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Research and Extension Gaps of Paddy Yield in Raigad District of Maharashtra State

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Abstract: Paddy is the staple food for the Indian population and plays a vital role in development of national economy. However, the yield level of paddy at the farmers filed level and in Front Line Demonstration fields is not on par with potential yield. There are research and extension gaps which need to be bridged to increase paddy production and productivity, to improve the efficiency of land and labor use, reduce production costs and increase the food security. The objectives of this study were to assess the research and extension gap in cultivating paddy through need based technological interventions. A total two interventions were used and were purposively selected to ascertain the research and extension gaps. The results reveal that both research and extension gaps are still prevalent with reference to the selected technological interventions. The extension gaps at the farmers field level is significantly high and is sending alarming signal to the scientific community to move the things in the right directions by guiding the farmers towards the adoption of these interventions on a scientific scale.

Keywords: research, extension, gap, paddy

INTRODUCTION

Paddy is the staple food crop for the Indian population. This crop plays an important role in the national economy of the country, yet many paddy cultivating farmers live below the poverty line. Most resource-poor farmers are forced to use their limited resources to produce adequate food for their family, leading to the degradation and reduction in potential of these resources. in order to achieve national food security, high yielding and hybrid varieties have been produced to increase the paddy production to reach self-sufficiency. However, the yield level of paddy varieties at the farmers filed level and in Front Line Demonstration (FLDs) fields is not on par with potential yield. The gap between potential yield and yield realized in FLDs refers to the Research gap and the yield gap between FLDs and due to farmers practice refers to the Extension gap. Earlier studies conducted in India in general and Andhra Pradesh in particular have highlighted the existence of both research and extension gaps with reference to the paddy. This gap can be conveniently classified into agronomic gaps, socio-economic gaps, institutional gaps and mixed gaps according to the nature of constraints in realizing the true benefits of technological interventions. Bridging these gaps is essential not only to increase paddy production and productivity, but also to improve the efficiency of land and labor use, reduce production costs and increase the food security. It is essential that, the narrowing of both research and extension gaps is not static, but dynamic considering the influence of technological interventions in boosting the paddy yields at FLDs level and at farmers field level and also with the improvement of the yield

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protentional of paddy varieties. This calls for integrated and holistic approaches, to address these two gaps through appropriate policy intervention, understanding of farmers actual constraints to higher yield of paddy, deploying new proven technologies for raising paddy production and adequate institutional support to farming community.

Keeping this in view the researchers finalized this study with specific objectives to assess both research and extension gaps in cultivating paddy through executing need based technological interventions.

METHODOLOGY

In view of the crucial significance of paddy crop in heavy rainfall area, Krishi Vigyan Kendra, Killa- Roha Dist. Raigad (M.S.) conducted Front Line Demonstrations (FLDs) in their operational area, the same was considered for this study in assessing both research and extension gaps in paddy cultivation. The data regarding Front Line Demonstrations (FLDs)in paddy conducted during the year 2012-13 to 2021-22 in the farmers field practicing paddy cultivation was collected. There are two technological interventions use by KVK Raigad and same were selected to ascertain both research and extension gaps. Primary information forms the data base and data on various parameters like use of variety, fertilizer management, cost of cultivation, FLD yield data, yield at farmers' fields, MSP of paddy etc. for the selected FLD period were collected.

Table 1: Selected technological interventions

Priority area	*Technological intervention*
Component	Improved variety
Whole package	Total production technology

RESULTS AND DISCUSSION

To ascertain the gaps in the adoption of selected technological interventions at the farmers level. The yield obtained by the farmers (of their own practice) are compared with the potential yield of the crop and the yields realized from the FLDs conducted in the farmers field. It is a known fact that, the potential yield of the variety under any type of technological interventions cannot be realized at farmers field level and even at the FLDs conducted by the scientific community at the field level. This variation might be due to change in the agronomic conditions, differences in managerial abilities across the farmers, farm infrastructural facilities available at different locations, soil heterogeneity etc.

However, the review of the past studies in Kurnool District of Andhra Pradesh revealed a disappointing picture regarding the wide disparity in yield of paddy with reference to FLDs and farmers' practices, when compared with the potential yield of selected variety. Here, this study was attempted to analyze both research and extension gaps in executing two interventions in cultivating paddy in Raigad district of Maharashtra state and the results are shown in Table 2 and Table 3.

The farmers are still going for traditional varieties instead of improved one. Informal discussion with farmers revealed that, they are preferring these varieties which are suitable for consumption and for poha making besides their low yield and high pest and disease resistance characters. Keeping these aspects in view, the Konkan Agricultural University had developed and released several paddy varieties for cultivation in Konkan region which are good for consumption, high yielding, resistance to pest and diseases and suitable to agroclimatic situations. To promote these varieties among the farming community, the KVK Raigad conducted several FLDs in the farmers field, as these demonstrations reflects the true picture of the varietal yield over local one. A close perusal of Table 2 reveals that there is 4.60 q/ha to 8.50 q/ha research gap and 3.80 q/ha to 9.11 q/ha extension gap while using improved variety. There exists a significant research gap even in the improved variety used FLDs and this is due to the biological constraints such as weeds, imbalanced use of fertilizers, pest and disease infestation, problematic soils, etc. As expected, the extension gap is more than the research gap and this is because of socio-economic constraints of farmers like inadequate credit availability etc. The results are similar to the results of Narayan Rao *et al.* (2012), Meena M L and Singh D (2017) and Lydia Zimik *et. al.* (2020). Proper

Table 2: Technological intervention- Improved variety

Year	Variety	Potential yield (q/ha)	Yield (q/ha)		Cost of cultivation (Rs./ha)		Gross return (Rs./ha)		Net return (Rs./ha)		Increase in net return over FP(Rs./ha)	Research gap (q/ha)	Extension gap (q/ha)
			FLD	FP	FLD	FP	FLD		FLD	FP			
2012-13	Karjat 3	45	36.50	28.20	37500	32000	45625	35250	8125	3250	4875	8.50	8.30
2013-14	Karjat 5	45	39.30	33.50	40500	38000	51483	43885	10983	5885	5098	5.70	5.80
2014-15	karjat 6	40	33.40	29.60	38200	38000	45424	40256	7224	2256	4968	6.60	3.80
2015-16	karjat 7	50	40.50	34.20	43700	40300	57105	48222	13405	7922	5483	9.50	6.30
2016-17	Karjat 8	40	34.50	30.20	44500	40600	50715	44394	6215	3794	2421	5.50	4.30
2017-18	karjat 9	50	43.25	34.14	48000	42200	67037	52917	19037	10717	8320	6.75	9.11
2018-19	Ratnagiri 5	38	33.20	29.50	48100	42000	58100	51625	10000	8625	1375	4.60	3.70
2019-20	Ratnagiri 6	45	40.30	33.50	57000	48350	73144	60802	16144	12452	3692	4.70	6.80
2020-21	Ratnagiri 7	50	42.50	34.63	60000	50000	79380	64688	19380	14688	4692	7.50	7.87
2021-22	Karjat 3	45	38.20	30.20	62000	50000	74108	58588	12108	8588	3520	6.80	8.00

* Gross return based on MSP for the particular year of production

Table 2: Technological intervention- Total production technology

Year	Variety	Potential yield (q/ha)	Yield (q/ha)		Cost of cultivation (Rs./ha)		*Gross return (Rs./ha)		Net return (Rs./ha)		Increase in net return over FP(Rs./ha)	Research gap (q/ha)	Extension gap (q/ha)
			FLD	FP	FLD	FP	FLD	FP	FLD	FP			
2012-13	Karjat 3	45	43.40	35.90	39800	35000	54250	44875	14450	9875	2575	1.60	7.50
2013-14	karjat 5	45	42.30	35.50	42300	41200	55413	46505	13113	5305	7808	2.70	6.80
2014-15	karjat 6	40	35.20	30.00	41400	38000	47872	40800	6472	2800	6672	4.80	5.20
2015-16	karjat 7	50	44.40	38.80	48000	45600	62604	54708	14604	9108	1266	5.60	5.60
2016-17	Karjat 8	40	36.10	32.60	48000	45000	53067	47922	5067	2922	3145	3.90	3.50
2017-18	karjat 9	50	44.60	36.00	52300	48100	69130	55800	16830	7700	9130	5.40	8.60
2018-19	Ratnagiri 5	38	36.40	29.00	52400	47300	63700	50750	11300	3450	2250	1.60	4.20
2019-20	Ratnagiri 6	45	42.80	34.20	60500	55400	77682	62073	17182	6673	6879	2.20	6.60
2020-21	Ratnagiri 7	50	44.75	36.10	66000	58200	83593	67435	17593	9235	9172	5.25	8.65
2021-22	Karjat 3	45	43.14	36.52	67000	59600	83691	70848	16691	11248	7443	1.86	6.62

* Gross return based on MSP for the particular year of production

planting method, balanced nutrition, promotion of farm mechanization, weed management and pests and disease management in paddy crop is gaining more significance, as it directly influences the output of paddy, minimization of costs. In the second technological intervention of FLD programme, all above aspects were considered along with improved variety. A data presented in Table 3 reveals that there is 1.60 q/ha to 5.60 q/ha research gap and 3.50 q/ha to 8.65 q/ha extension gap found while using total production technology intervention in the reporting period. The results are dissimilar with the results of **Mubark and Shakoor (2019).**

It is disheartening to note that, in spite of several recommendations offered by the scientific community the farmers are still going for higher dose of fertilizer application, no proper weed and pest management. The high cost of cultivation and low net returns in farmers field as well as in FLDs, points out the full exploitation of machinery usage efficiency is not realized. Of course, this research gap cannot be attributed due to inefficiency of machinery usage only, but due to sub-divided and fragmented land holding of the farmers.

However, the extension gap at the farmers level with reference to this technological intervention is significantly high, highlighting the indiscriminate use of fertilizers especially urea fertilizer by closely observing the neighboring farmers practice. The scientific community executed FLDs highlighting the comparison between weeding by herbicides and weeding by human labour, but the farmers are still going for manual weeding even at higher labour costs. Also, the scientific community has been recommended the farmers to go for IPM technology in paddy cultivation. But it was observed that, the farmers are spraying chemical fertilizers indiscriminately and this is adversely influencing the economics of crop production.

A close review of above technological interventions reveals that, the extension gaps at the farmers field level is significantly high and is sending alarming signal to the scientific community to move the things in the right directions by guiding the farmers towards the adoption of these interventions on a scientific scale.

CONCLUSION

The above results reveal that, both research and extension gaps are still prevalent with reference to improved variety and production technology intervention, though the scientific community and other stakeholders have been actively involved in disseminating the importance of these interventions to the farmers. It is high time now for the farmers to adopt these interventions on scientific scale to minimize the extension gap to the extent possible. The enabling environment in the country is encouraging the farmers in providing them the requisite interventions in crop production with relevant policy instruments in the form of subsidized inputs, ample power supply, credit at concessional rates of interest, constructing irrigation projects etc.

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