

“Constraints faced and Suggestions offered by Tribal Farmers of Navsari District of South Gujarat in Watershed Management through No- Cost and Low-Cost Technologies”**Niraj . G. Patel* and Dr. N. M. Chauhan******P.G. Student and Associate professor.*****Department of Extension Education, College of Agriculture,******Navsari Agricultural University, Waghai-Dang- 394 730, Gujarat*****Abstract**

The present study is carried out to find out, to what extent tribal farmers had adopted the low-cost and no-cost technologies of watershed management as well as which are the constraints faced by them and the possible remedies to overcome the same. For generating information on this dimension, this study is the modest attempt in developing sound and systematic knowledge. Keeping in view above facts present study entitled “Constraints faced and Suggestions offered by Tribal Farmers of Navsari District of South Gujarat in Watershed Management through No- Cost and Low-cost Technologies” was planned with specific objectives: To ascertain the relationship between profile of tribal farmer and extent of knowledge and adoption of no-cost and low-cost watershed management technologies, to study the constraints faced by tribal farmers in adoption of no-cost and low-cost watershed management technologies and to seek their suggestions from tribal farmers to overcome the constraints faced by them. The important findings of the study are slightly less than half (45.83 per cent) of the tribal farmers had medium level of overall knowledge about no-cost and low-cost technologies of watershed management. Slightly more than half (52.50 per cent) of the tribal farmers had medium level of overall adoption about no-cost and low-cost technologies of watershed management. Independent variables viz. age is the only negative and significant with knowledge and adoption of watershed management practices. Remaining all independent variables found positive and significant relationship between profile of tribal farmers and their knowledge and adoption of no-cost and low-cost technologies of watershed management. Less subsidy, lack of knowledge about soil and water conservation technology, construction of field bund is costly, lack of technical guidance and lack of finance were the major problems faced by tribal farmers in case of soil and water conservation technology. While, in case of crop production technology lack of knowledge about recommended crop production technology, low market price of agricultural products, lack of technical guidance, lack of finance to purchase inputs and high cost of farm inputs were the major problems expressed by tribal farmers in adoption of no-cost and low-cost technologies of watershed management. Tribal farmers of study area suggested that; field demonstrations should be organized, loan and subsidy should be easily available, remunerative market prices of agricultural products should be provided to the farmers, farmers should be protected by crop insurance in case of failure of season and more training should be imparted to the farmers.

Introduction

Agriculture in India basically depends upon vagaries of monsoon causing dwindling in the production. Now a day's Watershed Management is a new avenue for developing the rainfed areas. Government has launched ambitious watershed management activities for development of rainfed areas started science from July 1986, covering 16 states of India and 99 districts of Gujarat state as a new trust to improve village economy with an objective to promote holistic growth of the agricultural and allied sector through area based regionally different strategies; to increase and stabilize the agricultural production and narrowing down regional socio-economic imbalance in rainfed areas through development of natural resource base, diversify the rainfed farming system, tapping the local resource potential to attain higher productivity and services for improving standard of living of rural poor and tribal ,Anonymous, (2014). The present study is carried out to find up to what extent tribal farmers had adoption of low-cost and no-cost technologies of watershed management. For generating information on this dimension, this study is the modest attempt in developing sound and systematic knowledge.

Methodology

The present study was conducted in four tribal talukas of Navsari district in South Gujarat. Important and relevant low-cost and no-cost technologies of watershed management in two major areas of technologies (I) Soil and water conservation technologies, and (II) Crop production technologies were selected under study through expert opinion. With the help of random sampling method four villages were selected from each of selected tribal taluka. From each selected village, ten tribal farmers were randomly selected which constituted a total sample size of 120 tribal respondents.

The data were collected with the help of well structured pre-tested interview schedule incorporating all items pertaining to specific objectives of the study. The independent variables were measured with the help of appropriate scales used by other researcher with some modification. The dependent variable was measured by developing adoption index with the help of structure schedule developed by researchers. The collected data were compiled, tabulated and analyzed to get proper answer for specific objectives of the study with the help of various statistical tools to test the hypothesis under study. The statistical tools such as arbitrary method, percentage, and mean, ranking and coefficient of correlation were used.

Results and Discussion:

The information related to this study was collected from beneficiary farmers of selected watershed area, by means of structured interview schedule. The collected information was classified, tabulated and analyzed in light of the objectives of the study. The facts and findings derived after analyzing the information have been presented under following heads:

1. Relationship between profile of tribal farmers and their knowledge and adoption of no-cost and low-cost technologies of watershed management.

1.1 Relationship between profile of tribal farmers and their knowledge of no-cost and low-cost technologies of watershed management

Table: 1 Relationship between profile of tribal farmers and their knowledge of no-cost and low-cost technologies of watershed management

Sr. No.	Independent Variables	Correlation Coefficient ('r' value)
1	Age	- 0.192*
2	Education	0.489**
3	Experience in farming	0.222*
4	Social participation	0.223*
5	Training received	0.198*
6	Mass media exposure	0.527**
7	Extension contact	0.363**
8	Occupation	0.401**
9	Land holding	0.281**
10	Annual income	0.374**
11	Scientific orientation	0.253**

*= significant at 5% level of probability, **= significant at 1% level of probability

It is apparent from the data presented in the Table-1 that, age had negative and significant correlation ($r = -0.192$) with the knowledge of no-cost and low-cost technologies of watershed management by the tribal farmers. Negative correlation was found in case of age and knowledge might be due to that the old aged tribal farmers were traditional, they were skeptical in nature and resist the change as well as reluctant to learn and set habit for thinking resulted into low acquisition of knowledge. This finding is opposite in the line with the results of Karkar and Munshi (2003), and Gosh (2003). Remaining all independent variables found positive and significant relationship between profile of tribal farmers and their knowledge of no-cost and low-cost technologies of watershed management.

1.2 Relationship between profile of tribal farmers and their adoption of no-cost and low-cost technologies of watershed management

The adoption of recommended no-cost and low-cost technology of watershed management is a complex process involving sequence and thought of action. The action of individual tribal farmers is governed by personal, social, economic, psychological and cultural factors involved in situation. Some tribal farmers adopt new technology of watershed management more quickly than others because of the difference in personal characteristics. Similarly, if there is a difference in economic factors, process of action is changed, there by changing the pattern of adoption. Thus, in nutshell it may be stated that the adoption of recommended no-cost and low-cost technology of watershed management differs when there are difference in personal, socio- economic and psychological characteristics of tribal farmers. Hence, considering the important of these characteristics and review of past research studies, an attempt has been made in this investigation to ascertain the relationship if any, between socio-personal, economic, communicational and psychological characteristics of the tribal farmers and extent of adoption of selected no-cost and low-cost technologies of watershed management. This was determined and tested with help of Karl Pearson's coefficient correlation test and results obtained are presented in Table-2. Bhagat,(2004), Bhutia,(1993), Chauhan, (2008) and Shinde, (2011) also reported the same.

Table:2 Relationship between profile of tribal farmers and their level of adoption of no-cost and low-cost technologies of watershed management n=120

Sr. No.	Independent Variables	Correlation Coefficient ('r' value)
1	Age	-0.247**
2	Education	0.307**
3	Experience in farming	0.313**
4	Social participation	0.252**
5	Training received	0.216*
6	Mass media exposure	0.455**
7	Extension contact	0.438**
8	Occupation	0.348**
9	Land holding	0.326**
10	Annual income	0.328**
11	Scientific orientation	0.237**
12	Knowledge	0.666**

*= significant at 5% level of probability, **= significant at 1% level of probability,

It is apparent from the data presented in the Table-2 that, age had negative and significant correlation ($r = -0.247$) with the adoption of no-cost and low-cost technologies of watershed management by the tribal farmers. To epitomize the results of the study, it can be stated that young and middle aged farmers were more enthusiastic in nature with unique power of decision making. On other hand, old age farmers had greater reluctance to learn and had set habits in way of thinking which punctured in forming favorable attitude towards new innovation. This might have resulted into its influence on adoption of an innovation..The data presented in Table-2 make it clear that, remaining all independent variables found positive and significant or highly significant relationship between adoption of no-cost and low-cost technologies of watershed management by the tribal farmers. This finding is in the line with the results of Yadav,*et al* (2013) and Zala, P.K. (2005).

2.1. Constraints faced by tribal farmers in adoption of no-cost and low-cost technologies of watershed management.

Constraints in adoption of new technology never end. However, they can be minimized. Constraints in this study were operationalized as the item of difficulties faced by the farmers in adoption of no-cost and low-cost technologies of watershed management. The tribal farmers were requested to express the constraints faced by them in adoption of no-cost and low-cost technologies of watershed management. The percentage for each constraint was worked out. The results regarding the same are summarized in Table- 3.

The constraints were two fold *viz.*, related to soil and water conservation technology and related to crop production technology. Among soil and water conservation technology, the constraints *viz.*, less subsidy (72.50 per cent) was the main constraint expressed by the beneficiary farmers followed by lack of knowledge about soil and water conservation technology (68.33 per cent), construction of field bund is costly (66.66 per cent), lack of technical guidance (58.33 per cent), lack of finance (53.33 per cent), timely sowing is not possible (51.66 %), land levelling is costly (45.83 per cent), lack of timely and appropriate extension services (29.16 per cent), stone are not locally available for gully plugging (27.55

per cent), land wasted in bunds and channels (16.16 per cent) and lack of cooperation of neighbours (15.83 per cent) were the important constraints expressed by the tribal farmers.

Table: 3 Constraints faced by the tribal farmers in adoption of no-cost and low-cost technology watershed management.

Sr No	Constraints	Per cent	Rank
I	Soil & Water Conservation Technology		
1	Lack of knowledge about soil and water conservation technology	82 (68.33)	II
2	Lack of technical guidance	70 (58.33)	IV
3	Construction of field bund is costly	80 (66.66)	III
4	Land wasted in bunds and channels	20 (16.16)	X
5	Timely sowing is not possible	62 (51.16)	VI
6	Land leveling is costly	55 (45.83)	VII
7	Less subsidy	87 (72.50)	I
8	Lack of co-ordination between field staff and farmers	62 (51.66)	VI
9	Sowing with / without recommended spacing	33 (27.55)	IX
10	Lack of finance	64 (53.33)	V
11	Lack of co-operation of neighbors	19 (15.83)	XI
12	Lack of timely and appropriate extension services	35 (29.16)	VIII
II	Crop production technologies		
1	Lack of knowledge about recommended crop production technology	102 (85.00)	I
2	Lack of technical guidance	92 (76.00)	III
3	High cost of farm inputs	88 (73.33)	V
4	Low market price of agricultural products	100 (83.33)	II
5	Risk in adoption of new technology	69 (57.50)	VIII
6	Lack of transport facilities	35 (29.16)	XII
7	Irregular supply of electricity	55 (45.83)	XI

8	High rate of electricity	56 (46.66)	X
9	Lack of finance to purchase input	89 (74.16)	IV
10	Unavailability of sufficient labor in time	60 (50.00)	IX
11	High rate of labor	60 (50.00)	IX
12	Lack of communication facilities	85 (70.83)	VI
13	Lack of timely and appropriate extension services	70 (58.33)	VII

The constraints related to crop production technologies were concerned, it is clearly observed that, lack of knowledge about recommended crop production technology (85.00 per cent) was the main constraint expressed by the beneficiary farmers, followed by low market price of agricultural products (83.33 per cent), lack of technical guidance (76.66 per cent), lack of finance to purchase inputs (74.16 per cent), high cost of farm inputs (73.33 per cent), lack of communication facilities (70.83 per cent), lack of timely and appropriate extension services (58.33 per cent), risk in adoption of new technology (57.50 %), high rate of labour and unavailability of sufficient labour in time (50.00 %), high rate of electricity (46.66 per cent), irregular supply of electricity (45.83 %) and lack of transport facility (29.16 %) were the important constraints expressed by the beneficiary farmers. It can be thus concluded that, the major soil and water conservation technology related constraints were less subsidy, lack of knowledge about soil and water conservation technology and construction of field bund is costly. While, in case of crop production technology, the important constraints were: lack of knowledge about recommended crop production technology, low market price of agricultural products and lack of technical guidance. Jondhale *et al*, (2000), Kumar *et al* (2014) and Patel .(2005) also reported the same.

2.2 Suggestion made by the tribal farmers to overcome the constraints in adoption of no-cost and low-cost technology of watershed management.

An attempt has been made to know the suggestions of the tribal farmers to overcome the various problems faced by them in adoption of no-cost and low-cost technology of watershed management.

The tribal farmers were requested to offer their valuable suggestions for solving the problems faced by them in adoption of no-cost and low-cost technology of watershed management. The responses of farmers in this regard are presented in Table-4.

Table: 4 Suggestion made by the tribal farmers to overcome the constraints in adoption of no-cost and low-cost technology of watershed management.

Sr.No.	Suggestions	Frequency	Percentages
1	Farmer should be protected by crop insurance in case of failure of season	92	76.66
2	Field demonstration should be organized	110	91.67
3	More training should be imparted to the farmers	88	73.33

4	Proper technical guidance should be given to the farmers as and when they need	87	72.50
5	Loan and subsidy should be easily available	102	85.00
6	Farm input should be subsidized	82	68.33
7	More subsidy should be granted for soil and water conservation work	80	66.66
8	Remunerative market prices of agricultural products should be provided to the farmers	100	83.33

Table-4 shows that, very high majority (91.67 per cent) of tribal farmers suggested that field demonstrations should be organized, followed by loan and subsidy should be easily available (85.00 per cent), remunerative market prices of agricultural products should be provided to the farmers (83.33 per cent), farmers should be protected by crop insurance in case of failure of season (76.66 per cent), more training should be imparted to the farmers (73.33 per cent), proper technical guidance should be given to the farmers as and when they need (72.50 per cent), farm inputs should be subsidized (68.33 per cent) and more subsidy should be granted for soil and water conservation works (66.66 per cent) were offered as important suggestion by tribal farmers. Patel,(2000), Pawar,(2004) and Rabari (2006) also reported the same.

From the above discussion, it can be concluded that the important suggestions made by the tribal farmers to overcome the constraints were field demonstrations should be organized, loan and subsidy should easily available, remunerative market prices of agricultural products should be provided to the farmers and farmers should be protected by crop insurance in case of failure of season. Soleiman and Saeid , (2015).

2.Conclusion:

To epitomized the results it can be said that majority of them had found under medium to high level of overall knowledge level. The independent variables viz., education, experience in farming, social participation, training received, mass media exposure, extension contact, occupation, land holding, annual income, scientific orientation and knowledge regarding no-cost and low-cost watershed management technologies had establish significant and positive relationship with their knowledge and adoption whereas, reverse trend was observed in case of age. Less subsidy and lack of knowledge about recommended crop production technology were the major constraints faced by the tribal farmer in rainfed farming. Field demonstration of various innovative no-cost and low-cost technologies of watershed management and loan & subsidy should be easily available for rainfed farming were the major suggestions offered by the tribal farmers.

IMPLICATIONS AND RECOMMENDATIONS:

When, it is said and done the question of the action oriented men to provide some concrete steps remains to be answered. Based on the findings of the study one can safely recommend following implications.

1. These factors *viz.*, socio-personal, communicational, economical and psychological which affected the adoption of no-cost and low-cost technologies of watershed management should be reason while any programme of planned communication.
2. The tribal farmers overall adoption of no-cost and low-cost watershed management technology confined to the medium to high level. It indicates that implementing agencies of watershed management and agricultural department of the state had played significant role in adoption behaviour of the farmers. For improving the level of adoption of no-cost and low-cost watershed management technology, implementing agencies of watershed management, state agricultural department, SAUs., K.V.K. and NGOs. should give special attention for adoption of technologies namely irrigation in alternative row and furrow, sowing as per recommended spacing, afforestation, vegetative bunds and growing natural grasses on boundary & waterways in case of soil and water conservation technologies and use of herbicides, plantation of tree on farm boundary/waste land, supplementary irrigation, mid season correction and intercropping in case of crop production technologies during planning of farmers training programme.
3. The state Government, Agricultural Department, SAUs, Watershed Management Unit, K.V.K., N.G.Os., should continuously trying to increase the knowledge about no-cost and low-cost technologies of watershed management among the tribal farmers.
4. The constraints faced by tribal farmers in adoption of modern watershed management practices should be solved and incorporation of their suggestions should be in futurer planning.

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