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Research Paper

An analysis of extend of adoption vis-à-vis technological gaps in adoption of recommended practices of maize in district Ganderbal- J and K

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ABSTRACT

The reasons for low productivity of maize at all fronts in Kashmir Valley for almost all Districts including district Ganderbal despite the efforts being made through scientific interventions, trainings, demonstrations coupled with extension services. A noble idea was conceived by undertaking a research study entitled, "A Study on Technological Gaps in Adoption of Recommended Practices of Maize Cultivation in District Ganderbal" to assess the level of knowledge and extend of adoption of the scientific recommendation of maize production (developed through package of practices) so as to draw certain inferences and to arrive at some conclusion. The study reveals that 54.00 per cent of the respondents had medium level of adoption with an average score ranging from 9-13. The average adoption index for all 17 major activities was found to be 20.17 per cent while the average technological gap index was estimated at 79.83 percent. The respondents were also divided into three categories as 'Fully adopted', 'partially adopted' and 'not adopted' and scores for individual respondent-wise and activity-wise were also summarized. Besides, broad based activity- wise 'average adoption index' and 'Technological gap index' of the respondents was also calculated. For "Land preparation and sowing", the average adoption index and average technological gap index was found to be 23.22 per cent and 76.78 percent respectively. Likewise, for 'nutrient management' it was found to be 15.02 per cent and 84.98 per cent respectively. Similarly, the 'average adoption index' and 'Technological gap index' for 'plant protection measures' was found to be 4.56 per cent and 95.44 per cent while in case of 'irrigation & weeding', the average adoption index and average technological gap index was found to be 28.00 per cent and 72.00 percent respectively.

Key words: Adoption, Technological gap, Package of Practices

The current situation demands that foodgrain production has to be doubled by 2050 in order to meet the needs of the expected population of 1.80 billion. The United States produces more than 35% of the world's maize harvest followed by China with 21 per cent, while India accounts for 2 per cent of the global production, rest of the world including Brazil, Mexico, and Argentina contribute about 24 per cent of the total maize production (CGIAR Research programme on Maize- 2018). Maize is the third most important cereal crop in the world and is called the 'Queen of Cereals' because of its several uses such as grain, feed, fodder, green cobs, sweet corn, baby corn, popcorn, starch and many other industrial products. The importance of corn is due to its wide diversity of uses. It is used both as food for human and feed for animals. India's population is likely to reach 1.5 billion by 2030, the challenge facing the country is to produce more and more form diminishing per capita arable land limited water resources (Swaminathan, 2009). In India Maize is the third largest produced and consumed cereal crop after rice and wheat, however, National average yield of maize is quite low about 1.6 tonnes per ha as compared to world's total of 4.3 tonnes ha^{-1}. Punjab, Himachal Pradesh, Rajasthan, Uttar

Pradesh, Madhya Pradesh, Bihar, Gujarat, Andhra Pradesh and Karnataka are major maize growing states. Karnataka with an average productivity of 3 tonnes per hectare is the leading state in case of maize. Since ages, maize in Jammu & Kashmir being a staple cereal and will continue so because more than three fourth of the land remains rained.

In Jammu & Kashmir maize is cultivated on an area of 315.8 thousand hectares mostly as a Kharif crop with production of 633.2 thousand tonnes with average productivity of 20 Quintals per hectare (Anonymous, 2017). Maize is the only alternative crop to rice in conditions of low and erratic rainfall pattern. Maize crop in Jammu & Kashmir is followed by wheat or sometimes by toria or barley and mustard or by some fodder crop. The leading districts include Kupwara (18.74 thousand hectares), Baramulla (20.14 thousand hectares), Budgam (7.28 thousand hectares), Anantnag (11.14 thousand hectares) Bandipora (6.62 thousand hectares) and Ganderbal (4.01 thousand hectares) (Anonymous, 2017). It is pertinent to The average yield of maize in the world during 2016-17 was recorded at 5722 Kgs/ha in comparison to 2630 Kgs /ha in India during the same period reflecting a very significant and vast yield difference. While, J&K recorded an average yield of 1833 Kgs /ha during 2016-17 reflecting a significant yield difference of 43. 48 per cent in comparison to the national yield. Further, the average yield of maize during aforesaid period in Jammu Division was estimated at 1959.88 Kgs/ha while it was recorded at 1454.30 for Kashmir Division indicating a yield difference of about 34.76 per cent between the two regions. (Crop Estimation Survey -2019) There are obvious reasons for low production and yield. However, one of the most important reason appears to be the non-adoption of scientific recommendations / package of practices by farmers. Knowledge and awareness regarding the value and worth of scientific practices needs to be given to the farmers. Sharma *et al.* (2015) observed that farmers with higher or medium level of education can be easily motivated for adoption of recommended practices. Likewise, *Jayabhaye* (2014) in his study on technological gap in adoption of recommended practices of maize cultivation revealed income as of the factor for adoption. *Ugwumba and Okechukwu* (2014) while studying adoption of maize production technologies concluded that land holding had a significant influence on level of adoption. Adoption of package and practices was observed for obtaining higher yield levels, however, majority of the farmers still follow the traditional practices. *Ali-Olubandwa et al*. (2010) in his study on adoption of improved maize production practices among small scale farmers reported that only 20.90 per cent of the respondents had high adoption of package of practices.

MATERIALS AND METHODS

For the present study, District Ganderbal was selected purposively wherein Maize is the second largest crop in the district with an area of about 4373 hectares accounting for about 21.29 percent out of total area under cereal crops (20533 ha). Further, the average yield of maize crop in district Ganderbal accounts for 1751.37 Kgs / hectare which is at par with other important maize growing districts of the Valley including Baramulla (1460.12 kgs/ha), Anantnag (1342.10 Kgs/ha) and Kupwara (1311.90 Kgs/ha) indicating a greater potential to reach to a more desired productivity levels provided efficient Research / Extension services are made available to the end-users. While three Blocks were selected purposively based on the maximum acreage under maize and from each Block 05 villages were selected randomly making a total of 15 villages. Further, from each village ten respondents were selected making a total of 50 respondents from a block and 150 respondents in total from three blocks for the present study.

Socio-personal, socio- economic, socio-psychological and communication characteristics were taken as 'Independent variable' while Extent of adoption of recommended maize production technology by the maize growers was considered as 'Dependent variable' for the present study. Package of practices by SKUAST-Kashmir formed the core area of the schedule to develop tests for measurement of knowledge, adoption and technological gaps. For adoption vis-a-vis technological gaps as many as 17 statements comprising of major practices in complete harmony with the given package of practices were put forward for the present study. Further, the adoption levels were also assessed in terms of broad-based activity-wise parameters on the basis of various interventions / activities being carried out for maize crop.

RESULTS AND DISCUSSION

To determine the level of adoption of recommended practices for maize, a set of seventeen (17) statements starting from land preparation up to harvesting were prepared and administered. Each statement was sub-divided into three groups with Full adopted (F.A), Partial adopted (P.A) and non-adopted (N.A). A score of two (02) was given for Full adoption, one (01) for partial adoption and zero (0) for non-adoption of each statements.

The overall adoption level of the respondents was calculated by application of 'Adoption Index 'formula given as under:

$$\text{Adoption Index} \quad \frac{\text{Score obtained by respondent (s)}}{\text{Total score possible}} \times 100$$

Since a set of 17 statements regarding Adoption were administered, therefore, the total score possible for a particular statement was 03 and for all seventeen statements the total score possible was 51. Accordingly, the total score for each item and each respondent was summarized and the results are highlighted and given under Table-1:

Table -1: Level of adoption of recommendation practices of maize production /overall adoption

S. No	Category	Criterion (Score)	Frequency	Percentage (%)
1	Low	Up to 9	59	39.33
2	Medium	9 to 13	81	54.00
3	High	Above 13	10	6.67
Total			**150**	**100.00**

A keen observation of the data presented in Table -1 reveals that majority (54.00 %) of the respondents obtained an adoption score ranging from 9 to 13 and, therefore, qualified for medium level of adoption category. It was further observed that 39.33 % of the respondents scored up to 9 and thus formed low level of adoption category while 6.67 % of the respondents had score more than 13 and formed high adoption level among the respondents Consequently, the adoption index of all the respondents was calculated individually and overall mean average as well. The results thus obtained are given herewith at Table-2:

Table -2: Overall 'Adoption index' and 'Technological gap index' of the respondents

No of statements put forward for adoption	Max. score possible	Avg. adoption score obtained	Avg. adoption (% age)	Avg. technological gap index (% age)
17	51	10.29	20.17	79.83

Table -3: Activity-wise adoption index of the respondents

S. No	Activity /Practice	Adoption index (% age)
1	Land preparation	24.67
2	Time of sowing	58.67
3	Use of SKUAST released /HYVs	5.78
4	Seed rate	34.00
5	Seed treatment with chemical	3.56
6	Spacing	14.67
7	Application of FYM	40.22
8	Application of N (in split doses)	21.56
9	Application of P	6.00
10	Application of K	4.00
11	Application of ZnSo4	3.33
12	Thinning	34.67
13	Weeding	39.11
14	Irrigation	10.22
15	Insect /pest control	5.33
16	Disease control	3.78
17	Stage of harvesting	33.33
	Average adoption index (% age)	**20.17**

Regarding the adoption and technological gap assessment, the data given in the Table- 2 reveals that while 17 statements were administered to the respondents for various activities with a maximum score of 3 for a particular intervention, the average adoption score obtained by the respondents for all the interventions was estimated to be 10.29 while the adoption was calculated at 20.17 per cent. Similarly, the overall adoption gaps for the given intervention were observed to be as high as 79.83 per cent.

Further, an attempt was also made to assess the adoption index separately for all the given interventions and the results formed so are given under Table-3:

The data given under the Table-3 indicated that so far adoption index of the respondents was observed significant in case of activities including time of sowing, application of FYM, thinning /weeding. While case of activities viz: seed treatment, application of chemical fertilizers, disease control the adoption index was found very low reflecting a wide gap between farmers practice and that of recommended practices.

CONCLUSION

Regarding level of adoption of recommended practices of maize respondents, 54.00 per cent of the respondents had medium level of adoption with an average score ranging from 9-13. The average adoption index for all 17 major activities was found to be 20.17 per cent while the average technological gap index was estimated at 79.83 percent. Therefore, the investigation demands to increase the average adoption index, thereby, reducing the technological gaps in maize production. This is possible through various interactions, farm visits, demonstrations and other extension activities. While we will be able to increase the knowledge index of the respondents, it is expected to facilitate the adoption of practices to a desired level.

REFERENCES

Ali-Olubandwa, M.A. Odera-Wanga, D., Kathuri, N.J. and Shivoga, W.A. 2010. Adoption of improved maize production practices among small scale farmers in the agriculture reform era: The case of western province of Kenya. *Journal of International Agriculture and Extension Education,* **17**: 21-30.

CGIAR Research Programme on Maize Annual Report -2018 (*https://repository.cimmyt.org/*).

Crop Estimation -2019-20, Department of Agriculture & Farmers Welfare, GoJK.

Jayabhaye, P.M. 2014. Technological gap in maize cultivation. M. Sc. (Agri.) Thesis (Unpub.) Dr. PDKV, Akola.

Sharma, K., Dhaliwal N.S. and Ajay K. 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 and Education,* **15**:20-23.

Ugwumba, C.O.A. and Okechukwu, E. O. 2014. Adoption of improved maize production technologies in Enugu state, Nigeria. *International Journal of Agriculture Innovations & Research,* **3**: 259-261.