household nutrition: evidence from rural Bangladesh. *Agric. Food Secur.* 2022;11(35):2-11.
7. Statista. Volume of rice production in Assam FY 2021-2022. Statista Research Department; c2022. Available from: <https://www.statista.com>