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Technological Gap in Adoption of Improved Paddy Cultivation Practices

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A B S T R A C T

The aforementioned study was conducted in Navsari and Surat districts of South Gujarat during the year 2014-2016. The primary data was collected from 100 respondents by personal interview method using structure interview schedule. After the analysis of the data, it was observed that, majority of the paddy growers (85.00 %) belonged to medium level of overall technological gap category. 75.00 per cent gap was found in adoption of recommended herbicide in transplanted field and least gap (24.00 %) was found in case of adoption of recommended variety. Socio-economic variables associated with the respondents, such as risk orientation, scientific orientation, education, annual income and mass media exposure, extension participation, extension contact and social participation were negatively and significantly associated with the overall technological gap. The above results compel the research and extension system to work on the gaps and negative relationship in a pragmatic way.

Introduction

Agriculture the engine of Indian social heritage and rural economy, having been aiding as a major source of rural employment and national food security. Rice (*Oryza sativa L.*) is considered as a first cultivated crop of Asia. India positions second with 154.6 million tonnes of paddy next to China (FAO, 2015). With the world population projected to about 8.2 billion in the year 2030, the global rice demand will rise to approximately 765 million tonnes (FAO, 2014). Since the Green Revolution, the rice yield growth rate has declined to 1.1 per cent (Riveros and Figures, 2000). As far as average yield per hectare is concerned, Korea Republic ranks first (5200 kg/ha) and that of India is only 2424 kg/ha (Anonymous, 2014a). Rice, in addition being a major source of dietary energy, constitutes a natural medicine used mainly as a popular medication. The average yield in the districts under study Navsari & Surat is 3600 kg per hectare & 3650 kg per hectare, respectively. It is observed from the yield of paddy, the average yield at national level is 2424 kg per hectare and the average yield of rice of Gujarat state is 1500-1800 kg per hectare (Mehta *et al.*, 2010). Similarly, Paddy yield instability is being reported and it can be reduced by more investment on research leading to evolving of suitable rice production technology for varied agro climatic conditions of the Gujarat state. It is because of the poor productivity of this fragile ecosystem that brings down the total productivity (Narendra

et al., 2014). Some of the studies reported higher technological gap in case of winter rice in comparison to other cereals (Sharma, 2012). It is clear with the above background information that gap exist in adoption of the technology which negatively influences the production and productivity of the crop. Thus present study was undertaken. The outcome of the study is expected to contribute the extension personnel and policy planners in developing Strategic Research and Extension Plan (SREP) for the study area, and reduce the identified gaps in paddy production technology. With this premise the above study was undertaken with following specific objectives,

To know the technological gap in adoption of improved paddy cultivation practices

To ascertain the relationship between the technological gap and selected independent variables

Materials and Methods

The Ex-post-facto-research design was applied for this study and Navsari and Surat districts of South Gujarat region was locale of the study. There are seven districts in South Gujarat region out of those Navsari (3600 kg/ha), (Anonymous, 2014b) and Surat district (3650 kg/ha) (Anonymous, 2014c) were selected purposely as they are having highest productivity of paddy among all the seven districts. Form each selected district one taluka was selected following simple random sampling. Likewise from each selected taluka five villages were selected. In this way, total ten villages were selected for this study; from each village ten respondents (paddy growers) were selected randomly. A total of 100 respondents were interviewed for data collection. Personal interview method was followed to seek information, using structured interview schedule. Technological gap had been conceived as the difference between the packages of practices of paddy cultivation recommended by of Navsari Agricultural University and the extent of adoption of selected recommended practice at farmer's field level.Under each of the selected major practices, sub-practices were identified. The Gap for each major practice was calculated by deducting the number of sub practices adopted by the respondents from the total number of sub-practices adopted by the respondents. The per cent technological gap for each major practice and for the whole package, were worked out with help of following formula

$$\text{Technological gap} = \frac{\text{No. recommended practices - No. adopted practices}}{\text{No. recommended practices}} \times 100$$

$$\text{Mean technological gap} = \frac{\text{Total gap for all practices considered}}{\text{No. practices considered}} \times 100$$

$$\textbf{Technological gap} = \frac{\textbf{S} - \textbf{A}}{\textbf{A}} \times 100$$

Here S= Standard score (Total number of respondents), A=Actual score.

On the basis of overall technological gap, the respondents were grouped into three categories considering the mean and standard deviation as measure of check.Correlation between overall technological gap and selected independent variables was computed. The data was analyzed and results were interpreted accordingly.

Results and Discussion

Socio-economic profile of the respondents

Socio-economic status of the respondents is an important and integral part of any social science research. The profile study reveals that, half of the respondents (50.00 %) belonged to middle age category, majority of the respondents (58.00 %) had education up to the secondary level of education, 90.00

percent respondents were having medium (6 to 15 years) to high level (Above 15 years) of farming experience, 54.00 percent of them had medium (2 to 5 Acres) land holding, with 61.00 percent belonging to low income category (Rs. 50,001/- to 1,00,000 /-), more than 70.00 percent respondents belonged to medium categories in following variables, material possession (70.00 %), mass media exposure (73.00 %), risk orientation (80.00 %), social participation (77.00 %). 55.00 percent, 53.00 percent and 44.00 percent of respondents belonged to medium categories of scientific orientation, extension contact and extension participation, respectively.

Extent of technological gap in adoption of improved paddy cultivation practices

Overall technological gap in adoption of improved paddy cultivation practices

The data presented in the table 1, revealed that majority of the respondent paddy growers (85.00 %) belonged to medium overall technological gap category with mean technological gap score of 56.51, followed by 15.00 per cent of respondent who belong to low overall technological gap categories with mean technological gap score of 21.94.

It is also evident from the data presented in the same table that not a single respondent paddy grower belongs to the high overall technological gap category. The probable reason for this outcome might be the low level of adoption of recommendations and medium level of socio-economic status.

The above findings are in congruence with the findings of Patel and Vyas (2014), who found that 65.00 per cent of sugarcane growers had medium technological gap, followed by low (19.00 per cent) and high (16.00 per cent) technological gap in adoption of improved sugarcane cultivation practices, respectively.

Technological gap with respect to recommended individual paddy cultivation practices

The data with respect to the technological gap for different practices of paddy cultivation is presented in table 2, reveals that 75.00 per cent technological gap was reported by respondent paddy growers in the recommended practice "Herbicide in transplanted field", this outcome may be attributed to use of other herbicides as observed during the filed visits by the researcher.71.00 percent gap was observed in practicing Split application of nitrogen fertilizer, it may be due to lack of knowledge leading to lower level of adoption. There was 69.00 percent technological gap in use of recommended herbicide in nursery, it was observed that very few farmers raised seedlings in nursery, most of them purchased seedlings for transplantation, this might have led to poor knowledge and adoption.

In case of adoption of recommended level of water at tillering stage the gap was 66.00 percent, it might be due to lack of knowledge and also the availability of irrigation at that time, as it was noticed and expressed by farmers too, farmers at the tail end of the irrigation canal face shortage of water during such crucial time. 61.00 percent gap was found in case of adoption of green manuring crops and also size of seed bed, it may be due to availability and use of chemical fertilizers very few farmers adopted the technology and, as said above very few farmers had nursery so they possessed limited knowledge of all the practices of nursery management. Following practices reported technological gap ranging between 50.00 percent to less than 60.00 percent, "Level of water before harvesting (59.00 % gap)", "Pesticide for bacterial blight (58.00 % gap)", "Time of transplanting (57.00 % gap)", "Number of cartload of FYM (57.00 % gap)", "Number of seedlings per hill (55.00

% gap)", "Time of sowing seed in seed bed (54.00 % gap)", "Dosage of NPK/ha (51.00 % gap)", these above outcomes might be due to lack of through knowledge or having partial knowledge leading to medium level of adoption.

Table.1 Distribution of the respondents according to their overall technological gap

(n=100)

Sr.	Category	Frequency	Percentage	Mean score
1.	Low (Up to 33.99)	15	15.00	21.94
2.	Medium (Between 34 to 84.99	85	85.00	56.51
3.	High (More than 85.00)	0	0.00	00.00
	Total	100	100.00	-

(Mean =51.33) (Standard deviation=16.96)

Table.2 Distribution of respondents according to technological gap with respect to recommended individual paddy cultivation practices (n=100)

Recommended package of practices	Gap in percentage
1. Recommended Green manure crop	61.00
2. Recommended level of water at puddling	49.00
3. Recommended variety	24.00
4. Recommended area of nursery for one hectare	47.00
5. Recommended size of seed bed	61.00
6. Recommended time of seed sowing in seed bed	54.00
7. Recommended seed rate	43.00
8. Recommended chemical for seed treatment	71.00
9. recommended age of seedling to be used	42.00
10. Recommended time of transplanting	57.00
11. Recommended spacing in main field	36.00
12. Recommended number of seedlings per hill	55.00
13. Recommended number of cartloads of FYM /ha	57.00
14. Recommended dosage of NPK	51.00
15. Recommended split application of nitrogen	70.00
16. Recommended level of water at tillering stage	66.00
17. Recommended level of water before harvesting	59.00
18. Recommended herbicide in nursery	69.00
19. Recommended herbicide in transplanted field	75.00
20. Recommended pesticide for BPH	29.00
21. Recommended pesticide for rice gundhi bug	32.00
22. Recommended pesticide for Bacteria blight	58.00
23. Recommended pesticide for rice blast	37.00
24. Recommended stage of crop for harvesting	29.00

Table.3 Relationship between the overall technological gap and selected independent variables

Sr.	Independent Variables	Coefficient of Correlation (' r ' Value)
1.	Age	+ 0.253*
2.	Education	- 0.217*
3.	Farming experience	+ 0.195^{NS}
4.	Land holding	+ 0.190^{NS}
5.	Annual income	- 0.207*
6.	Material possession	+ 0.011^{NS}
7.	Extension contact	- 0.201*
8.	Mass media exposure	- 0.239*
9.	Extension participation	- 0.198*
10.	Risk orientation	- 0.262**
11.	Scientific orientation	- 0.273**
12.	Social participation	- 0.221*
***significant at 0.05, **significant at 0.01, NS = Non Significant*		

Less than 50.00 percent technological gap was found in following practices; "Level of water during puddling (49.00 % gap)", "Area of nursery for one hectare (47.00 % gap)", " Seed rate (43.00 % gap)", "Age of seedling to be used (42.00 % gap)", "Pesticide for rice blast (37.00 % gap)", "Spacing in main field (36.00 % gap)", "Pesticide for rice gundhi bug (32.00 % gap)", "Pesticide for BPH (29.00 % gap)", "Stage of crop for harvesting (29.00 % gap)" and "Variety (24.00 % gap), these findings might have been factored by high level of knowledge among respondents, availability of the technology, its ease of use and affordability, relative advantage and some are no-cost technologies, thus lower gaps are seen.

Relationship between the overall technological gap and selected independent variables

From the data presented in the table 3, it is evident that independent variable "Risk orientation" and "Scientific orientation" were negatively and significantly associated with the overall technological gap at one per cent level of significance, risk bearing ability is one of the prime attributes of an entrepreneur, thus farmers with higher risk bearing ability are ready to adopt the said technology, thus lower will be the technological gap. As the etymological meaning of science is "to know", farmers with scientific orientation are eager to know the new which might have factored in adoption of technologies and thus low level of gap. Socio economic variables such as "Education", "Annual income", education and income are crucial for knowledge, affordability and adoption of any proven technology, thus have nullify the gaps, thus they were reported to be negatively and significantly associated with overall technological gap at five percent level of significance. Other socio-economic variables such as "Mass media exposure", "Extension participation", "Extension contact" and "Social participation" were negatively and significantly associated with overall technological gap at five per cent level of significance, these exposures will enhance farmers' knowledge and adoption, this might

be the probable reason for the reported outcome. This indicated that technological gap is dependent on the above discussed independent variables, as the aforementioned independent variables pose their effect on overall technological gap.

Further, age of the respondent paddy growers was positively and significantly associated with overall technological gap at five per cent level of significance. Independent variables such as "Farming experience", "Land holding", "Material possession" were positively and non-significantly associated with overall technological gap. The current findings of the study are medium level of profile of the respondents, medium level of technological gap, and the negative and significant association of technological gap and selected variables. In order to narrow down the technological gap, the adoption of those least adopted technologies need to be increased. The negatively associated variable have to be strengthen so that adoption is increased and gap is narrowed.

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