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Relationship of personal characteristics of farmers with knowledge of soil and water conservation practices in watershed development project area

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Abstract

The present study was conducted mainly with the objective to study "Relationship of personal characteristics of farmers with knowledge of soil and water conservation practices by farmers in watershed development project area" for the study Beed district was selected randomly. Multistage random sampling technique was used for selecting one watershed area, villages and respondents. The study was conducted at Bindusara watershed area in Beed district of Marathwada region (M.S.) randomly. From five selected villages, 20 farmers from each village were selected randomly to comprise a sample of 100 respondents for the study. It was noticed from study that majority of the respondents were adopted soil and water conservation practices like preparation of small ridges across the slope, graded bunds, tillage practices parallel to contour line on area having uneven slope, intercropping like Cotton + Green gram/Black gram/Soybean (1:1), Jowar + Pigeon pea (4:2), Soybean + Pigeon pea (4:2), Bajra + Pigeon pea (3:3), Rabi Jowar + Safflower (6:3), vegetative bunds of Subabul, staggered contour trenches, ridges & furrows at distance of 50-60cm, farm pond, Jowar, Bajra, Green gram, Black gram, Soybean (After 4-6 lines) and farm pond. Independent variables namely farming experience, education, family type, family size, land holding, annual income, use of sources of information, social participation and extension contact were positive and highly significant relationship with the level of knowledge of soil and water conservation practices. Independent variables like education and family type had positive and highly significant contribution while use of sources of information and extension contact had significant contribution and farming experience, family size, land holding, annual income and social participation had negatively significant contribution in the impact on dependent variable knowledge about soil and water conservation practices.

Keywords: Knowledge, independent variables, correlation, multiple regression

Introduction

The concept of watershed development has gained much importance in the recent past. It is due to realization of need for conservation of most valuable natural resources like soil, water, forest and so on. It is considered as an integrated approach towards bringing out the rural development in general and the development of all the land based activities in the particulars. Watershed management is an integrated scientific management of natural resources aimed at the optimal use of land, water, plant, man, animal and environment on watershed basis for optimizing production of food, fodder, fuel, fiber and fruits to meet the increasing demand of human and animal population on sustained basis. Watershed development is a vital strategy of agricultural and overall rural development in rural areas.

The aim is to lower the water velocity, to make the water flow vertically downwards rather than horizontally across the village. Regarding soil, the soil conservation is the only known way to protect the productive land. In country like India, where droughts and floods cause chronic food scarcity, soil conservation not only increases crop yield, but also prevents further deterioration of land. Hence with a view to understand the relationship of personal characteristics of farmers with knowledge of soil and water conservation practices, the present study was undertaken.

Objective

To study the relationship of personal characteristics of farmers with knowledge of soil and water conservation practices in watershed development project area.

Methodology

The present study was carried out in Bindusara is a medium watershed development project designed by Government of Maharashtra. Bindusara watershed having storage capacity about 7.106 cubic mm and operational area about 1288 ha. This project operated in Beed district and covered nearby villages under irrigation. For the purpose of the study, five villages were randomly selected from Bindusara watershed area namely, Pali, Karjani (Mothi), Karchundi, Karjani (Chhoti) and Kolwadi. From these five selected villages, 20 farmers from each village were selected randomly to comprise a sample of 100 respondents for the study. Ex-post facto research design with one shot case study method will be adopted for the study.

Research findings and Discussion

The results of the present study as well as relevant discussions have presented under following sub heads:

Relationship of personal characteristics of farmers with knowledge of soil and water conservation practices:

Karl Pearson’s coefficient of correlation

This technique was used to find out the relationship between two variables. Following formula was used for computation of ‘r’ value.

$$r = \frac{\sum XY - \frac{(\sum X) - (\sum Y)}{n}}{\sqrt{\left[\frac{\sum X^2 - (\sum X)^2}{n}\right] \times \left[\frac{\sum Y^2 - (\sum Y)^2}{n}\right]}}$$

Where,

N = Number of observations.

r = Coefficient of correlation

X = Score of independent variables

Y = Score of dependent variable

Table 1: Correlation between different personal characteristics of farmers and their knowledge of soil and water conservation practices

n =100

Independent variables	Correlation coefficient (‘r’) knowledge
1. Farming experience	0.645**
2. Education	0.875**
3. Family type	0.652**
4. Family size	0.700**
5. Land holding	0.671**
6. Annual income	0.645**
7. Use of sources of information	0.781**
8. Social participation	0.724**
9. Extension contact	0.765**

**Significant at 0.01 % level of probability

It is conspicuous from Table 1 that the results of correlation coefficient (r) showed that the independent variables namely farming experience, education, family type, family size, land holding, annual income, use of sources of information, social participation and extension contact were positive and highly significant relationship with the level of knowledge of soil and water conservation practices.

Multiple regression analysis of knowledge of farmers about soil and water conservation practices.

The data were analyzed to know the combined effect of all the independent variables in explaining the variation in the dependent variable. Thus, influence of independent variable was found out by using the equation.

$$Y = a + b_1x_1 + b_2x_2 + \dots + b_nx_n + \mu$$

Where,

Y = Dependent variable

x₁ = Independent variable

b₁ = Partial regression coefficient

a = Constant

n = Total number of variables

μ = Error terms

Testing the Significance of ‘r’

After computing ‘r’ its significance was tested by Student’s t test by using following formula.

$$t = \frac{r}{\sqrt{1 - r^2}} \times \sqrt{n - 2}$$

Where,

t = Student’s t value

n = Number of respondents

r = Correlation Coefficient

Table 2: Multiple regression analysis of knowledge of farmers about soil and water conservation practices.

n=100

Independent variables	Regression coefficient (‘Bi’)	Standard Error (SE)	Calculated ‘t’ value
1. Farming experience	-3.461	4.238	-8.167
2. Education	3.411	3.806	8.961**
3. Family type	1.291	1.374	9.398**
4. Family size	-2.239	2.577	-8.687
5. Land holding	-4.073	8.024	-5.076
6. Annual income	-7.245	1.515	-4.780
7. Use of sources of information	2.546	9.950	2.558*
8. Social participation	-2.042	5.338	-3.826
9. Extension contact	2.463	1.219	2.020*

R² = 0.831, F-value = 4.906,

* Significant at 0.05 % level of probability

** Significant at 0.01 % level of probability

A cursory look at Table 2 shows the multiple regression analysis which depicts that the nine independent variables namely, farming experience, education, family type, family size, land holding, annual income, use of sources of information, social participation and extension contact accounted for 83.10 per cent of total variation in the dependent variable knowledge of soil and water conservation practices. Data shows that education and family type had positive and highly significant contribution while use of sources of information and extension contact had significant contribution and farming experience, family size, land holding, annual income and social participation had negatively significant contribution in the impact on dependent variable knowledge about soil and water conservation practices.

Conclusion

Independent variables namely farming experience, education, family type, family size, land holding, annual income, use of sources of information, social participation and extension contact were positive and highly significant relationship with the level of knowledge of soil and water conservation practices.

Independent variables like education and family type had positive and highly significant contribution while use of sources of information and extension contact had significant contribution and farming experience, family size, land holding, annual income and social participation had negatively significant contribution in the impact on dependent variable knowledge about soil and water conservation practices.

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