Research Paper | Education

Extent of Variation Caused By Independent Variables Overall Extent of Contribution of Tribal Farmwomen in Agricultural Activities

Dr. Mahesh R. Patel	Assoc. Ext. Educationist, EEI, AAU, Anand, Gujarat, India
Dr. Arun Patel	Director, EEI, AAU, Anand, Gujarat, India
Shri Jaydip D. Desai	Senior Research Assistant, DoEE, AAU, Anand, Gujarat, India
Shri Vijay B. Patel	Assist. Research Scientist (Ext.), RRS, AAU, Anand, Gujarat, India
Dr. N. R. Patel	Ex. Assoc. Ext. Educationist, EEI, AAU, Anand, Gujarat, India

ABSTRACT 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. 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 Extent of Variation Caused by Independent Variables overall extent of contribution of tribal farmwomen in Agricultural activities. The result of the study revealed that education of tribal farmwomen was the most important variable affecting directly and positively to the overall extent of contribution of tribal farmwomen in agricultural operations. It had also provided a way for the variables viz., attitude towards different development programmes, awareness regarding different development programmes, risk preference, scientific orientation innovativeness, source of information, social participation, material possession and annual family income in exerting their indirect substantial effect on overall extent of contribution of tribal farmwomen in agricultural operations.

KEYWORDS : contribution, tribal farmwomen

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. 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 "Extent of Variation Caused by Independent Variables overall extent of contribution of tribal farmwomen in Agricultural activities" was undertaken.

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 (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.

Method of Data Collection

The interview schedule was prepared keeping in view the objectives of the study. The interview schedule was translated in to Gujarati language and pre-tested

in the field on a separate 20 non-sampled respondents. On the basis of pre-testing, necessary modifications were made in the final draft and used as the instrument for data collection.

Selection of variables

The selection of the variables included in the study was done on the basis of an extensive review of literature on the subject, consultation with experts and from previous studies taken up on the related subjects. Only those variables which were found having most relevant to the present investigation were finally selected for the study. The list of the selected variable is as under:

(A) Independent variables

I. Personal-social
1. Age
2. Education
3 Marital status
4. Type of family
5. Size of family
6. Social participation
7. Socio-economic status

II. Economical
1. Occupation
2. Bullocks possessed
3. Material possession
4. Size of land holding
5. Herd size
6. Number of other working family member
7. Migration habit
8. Annual family income

III. Psychological
1. Innovativeness
2. Risk preference
3. Scientific orientation

4. Attitude towards different development programmes
5. Awareness regarding different development programmes
   IV. Communication
1. Source of information
(B) Dependent variables
   Contribution of tribal farmwomen in agricultural opera
   tions

Path Analysis
the direct and indirect effects of various independent variables on the dependent variables, the method of path co-efficient analysis (Wright, 1921) was employed**.**

 correlation is an extension of the technique of standard partial regression co-efficient. Path effects were obtained by solving the simultaneous equations set up for the purpose using the correlation matrix. Considering X1 independent variable to be influencing the dependent variable "Y" the simultaneous equation would be:

$$n$$

$$ryxi = Pyxi + \sum rxixj \quad x \ Pyxj$$

$$i.j = 1$$

for i = 1, 2, 3............................. n

for j = 1, 2, 3............................. n (i ≠ j)

Where,

ryxi = Correlation co-efficient of X1 with Y

Pyxi = Direct effect and each of other terms in the equation is an indirect effect

 n

$\sum$ rxixj x Pyxj = Indirect effect of independent variables to dependent

        i,j =1   variable via other independent variables

RESULTS AND DISCUSSION
DIRECT, TOTAL INDIRECT AND SUBSTANTIAL INDIRECT EFFECTS OF THE SELECTED INDEPENDENT VARIABLES ON DEPENDENT VARIABLES

The correlation analysis of the data indicated the relationship between variables in the presence of all other variables; which normally operate in a life situation. The relationships revealed by correlation study may undergo change in different situations where some of the independent variables may not exist in the environment or they may be latent.

The stepwise regression analysis determines only the amount of contribution/predictive abilities of significant variables on dependent variable. Hence, to study the effects of independent variables on the dependent variables, both directly as well as indirectly through other variables present in the situation, the path analysis was employed.

For the purpose of using path analysis, only those independent variables (characteristics of tribal farmwomen) were selected which had showed significant association with dependent variable i.e. overall extent of contribution of tribal farmwomen in agricultural operations. The results of the path analysis are discussed as under :

Direct, total indirect and substantial indirect effects of personal-social, economical, psychological and communicational variables on overall extent of contribution of tribal farmwomen in agricultural operations
Total, 21 personal-social, economical, psychological and communicational characteristics of the tribal farmwomen were selected as independent variables for the study. In correlation analysis out of twenty one variables, a total of twelve variables were found to be significant

with the overall extent of contribution of tribal farmwomen in agricultural operations. While, in stepwise regression only three variables i.e. education, heard size and risk preference of tribal farmwomen were found significant and exerted their joint effects on overall extent of contribution of tribal farmwomen in agricultural operations. In path analysis, only those variables were included which had shown significant relation in correlation analysis. A total of twelve variables were found significant, therefore, they were included in path analysis. The results of path analysis are presented in Table 1 and diagrammatically in Fig. 1.

Table 1 : Path coefficient showing the direct, total indirect, and substantial indirect effect of independent variables on over all extent of contribution of tribal farmwomen in   agricultural operations

n = 200

Sr. No.	Variables		Direct effect	Total indirect effect	Substantial indirect effect through				
					First order		Second order		
1	X_1	Age	-0.0455	-0.2539	-0.2002	X_2	0.0335	X_{19}	
2	X_2	Education	0.9351	-0.2020	-0.1224	X_{20}	0.1124	X_{16}	
3	X_6	Social participation	-0.1035	-0.4389	0.4893	X_2	-0.0791	X_{20}	
4	X_7	Occupation	0.0715	-0.2582	-0.3107	X_2	0.0438	X_{19}	
5	X_9	Material possession	0.0917	0.1096	0.2493	X_2	-0.0365	X_{20}	
6	X_{14}	Annual family income	-0.0782	0.2406	0.1571	X_2	0.0966	X_{11}	
7	X_{15}	Innovativeness	0.0216	0.4433	0.5310	X_2	-0.1259	X_{20}	
8	X_{16}	Risk preference	0.1792	0.3488	0.5867	X_2	-0.1386	X_{20}	
9	X_{17}	Scientific orientation	-0.0572	0.5517	0.5502	X_2	-0.1338	X_{20}	
10	X_{18}	Source of information	0.1470	0.3322	0.5234	X_2	-0.1538	X_{20}	
11	X_{19}	Attitude towards different development programmes	-0.1441	0.6849	0.6959	X_2	-0.1245	X_{20}	
12	X_{20}	Awareness regarding different development programmes	-0.1714	0.7337	0.6678	X_2	0.1450	X_{16}	

Direct Effect
The Table 1 makes it clear that the highest positive direct effect on overall extent of contribution of tribal farmwomen in agricultural operations was exerted by education (0.9351), followed by risk preference (0.1792), source of information (0.1470), material possession (0.0917), occupation (0.0715) and innovativeness (0.0216). Whereas the variables awareness regarding different development programmes (-0.1714), attitude towards different development programmes (-0.1441), social participation (-0.1035), annual family income (-0.0782), scientific orientation (-0.0572) and age (-0.0455) in order of sequence had exerted negative direct effect on overall extent of contribution of tribal farmwomen in agricultural operations. From the above discussion, it can be concluded that variable education had exerted the highest positive direct effect on overall extent of contribution of tribal farmwomen in agricultural operations. The other variables like risk preference, source of information, material possession, occupation and innovativeness had exerted higher positive direct effect in sequential order. Whereas, attitude towards different development programmes, social participation, annual family income, scientific orientation and age had exhibited the largest negative direct effect on overall extent of contribution of tribal farmwomen in agricultural operations in sequential order.

Total indirect effect
It is revealed from the Table 1 that the highest positive total indirect effect on overall extent of contribution of tribal farmwomen in agricultural operations was exerted by awareness regarding different development programmes (0.7337) followed by attitude towards different development programmes (0.6849), scientific orientation

(0.5517), innovativeness (0.4433), risk preference (0.3488), source of information (0.3322), annual family income (0.2406) and material possession (0.1096). Whereas, social participation (-0.4389), occupation (-0.2582), age (-0.2539) and education (-0.2020) exerted negative total indirect effect on overall extent of contribution of tribal farmwomen in agricultural operations. The above foregoing discussion leads to conclude that among the positively and indirectly affecting variables, awareness regarding different development programmes exerted the highest positive total indirect effect on overall extent of contribution of tribal farmwomen in agricultural operations. The other variables namely, attitude towards different development programmes, scientific orientation, innovativeness, risk preference, source of information, annual family income and material possession exhibited higher positive total indirect effect on overall extent of contribution of tribal farmwomen in agricultural operations. Whereas variables namely, social participation, occupation, age and education exerted negative total indirect effect on overall extent of contribution of tribal farmwomen in agricultural operations.

Substantial indirect effect
A. First order effect
It is observed from Table 1 that the first order substantial indirect effect on overall extent of contribution of tribal farmwomen in agricultural operations was exerted through the variables namely, education and awareness regarding different development programmes. The first highest positive substantial indirect effect on overall extent of contribution of tribal farmwomen in agricultural operations was exerted by attitude towards different development programmes (0.6959) through education, followed by awareness regarding different development programmes (0.6678), risk preference (0.5867) and scientific orientation (0.5502), respectively. The other variables exerted considerable first order positive substantial indirect effect through education, were innovativeness (0.5310), source of information (0.5234), social participation (0.4893), material possession (0.2493) and annual family income (0.1571) in descending order. It is interesting to note that all of the independent variables were exerted first order positive substantial indirect effect on overall extent of contribution of tribal farmwomen in agricultural operations through education.

While age (-0.2002) had exerted negative first order substantial indirect effect through education and education (-0.1224) had exerted negative first order substantial indirect effect through awareness regarding different development programmes on overall extent of contribution of tribal farmwomen in agricultural operations.
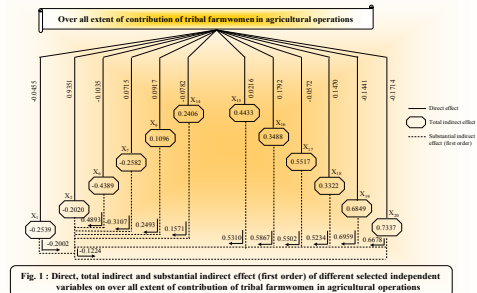
B. Second order effect
In case of second order substantial indirect effect on overall extent of contribution of tribal farmwomen in agricultural operations was exerted through awareness regarding different development programmes, risk preference and herd size.

The second highest positive substantial indirect effect on Overall extent of contribution of tribal farmwomen in agricultural operations was exerted by awareness regarding different development programmes (0.1450) through risk preference followed by education (0.1124) through risk preference, annual family income (0.0966) through herd size, occupation (0.0438) and age (0.0335) through attitude towards different development programmes in their sequential order. Whereas, sources of information (-0.1538), risk preference (-0.1386), scientific orientation (-0.1338), innovativeness (-0.1259), attitude towards different development programmes (-0.1245), social participation (-0.0791) and material possession (-0.0365) exerted negative second order substantial indirect effect through awareness regarding different development programmes on overall extent of contribution of tribal farmwomen in agricultural operations.

The foregoing discussion leads to conclude that education of tribal farmwomen was the most important variable affecting directly and positively to the overall extent of contribution of tribal farmwomen in agricultural operations. It had also provided a way for the variables viz., attitude towards different development programmes, awareness regarding different development programmes, risk preference, scientific orientation innovativeness, source of information, social participation, material possession and annual family income in exerting their indirect substantial effect on overall extent of contribution of

tribal farmwomen in agricultural operations. Therefore implementing agencies of different development programmes taken up in the areas of ITDP Dahod, non-government organizations and other extension agencies should come forward to increase education of tribal farmwomen through various extension activities, so that tribal farmwomen can take the advantages of different development programmes taken up in the areas of ITDP Dahod and they give their more contribution in different agricultural development activities.

Fig. 1 : Direct, total indirect and substantial indirect effect (first order) of different selected independent variables on over all extent of contribution of tribal farmwomen in agricultural operations

CONCLUSION
It is concluded from the study that the variable education had exerted the highest positive direct effect on overall extent of contribution of tribal farmwomen in agricultural operations. The other variables like education, risk preference, source of information, material possession and occupation had exerted higher positive direct effect in sequential order.

Among the positively and indirectly affecting variables, awareness regarding different development programmes had exerted the highest positive total indirect effect on overall extent of contribution of tribal farmwomen in agricultural operations. The other variables namely, attitude towards different development programme, scientific orientation, innovativeness, risk preference, source of information, annual family income and material possession exhibited positive total indirect effect overall extent of contribution of tribal farmwomen in agricultural operations. Whereas variables namely, social participation, occupation, age and education exerted negative total indirect effect on overall extent of contribution of tribal farmwomen in agricultural operations.

The first order highest positive substantial indirect effect on overall extent of contribution of tribal farmwomen in agricultural operations was exerted by attitude towards different development programmes (0.6959) through education, followed by awareness regarding different development programmes (0.6678), risk preference (0.5867) and scientific orientation (0.5502), respectively. The other variables exerted considerable first order positive substantial indirect effect through education, were innovativeness (0.5310), source of information (0.5234), social participation (0.4893), material possession (0.2493) and annual family income (0.1571) in descending order. It is interesting to note that all of the independent variables were exerted first order positive substantial indirect effect on overall extent of contribution of tribal farmwomen in agricultural operations through education.

While age (-0.2002) had exerted negative first order substantial indirect effect through education and education (-0.1224) had exerted negative fist order positive substantial indirect effect on overall extent of contribution of tribal farmwomen in agricultural operations.

The second order highest positive substantial indirect effect on overall extent of contribution of tribal farmwomen in agricultural operations was exerted by awareness regarding different development programmes (0.1450) through risk preference followed by education (0.1124) through risk preference, annual family income (0.0966) through herd size, occupation (0.0438) and age (0.0335) through attitude towards different development programmes in their sequential order. Whereas, sources of information (0.1538), risk preference (-0.1386), scientific orientation (-0.1338), innovativeness (-0.1259), attitude towards different development programmes (-0.1245), social participation (-0.0791) and material possession (-0.0365) exerted negative second order substantial indirect effect through awareness

regarding different development programmes on overall extent of contribution of tribal farmwomen in agricultural operations.

REFERENCES

1. Snedecor. G. W. and Cochran, W. G. (1967). 'Statistical Methods' (6th Ed.). Oxford & IBI Publishing Co. Pvt. Ltd., New Delhi.

2. Patel, J. G. (1998). Indigenous resource management by tribal farmwomen in Vadodara district of Gujarat state. Ph. D. thesis (Unpub), GAU, Anand.

3. Wrights, S. A. (1921). Correlation and causation. *J. of Agril. Res.,* **20** : 557-585.