Correlates of Adoption of Cotton Cultivation Practices

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Introduction

Cotton is one of the most important commercial cash crops in our country. It is also the major crop cultivated in the rehabilitated area of Baroda district of Gujarat by the Project Affected Farmers (PAFs). However, the PAFs have not yet increased their agricultural income because they are not aware about modern agricultural technology. Therefore the Sardar Sarovar Narmada Nigam Limited, Baroda has been providing them technical guidance as well as supplying the improved seed/variety of different crops. It is observed that the farmers do not adopt the recommended cotton cultivation practices fully, due to various reasons, even though the production per unit area is low. The process of acquisition of knowledge and adoption of recommended practices by the PAFs depends on their profile constituted by various socio-personal, economic, communicational and psychological characteristics. The present study was therefore conducted in order to analyse the influence of various socio-personal, economic, communicational and psychological characteristics of the PAFs on adoption of recommended cotton cultivation practices.

Methodology

The study was conducted in five talukas of Baroda district, where large numbers of PAFs were resettled. All vasahats falling under selected talukas were included in the study. Thus, a total of 121 vasahats from five talukas were selected for the study. From the availability of PAFs in each vasahat of five talukas, five per cent of PAFs were selected through proportionate random sampling technique. A total of 250 PAFs were thus randomly selected as respondents for the present study. Data were collected with the help of a pretested structured interview schedule. An adoption index was developed for the measurement of adoption of recommended cotton cultivation practices of the respondents.

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Results and Discussion

1. Extent of Adoption of Recommended Cotton Cultivation Practices

The data on the extent of adoption of recommended cotton cultivation practices is presented in Table 1. It is seen from the table that the adoption was almost uniform ranging from 32 per cent in low category to 34 per cent in both medium and high category. It is thus seen that there is almost commonality across farmers in the study area with respect to adoption of the practices in cotton cultivation.

Table 1: Extent of Adoption of Cotton Cultivation Practices

Sr. No.	Category	Number	Per cent
1.	Low (upto 40 score)	80	32.00
2.	Medium (41 to 47 score)	85	34.00
3.	High (above 47 score)	85	34.00
Total		250	100.00
Mean 43.79		0.5 SD 3.44	

2. Characteristics associated with Adoption of Cotton Cultivation Practices

2.1 Socio-personal Characteristics

The data in Table 2 revealed that age of the respondents was significantly but negatively correlated with their adoption of cotton cultivation practices. The negative trend indicated that as age increased, the adoption of new innovations decreased, thus indicating that young farmers are more amenable to adoption since youngsters are energetic, enthusiastic and economically motivated and work for excellence in life. This could be a reason for negative correlation between age of the PAFs and their adoption of cotton cultivation practices.. Age is the factor that determines the zeal, aptitude and hard work required for determining effectiveness in any activity. The education level of the PAFs was positively and significantly related with their adoption of cotton cultivation practices. The probable reason is that education leads to desirable changes in human behaviour and helps the individual to progress in the right direction. It is relevant to quote that change in attitude is partly a function of education and education develops knowledge of an individual and makes them aware of new innovations. These factors might have influenced the PAFs to adopt cotton cultivation practices. These findings are in conformity with the findings of Chauhan (1994) and Vanker (2000). The data in Table 2 also revealed that the family types and size of the PAFs were positively and significantly related with their adoption of cotton cultivation practices. PAFs being an important member of nuclear family make independent decisions regarding any matter concerning income generation for their family.

The social participation of the PAFs was non-significantly associated with their adoption of cotton cultivation practices. It means that active social participation of the PAFs had not played a significant role in improving level of adoption of important major crops. Singh (1993) also reported similar findings.

2.2 Economic Characteristics

Table 2 indicates that the type of house of the PAFs was positively and significantly related with their adoption of cotton cultivation practices while occupation and animal

Table 2: Coefficient of Correlation of Characteristics of PAFs with their Adoption of Cotton Cultivation Practices **N = 250**

Sr. No.		Independent variable	'r' value
I] Socio- personal Characteristics			
1	X1	Age	- 0.424**
2	X2	Education	0.389**
3	X3	Type of family	0.141*
4	X4	Size of family	0.148*
5	X5	Social Participation	0.101NS
II] Economic Characteristics			
1	X6	Type of house	0.144*
2	X7	Occupation	0.0358NS
3	X8	Animal possession	0.096NS
4	X9	Material possession	0.498**
5	X10	Land holding	0.125*
6	X11	Socio-economic status	0.416**
7	X12	Annual income	0.626**
III] Communication Characteristics			
1	X13	Extension contact	0.248**
2	X14	Sources of information	0.289**
IV] Psychological Characteristics			
1	X15	Innovativeness	0.493**
2	X16	Risk orientation	0.421**
3	X17	Scientific orientation	0.393**
4	X18	Attitude towards modern agriculture	0.448**

* Significant at 0.05 level of probability

* * Significant at 0.01 level of probability

possession of the PAFs were found to be non-significantly associated with their adoption of cotton cultivation practices. This indicates that occupation and possession of animals by the PAFs does not play any role in adoption of modern agricultural technology. The present finding is in accordance with the finding of Vanker (2000).

It is also revealed from the table that material possession of the PAFs was positively and significantly correlated with their adoption of cotton cultivation practices. The probable reason might be that, to reap the benefits of modern agricultural technology, material possession is an important component to a moderate extent. The irrigation facility enabled the farmers to afford to have men, money and materials at their disposal. Thus, the above variables have significantly contributed to the extent of adoption.

Land holding of the PAFs was positively and significantly correlated with their adoption of cotton cultivation practices. The person owning larger land holdings would have better economic condition thus providing more scope for experimentation in adoption of innovations. This might be the probable reason for positive and significant relationship between land holding and adoption of important crops. It is also evident from Table 2 that socio-economic status and annual income of the PAFs were found to be positively and significantly related with their adoption of cotton cultivation practices. This indicates that as the socio-economic status increases, level of adoption also increases due to higher capital investment. The PAFs with high socio-economic status have better access or contacts with extension agencies, greater social participation, and more positive attitude to adopt innovations. This might have resulted in a favourable attitude towards modern agriculture and higher adoption of the recommended technology. The PAFs who already have higher income will also have higher capacity to invest money in adopting the new agricultural technologies. The present findings are in accordance with the findings of Shinde et al. (1999).

2.3 Communication Characteristics

The data presented in Table 2 reported that extension contact and utilization of information sources of the PAFs had a positive and significant association with their adoption of cotton cultivation practices. The possible reason might be that the frequency of contact of the PAFs with the extension agencies helped them in acquiring more and more farm information either to solve farm problems or to venture to adopt innovations. Due to the easy accessibility of different sources of information and availability of different sources at the rehabilitated place of the PAFs, the utilization of information

sources played an important role in adoption of new innovations. Patel and Sangle (1991-92) and Shinde et al. (1999) also reported similar findings.

2.4 Psychological Characteristics

Table 2 reveals that innovativeness of the PAFs was positively and significantly related with their adoption of cotton cultivation practices. Innovativeness offers a kind of "hard data" about the extent to which adoption has occurred. Innovator minded persons are willing to seek new ideas and possess high mass-media exposure, which motivate individuals to adopt new scientific practices on their farm at the earliest to excel over others in a social system to attain social prestige. This might be the reason for the above findings. This finding is in conformity with the finding of Patel and Sangle (1991-92). The data presented in Table 2 also reported that risk orientation and scientific orientation of the PAFs were positively and significantly correlated with their adoption of cotton cultivation practices. The probable reason might be due to the fact that high risk oriented persons have the ability to take risk in testing or adopting new things to get better economic advantage and also due to the fact that scientifically oriented farmers are likely to have more inclination to use scientific methods in farming, which led them to adoption of cotton cultivation practices.

It was also obvious from Table 2 that attitude of the PAFs towards modern agricultural technology and their adoption of cotton cultivation practices was positively and significantly correlated. This implies that greater the favourable attitude of the PAFs, higher was their adoption of cotton cultivation practices. These findings are in line with the findings of Chauhan (1994) & Vanker (2000).

3. Stepwise Regression Analysis of Independent Variables on Adoption of Cotton Practices

Stepwise regression analysis with adoption of cotton practices as a dependent variable and eighteen independent variables was carried out. The results are presented in Table 3.

It is obvious from Table 3 that out of eighteen variables, only four variables viz., land holding, socio-economic-status, annual income, and innovativeness had significant effect on the adoption of cotton practices. All these four independent variables jointly accounted for 53.27 per cent of the total variation in adoption of cotton practices.

Table 3. Stepwise Multiple Regression Analysis of Adoption of Cotton Practices

Sl. No.	Variables	Partial Regression Coefficient	SE of Regression Coefficient	't' value	'F' value	Standard Partial Regression Coefficient	Rank
1	Land holding (X10)	-0.6281	0.2014	-3.1187*	9.722	0.0382	IV
2	Socio-economic status (X11)	0.304	0.0637	4.7724*	22.761	0.085	III
3	Annual income (X12)	0.2442	0.0256	9.5391*	90.968	0.2708	I
4	Innovativeness (X15)	0.3202	0.054	5.9297*	35.161	0.1255	II
Constant = 21.8505			R= 0.7299		R^2 = 0.5327		

As a result of stepwise regression analysis, the following regression model was obtained. $Y_2 = a + b_{10}X_{10} + b_{11}X_{11} + b_{12}X_{12} + b_{15}X_{15}$

Where, Y_2 = Adoption of cotton practices

a = The intercept i.e. 21.8505 (Constant)

b_{10} = Coefficient of partial regression of y2 on x10 i.e. - 0.6281

b_{11} = Coefficient of partial regression of y2 on x11 i.e. 0.3040

b_{12} = Coefficient of partial regression of y2 on x12 i.e. 0.2442

b_{15} = Coefficient of partial regression of y2 on x15 i.e. 0.3202

X_{10}, X_{11}, X_{12} and X_{15} are independent variables as stated in Table 4

Therefore the fitted regression equation should be as

$$Y_1 = 21.8505 + (-0.6281)X_{10} + 0.3040X_{11} + 0.2442X_{12} + 0.3202X_{15}$$

The partial regression coefficient (byij) values of these four variables were converted into standard partial regression coefficient (b'yij) value. The 't' value of partial regression coefficient was observed to be significant for all the variables viz., land holding, socio-economic status, annual income, and innovativeness. Based on the absolute values of standard partial regression coefficient, they were ranked from highest to lowest order of contribution as shown in Table 3.

The extent of variation accounted by different independent variables on adoption of cotton practices are presented in Table 4.

The data presented in Table 4 clearly indicates that the variable annual income of the PAFs alone had contributed 39.16 per cent of the total variation in adoption of

cotton practices, while annual income and innovativeness together contributed for 48.90 per cent of variation and socio-economic status + annual income + innovativeness accounted for 51.42 per cent variation. The variables viz., land holding, socio-economic status, annual income and innovativeness accounted for 53.27 per cent variation in the adoption of cotton practices..

Table 4: Stepwise Variation accounted by different Independent Variables on Adoption of Cotton Practices

Step No.	Variable included	Multiple correlation coefficient (R)	Total variation accounted (% R^2)
I	X12 (Annual income)	0.6257	39.16
II	X12 + X15 (Innovativeness)	0.6993	48.9
III	X11 (Socio-economic status) + X12 +X15	0.7171	51.42
IV	X10 (Land holding) + X11 + X12+ X15	0.7299	53.27

It can be inferred that the adoption of cotton practices was found to be predicted by four independent variables namely, land holding, socio-economic status, annual income and innovativeness, which had jointly contributed to 53.27 per cent of the total variation in adoption of cotton practices.

Conclusion

It can be concluded from the above findings that the majority (68.00 per cent) of the respondents had medium to high level of adoption (41 and above score) about recommended cotton cultivation practices. The relational analysis has indicated that except for social participation, occupation and animal possession; all the independent variables included in the study, namely age, education, type of family, size of family, type of house, material possession, land holding, socio-economic-status, annual income, extension contact, sources of information, innovativeness, risk orientation, scientific orientation and attitude towards modern agriculture were significantly correlated with the level of adoption of recommended cotton cultivation practices by the PAFs. In case of multiple regression analysis the four independent variables namely, land holding, socio-economic status, annual income and innovativeness, jointly contributed to 53.27 per cent of the total variation on adoption of cotton practices.

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