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Adoption of New Agricultural Technology by Beneficiary Farmers in Watershed Area

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INTRODUCTION

Under the National Watershed Development Programme efforts are being made to improve the productivity status of soil by providing soil and water conservation structures infarmers' fields, educating the farmers about new crop production practices and organising block demonstration on farmers' fields after soil conservation work. Through this motivation, it would be assumed that beneficiary farmers can adopt new agricultural technology in watershed area. But, adoption of agricultural technologies are presumed to be influenced by socio-psycho and agro-economic variables. Reddy (1987), Ingle and Wayazade (1989), Bhoite and Girase (1991) observed that attitude towards watershed development programme, annual income, cropping intensity were positive and significantly related to the extent of adoption of agricultural technology in rainfed farming.

The National Watershed Development Programme is in operation since 1986-87 in Gujarat State, the studies on adoption of new agricultural technology by beneficiary farmers in watershed area are rarely available. The present study therefore is an attempt to investigate the extent of adoption of new agricultural technology and to know the factors which influence adoption behaviour so as to able to predict the behaviour of the farmers and control the known factors in a desired manner and channelised the course of farmers' action in a desirable direction.

METHODOLOGY

Mehsana and Banaskantha districts were purposively selected from low rainfall group. One watershed from each district was selected randomly by lottery method. As per proportionate random sampling, 105 beneficiary farmers were selected from each water shed according to their size of land holding groups i.e. marginal, small and big farmers. Thus, total sample for this study was 210 beneficiary. The dependent variable undertaken in this study was extent of adoption of new agricultrual technology. Six selected new agricultural technologies used per unit area by the beneficiary farmers have been considered as extent of adoption in watershed area. On the basis proportion (ratio) used for the each agricultural technology, the adoption index was calculated for an individual respondent. The total score obtained by the respondents indicated their extent of adoption. Based on the mean and S.D., respondents were grouped into low, medium and high categories. The stepwise regression analysis was employed to predict the extent of adoption by the selected socio-psychological and agro-economic variables. The study was under-taken during the year 1990-91 (kharif and rabi). The data were collected personally with the help of interview schedule.

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RESULTS AND DISCUSSION

Extent of adoption of new agricultrual technology

Data presented in Table 1 reveal that majority (61.12, 69.44, 79.64 and 71.43 per cent) of the marginal, small, big and pooled sample farmers were having medium level of extent of adoption respectively.

Variables predicting extent of adoption

Marginal farmers

From the data presented in Table 2, it can be observed that out of 13 independent variables, the herd size alone significantly contributed to the change in extent of adoption to the extent of 30.00 per cent in case of marginal farmers.

Small farmers :

It is evident from the Table 3 that out of 13 independent variables, three variables namely annual income, knowledge about soil and water conservation and cropping intensity together had significantly contributed 40.72 per cent variance in dependent variable. Annual income alone contributed to the extent of 22.46 per cent. The order of contribution of these three variables from highest to lowest was knowledge about soil and water conservation, annual income and cropping intensity.

Big farmers :

It is clear from the Table 4 that in case of big farmers, 24.53 per cent variance in extent of adoption was brought by two independent variables, namely annual income and cropping intensity. Here both the R^2 values were significant. The order of contribution of these variables from highest to lowest was annual income and crop intensity.

Pooled sample farmers :

The data presented in Table 5 indicate that out of 13 variables, three variables namely knowledge about soil and water conservation, cropping intensity and annual income were jointly contributing significantly to 26.28 per cent of the variation in the extent of adoption. As far as their relative importance in predicting the extent of adoption, on the basis of standard partial 'b' values, rank orders were given first to cropping intensity, second to annual income and third to knowledge about soil and water conservation.

CONCLUSIONS AND IMPLICATIONS

It can be concluded that variables like herd size, knowledge about soil and water conservation, annual income and cropping intensity were contributed significantly to the prediction of the extent of adoption in different categories of beneficiary farmers. Hence, effort should be given on training to the farmers in respect of scientific management of livestock and knowledge about soil and water conservation. Moreover, subsidiary occupation like dairy, sericulture, poultry etc. be created by project implementing authority which will help to increase annual income of farmers. Extension agency should popularise short duration improved varieties, better management of rain water, early sowing of kharif crops which may lead to increase cropping intensity. All these efforts will ultimately increase the adoption of new agricultural technologies in watershed area.

Table 1. Distribution of respondents according to their extent of adoption.

Sr. No.	Extent of adoption (score)	Marginal farmers (n=154)		Small farmers (n=72)		Big farmers (n=84)		Total sample farmers (n=210)	
		No.	Per cent.	No.	Per cent	No.	Per cent	No.	Per cent.
1.	Low (upto 8 score)	13	24.07	9	12.50	2	2.38	24	11.43
2.	Medium (9 to 14 scores)	33	61.12	50	69.44	67	79.76	150	71.43
3.	High (Above 14 scores)	8	14.81	13	17.06	15	17.86	36	17.14
	Total	54	100.00	72	100.00	84	100.00	210	100.00

Table 2. Stepwise regression analysis of the extent of adoption and independent variables for marginal farmers.

(n = 54)

Sr. No.	Independent Variables	Multiple correlation coefficient (R)	Coefficient of determination (R^2)	'F' values	Partial regression coefficient	't' value	Standard partial regression coefficient	Rank order
1	Herd size	0.5479	0.3002	21.974**	1.3882	4.6882**	0.5031	I
2	Knowledge about soil and water conservation	0.6310	0.3981	3.289	0.0744	1.8146^{NS}	0.2180	II
3.	Cropping intensity	0.6593	0.4347	3.237^{NS}	0.0343	1.7876^{NS}	0.1880	III

** Significant at 0.01 level of probability

NS Non-significant

Table 3. Stepwise regression analysis of the extent of adoption and independent variables for small farmers.

(n = 72)

Sr. No.	Independent Variables	Multiple correlation coefficient (R)	Coefficient of determination(R^2)	'F' values	Partial regression coefficient	't' value	Standard partial regression coefficient	Rank order
1	Annual income	0.4739	0.2246	8.058**	0.0001	3.3330**	0.3190	II
2	Knowledge about soil and water conservation	0.5878	0.3455	11.404**	0.1078	3.3793**	0.3322	I
3	Cropping intensity	0.6381	0.4072	7.070**	0.0316	2.6554**	0.2649	III

** Significant at 0.01 level of probability

Table 4. Stepwise regression analysis of the extent of adoption and independent variables for big farmers.

(n = 84)

Sr. No.	Independent Variables	Multiple correlation coefficient (R)	Coefficient of determination (R^2)	'F' values	Partial regression coefficient	't' value	Standard partial regression coefficient	Rank order
1	Annual income	0.4208	0.1771	14.771**	0.0003	3.00**	0.3532	I
2	Cropping intensity	0.4953	0.2453	7.328**	0.0363	2.70083**	0.2644	II

** Significant at 0.01 level of probability

Table 5. Stepwise regression analysis of the extent of adoption and independent variables for Pooled sample farmers.

(n = 210)

Sr. No.	Independent Variables	Multiple correlation coefficient (R)	Coefficient of determination (R^2)	'F' values	Partial regression coefficient	't' value	Standard partial regression coefficient	Rank order
1	Knowledge about soil and water conservation	0.3613	0.1305	7.582**	0.0445	2.7469**	0.1849	III
2	Cropping intensity	0.4513	0.2037	22.686**	0.0415	4.7701**	0.2946	I
3	Annual income	0.5127	0.2628	16.515**	0.0003	3.00**	0.2493	II

** Significant at 0.01 level of probability

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Life is a game of bridge. We did not invent the same or design the cards. we did not frame the rules and we cannot control dealing, the cards are dealt out to us whether they be good or bad. But, we can play the game well or play it badly.

A skilful player may have a good hand and yet make a mess of it.

Our life is a mixture of necessity and freedom, change and choice. We may not change events, but, we can change our approach to events.

— Dr. S. Radhakrishnan.