

Adoption of selected Cotton crop production technology by the tribals

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INTRODUCTION

Experiences gained in the Tribal Sub-Plans and Operational Research Projects indicated that potential for agricultural development in tribal area is immense. However, the tribal farmers still persistently follow the traditional method of agriculture. The marathwada Agricultural University technical feasibility survey report (1979) pointed out that 11 per cent and 4 per cent tribal farmers have used high yielding varieties of Jowar and cotton respectively. Gholve (1986) observed with regard to adoption of recommended technology in cotton and jowar that very few were high adopters and majority were adopting only improved seeds, least number of respondents used plant protection methods. Ingle, *et al.* (1988) found that improved seeds, fertilizers and plant protection technologies were adopted 65.22, 58.69 and 21.74 per cent respectively by the tribals of Melghat.

To analyse the adoption behaviour pattern of tribal farmers variables influencing it, the present study was taken-up. The present investigation was planned with the

following objectives :

OBJECTIVES

1. To study the extent of adoption of selected improved cotton cultivation practices by the tribal farmers.
2. To study the relationship of different characteristics of tribal farmers and extent of adoption of improved practices by them.
3. To know the predicting ability of different characteristics to explain variation on extent of adoption of improved practices by the tribal farmers.

METHODOLOGY

This study was undertaken in tribal area of Kinwat block of Nanded district of Maharashtra State. The cotton crop in Kinwat belt occupies about half of (48 per cent) the area and hence it was considered appropriate for studying adoption of three production technology viz seed technology, fertilizer technology and plant protection technology by the tribals.

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The procedure followed for measurement of extent of adoption of three practices was as under :

1. Use of seeds of hybrid. and high yielding variety $= \frac{\text{Actual area in ha.}}{\text{Potential area in ha.}} \times 100$
2. Application of chemical fertilizers.
 - a) Application of 'N' $= \frac{\text{Quantity of 'N' applied/ha.}}{\text{Quality of 'N' recommended/ha.}} \times 100$
 - b) Application of 'P' $= \frac{\text{Quantity of 'P' applied/ha.}}{\text{Quality of 'P' recommended/ha.}} \times 100$
 - c) Application of 'K' $= \frac{\text{Quantity of 'K' applied/ha.}}{\text{Quality of 'K' recommended/ha.}} \times 100$
3. Application of Pesticides $= \frac{\text{Quantity of pesticides applied/ha.}}{\text{Quality of pesticides recommended/ha.}} \times 100$

The proportions of each of these practices (actual/recommended) for use of cotton technologies were calculated by the above procedure. This was done separately for each year of adoption (1987-88) and 1988-89) and then averaged for each practice so as to derive score on each practice. In order to obtain the overall pattern of the use of all the three practices, extent of use of each practice was summed up and mean of extent of tech

nology use was calculated. Pearson's coefficient of correlation was computed to findout the relationship between the characteristics and extent of adoption of improved practices of tribal farmers. The multiple regression analysis was done to know the combine effect of all independent variables in explaining the variation in the extent of adoption of technology by the tribal farmers.

FINDINGS AND DISCUSSION

Adoption of improved seeds :

The extent of adoption of improved sees by tribal farmers is presented in table 1.

Table : 1 Extent of adoption of improved seeds

(n=210)				
Sr. No.	Category of farmers	Number	Per cent	Extent of adoption (Mean score)
1	Small	125	59.52	86.69
2	Medium	37	17.62	92.67
3	Big	48	22.86	94.36
	Total	210	100.00	
	Mean			89.50

It was observed that the extent of adoption of improved seeds expressed in terms of mean score was 89.50. It was found high in all the categories of tribal farmers.

Adoption of fertilizers :

The extent of adoption of fertilizers by the tribals is given in Table 2.

Table : 2 Extent of adoption of fertilizers

(n=210)

Sr. No.	Category of farmers	Number	Per cent	Extent of adoption (Mean score)
1	Small	125	59.52	56.20
2	Medium	37	17.62	69.88
3	Big	48	22.86	61.45
	Total	210	100.00	
	Mean			59.81

Table 2 indicates that the mean score of the extent of adoption of fertilizer was 59.81. The fertilizer use was comparatively higher in case of medium farmers and low in case of small farmers. The extent of adoption of fertilizers was 56.20, 69.88 and 61.45 for small, medium and

big farmers, respectively.

Adoption of plant protection measures

The extent of adoption of plant protection measures by the respondents is presented in Table 3.

Table 3 Extent of adoption of plant protection measures

(n=210)

Sr. No.	Category of farmers	Number	Per cent	Extent of adoption (Mean score)
1	Small	125	59.52	14.39
2	Medium	37	17.62	20.01
3	Big	48	22.86	31.90
	Total	210		100.00
	Mean			19.38

Table 3 reveals that the extent of adoption of plant protection measures, in general, among all categories of farmers was low. It was still lower in case of small farmers than that of medium and big farmers. The extent of adoption of plant protection measures was comparatively more

(31.90) in case of big farmers.

Extent of adoption of technology

The extent of adoption of three technology (pooled) by the respondents according to their categories is presented in Table4.

Table 4: Extent of adoption of agricultural technology

Sr. No.	Extent of adoption	Category							
		Small		Medium		Big		Total	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent
1.	No. (0 score)	17	13.6	5	13.51	6	12.5	28	13.33
2.	Low (1 to 33 score)	48	38.4	14	37.88	12	25.0	74	35.24
3	Medium (34 to 66 score)	46	36.8	17	45.95	22	45.84	85	40.48
4	High (67 and above score)	14	11.2	1	2.71	8	16.66	23	10.95
Total		125	100.00	37	100.00	48	100.00	210	100.00

Table 4 indicates that only 10.95 per cent farmers were high adopters and 40.48 per cent were medium adopters. The non adopters were 13.33 per cent. While low adopters were 35.24 per cent. Further, the majority from the two categories of farmers (medium and big) were medium adopters, while in case of small farmers 38.4 per cent were low adopters. Thus the data in general revealed that the extent of adoption of tribal farmers was medium level.

The mean of extent of adoption of cotton technologies was only 44.06, which indicates that the tribal farmers were using the improved seeds on large scale, Application of fertilizers and use of plant protection measures was much below the desired level. Replacement of seed is relatively simple technology and more so because it is covered under subsidised supply to the tribal farmers. Fertilizers and plant protection are relatively difficult specially for the tribal farmers who have

been recently introduced to their advantages but also due to high cost of these inputs. During data collection, it was observed that farmers were of opinion that the use of fertilizers caused depletion of soils and hence they did not fertilize the crops. Some of the respondents also quoted that they did not get fertilizers when needed. This also resulted in the low use of fertilizers. The use of plant protection was found very low because tribal farmers felt that killing the insects would invite the wrath of God. Conservatism and fatalistic values seem to have over dominated in their behaviour more than any other factors.

Relationship between independent and dependent variables.

In order to know the relationship between characteristic and extent of adoption of improved technology, the data were subjected to correlation analysis. The correlation co-efficient 'r' was calculated. The results are furnished in Table 5.

Table 5 : Relationship of independent variable with extent of adoption of the respondents.

Sr. No.	Independent variables	Extent of adoption of technology Zero order correlation Co-efficient (r value)
1	Age	-0.008
2	Education	0.385 **
3	Size of family	-0.106
4	Type of family	0.111
5	Social participation	0.574 **
6	Land holding	0.039
7	Annual Income	0.686 **
8	Market orientation	0.484 **
9	Credit orientation	0.586 **
10	Innovativeness	0.490 **
11	Achievement motivation	0.420 **
12	Knowledge about technology	0.609 **
13	Attitude towards farming	0.519 **
14	Extension contact	0.646 **
15	Sources of information	0.617 **
16	Innovation decision process	0.792 **

** Significant at 0.01 level probability

It is evident from Table 5 that out of 16 independent variable, 12 variables namely, education, social participation, annual income, market orientation, credit orientation, innovativeness, achievement motivation, knowledge about technology, attitude towards farming, extension contact, source of information and innovation decision process had positive and significant relationship with the extent of adoption of cotton production technology by the farmers. These variables were found significant at 0.01 level of probability. Age, size of family, type of family, and land holding of respondents did not indicate any relationship with their extent of adoption of improved agricultural technology. Hence, it was concluded that out of 16 variables, 12 variables were significantly

and positively related with extent of adoption of improved agricultural technology and there was no significant relationship between 4 variables of the respondents and their extent of adoption of improved production technology. These findings were supported by Gholve (1986) in similar study area.

Multiple regression analysis for extent of adoption of technology

The multiple regression analysis was carried out to know the important variables with their predicting ability in explaining the variation in extent of adoption of improved technology by the tribal farmers.

In multiple regression analysis, 16 independent variables were fitted to explain the

Table 6 : Multiple regression analysis of extent of adoption of technology of the tribal farmers.

Sr. No.	Independent variables	Extent of adoption Regression Coefficient (b)	`t' value
1	Age	-0.0896	-0.800
2	Education	-0.4179	-0.552
3	Size of family	-0.7609	-1.444
4	Type of family	-4.1600	-1.869
5	Social participation	-1.0740	1.016
6	Land holding	-0.8390	-1.224
7	Market orientation	-0.1185	-0.365
8	Annual income	0.6313	5.933 **
9	Credit orientation	0.5182	2.696 **
10	Innovativeness	2.4543	1.541
11	Achievement motivation	-0.4406	-1.415
12	Knowledge about technology	0.4756	2.273 *
13	Attitude towards farming	0.2936	1.318
14	Extension contact	0.4139	1.005
15	Sources of information	0.1797	0.470
16	Innovation decision process	2.0128	7.096 **

R² = 0.7850, R = 0.8860, F = 44.0472 **

* Significant at 0.05 level of probability

** Significant at 0.01 level of probability.

variation in extent of adoption of the respondents. The detailed results are given in Table 6.

It is observed from table 6 that 78.50 per cent of the total variation in respondents' extent of adoption was explained through 16 variable considered for regression equation. The `F' value was found significant at 0.01 level of probability. The un-explained variation was 21.50 per cent which may be due to extraneous (uncontrolled) factors which were out of the scope of the study.

From the regression analysis, it was concluded that out of 16 variables, four variables namely annual income, credit

orientation, knowledge about technology and innovation decision process had significant effect on extent of adoption of improved technology by the tribal farmers. Regression co-efficient indicated that one unit change in these variables would effect 0.6313 units, 0.5182 units, 0.4756 units and 2.0128 units change in the respondents extent of adoption of technology respectively.

The `t' value for annual income, credit orientation and innovation decision process were significant at 0.01 level of probability and for remaining one variable value was significant at 0.05 level of probability.

This implies that annual income, credit orientation, knowledge about technology and innovation decision process had indicated consistent effect on the respondents extent of adoption of improved production technology.

IMPLICATIONS

The findings with regard to adoption of recommended technology indicated that very few were high adopters and majority were adopting only improved seed on large scale. Few used fertilizers and very few adopted plant protection measures. Therefore, it is suggested that demonstrations

would help in educating and motivating farmers for using fertilizers and plant protection measures. Certified seeds, fertilizers and chemicals should be supplied through tribal co-operative on subsidised rate. Majority of the tribals have small land holding, less than two hectares. Size of holding being one of the major determinants of socio-economic status these farmers are the weaker sections of the rural communities.

Rigorous implementation of poverty alleviation programmes with accent on education would help in building-up right type of attitude.

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