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RESEARCH NOTE

# Multiple Regression Analysis of Selected Characteristics of Drip Adopters and Extent of Adoption of Drip Irrigation System by Them

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## INTRODUCTION

Due to severe and persistant droughts in the state, it is imperative to put emphasis on efficient utilization of every drop of water for higher agricultural production in the state.

Drip irrigation is an efficient method of providing irrigation water drop by drop directly into the soil at the root zone of plant and it permits the irrigator to limit the watering closely to the consumptive use of the palnts.

Considering the improtance of drip irrigation system in the efficient water management practices, the present study was to planned with an objective to study the relationship between personal, socio-economic and psychological characteristics of drip adopters and their knowledge and their exten of adoption of drip irrigation system.

## METHODOLOGY

This study was conducted in Mahesana Banaskantha and Sabarkantha districts of Gujarat state under ex-post-facto research design. From each district, two talukas having the highest number of drip sets were selected purposively. From the selected six talukas, 20 respondents from each taluka were selected through equal allocation method. Thus, a sample of 120 farmers who practiced drip irrigation representating 22 villages from six talukas, namely Deesa and Kankrej talukas from Banaskantha district, Mehesana and Vijapur talukas from Mehesana district and Himatnagar and Idar talukas from Sabarkantha district of North Gujarat was drawn by using purposive random sampling technique. Ten independent variables were considered and subjected to different statistical analysis for studying their contribution of influence collectivity on the dependent variables-knowledge and extent of adoption.

## RESULTS AND DISCUSSION

### (1) CORRELATION ANALYSIS

It could be from Table 1 that among the 10 variables selected for the study, 6 variables were observed to be positively and significantly related to knowledge and adoption of drip irrigation system. These were education, occupation, annual income, social participation, socio-economic status and attitude. The computed correlation coefficient of these attributes were found statistically significant at one per cent level of significance.

On the other hand, three variables viz., age, type of family and size of family were found to have negative and significant relation

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with knowledge and adoption of drip irrigation system. Among them, age and type of family were statistically found significant at 1 per cent level of significance and size of family at 5 per cent level of significance. The variable 'size of land holding' failed to established any relationship with knowlegde and adoption of drip irrigation system.

## (2) MULTIPLE REGRESSION ANALYSIS

### 2.1 Multiple Regression Analysis of Independent Variables and Knowledge

It may be seen from Table 2 that ten independent variables explained to the extent of 69.96 per cent variation in the level of knowledge of drip irrigation by the adopters. The multiple correlation was 0.836 indicating that correlation between actual level of knowledge about drip irrigation system possessed by the drip adopters and level of knowledge calculated on the basis of independent variables was significant. Of ten independent variables, three variables namely, education, socio-economic status and attitude towards drip irrigation system had positive and significant influence on the knowledge level of specific aspects in use of drip irrigation system. The 't' value for the education and socio-economic status were significant at 0.01 level while attitude was significant at 0.05 level of probability.

### 2.2 Multiple Reqression Analysis Independent Variables and Adoption

Table 3 reveals that ten independent variables explained to the exten of 61.64 per cent variation in the extent of adoption of drip irrigation system by the adopters. The mutilple correlation was 0.758 indicating that correlation between actual extent of adoption of drip irrigation technology by the farmers and extent of adoption calculated on the basis of independent variables was significant.

Out of ten independent variables, four variables, namely occupation, size of land holding, socio-economic status and attitude towards drip irrigation had positive and significant, whereas type of family had negative and significant influence on the extent of adoption of drip irrigation system by the farmers. The 't' value for the occupation, type of family, size of land holding, socio-economic status were significant at 0.01 level of probability, whereas attitude towards drip irrigation system was significant at 0.05 level of probability.

## CONCLUSION

The following conclusion can be drawn from the above findings. The independent variables, education, occupation, annual income, social participation, socio-economic status and attitude towards drip irrigation system were found positively significant whereas age, type and size of family were found negatively significant with knowledge and adoption, whlie 'size of land holding' did not show any relationship with knowledge and adoption.

Likewise, the independent variables, education, socio-economic status and attitude towards drip irrgation system, were fround positively significant with

**Table 1 : Relationship between selected characteristics of the respondents with their knowledge and adoption (N=120)**

| Variable Number | Characteristics | Zero order correlation coefficient (r) | |
|---|---|---|---|
| | | Knowledge | Adoption |
| $X_1$ | Age | -0.343** | -0.316** |
| $X_2$ | Education | 0.733** | 0.616** |
| $X_3$ | Occupation | 0.447** | 0.492** |
| $X_4$ | Type of family | -0.278** | -0.372** |
| $X_5$ | Size of family | -0.198* | -0.232* |
| $X_6$ | Size of land holding | -0.057 | -0.035 |
| $X_7$ | Annual income | 0.382** | 0.311** |
| $X_8$ | Social participation | 0.643** | 0.544** |
| $X_9$ | Socio-econimic status | 0.743** | 0.651** |
| $X_{10}$ | Attitude towards drip irrigation system | 0.558** | 0.501** |

* Significant at 0.05 level of probability
** Significant at 0.01 level of probability

**Table 2 : Multiple regression analysis of independent variables and knowledge.**
**(N=120)**

| Variable Number | Independent variables | Regression coefficient (b) | "t" value |
|---|---|---|---|
| $X_1$ | Age | -0.0175 | -0.561 |
| $X_2$ | Education | 1.377 | 2.685** |
| $X_3$ | Occupation | 0.491 | 1.364 |
| $X_4$ | Type of family | -0.848 | -1.012 |
| $X_5$ | Size of family | -0.093 | -0.187 |
| $X_6$ | Size of land holding | -0.319 | 1.766 |
| $X_7$ | Annual income | 0.00017 | 1.227 |
| $X_8$ | Social participation | 0.393 | 1.758 |
| $X_9$ | Socio-econimic status | 0.173 | 3.672** |
| $X_{10}$ | Attitude towards drip irrigation system | 0.0782 | 2.192* |

$R^2 = 0.6996$ $R = 0.8364$ 'F' value = 25.389**
* Significant at 0.05 level of probability
** Significant at 0.01 level of probability

**Table 3 : Multiple regression analysis of independent variables and adoption.**

**(N=120)**

| Variable Number | Independent variables | Regression coefficient (b) | "t" value |
|---|---|---|---|
| $X_1$ | Age | -0.021 | -0.842 |
| $X_2$ | Education | 0.381 | 0.885 |
| $X_3$ | Occupation | 0.995 | 3.159** |
| $X_4$ | Type of family | -1.711 | -2.431** |
| $X_5$ | Size of family | -2.241 | -0.574 |
| $X_6$ | Size of land holding | 0.503 | 3.311** |
| $X_7$ | Annual income | -0.000000063 | -0.054 |
| $X_8$ | Social participation | 0.324 | 1.727 |
| $X_9$ | Socio-econimic status | 0.105 | 2.657** |
| $X_{10}$ | Attitude towards drip irrigation system | 0.065 | 2.178* |

$R^2 = 0.6164$ R = 0.7581 'F' value = 17.517**

* Significant at 0.05 level of probability.

** Significant at 0.01 level of probability.

knowledge. In respect of adoption level, occupation, size of land holding, socio-economic status and attitude towards drip irrigation were found positively significant whereas, type of family was found negatively significant with exten of adoption.

## IMPLICATIONS

The above findings clearly indicated that education, socio-economic status and attitude towards drip irrigation system were the important variables contributing positively and significantly in increasing knowledge and adoption of drip irrigation practices among the farmers. It is for the Govt. agencies to motivate the farmers to educate their children. Education also helpe in developing personality. Attitude is the prior stage of decision-making extension agencies needs to strengthen their efforts in building positive attitude among the farmers about drip irrigation system.