



## Original Research Article

### Determinants of Knowledge and Adoption of Soil and Water Conservation Practices among the Farmers

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#### ABSTRACT

The present study conducted in Beed district of Marathwada region with an objective to analyze the personal, socio-economic and psychological profile of the respondents and their relationship with knowledge and adoption of soil and water conservation practices among the farmers. Results revealed that most of the farmers (42.50%) were from middle age group, 39.16 per cent of them were educated up to high school level, 39.16 per cent of them belongs to small size of land holding, 71.66 per cent respondents had their agriculture as a main occupation. Whereas majority of the respondents (29.16 %) had annual income below Rs. 50,000 /-, 46.67 per cent of them were having moderate type of soil, 70.00 percent of respondents had medium level of social participation, 66.67 per cent of them had medium extension contact. While 81.67 per cent of the respondents had medium innovativeness, most of the respondents (77.50%) belonged to high risk preference category. Result of correlation coefficient ( $r$ ) showed that independent variables namely age, education, land holding, annual income, topography of land, social participation, extension contact, risk preference and innovativeness of the respondents were positively and significantly related with knowledge of the respondents about soil and water conservation practices. Multiple regression analysis showed 32.19 per cent variation in extent of knowledge of soil and water conservation practices caused by eleven independent variables selected for study. Data also observed that age, education, land holding, annual income, topography of land, social participation, extension contact, risk preference and innovativeness were positively and significantly related with adoption of soil and water conservation practices. Multiple regression analysis showed 40.93 per cent variation in extent of adoption of soil and water conservation practices caused by eleven independent variables selected for study. From the regression analysis, it was also revealed that out of eleven independent variables two variables viz., land holding and annual income shows significant effect on extent of adoption of soil and water conservation practices.

#### Keywords

Soil and Water Conservation, Knowledge, Adoption, Marathwada region

## Introduction

Soil and water are precious for agriculture. Every drop of water and every soil particle have to be protected and conserved and excess runoff water is to be disposed off safely. For efficient utilization of limited soil and water resources, it is essential to

increase food production per unit area and per unit time on sustainable basis. The total geographical area of Maharashtra state is 307.58 lakh hectares, out of which 80.24 per cent area is rainfed. Besides this, the soil is of poor quality and the degraded land

consists of 42.40 per cent of total area, and 52 per cent area is drought prone. The major effect of soil erosion is degradation of physical properties of soil and loss of plant nutrients. The major source of water is rainfall received from South-West monsoon during the period from June to September. This rainfall is erratic in nature, unevenly distributed and inadequate to meet the soil moisture requirement. Due to improper soil and water conservation practices, it has been reported that about 600 million tones of soil are washed annually. Although several soil conservation technologies had been developed and promoted through past decades, the adoption of many recommended measures was still minimal. Conservation practice adoption is a multidimensional process. Numerous factors determine farmers' willingness to use conservation practices of soil and water. The multiplicity of factors combined with the potential interactions between them contributes to the complication in identifying features that contribute to adopting conservation practices. So studies needed to be conducted in search of socio-economic determinants which influencing knowledge and adoption of soil and water conservation practices by the farmers with following specific objectives.

To study the personal, socio-economic and psychological profile of the farmers.

To study the relationship between profile of the farmers with knowledge and adoption of soil and water conservation practices by the farmers.

### **Materials and Methods**

The present study conducted in Beed district of Marathwada region as considerable are under dry land farming. Two talukas viz. Parli and Ambejogai were selected

randomly from the Beed district. From each talukas, three villages were also selected on the basis of random sampling by using lottery method. Twenty respondents from each selected village were selected randomly. Thus, total 120 respondents were selected for the purpose of the study. The data were collected by personally interviewing the selected respondents with the help of structured interview schedule. Collected data were classified, tabulated analyzed by using frequency, percentage, correlation coefficient and multiple regression were used for the analysis.

### **Results and Discussion**

#### **Personal, socio-economic and psychological profile of the respondents**

It is evident from Table 1 that most of the farmers (42.50%) were from middle age group, followed by young age group (35.80 %) and old age group (21.66 %) category. About forty per cent of the farmers (39.16 %) were educated up to high school level, followed by 35.83 per cent of them were educated up to college level, 12.50 per cent of them were educated up to middle school level. Only 7.50 per cent of them were educated up to primary school level and 5.00 percent of them were illiterates. It can be inferred that majority of the respondents (39.16 %) belongs to small size of land holding, followed by 23.33 per cent of them had semi medium size of land holding. Whereas 20.83 per cent and 15.83 per cent of them had marginal and medium size of land holding, respectively and only 00.85 per cent had large size of land holding. As regards to occupation of the respondents, 71.66 per cent respondents had their agriculture as a main occupation, followed by 18.33 per cent of them having occupation as agriculture alongwith allied occupation. Only 9.18 per cent respondents having

occupation as agriculture plus labour. Very few of them (00.83%) having occupation as agriculture plus business and none of them were doing agriculture with service.

It is evident that majority of the respondents (29.16 %) had annual income below Rs. 50,000, followed by 28.33 per cent of them were found to have annual income between Rs. 50,001 to 1, 00,000 /-. The respondents having annual income above Rs. 2,50,001 /- were only 10.85 per cent. The percentage of the respondents having annual income between Rs. 1, 50,001 to 2, 00,000 /- and 2,00,001 /- to 2,50,000 /- were found to be 9.16 per cent and 7.50 percent, respectively. Regards to type of soil, majority of them (46.67%) were having moderate type of soil followed by 40.00 per cent respondents having deep soil. About 5.83 per cent respondents having very deep soil land, 5.00 per cent having shallow soil and only few (2.50%) respondents having very shallow type of soil. It is noticed from Table 1 that

majority of the respondents (78.33%) having plane topography of land, followed by 21.67 per cent respondents having undulating topography of land.

It is also revealed that 70.00 percent of respondents had medium level of social participation, followed by low (17.50%) and high (12.50%) level of social participation. Majority of the respondent (66.67%) had medium extension contact, followed by 18.33 per cent them had low extension contact and only 15.00 percent respondents had high extension contact. It is noticed that 81.67 per cent of the respondents had medium innovativeness, followed by 15.00 percent of them had low innovativeness and only 3.33 per cent respondents had high level of innovativeness. In case of risk preference, the most of the respondents (77.50%) belonged to high risk preference category, followed by 19.17 per cent and 3.33 per cent belonged to medium and low risk preference, respectively.

**Table.1** Personal, socio-economic and psychological profile of the respondents

(N=120)

<b>Profile of the respondents</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Age</b>		
Young (up to 35)	43	35.80
Middle(35 to 50)	51	42.54
Old (above 51)	26	21.66
<b>Education</b>		
Illiterate	06	05.00
Primary School	09	07.50
Middle School	15	12.50
High School	47	39.16
College	43	35.84
<b>Land holding (ha)</b>		
Marginal (Up to 1.00)	25	20.83
Small (1.01 to 2.00)	47	39.16
Semi medium (2.01 to 4.00)	28	23.33
Medium (4.01 to 10.00)	19	15.83

Large (Above 10.00)	01	00.85
<b>Occupation</b>		
Agriculture	86	71.66
Agriculture + Labour	11	09.18
Agriculture + Allied occupation	22	18.33
Agriculture + Business	1	00.83
Agriculture +Service	00	0.00
<b>Annual income</b>		
Up to 50,000	35	29.16
50,001 to 1,00,000	34	28.33
1,00,001 to 1,50,000	18	15.00
1,50,001 to 2,00,000	11	09.16
2,00,001 to 2,50,000	09	07.50
Above 2,50,001	13	10.85
<b>Type of soil</b>		
Very deep	07	05.83
Deep	48	40.00
Moderate	56	46.67
Shallow	06	05.00
Very shallow	03	02.50
<b>Topography of land</b>		
Plane land	94	78.33
Undulating land	26	21.67
<b>Social participation</b>		
Low(up to 3.147)	21	17.50
Medium(3.147 to 6.553)	84	70.00
High(above 6.554)	15	12.50
<b>Extension contact</b>		
Low(up to 7.9386)	22	18.33
Medium(7.938 to 11.494)	80	66.67
High(above 11.495)	18	15.00
<b>Innovativeness</b>		
Low(up to 10.076)	18	15.00
Medium(10.076 to 14.056)	98	81.67
High(above 14.057)	4	03.33
<b>Risk preference</b>		
Low(up to)	04	03.33
Medium(up to)	23	19.17
High(up to)	93	77.50

**Table.2** Co-relationship between profile of the farmers with knowledge of soil and water conservation practices among the farmers

Independent variable	Correlation coefficient (r)
Age	0.258**
Education	0.296**
Land holding	0.198*
Occupation	0.185 <sup>NS</sup>
Annual income	0.197*
Soil type	-0.122 <sup>NS</sup>
Topography of land	0.280**
Social participation	0.256**
Extension contact	0.262**
Innovativeness	0.278**
Risk preference	0.221*

\* Significant at 0.05 per cent level of probability

\*\* Significant at 0.01 per cent level of probability

NS - Non significant

**Table.3** Multiple regression analysis of selected profile of the farmers with knowledge of soil and water conservation practices

Variables	Coefficients	S.E	t value
Age	0.0129	0.0064	2.0108*
Education	0.2185	0.0608	3.5886**
Land holding	0.01292	0.0173	0.7431
Occupation	0.1568	0.0853	1.8381
Annual income	7.82397	8.9275	0.0876
Soil type	-0.1102	0.0870	-1.265
Topography of land	0.3259	0.1809	1.8018
Social participation	-0.0285	0.0469	-0.6083
Extension contact	0.0630	0.0419	1.5035
Innovativeness	0.06002	0.0358	1.6730
Risk preference	0.0342	0.0360	0.9524

F = 4.662615211

R<sup>2</sup> = 0.32198609

**Table.4** Co-relationship between profile of the farmers with adoption of soil and water conservation practices among the farmers

Independent variables	Correlation coefficient (r)
Age	0.196*
Education	0.209 *
Land holding	0.455**
Occupation	-0.021 <sup>NS</sup>
Annual income	0.542**
Soil type	-0.075 <sup>NS</sup>
Topography of land	0.256**
Social participation	0.324**
Extension contact	0.220**
Innovativeness	0.229*
Risk preference	0.198*

\* Significant at 0.05 per cent level of probability

\*\* Significant at 0.01 per cent level of probability

NS - Non significant

**Table.5** Multiple regression analysis of selected profile of the farmers with adoption of soil and water conservation practices

Variables	Coefficients	S.E	t value
Age	0.0041	0.0108	0.3842
Education	-0.0190	0.1026	-0.18584
Land holding	0.0530	0.0293	1.9788**
Occupation	-0.2006	0.1437	-1.3958
Annual income	5.2436	1.5045	3.4852**
Soil type	-0.0627	0.1467	-0.4273
Topography of land	0.5388	0.3048	1.7674
Social participation	0.0735	0.0790	0.9302
Extension contact	0.0302	0.0706	0.4285
Innovativeness	0.0106	0.0604	0.17549
Risk preference	0.1065	0.0606	1.7556

F = 3.3616342

R<sup>2</sup> = 0.4093214

### **Relationship between profile of the farmers with knowledge of soil and water conservation practices among the farmers**

#### **Correlation analysis**

Result of correlation coefficient (r) (Table 2) showed that independent variables namely age, education, land holding, annual income, topography of land, social participation, extension contact, risk preference and innovativeness of the respondents were positively and significantly related with knowledge of the respondents about soil and water conservation practices. Whereas, occupation and soil type were non-significant with knowledge of the respondents about soil and water conservation practices.

#### **Multiple regression analysis**

It is evident from Table 3 that the multiple regression analysis showed 32.19 per cent variation in extent of knowledge of soil and water conservation practices caused by eleven independent variables selected for study. From the regression analysis it was also revealed that out of eleven independent variables two variables viz. age and education shows significant effect on extent

of knowledge of soil and water conservation practices. While, occupation, land holding, annual income, soil type, topography of land, social participation, extension contact, innovativeness and risk preference had not shows any relationship.

### **Relationship between profile of the farmers with adoption of soil and water conservation practices.**

#### **Correlation analysis**

It is conspicuous from the Table 4 that age, education, land holding, annual income, topography of land, social participation, extension contact, risk preference and innovativeness were positively and significantly related with adoption of soil and water conservation practices. Whereas, occupation and soil type had non-significant relationship with adoption of soil and water conservation practices.

#### **Multiple regression analysis**

It is evident from Table 5 that the multiple regression analysis showed 40.93 per cent variation in extent of adoption of soil and water conservation practices caused by eleven independent variables selected for

study. From the regression analysis, it was also revealed that out of eleven independent variables two variables viz., land holding and annual income shows significant effect on extent of adoption of soil and water conservation practices. While, age, education, occupation, soil type, topography of land, social participation, extension contact, innovativeness and risk preference had not shows any relationship. Similar findings were also noticed by Chawane (2002), Nemade (2007), Ahmad Rezvanfar *et al.*, (2009) and Jadhav (2009).

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