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TECHNOLOGICAL GAPS AND BARRIERS IMPACTING BASMATI RICE CULTIVATION

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ABSTRACT

The investigation was conducted to find out the technological gap between knowledge and adoption level and the constraints faced by the basmati rice growers in Shahjahanpur district of Uttar Pradesh. The data was collected through personal interview schedule from the basmati rice growers. The study was revealed that most of the respondents had high knowledge and fully adopted package of practices with respect to mean percentage score (MPS) of 89.16 and 62.50 about 'land preparation' respectively. On the basis of analysis, highest technological gap was found in 60.00 per cent in use of green manure in basmati rice cultivation, followed by 36.95 per cent in seed treatment, 32.22 per cent in pest and disease management, 31.95 per cent in soil treatment, 31.94 per cent in use of balanced fertilizers and nutrient management. 26.67 per cent in method of application of fertilizers and pesticides, 26.66 per cent in land preparation, 22.22 per cent in harvesting time in basmati rice crop, 18.05 per cent in inter cultivation practices and the 04.28 per cent in in recommended soil in basmati rice cultivation which were the lowest technological gap found in basmati rice cultivation. The study further reveled that the 95.00 per cent of the basmati rice growers were faced constraints related to high prices of pesticides in terms of input constraints, followed by 100 per cent of the basmati rice growers were reported to lack of adequate marketing facilities, 86.66 per cent of the basmati rice growers were reported to not getting subsidy on seeds and chemicals in terms of financial constraints faced in the basmati rice cultivation.

Key words: Basmati Rice, Technological Gap, Constraints

Introduction

Basmati rice is one of the most important varieties of rice production in the country. Basmati, which means "queen of fragrance," is a long grain rice variety known for its fragrance and delicate flavor. It is usually assumed that the Hindi word "Bas" means "aroma" and "Mati" means "full of," therefore the word "Basmati" means "full of aroma." It has been farmed for millennia in a tiny geographical region of the Indian subcontinent, having a documented history of over 200 years. Basmati rice, a long-grained, non-glutinous rice with a beautiful fragrance, is a lovely compliment to any meal. The aroma and elongation after cooling distinguish this rice from other rice kinds. This unique combination of characteristics can't be found in any other rice. Basmati rice has become a delicacy due to its post-cooking extension of more than twice its original length, scent, and sweet taste. Basmati rice is cultivated largely in India and Pakistan. The best basmati varietals are produced in the Himalayan foothills. Rice Tec Corporation of the United States attempted to patent its aromatic rice variety known as 'Basmati'. The Indian government later withdrew its willingness to engage due to intense patent competition. The "Geographical Indication of Goods (Registration and Protection) Act, 1999" (approved by the WTO) protects rice grown in India and prevents anyone from outside India and the Gangetic area from obtaining a patent for basmati protection. Because of the high demand for basmati rice on foreign markets, it is exported. In India, over two-thirds of the basmati rice produced is exported. India produces more than 70% of the total world basmati rice production and the rest is produced by Pakistan. The

production of basmati rice in India is 8.7 million tons from 2.1 million hectares during 2018-19 crop year. India exported 4.4 million metric tons of basmati rice from April 2018 to March 2019 and worth of Rs. 31,025.91 crores during the year 2019-20. (APEDA, 2019) Basmati rice was originated in India and Pakistan; however, India is the world's top producer and exporter of Basmati Rice, accounting for over 70% of global supply. Up to 2015, there were 23 types of basmati rice authorized under the Seeds Act of 1966. Haryana has the most Basmati paddy acreages, accounting for 44 percent of basmati acreages, followed by Punjab (28 percent) and Uttar Pradesh (24 percent). Basmati has a high demand for a premium price due to its distinct characteristics and incomparable aroma. Basmati rice growers never entirely accept basmati rice producing technique in all areas. In this way, they are always limited in their ability to accept recommended technologies. More efforts are needed in the study region as well as around the country to boost production and enhance quality. If we wish to enhance basmati rice production while also improving its quality, we should focus on using approved production techniques. Adequate knowledge of preferred technology is required before innovations may be adopted. The proposed research will assist farmers in overcoming barriers to the adoption of enhanced basmati rice package of practices and export quality.

An attempt will be made to investigate the current state of basmati rice farmers in depth and to find out the technological gap which were based on the current knowledge and adoption level of basmati growers as well as the constraints, they face in terms of basmati production technology. Farmers needs to know the latest information regarding the current researches. Latest high yielding varieties, methods of balanced fertilizer application, method of seed treatment, new techniques of irrigation and the most important new plant protection about to maintain quality and nutritive value of basmati rice.

Materials and Methods

The study was carried out in Uttar Pradesh's Western Zone. In Western Uttar Pradesh the Shahjahanpur district was purposively selected for the investigation based on the maximum basmati rice area and production. Ex – post facto research design was used for the investigation. The two blocks, Dadraul and Tilhar, of the districts were purposively selected for the investigation based on higher basmati rice area and production. From each block four villages were selected purposively; thus, the total 8 village was selected for the investigation. After this prepared a list of basmati rice growers of all selected villages and 15 basmati rice growers were selected randomly from each village for the investigation. Thus, the total sample size of 120 rice growers for the investigation. The investigator himself collected the data from the respondents with the help of pre-tested interview schedule. The collected data were analyzed by using appropriate statistical tools procedures to determine the frequency, percentage, mean, mean average, mean percentage score, standard deviation, and rank order. The technological gap is the difference between the recommended technologies and the adoption of technology use by farmers.

Result and Discussion

The Technological Gap Between Knowledge and Adoption Level with Reference to Package of Practices

The data presented in table 1, shows that the overall technological gap between knowledge and adoption level of respondents was found 23.78 per cent regarding improved cultivation package of practices of basmati rice cultivation, which clearly shows that still there had been a significant gap between the knowledge and adoption level of recommended cultivation practices of basmati crop. Further, analyzed in table 1, concluded that majority

Table 1: Distribution of basmati rice growers according to technological gap. n=120

Sr. No.	Particulars	Know-ledge (MPS)	Adoption (MPS) Gap (%)	Techno-logical	Rank
1.	Use of green manures	82.22	22.22	60.00	I
2.	Soil treatment	43.33	11.38	31.95	IV
3.	Recommended soil	66.94	62.66	04.28	XV
4.	Land Preparation	89.16	62.50	26.66	VII
5.	Nursery Preparation	61.38	51.38	10.00	XIV
6.	Selection of improved basmati rice varieties	65.00	48.88	16.12	X
7.	Seed rate	67.77	54.44	13.33	XII
8.	Seed treatment	44.72	07.77	36.95	II
9.	Seedling trans planting	66.38	53.51	12.77	XIII
10.	Use of balanced fertilizers	56.94	25.00	31.94	V
11.	Method of application	60.83	34.16	26.67	VI
12.	Inter cultivation practices	71.38	53.33	18.05	IX
13.	Irrigation	75.55	61.94	13.61	XI
14.	Pest and disease management	56.94	24.72	32.22	III
15.	Harvesting	80.55	58.33	22.22	VIII
Overall technological gap		**65.93**	**42.15**	**23.78**	

of the respondents had high knowledge and full adopted package of practices with respect to mean percentage score (MPS) of 89.16 and 62.50 about 'land preparation' respectively.

Table 2: Distribution of respondents on the basis of constraints perceived by the growers. n=120

Sr. No.	Problems	F	P	Rank order
A.	**Constraints related to inputs perceived by farmers**			
1.	Non-availability of inputs at village level	98	81.66	II
2.	High cost of seed	93	77.50	III
3.	High prices of chemicals	114	95.00	I
4.	Non-availability of quality seeds and chemicals	55	45.83	V
B.	**Constraints related to production perceived by farmers**			
1.	Low production due to unfavorable weather conditions	55	45.83	III
2.	High weed infestation	70	58.33	II
3.	Attack of drought prone plant disease	40	33.33	IV
4.	Attack of insects-pests	100	83.33	I
C.	**Constraints related to technical guidance perceived by farmers**			
1.	Lack of guidance at sowing time by extension worker	45	37.50	III
2.	Lack of guidance about recommended doses of chemicals and their application techniques	48	66.66	I
3.	Lack of proper knowledge about irrigation schedule	46	38.33	II
D.	**Constraints related to marketing perceived by farmers**			
1.	Low price of produce in spite of export-oriented food grain	100	83.33	II
2.	Lack of minimum support price	80	66.66	V
3.	Wide fluctuation in prices	79	65.83	VI
4.	Lack of marketing facilities in village	120	100	I
5.	Lack of marketing knowledge & intelligence	73	60.83	VI
6.	More interfere of middle man	90	75.00	III
7.	High market charges for sieving, cleaning, loading and unloading of produce	88	73.33	IV
E.	**Financial constraints perceived by farmers**			
1.	No subsidy on seed and chemicals	104	86.66	I
2.	Credit facility not available on low interest rate	83	69.16	II
3.	Inadequate credit facilities for purchase of inputs	74	61.66	IV
4.	Other	75	62.50	III

"F= Frequency, P= Percentage"

On the basis of analysis, highest technological gap was found in 60.00 per cent use of green manure in basmati rice cultivation, followed by 36.95 per cent in seed treatment, 32.22 per cent in pest and disease management, 31.95 per cent in soil treatment, 31.94 per cent in use of balanced fertilizers and nutrient management, 26.67 per cent in method of application of fertilizers and pesticides, 26.66 per cent in land preparation, 22.22 per cent in harvesting time in basmati rice crop, 18.05 per cent in inter-cultivation practices, 16.12 per cent in improved basmati rice varieties, 13.61 per cent in irrigation, 13.33 per cent in seed rate of basmati rice, 12.77 per cent in seedling transplanting per hill, 10.00 per cent nursery preparation, 04.28 per cent recommended soil in basmati rice cultivation.

To Find Out Constraints Faced by the Basmati Rice Growers in Quality Basmati Rice Cultivation

The data presented in table 2, depicts that the constraints faced by the basmati rice growers in cultivation of basmati rice were divided into five sections, i.e., Input constraints, Production constraints, technical constraints, Marketing constraints and financial constraints. Considering the ranking major 'input related constraints perceived by the farmers' were: High prices of chemicals (I) and non-availability of inputs at village level (II). Major 'production related constraints' perceived by famers were: Attack of insects-pests (I) and high weed infestation (II). Major 'technical guidance constraints' perceived by farmers were: Lack of guidance about recommended doses of chemicals and their application techniques (I) and lack of proper knowledge about irrigation schedule (II). Major constraints related to 'marketing perceived by farmers' were: Lack of marketing facilities in village (I) and Low price of produce despite export-oriented food grain (II). Constraints related to 'financial constraints perceived by farmers' were: no subsidy on seed and chemicals (I) and Credit facility not available on low interest rate (II).

Conclusion

It may be concluded that the highest technological gap was found between knowledge and adoption in use of green manures in basmati rice cultivation while lowest technological gap found in recommended soil in basmati rice cultivation. It may also conclude that the most of the basmati rice growers were faced input related constraints which were high prices of pesticides and chemicals and the lack of adequate marketing

facilities in villages.

Conflict of Interest

This is to declare that there is "No conflict of interest" among researcher.

References

Bhabhor, G. K., Patel, U. M. and Makwana, N. D. (2017). Factors affecting the technological gap of tribal wheat growers; *Guj. J. Ext. Edu.,* **28 (1):** 90-92

Burman, U., Pathak, K., and Kalita, M. K. (2000). Analysis of technological gap in ahu rice cultivation in Assam, *Annals of Agri Bio Research;* **5(2):** 195-197

Chaudhary, K.M. (2014). Technological gap in adoption of improved cultivation practices by Maize growers. M.Sc. (Agri.), Thesis (Unpublished), AAU, Anand

Harshitha, M., and Das, E. P. K. (2018). Technology adoption gap in paddy in West Godavari district in Andhra Pradesh, *Journal of Pharmacognosy and Phytochemistry;* **7(6):** 1296-1299.

Iqbal, S., Kumar, S. S., Singh, A., (2016). A study on knowledge level and constraints faced by paddy growers of Jammu district of J&K, *Agro-Economics*; **3(1):** 31-35.

Jaiswal, P. K. and Sharma, P. N. (1990). Constraints in adoption of improved technology of rice; *Maharashtra J. Ext. Edu;* **9(2):** 341-343.

Jatapara, A. C., Soni, N. V. and Vyas, B. H. (2017). Constraints faced by the gram growers in adoption of improved cultivation practices of gram crop; *Guj. J. Ext. Edu.*,**28(1):** 152-154

Kumar, Nimit, Singh, S.P., Bhat, Anil, Parihar, Poonam and Singh, Harminder (2014). Constraints faced by the farmers in basmati rice production and marketing in Jammu district of J&K state, *New Agriculturist;* **25(2):** 169–173.

Kumar, V., Khalache, P. G., and Gaikwad, J. H (2008). A study of the extent of technological gap in adoption of paddy cultivation technology by the respondent paddy growers of Sitamarhi district of Bihar state and their suggestions, *Agriculture Update*; **3/4(3):** 290-292.

Marak, B. R. and Bandyopadhyay, A. K. (2015). Analysing the factors contributing towards technological gap of scientific rice cultivation in west Garo Hills district of Meghalaya *Journal Crop and Weed;* **11(1):** 124-127.

Pandey, J. and Singh A. (2012). Opportunities and constraints in organic farming: An Indian perspective, *Journal of Scientific Research Banaras Hindu University, Banaras;* **5(6):** 47- 72.

Parikh, A. H., Soni, N. V. and Chaudhari, J. K. (2015). Technological Gap in Adoption of Improved Cultivation Practices by Soybean Growers; *Guj. J. Ext. Edu.,* **26(2):** 192-194

S. Sabi, K. V. Natikar and S. L. Patil (2014). Knowledge and technological gap in adoption of recommended cultivation practices in wheat. Karnataka, *J. Agric. Sci.,* **27 (4):** 485-488

Salunkhe, S., Timbadia, C. K. and Lad, A. N. (2019). Constraints faced by tribal farmers in adoption of paddy production technology in Tapi district of south Gujarat, *Guj. J. Ext. Edu. Special Issue on National Seminar,* 130-131

Sharma S., Sharma B.K., Singh S.P., and Kumar, S. (2008). Factors responsible for productivity gap in rice, *Progressive Agriculture*; **2(8):** 160-164.

Sharma, K., Dhaliwal, N. S. and Kumar, A. (2015). Analysis of adoption and constraints perceived by small paddy growers in rice production technologies in Muktsar district of Punjab state, India. *Indian Research Journal of Extension Education*, **15(2):** 20-23

Singh S., and A. C., Lall (2001). Studies on technological gaps and constraints in adoption of weed management practices for rice-wheat cropping system, *Indian Journal of Weed Science;* **3&4(33):** 116-119.

Singh, D., Chahal, P. K., and Ghanghas, B. S. (2020). To ascertain the technological gap in rice production technology in Haryana, *Annals of Biology;* **36 (3):** 494-496.

Singh, J. P., Hussain, H. I., Sharma, A. K., Singh, R. P. and Singh, R. K. (2000). Reasons for technological gap of paddy cultivation in respect of soil-technology among small and marginal farmers, *Journal of Agricultural and Scientific Research*; **36(1):** 57-59

Singh, M. (2011). Yield gap and production constraints in rice-wheat system: scenario from eastern Uttar Pradesh, *Bangladesh J. Agril. Res.*, **36(4):** 623-632.

Singh, P. K., and Varshney, J. G. (2010). Adoption level and constraints in rice production technology, *Indian Res. J. Ext. Edu.*, **10(1):** 91-94

Verma, S. (2009). A study on knowledge and adoption of organic farming practices in paddy cultivation among the tribal farmers of Kanker district (C.G.). M.Sc. (Ag.) *Thesis*, IGKV, Raipur (C.G.).