

REGRESSION ANALYSIS OF PERSONAL ATTRIBUTES OF FPOs MEMBERS AND THEIR ENTREPRENEURIAL BEHAVIOR

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ABSTRACT

An effort was made to study the entrepreneurial behavior of FPO members and contribution of personal attributes of members in changing their entrepreneurial behavior. Based on maximum number of FPOs, Pune district of Western Maharashtra was purposively selected. Ex- post facto research design was used for the present study. Data were collected from 200 member farmers from three talukas of Pune districts through personal interview schedule by multistage sampling procedure. Multiple regression analysis is used to know the combined effect of all the independent variables in explaining the total variation in the dependent variable. The results indicated that majority of the respondents (67.50 per cent) were observed in the medium level of entrepreneurial behaviour. The results of regression analysis revealed that all the independent variables explained 77.30 per cent total variation in the entrepreneurial behaviour of members of which age, education, knowledge and attitude indicated significant contribution at 1 per cent level of significance. Further in step-wise multiple regression analysis six variables viz., age, education, social participation, annual income, knowledge and attitude combinedly explained 76.60 per cent of total variation in the entrepreneurial behavior indicating “t” value and “f” values for all the above six variables were found significant at 5 per cent level of significance. Thus it can be concluded that KVKs, extension functionaries, agriculture department should consider these variables while planning developmental activities for FPO members. It will be helpful for creating favourable environment for FPOs to run their enterprise effectively.

Keywords: Entrepreneurial behavior, farmer, knowledge, attitude, FPO

INTRODUCTION

In order to ascertain the relative importance of each of independent variables in explaining the dependent variable regression analysis is used (Efroymsons, 1962). The multiple regression technique was used to study the combined effect of all personal attributes of member farmers of farmer Producers' organisation in changing their entrepreneurial behavior. In India, Maharashtra is one of the leading states with total no. of FPOs registered till 2021. Farmer producers' organisation provided the gateway to the small and marginal farmers to market, technology and credit. These functional groups formed at taluka and village level mobilized their resources, facilitated the members for collective purchase of inputs, collective marketing, storage value addition, processing etc. Organisations helped member farmers to develop entrepreneurial qualities viz. planning ability, decision making, marketing skills, business skills etc. An attempt was made to study the entrepreneurial behavior of FPO members and to find the contribution of each personal attribute of member farmer in changing the entrepreneurial behavior by

applying the step-wise multiple regression technique. This procedure premises the study of linear relationship between a set of independent variables and a dependent variable. Mehta *et al.* (2017) studied the association between knowledge levels of farmers about improved animal husbandry practices and constraints perceived by the farmers in adoption of improved animal husbandry practices in the Chhotaudepur district of Gujarat, India. It revealed that significant association was found between age, education, family type, herd size and annual income with knowledge level of respondents. It was also found that location of artificial insemination centre at distance place, poor adaptability of cross bred cow in local climate condition and there is no provision of loan for cattle purchasing by society and bank were perceived most important constraints by both producer members and non member respondents.

Kumar *et al.* (2012) studied the 240 respondents of four panchayat samities of Jaipur and two of Sikar districts of Rajasthan. Two gram panchayat samities from each panchayat samities were selected to know the factor which

hinders the adoption of drip irrigation technology. It was concluded that economic motivation, size of land holding, mass media exposure and socioeconomic status were found positively and significantly associated with the extent of adoption of drip irrigation by the farmers while irrigation potentiality found negatively associated with the adoption of drip irrigation technology. Experience in farming was non-significantly associated with the adoption of drip irrigation technology. In order to know the relative contribution of each independent variable in deciding dependent variable, the present investigation was undertaken.

OBJECTIVE

To study the personal attributes of member farmer of FPO, and to ascertain the contribution of each personal attribute to change the entrepreneurial behavior by applying regression analysis.

METHODOLOGY

The study was conducted in Pune district of Western Maharashtra. The tehsils viz. Khed, Junnar and Purander tehsils were purposively selected. The selections of tehsils were based on maximum number of FPOs working in vegetable production. Total Five, four and two FPOs were selected from Khed, Junnar and Purander tehsils, respectively. Based on total number of members of FPO, 10 per cent respondents were selected proportionately from each FPO to form total 200 sample size. Main indicators of entrepreneurial behaviour were identified by taking the expert opinion of judges and structured schedule was developed to study the contribution of each indicator towards developing overall entrepreneurial behaviour of the member. The respondents were grouped into three categories based on the entrepreneurial behaviour index (EBI). Entrepreneurial behaviour index was calculated by following formula and respondents were grouped into three categories on the basis of mean ($\bar{X}$) and standard deviation (S.D.).

$$EBI = \frac{\sum(\text{Score obtained for the indicator} \times \text{Scale value of the indicator})}{\sum(\text{Maximum score for the indicator} \times \text{Scale value of the indicator})} \times 100$$

$$\bar{X} = \frac{\sum X_i}{n}$$

Where,

$$\sum X_i \text{ is the sum of all observations.}$$

n is total of observations.

$$S = \frac{\sqrt{\sum (X_i - \bar{X})^2}}{n - 1}$$

Where,

S is the sample standard deviation.

i observations in sample.

$\bar{X}$ is the mean of sample.

n is the size of sample

Further, stepwise regression provides a judgment on the contribution made by each variable entered irrespective of its actual point of entry into the model. Any variable, which provides a non-significant contribution, is removed from the model. This process is continued until no more variables will admit to the equation and no more are rejected. (Draper and Smith, 1966). In the present study, the step-wise regression analysis was conducted on computer. The approach used in this programme for selection of independent variables was according to their importance and significances. In this model, the regression of Y (dependent variable) on all independent variables ($X_1, X_2, X_3, \dots, X_{14}$) was calculated.

The prediction equation was used as-

$$\hat{Y} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_{14}$$

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Where,

$\hat{Y}$ is the predicted value of dependent variable.

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 β_0 is the intercept

$\beta_1, \beta_2, \beta_3, \dots, \beta_{14}$ are the regression coefficient of independent variables

$X_1, X_2, X_3, \dots, X_{14}$ are the independent variables

ϵ is the error term

RESULTS AND DISCUSSION

The results of distribution of the member farmers of FPO by their entire according to the category as low, medium and high as their entrepreneurial behavior index is presented in table 1. It can be seen that majority of the respondents (67.50 per cent) were observed in the medium level of entrepreneurial behaviour index, while 19.00 per cent respondents fell under the category of high entrepreneurial behaviour. The remaining 13.50 per cent respondents possessed low level of entrepreneurial behaviour. These findings are in conformity with the findings of Vinaya *et al.* (2013); Chaurasiya *et al.* (2017), Lawrence and Ganguly (2012) and Shailesh Kumar *et al.* (2013).

Table 1 : Distribution of the member farmers of FPO by their entrepreneurial behavior Index

(n = 200)

Sr. No.	Category	Frequency	Percent
1	Low (upto 73.96 E.B.I.)	27	13.50
2	Medium (73.97 to 82.56 E.B.I.)	135	67.50
3	High (above 82.56 E.B.I.)	38	19.00
Total		200	100.00

mean ($\bar{X}$) = 78.76 and S.D. = 4.86

The 14 independent variables were considered in the multiple regression models for the explanation of the variation in entrepreneurial behaviour. The results are presented in Table 2 and diagrammatically depicted by Fig.1. It revealed that all the independent variables were explained 77.30 per cent total variation in the entrepreneurial behaviour

of members. The unexplained variation of 22.70 per cent may be due to factors outside the scope of this study. The four variables viz., age, education, knowledge and attitude were significant at 1 per cent level of significance, indicating significant contribution of these four variables in explaining the variation in entrepreneurial behaviour of members.

Table 2 : Results for personal attributes of the FPO members

(n = 200)

Sr. No.	Variables	Regression coefficient (β_i)	S.E.	't' value (D.F.=185)
X ₁	Age	-0.119**	0.04	-2.794
X ₂	Education	2.131**	0.660	3.229
X ₃	Occupation	0.335	0.302	1.112
X ₄	Social participation	0.888	0.577	1.538
X ₅	Land holding	0.017	0.420	0.040
X ₆	Annual income	3.963x10 ⁻⁶	0.001	1.779
X ₇	Credit utilization	-0.724	0.555	-1.305
X ₈	Irrigation method	-0.208	0.196	-1.063
X ₉	Cropping Pattern	0.070	0.557	0.127
X ₁₀	Market distance	0.001	0.018	-0.041
X ₁₁	Knowledge	0.818**	0.175	4.682
X ₁₂	Attitude	0.115**	0.023	4.984
X ₁₃	Sources of information	0.032	0.077	0.413
X ₁₄	Extension participation	0.080	0.059	1.368

**Significant at 1% level, $R^2 = 77.30$ and Multiple $R = 0.879$

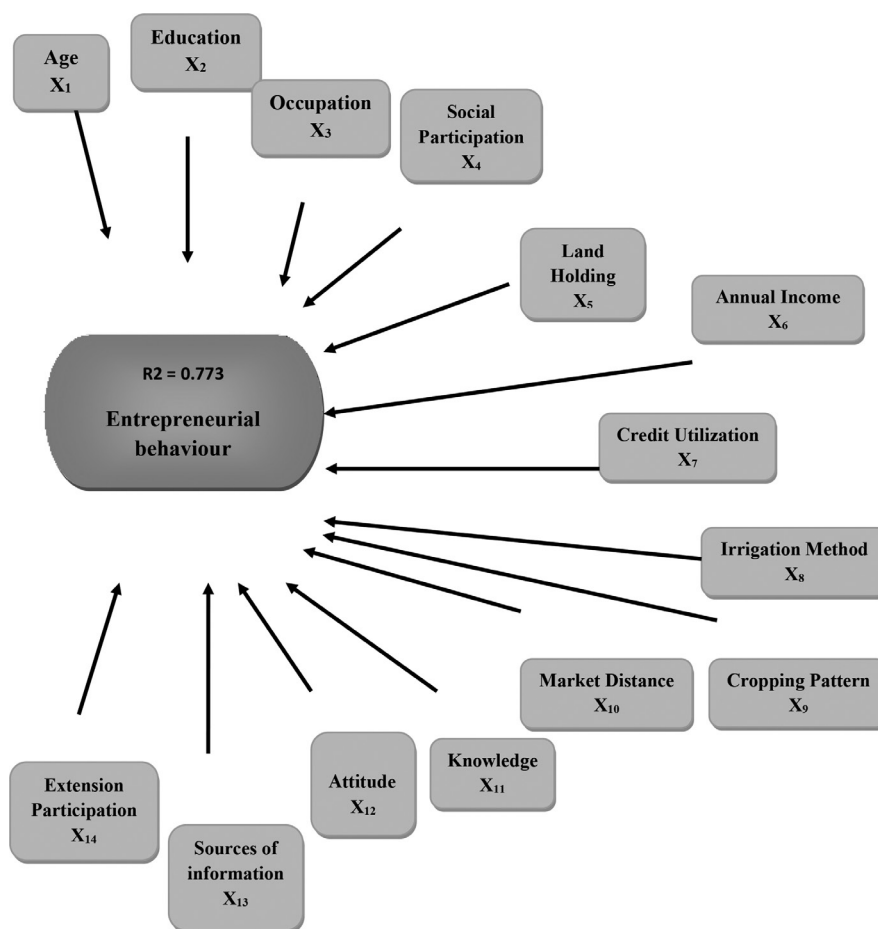


Fig. 1 : Multiple regression analysis of profile of respondents

The stepwise multiple regression analysis has got the added advantage that at each stage of analysis, every variable is subjected to an examination for its predictive value. Based on this approach the step-wise multiple regression analysis was carried out to find out the important variables with their predictive ability in explaining the variation in the dependent variable (Drapper, 1966). In step-wise regression analysis, all the 14 independent variables were considered and the results are given in Table 3 and Fig.2. It is obviously from the Table3 that the six variables viz., age, education, social

participation, annual income, knowledge and attitude put together explained as much as 76.60 per cent of total variation in the entrepreneurial behaviour. The unexplained variation of 23.40 per cent may be due to factors other than the above mentioned six variables which are not included in the study. It can also seen that all the six variables were found significant at 5 per cent level of significance indicating significant contribution of these six variables on entrepreneurial behaviour of members of vegetable producers organization.

Table 3 : Step-wise multiple regression analysis of the personal attributes of the FPO members

(n = 200)

Sr. No.	Independent variables	Partial regression coefficient (b_i)	S.E. of (b_i)	"t" value (DF=193)	"F" value (DF=193)	Standardized partial regression coefficient (b_i')	Rank
X ₁	Age	-0.116	0.040	-2.876	8.271	0.03812	II
X ₂	Education	2.117	0.627	3.378	11.408	0.07653	I
X ₃	Social participation	1.229	0.501	2.454	6.022	0.0366	V
X ₄	Annual Income	3.862×10^{-6}	1.698×10^{-6}	2.274	5.171	0.0353	VI
X ₅	Knowledge	0.924	0.160	5.768	33.267	0.0746	III
X ₆	Attitude	0.135	0.020	6.878	47.304	0.03878	IV

Intercept = 231.74, Multiple R = 0.875 and R^2 = 76.60 per cent.

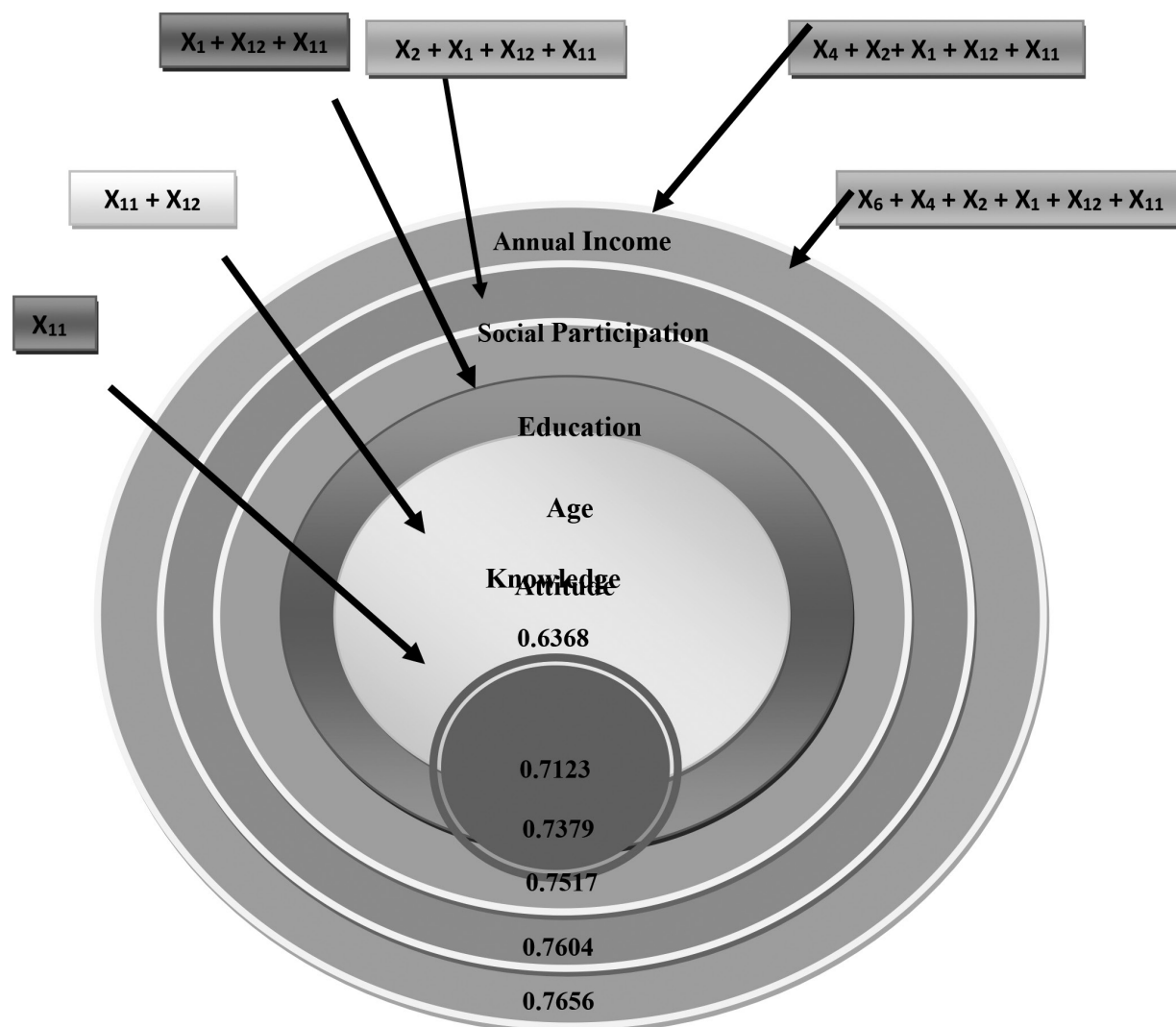


Fig. 2 Extent of variation caused by independent variables on Entrepreneurial behaviour

Table 4 : Step-wise variation accounted by selected independent variables in entrepreneurial behaviour (n = 200)

Step No.	Variables included	Multiple "R"	Total variation accounted (R ²)	Variation between step
1	Knowledge (X ₁₁)	0.798	0.6368 (63.68 %)	63.68
2	Attitude (X ₁₂) + X ₁₁	0.844	0.7123 (71.23 %)	7.55
3	Age (X ₁) + X ₁₂ + X ₁₁	0.859	0.7379 (73.79 %)	2.56
4	Education (X ₂) + X ₁ + X ₁₂ + X ₁₁	0.867	0.7517 (75.17 %)	1.38
5	Social participation (X ₄) + X ₂ + X ₁ + X ₁₂ + X ₁₁	0.872	0.7604 (76.04 %)	0.87
6	Annual Income (X ₆) + X ₄ + X ₂ + X ₁ + X ₁₂ + X ₁₁	0.875	0.7656 (76.56 %)	0.52
Total				76.56%

It is also clear from Table 4 that the variable, knowledge accounted alone 63.68 per cent variation in entrepreneurial behaviour followed by (knowledge + attitude) 71.23 per cent, (knowledge + attitude+ age) 73.79 per cent, (knowledge + attitude+ age+ education) 75.17 per cent, (knowledge + attitude+ age+ education+ social participation) 76.04 per cent and (knowledge + attitude+ age+ education+ social participation + annual income) accounted 76.56 per cent variation of total variation was accounted by a set of six independent variables viz., knowledge, attitude, age, education, social participation and annual income put together on entrepreneurial behaviour. The standardized partial values also indicated that the education (0.07653) and knowledge (0.0746) were in the highest order of magnitude, which reflected its importance (fig 2). The findings were closely associated with the findings of Mahammad Shafi *et al.* (2021) and Shaik *et al.* (2019), also by Zala *et.al* (2025); Dehariya *et al.* (2025); Patil *et al.* (2025); Anusha *et al.* (2025); Navya *et al.* (2025); Lade *et al.* (2024); Machapathri *et al.* (2024).

RECOMMENDATION

The multiple regression analysis revealed that six variables viz., age, education, social participation, annual income, knowledge and attitude combined explained 76.60 per cent of total variation in the entrepreneurial behaviour. Therefore, it can be recommended that the policy makers, SAU's, KVK's extension functionaries, agriculture department should consider these variables for designing training programme, business development activities of FPO's for their economic sustainability.

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CONFLICT OF INTEREST

There is no conflict of interest among the researcher.

CONCLUSIONS

It is revealed that the members of farmer producers organization had shown fairly good entrepreneurial behavior, it can be said that organization helped them to develop entrepreneurial qualities. Further it is observed that four variables viz., age, education, knowledge and attitude indicated significant contribution in explaining the variation in entrepreneurial behaviour of members at 1 per cent level of significance. Also six variables viz., age, education, social participation, annual income, knowledge and attitude combined explained 76.60 per cent of total

variation in the entrepreneurial behaviour. Thus it can be concluded that KVKs, extension functionaries, agriculture department should consider these variables while planning developmental activities for FPO members. It will be helpful for creating favourable environment for FPOs to run their enterprise effectively.

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