The Pharma Innovation

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Relationship of personal characteristics of farmers with adoption 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 Adoption 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 Subabhul, 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 adoption of soil and water conservation practices. Independent variables education and social participation had exhibited highly significant, extension contact had significant, family type and use of sources of information had non-significant and farming experience, while family size, land holding, annual income had negatively significant relationship with adoption of soil and water conservation practices.

Keywords: Adoption, independent variables, correlation, multiple regression

Introduction
The concept of watershed management was evolved in early 1980's. In India the functioning of departments like Agriculture, Soil and Water Conservation, Horticulture, Forestry, Animal husbandry and Fisheries in isolation has not resulted expected progress. Hence the concept of watershed management was evolved with sole objective of using the land according to its capability, thereby reducing the production and productivity on sustainable basis.

The topography of any region may be subdivided into several ecological units, each of which drains to a common point. Each such ecological unit is referred to as watershed. Strictly speaking, the higher land that separates each such unit is called a watershed, and the unit itself being termed as the catchment area. However, it has become fairly common now to speak of catchment area and watershed in identical terms. The size of a watershed may vary from a few hectares to thousands of square kilometers.

India's ever increasing population is exerting tremendous pressure on agriculture. Deforestation and natural calamities are some of the evils which have led to direct consequences like poor yields, erratic rainfall and famine. To meet the requirement of our increasing population, soil and water conservation and management technology holds the key. Adoption of soil and water conservation and management practices ranks top most among the available choices to rectify this situation. So it is desirable to know the relationship of personal characteristics of farmers with adoption of soil and water conservation practices.

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

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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 between personal characteristics of farmers and their adoption level 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.

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

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 adoption of soil and water conservation practices

n =100

Independent variables	Correlation coefficient ('r') adoption
1. Farming experience	0.644**
2. Education	0.865**
3. Family type	0.687**
4. Family size	0.751**
5. Land holding	0.681**
6. Annual income	0.681**
7. Use of sources of information	0.775**
8. Social participation	0.770**
9. Extension contact	0.785**

**Significant at 0.01% level of probability

A perusal of data in Table 1 vividly present the fact 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 adoption of soil and water conservation practices.

Multiple regression analysis of adoption of soil and water conservation practices by the farmers
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.

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

Where,
Y = Dependent variable
x_1 = Independent variable
b_1 = 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.

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

Where,
t = Student's t value
n = Number of respondents
r = Correlation Coefficient

Table 2: Multiple regression analysis of adoption of soil and water conservation practices by the farmers

n =100

Independent variables	Regression coefficient ('Bi')	Standard Error (SE)	Calculated 't' value
1. Farming experience	-8.945	4.142	-2.159
2. Education	2.878	3.720	7.738**
3. Family type	1.591	1.343	1.184NS
4. Family size	-1.057	2.519	-4.196
5. Land holding	-8.876	7.843	-1.131
6. Annual income	-1.693	1.481	-1.143
7. Use of sources of information	1.374	9.725	1.413NS
8. Social participation	2.778	5.217	5.325**
9. Extension contact	2.505	1.191	2.102*

R^2 = 0.825, F-value = 4.709, NS -Non-significant* Significant at 0.05% level of probability ** Significant at 0.01% level of probability

It is conspicuous from Table 2 that the nine independent variables namely, farming experience, education, family type, family size, land holding, annual income, social participation, use of sources of information, extension contact accounted for 82.50 per cent of total variation in the dependent variable adoption. Data shows that education and social participation had exhibited highly significant, extension contact had significant, family type and use of sources of information had non-significant and farming experience, while family size, land holding, annual income had negatively significant impact on adoption of 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 adoption of soil and water conservation practices. Independent variables education and social participation had

exhibited highly significant, extension contact had significant, family type and use of sources of information had non-significant and farming experience, while family size, land holding, annual income had negatively significant impact on adoption of soil and water conservation practices.

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