

INFLUNCES OF INDEPENDENT VARIABLES ON OVERALL EXTENT OF CONTRIBUTION OF TRIBAL FARMWOMEN

Mahesh R. Patel¹, Arun Patel² and Jaydip D. Desai

1 Assoc. Ext. Educationist, EEI, AAU, Anand - 388 110

2 Director, EEI, AAU, Anand - 388 110

3 Senior Research Assistant, DoEE, AAU, Anand - 388 110

Email : newsmrp@gmail.com

ABSTRACT

Agricultural production plays a significant role in the Indian economy. In India, women and agriculture seem synonymous terms. One cannot think of agriculture without women. There is hardly any activity in agriculture except ploughing, where women are not involved. The tribal farmwoman shares with her husband the arduous burden of farm work in addition to her major responsibility as home maker, by helping in all other agricultural and animal husbandry activities. Keeping this fact in mind, the present study was carried out to find out influences of independent variables on overall extent of contribution of tribal farmwomen. The result of the study revealed that overall extent of contribution of tribal farmwomen in agricultural operations was found to be predicted by four independent variables namely, age, education, herd size and risk preference of tribal farmwomen from highest to lowest order based on standard partial regression coefficient with combine effect of 57.65 per cent of the total variation in it. The co-efficient of determination (R^2) indicated that the variable education of tribal farmwomen alone contributed significantly to 53.74 per cent of total variation in their overall extent of contribution in agricultural operations.

Keywords : *usefulness, tribal farmermen*

INTRODUCTION

Agriculture is the largest industry in India contributing to the source of livelihood for over 70 per cent of population. Agricultural production plays a significant role in the Indian economy. In India, women and agriculture seem synonymous terms. One can not think of agriculture without women. There is hardly any activity in agriculture except ploughing, where women are not involved. In some of the activities, she is relatively more efficient than man. Dahod is one of the Integrated Tribal Development Project (ITDP) areas of Gujarat State, where various administrative measures have been adopted through large number of tribal development and welfare programmes under Tribal Area Sub Plan (TASP). Since, independence huge fund have been diverted by the Central and State Government through different agencies with a view to uplift their living standard and bringing them into the main stream of nation. Even after lapses of more than 50 years of independence the progress of tribal farmwoman is not yet up to the level of expectation in the field of agriculture and animal husbandry as she is continued to be in a state of neglect. A victim of man made

system, she is hardly considered equal to man in wage and social status. Women constitute half of the population and 48 per cent of the rural population. The tribal farmwoman shares with her husband the arduous burden of farm work in addition to her major responsibility as home maker by helping in all other agricultural operations. (Patel *et al.*, 2016). Keeping in view the above said facts and information about the tribal farmwoman's situation and her multiple roles in agriculture and animal husbandry a study on "Influnces of Independent variables on overall extent of contribution of tribal farmwomen" was undertaken.

OBJECTIVE

To know the influnces of independent variables on overall extent of contribution of tribal farmwomen

METHODOLOGY

The present study was undertaken in Integrated Tribal Development Project areas of Dahod district of Gujarat. Out of seven talukas of the district, five talukas namely (1) Dahod (2) Zalod (3) Limkheda (4) Garbada and

Extension Plus: Expanding the Horizons of Extension for Holistic Agricultural Development

(5) Dhanpur were selected purposively for this study. Out of total villages of each selected taluka, two villages were randomly selected comprising total ten villages from five selected talukas kof ITDP Dahod. From each village, 20 respondents were selected randomly, thus, total sample of 200 respondents were selected for the present study. The data were collected by interview schedule.

Total 22 variables were selected for the study. The list of the selected variables are as under:

(A) Independent variables

I. Personal-social

- X₁ Age
- X₂ Education
- X₃ Marital status
- X₄ Type of family
- X₅ Size of family
- X₆ Social participation
- X₇ Socio-economic status

II. Economical

- X₈ Occupation
- X₉ Bullocks possessed
- X₁₀ Material possession
- X₁₁ Size of land holding
- X₁₂ Herd size
- X₁₃ Number of other working family member
- X₁₄ Migration habit
- X₁₅ Annual family income

III. Psychological

- X₁₆ Innovativeness
- X₁₇ Risk preference
- X₁₈ Scientific orientation
- X₁₉ Attitude towards different development programmes
- X₂₀ Awareness regarding different development programmes

IV. Communication

- X₂₁ Source of information

(B) Dependent variables

Contribution of tribal farmwomen in agricultural operations

Stepwise regression analysis

In order to study the joint effect of independent variables on dependent variables and to develop prediction equation the stepwise regression analysis was used.

In the stepwise regression analysis the regression analysis was started with regression of Y and X₁, X_k taken singly. The variable giving the highest accountability in sum of squares of Y is first selected. Then the bivariate regression in which X₁ appeared were worked out. The variate, which gives the highest additional accountability in sum of squares in Y after fitting X₁ variable was selected. All the trivariate regression that includes both X₁ and X₂ were computed. The analysis was continued till the last variate of which additional contribution was the least of all variables. The prediction equation used as:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_kX_k$$

Where,

Y = Dependent variable

a= Intercept

b₁,.....b_k = Partial regression co-efficient of respective independent variable

X₁,X_k = Independent variable

After fitting the regression equation, the “t” values for partial regression co-efficient were tested for their significance.

Standard partial regression coefficient

The various independent variables had their own unit of measurement, which did not permit a comparison of the partial (b_{Yi.j}) values. To facilitate comparison, the partial (b_{Yi.j}) values were converted into standard partial (b'_{Yi.j}) values which were free from the units of measurements. A standard or adjusted partial (b'_{Yi.j}) is called beta weight.

In order to assign the rank to various selected independent variables, the standard partial regression coefficient was used. To calculate the same, the following formula (Snedecor and Cochran, 1967) was used:

$$b_{Yi.j} = b_{Yi.j} \times \frac{\text{S D } \delta \text{ independent variable}}{\text{S D } \delta \text{ dependent variable}}$$

Where,

$b'_{Yi.j}$ = Standard partial regression coefficient or beta weight

$b_{Yi.j}$ = Partial ($b_{Yi.j}$)

A comparison of any two beta weights in a set of multiple regression equation indicates the relative importance of the independent variables involved in predicting the rational behaviour. The significance of the partial regression coefficient was tested by “t” statistic.

RESULTS AND DISCUSSION

Extent of variation caused by independent variables on dependent variables

In the previous sub-section, the relationships between independent and dependent variables were ascertained by computing correlation coefficients (r). The correlation coefficient value only gives the strength and direction of association but does not reflect on predictive ability of independent variables to the dependent variable. Hence, in order to access the amount of contribution (influence or predictive abilities) of each independent variable to the dependent variables, the stepwise regression analysis was carried out with the help of computer. Efroymsom’s (1962) stated that the stepwise regression is one such method which

had widely adopted in multiple regression analysis. It has got the added advantage that at each stage of analysis, every variable is subjected to an examination for its predictive value. The multiple regression co-efficient (R) represents the correlation between the dependent variables’ actual score and the predicted score obtained from the fitted multiple regression equation. The co-efficient of multiple regression determination (R²) gives the average amount of change in dependent variables, when all independent variables were taken together and was tested with ‘ F ’ test for its significance.

The partial regression co-efficient ($b_{Yi.j}$) represents the change in dependent variable (Y_i) with a quite change in independent variable (x_i) keeping other variables constant and it was tested with student’s ‘ t ’ test for its significance. The various independent variables had their own unit of measurement, which did not permit a comparison of the partial (b_{Yij}) values. To facilitate comparison, the partial (b_{Yij}) values were converted into standard partial (b'_{Yij}) values, which were free from the units of measurements. The independent variables were then ranked on the basis of standard partial (b'_{Yij}) values (ignoring sign) to find out their relative importance in predicting the dependent variable.

Stepwise regression analysis of independent variables on overall extent of contribution of tribal farmwomen in agricultural operations

Stepwise regression analysis with overall extent of contribution of tribal farmwomen in agricultural operations as a dependent variable and twenty one independent variables was carried out. The results are presented in Table 1 and Table 2 and diagrammatically in Fig. 1.

Table 1: Stepwise regression analysis of overall extent of contribution of tribal farmwomen in agricultural operations n = 200

Sr. No.	Independent variable	Partial regression coefficient (b_{Yij})	Standard partial error of regression coefficient (SE of b_{Yij})	‘t’ value	‘F’ value	Standard partial regression coefficient (b'_{Yij})	Rank
1	Age (X_1)	- 0.0040	0.0023	1.873 NS	3.012 NS	- 0.0843	IV
2	Education (X_2)	0.3845	0.0376	10.679**	104.676**	0.6279	I
3	Herd size (X_{11})	0.1680	0.0462	3.368**	13.194**	0.1766	II
4	Risk preference (X_{16})	0.0210	0.0081	2.519*	6.715*	0.1594	III

Constant : 7.2728,

Multiple R = 0.7593,

R² = 0.5765

NS = Non-Significant

* = Significant at 0.05 level of probability

** = Significant at 0.01 level of probability

Extension Plus: Expanding the Horizons of Extension for Holistic Agricultural Development

The data presented in Table 1 indicate that out of 21 independent variables, only four variables namely, age, education, herd size and risk preference of tribal farmwomen were accounting influence on overall extent of contribution of tribal farmwomen in agricultural operations. All the four independent variables together accounted 57.65 per cent extent of variation as indicated by multiple regression coefficient value (R²) for overall extent of contribution of tribal farmwomen in agricultural operations. As a result of stepwise regression analysis, the following regression model was obtained :

$$Y_1 = a + b_1 X_1 + b_2 X_2 + b_{11} X_{11} + b_{16} X_{16}$$

Where,

Y₁ = Overall extent of contribution of tribal farmwomen in agricultural operations

a = The intercept i.e. 7.2728 (constant)

b₁ = Coefficient of partial regression of Y₁ on X₁ i.e. - 0.0040

b₂ = Coefficient of partial regression of Y₁ on X₂ i.e. 0.3845

b₁₁ = Coefficient of partial regression of Y₁ on X₁₁ i.e. 0.1680

b₁₆ = Coefficient of partial regression of Y₁ on X₁₆ i.e. 0.0210

X₁ = Age

X₂ = Education

X₁₁ = Herd size

X₁₆ = Risk preference

Therefore, the fitted equation would be as under :

$$Y_1 = 7.2728 - 0.0040 X_1 + 0.3845 X_2 + 0.1680 X_{11} + 0.0210 X_{16}$$

The partial regression coefficient (b_{Yij}) value of these four variables were converted in to standard partial regression co-efficient (b'_{Yij}) value. The 't' values of partial b_{Yij} were found to be positively significant at 0.01 level of probability for two variables namely, education, herd size and at 0.05 level of probability for variable risk preference, whereas variable age found non-significant (results are in line with Vinaya et al, 2013). Based on the absolute values of standard partial regression coefficients (b'_{Yij}) they were ranked from highest to lowest order of contribution as under :

Standard partial regression coefficient (b' _{Yij})	Name of variable	Rank
0.6279	Education (X ₂)	I
0.1766	Herd size (X ₁₁)	II
0.1594	Risk preference (X ₁₆)	III
- 0.0843	Age (X ₁)	IV

The extent of variation accounted by different independent variables on overall extent of contribution of tribal farmwomen in agricultural operations are presented in Table 2.

Table 2 : Stepwise extent of variation accounted by different independent variables on overall extent of contribution of tribal farmwomen in agricultural operations n = 200

Step No.	Variables included	Multiple correlation coefficient (R)	Total variation accounted [R ² (%)]
Step-I	Education (X ₂)	0.7331	0.5374 (53.74 %)
Step II	X ₂ + Herd size (X ₁₁)	0.7457	0.5560 (55.60 %)
Step III	X ₂ + X ₁₁ + Risk preference (X ₁₆)	0.7549	0.5699 (56.99 %)
Step IV	X ₂ + X ₁₁ + X ₁₆ + Age (X ₁)	0.7593	0.5765 (57.65 %)

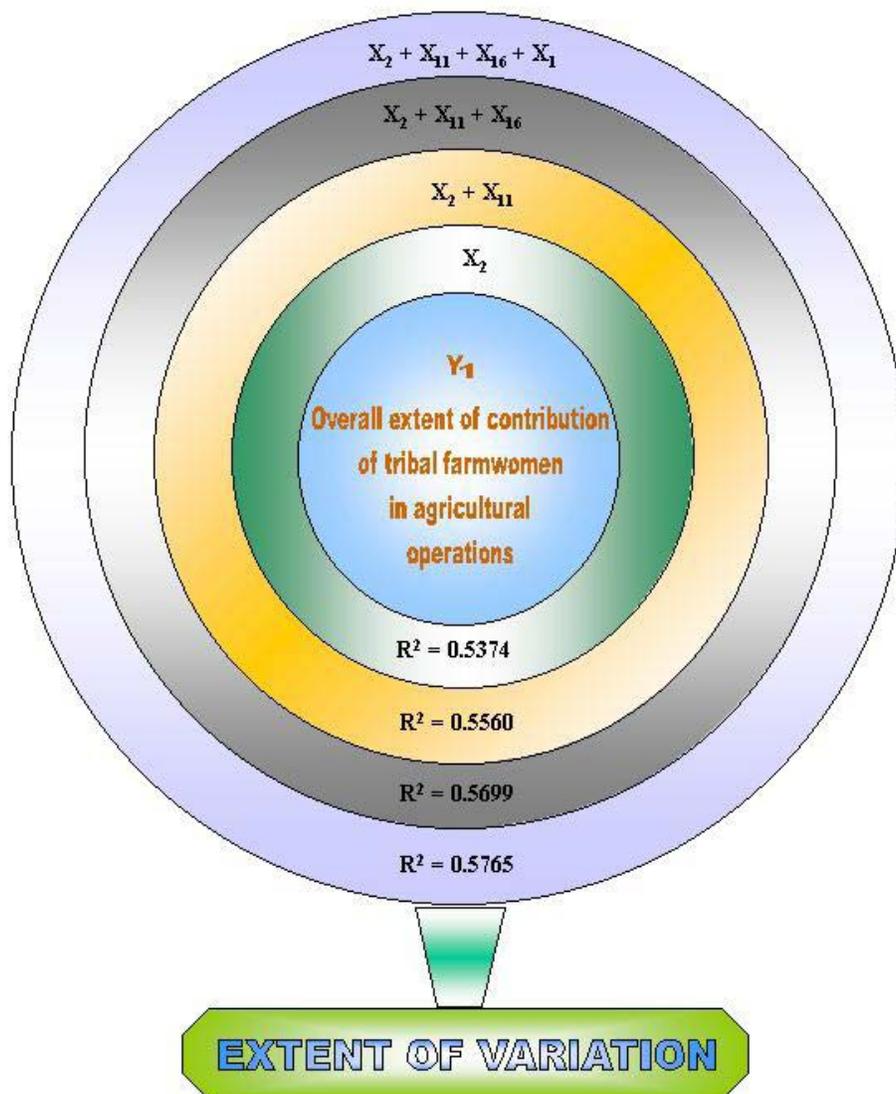
It is apparent from the Table 2 that the variable, education of tribal farmwomen had independently contributed to 53.74 per cent of total variation in overall extent of contribution of tribal farmwomen in agricultural operations. Whereas, herd size and education of tribal farmwomen jointly contributed to 55.60 per cent and risk preference, herd size and education of tribal farmwomen jointly contributed their

role to 56.99 per cent. While, 57.65 per cent joint influences on overall extent of contribution of tribal farmwomen in agricultural operations was observed from all the variable namely age, risk preference, herd size and education of tribal farmwomen.

On the whole, it can be concluded that overall extent of contribution of tribal farmwomen in agricultural operations

was found to be predicted by four independent variables namely, age, education, herd size and risk preference of tribal farmwomen having with the combine effect of 57.65 per cent of the total variation in overall extent of contribution of tribal farmwomen in agricultural operations. This findings are suggestive of fact that for increasing overall extent of

contribution of tribal farmwomen in agricultural operations in the areas of ITDP Dahod, implementing agencies of different development programmes taken up in integrated tribal development project Dahod have to increase the level of education of tribal farmwomen by organizing different education promoting programmes/activities.



Key to figure : Y_1 = Overall extent of contribution of tribal farmwomen in agricultural operations, X_2 = Education, X_{11} = Herd size, X_{16} = Risk preference, X_1 = Age

Fig. 1 : Extent of variation accounted by independent variables in overall extent of contribution in agricultural operations

CONCLUSION

It is concluded from the study that Overall extent of contribution of tribal farmwomen in agricultural operations was found to be predicted by four independent variables namely, age, education, herd size and risk preference of tribal farmwomen from highest to lowest order based on standard partial regression coefficient with combine effect of 57.65 per cent of the total variation in it. The co-efficient of determination (R^2) indicated that the variable education of tribal farmwomen alone contributed significantly to 53.74 per cent of total variation in their overall extent of contribution in agricultural operations.

REFERENCES

- Patel, G. J., Vahora, S. G. and Thorat, G. N. (2016). Training needs of tribal farm women in maize production technology. *Guj. J. Ext. Edu.* Vol. 27 : December, 2016
- Patel, J. G. (1998). Indigenous resource management by tribal farmwomen in Vadodara district of Gujarat state. Ph. D. thesis (Unpub), GAU, Anand
- Snedecor. G. W. and Cochran, W. G. (1967). 'Statistical Methods' (6th Ed.). Oxford & IBI Publishing Co. Pvt. Ltd., New Delhi
- Vinaya Kumar H.M, Mahatab Ali, K. M and Sujay Kumar, S. (2013). Personal and socio-psychological characteristics of the Beneficiary farmers of Community Based Tank Management Project and their relationship with socio-economic status. *International Journal of Advanced Biological Research.* 3(2): 184-187