Research Article

FACTORS DETERMINING THE MEMBERSHIP OF FARMERS IN FARMER PRODUCER ORGANISATIONS (FPO) IN TAMIL NADU

MONIKA E.[1]*, THILAGAVATHI M.[2], PRAHADEESWARAN M.[3] AND DURAISAMY M.R.[4]

[1]Department of Agricultural Economics, Agricultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore, 641 003, Tamil Nadu, India
[2]Professor, Department of Agricultural Economics, Agricultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore, 641 003, India
[3]Department of Agricultural Economics, Agricultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore, 641 003, Tamil Nadu, India
[4]Professor and Head, Department of Physical Sciences and Information Technology, Agricultural Engineering College and Research Institute, Tamil Nadu Agricultural University, Coimbatore, 641 003, Tamil Nadu, India
*Corresponding Author: Email - monikae1804@gmail.com

Abstract: Farmer Producer Organisation (FPO) has emerged as a viable institutional form for addressing the major challenges faced by the small and marginal farmers. The central government had been taking several measures to vigorously increase the number of FPOs in the country. But these measures by the government will become meaningless if farmers did not take the membership. Therefore, in order to ensure the membership of farmers and sustainability of FPOs, there is a need to identify the factors influencing membership of farmers in the FPOs. With this aim, the present study was carried out in Erode district of Tamil Nadu. A total of 180 respondents comprising of ninety member and ninety non-member farmers was selected by multistage purposive cum random sampling. A pre tested interview schedule was employed for data collection. The binary logistic regression was carried out to determine the factors influencing farmers' membership in the FPOs. The results showed that education, number of dependents, credit availed per year, on-farm income, extension agency contact and membership in other organization or association or groups were found to have a significant influence on the membership of farmers in the FPOs. Except number of dependents and credit availed per year, the other variables are found to have a positive influence on the membership. The study concludes that farmers' membership in FPOs can be improved by increasing their on-farm income through improved technologies, organizing farmers into farmers' interest groups or farmers associations and by ensuring maximum participation of farmers in the extension activities taken by the governmental or non-governmental organizations.

Keywords: *Membership, Farmer Producer Organisations (FPOs), Logit model*

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Introduction

Collectivisation of farmers in the form of institutions had received wider acknowledgement all over the world in the last two decades. Of which, Farmer Producer Organizations (FPOs) have emerged as the most effective pathways for addressing the problems of small holder farmers in agriculture. In India, majority of the farm households, nearly 86.2 percent were small and marginal farmers but their share in the country's operational area was only about 43.6 percent [1]. These small holder farmers are characterized by limited access to quality and affordable inputs, less capital and higher cost of credit which leads to lower rates of production [2]. Higher transaction cost, lack of market information and price instability in turn reduces their market efficiency [3]. In addition, poor access to extension services, insufficient finance and higher vulnerability to climate risks leaves them to lower rates of technology adoption [4]. Thus, these farmers find themselves competing with large farmers and big commercial companies due to their lower marketable surplus and less bargaining power [5].

Therefore, institutional reforms in the form of cooperatives or producer organizations gained importance to alleviate the problems of small and marginal farmers. But the cooperative system in the country has failed to an extent to address the issues of small holder farmers due to high political interference, corruption, its inward orientation, poor efficiency and capital constraints due to declining governmental support except in cases of few dairy and large cooperatives [6]. Therefore, an attempt was made to strengthen the cooperative movement in 2002 under the recommendations of Y.K. Alagh committee,

which was the amendment of Companies Act 1956 that led to the incorporation of Farmer Producer Companies in India. During their initial phases, they faced challenges such as lack of recognition or capital support from the government, lack of credit facilities [6]. But later in 2013, the Government of India formulated the policy guidelines for Farmer Producer Organisations (FPOs) in India which stressed the role of state and central government in the promotion of FPOs. Since then, FPOs were recognized as the most appropriate institutional form to mobilize farmers and for improving their economies of scale by collectively building their production and marketing strengths. Presently, around 5000 FPOs are in existence in the country which were promoted under various initiatives of the GoI including SFAC, NABARD, State governments and other non-governmental organizations.

The importance of FPOs is gaining momentum in the country as they are said to improve the income of small and marginal farmers through bulk procurement of inputs, reduced transaction costs, better access to input markets, better credit facilities, improved knowledge on new technologies on the input side and through improved storage and processing facilities, developed market networks on the output side. Thus, the Government of India introduced and approved a project, 'Operation Greens' in the Union budget of 2018-19 to promote farmer producer organizations in the country with the aim of doubling farmers income by 2022. More recently, in the Union budget of 2019-20, the Government of India has declared its decision to create 10,000 FPOs in the next 5 years so as to ensure the economies of scale of the farmers [7].

Table-1 *Definition and Descriptive statistics of the dependent and independent variables*

Variable	Type	Definition of variable	Expected Sign	Mean	Standard Deviation
Dependent variable					
PARTFPO (Y)	Dummy	1 if farmer participate in the farmer producer organisation, 0 otherwise	N/A	0.50	0.50
Independent variables					
AGE (X_1)	Continuous	Age of the household head (years)	-	46.75	8.96
GEND (X_2)	Dummy	1 if the household head is male, 0 if female	+	0.90	0.30
FSIZE (X_3)	Continuous	Operational farm size (acres)	+	6.03	5.31
EDUCTN (X_4)	Continuous	Educational level of the household head (No. of schooling years)	+	10.27	4.13
DEPEND (X_5)	Continuous	Number of dependents per family	-	2.84	0.95
CRDT (X_6)	Continuous	Credit availed per household (Rs/year)	-	132805.56	73474.72
SAVNG (X_7)	Continuous	Savings per household (Rs/year)	+	284466.94	177358.39
ONFARIN (X_8)	Continuous	On-farm income per household (Rs/year)	+	533815.36	255711.10
NONFIN (X_9)	Continuous	Non-farm income per household (Rs/year)	+	84944.44	168764.81
EXTCON (X_{10})	Continuous	Extension agency contact (Frequency of contacts per year)	+	5.03	2.94
MEMOTHR (X_{11})	Dummy	1 if the farmer is a member in any other organisation/ association/ group, 0 otherwise	+	0.54	0.50

Table-2 *Socio-economic characteristics of the sample households*

SN	Categories	Member		Non-member	
		No. of households	Percent to total	No. of households	Percent to total
1	*Age*				
a)	< 40	32	35.56	23	25.56
b)	40 – 50	45	50.00	43	47.78
c)	> 50	13	14.44	24	26.67
	Average (years)	44.10		49.40	
2	*Education*				
a)	Illiterate	0	0.00	6	6.67
b)	Primary (upto 5th)	12	13.33	19	21.11
c)	Secondary (6th to 12th)	54	60.00	51	56.67
d)	Collegiate (above 12th)	24	26.67	14	15.56
	Average (No. of schooling years)	11.23		9.31	
3	*Household size*				
a)	Small (<4)	29	32.22	14	15.56
b)	Medium (4-5)	50	55.56	60	66.67
c)	Large (>5)	11	12.22	16	17.78
	Average (Numbers)	3.78		4.57	
4	*Farming experience*				
a)	< 15 years	20	22.22	10	11.11
b)	15 - 35 years	53	58.89	50	55.56
c)	> 35 years	17	18.89	30	33.33
	Average (years)	25.21		32.54	
5	*Landholding size*				
a)	Marginal (<2.5 acres)	22	24.44	23	25.56
b)	Small (2.5-5 acres)	31	34.44	36	40.00
c)	Semi medium (5-10 acres)	21	23.33	19	21.11
d)	Medium (10-25 acres)	13	14.44	9	10.00
e)	Large (>25 acres)	3	3.33	3	3.33
	Average (acres)	6.23		5.83	
6	*Annual Credit*				
a)	< 60000	16	17.78	6	6.67
b)	60000 – 180000	64	71.11	68	75.56
c)	> 180000	10	11.11	16	17.78
	Average (Rs/year)	113306.56		152305.56	
7	*Annual Savings*				
a)	< 100000	7	7.78	20	22.22
b)	100000 – 400000	54	60.00	47	52.22
c)	>400000	29	32.22	23	25.56
	Average (Rs/year)	304482.22		264451.67	
8	*Annual Income*				
a)	< 300000	11	12.22	16	17.78
b)	300000 – 600000	56	62.22	63	70.00
c)	> 600000	23	25.56	11	12.22
	Average (Rs/year)	620352.36		479900.58	
9	*Annual Expenditure*				
a)	< 60000	13	14.44	16	17.78
b)	60000 – 120000	53	58.89	64	71.11
c)	> 120000	24	26.67	10	11.11
	Average (Rs/year)	103910.67		87570.67	

But all these efforts of the government will go in vain if the farmers are reluctant to join in these FPOs. The emphasis on number of FPOs has led membership to become non-serious and ineffective. Few studies exist on the factors that influence the participation of farmers in producer organizations in general but not tied to a particular organization and there are only a few evidences on why some farmers are not participating in these organizations. With this background this study was attempted to identify the factors that influence the membership of farmers which will help the policy makers and extension personnels in mobilizing the farmers into the FPOs.

Monika E., Thilagavathi M., Prahadeeswaran M. and Duraisamy M.R.

Table-3 *Parameter estimates of the logistic regression*

SN	Variable	Coefficient	Standard error	Wald statistics	p-value	Odds ratio
1	Age (years)	0.044NS	0.127	0.120	0.729	1.045
2	Gender	-1.268NS	1.505	0.709	0.400	0.281
3	Farm size (acres)	0.293NS	0.384	0.582	0.446	1.340
4	Education (No. of schooling years)	0.550**	0.265	4.312	0.038	1.734
5	Number of dependents per family	-2.72**	1.061	6.566	0.011	0.066
6	Credit availed per household (Rs/year)	-0.000049***	0.000017	7.885	0.005	1.000
7	Savings per household (Rs/year)	0.000012NS	0.0000087	1.853	0.173	1.000
8	On-farm income per household (Rs/year)	0.0000051**	0.0000024	4.487	0.034	1.000
9	Non-farm income per household (Rs/year)	0.0000070NS	0.0000052	1.811	0.178	1.000
10	Extension agency contact (Frequency of contacts per year)	2.503***	0.657	14.494	0.000	12.214
11	Membership in any other organisation/ association/ group	3.575***	1.251	8.174	0.004	35.707
12	Constant	-14.656NS	9.048	2.623	0.105	0.000
	Number of observations	180				
	-2 Log likelihood	32.180				
	Pseudo R^2	0.701				
	Chi square statistic	217.353***				

***significant at 1% level, **significant at 5% level, NS Non-significant

Material and Methods

There are nearly 468 numbers of FPOs and more than four lakh farmers are mobilized in the collective action under FPOs in Tamil Nadu. The present study was carried out in the state of Tamil Nadu and Erode district was purposively selected for the study as it contains the highest number of FPOs, namely twenty nine promoted by different agencies such as central SFAC, NABARD, TNSFAC and Government of Tamil Nadu. A multistage purposive cum random sampling was adopted for the selection of respondents for the study. Three FPOs namely, Erode Precision Farm Producer Company Limited (EPFPCL) which is located in Modakurichi block, Kazhani Farmer Producer Company Limited (KFPCL) from Gobichettipalayam block and Nanayam Farmer Producer Company Limited (NFPCL) from Kodumudi block were purposively selected based on the performance, years of experience, member strength and profitability of the FPOs. From each of the selected FPOs, three villages were selected at random making a total of nine villages. From each of the selected nine villages, ten member and ten non-member farmers were drawn at random. Thus, a total sample size of 180 farmers was drawn comprising ninety member and ninety non-member farmers. A well-structured interview schedule was used as an instrument for data collection. Appropriate descriptive statistics such as frequencies, percentages, mean scores and standard deviation were used to analyse and present the socio-economic characteristics of the selected respondents. In order to determine the factors influencing membership of farmers, a binary logistic regression model was used since the outcome variable, membership in FPO is a dichotomous variable taking the value of 1 if the farmer is a member in the FPO and 0 if the farmer is a non-member. The Statistical Package for Social Sciences (SPSS) 21.0 software was used to carry out the logistic regression analysis. The membership of farmers in FPOs was taken as the dependent variable whereas age, gender, farm size, education, number of dependents, credit availed, savings, on-farm income, non-farm income, extension agency contact and membership in other organization or association or group were taken as the independent variables. As the logistic regression excludes the assumption of linearity between dependent and independent variables and homoscadesticity, it has advantage over other models in the analysis of dichotomous outcome variable. [Table-1] shows the description of dependent and independent variables used in the logit model.

The logistic distribution indicating the membership of farmers can be specified as follows

$$\text{Prob}(Y_i = 1) = P_i = \frac{1}{1+e^{-(\beta_0+\beta_1 X_1+\beta_2 X_2+\ldots+\beta_n X_n+\mu)}} \qquad (1)$$

Where P_i is the probability that Y_i takes the value of 1(member of an FPO)
Therefore, the probability of being a non-member can be derived as

$$\text{Prob}(Y_i = 0) = (1-P_i) = \frac{1}{1+e^{(\beta_0+\beta_1 X_1+\beta_2 X_2+\ldots+\beta_n X_n+\mu)}} \qquad (2)$$

From the equation (1) and (2), we obtain the Odds ratio,

$$\text{Odds ratio} = \frac{P_i}{(1-P_i)} = e^{(\beta_0+\beta_1 X_1+\beta_2 X_2+\ldots+\beta_n X_n+\mu)}$$

Taking natural log on both sides we get the logit model specification as follows,

$$\text{Logit}(L_i) = \ln\left[\frac{P_i}{1-P_i}\right] = \beta_0+\beta_1 X_1+\beta_2 X_2+\ldots+\beta_n X_n+\mu$$

where, L_i stands for the logit model
Y_i is the binary dependent variable
'i' refers to the ith observation in the sample
P_i is the probability of a farmer being a member of the FPO
$(1-P_i)$ is the probability of a farmer not being a member of the FPO
"β0" is the intercept form
$\beta_1, \beta_2,\ldots, \beta_n$ are the coefficients of the independent variables
$X_1, X_2,\ldots, X_n$ are the independent variables

Results and Discussion
Socio-economic characteristics of the sample households

[Table-2] provides a summary of the socio-economic characteristics of the FPO member and non-member farmers separately for comparison. The study revealed that the percentage of young farmers with < 40 years of age was relatively high in case of member farmers (35.56 percent), whereas in case of non-member farmers the distribution of older farmers with > 50 years of age was relatively high (26.67 percent). Better educated farmers with secondary or collegiate education were found to be present in higher proportions (86.67 percent) in the member farmers compared to the non-member farmers (72.23 percent). In case of household size, majority of the respondents in both the categories had a medium sized family (55.56 percent in members and 66.67 percent in non-members) but the presence of large family was comparatively high in case of non-members (17.78 percent). The average farming experience of the non-members (32.54 years) was found to be high compared to the member farmers with 25.21 years of experience. In case of landholding size, the distribution of small and marginal farmers was found to be high in both the categories (58.88 percent in member and 65.56 percent in non-member). But the average landholding size was found to be higher in the member farmers compared to the non-member farmers. When it comes to the category of annual credit availed by the farmer, the percentage of farmers availing more than Rs. 1,80,000 was relatively high in case of non-member farmers (17.78 percent) when compared to the member farmers (11.11 percent). In case of annual savings, the average savings of members Rs. 3,04,482.22 was quite high compared to that of non-members with Rs. 2,64,451.67 as average annual savings. On an average, FPO member farmers were found to earn an income of Rs. 51,696.03 per month which is considerably high compared to the non-members with Rs. 39,991.72 of monthly income. Similar to income, the monthly expenditure was found to be high in case of member farmers (Rs. 8,659.22) compared to the non-member farmers (Rs. 7,297.56).

Factors determining membership in the FPOs

[Table-3] presents the parameter estimates of the logistic regression model. Out of the 11 variables included for the analysis, only 6 variables (Education, Number of dependents, Credit availed, On-farm income, Extension agency contact and Membership in other organization/association/groups) were found to have a significant influence on the membership of farmers in the FPOs. The negative 2 log likelihood of 32.180, the Pseudo R^2 of 0.701 and the Chi square statistic of

217.353 (significant at 1 percent level) indicates that the overall model is fitted and the independent variables included are collectively able to explain the farmer's membership in the FPOs. The coefficient of EDUCTN was positive and significant at 5 percent level. The odds ratio was worked out to be 1.734 indicating that increase in a year of formal education of the household increases the probability of membership by 1.734 times. This may be due to the fact that farmers with better education are able to recognize the benefits of the FPOs and quickly respond by taking a membership in it. This finding is supported by similar studies where education was found out to be a major determinant of FPO membership [4, 8]. The coefficient of DEPEND was negative and significant at 5 percent level. The odds ratio of 0.066 indicates that increase in one unit of dependents per family decreases the probability of membership by 0.066 times. The reason could be that the more the number of dependents, less will be the net income available with the farmer. As majority of the earnings are used to meet the consumption expenditure of the family, the farmers are less likely to become a member in the FPOs. The negative and statistically significant (1 percent level) coefficient of CRDT indicates that increase in the amount of credit availed per year will decrease the probability of membership in the FPOs. In general, access to credit was found to have a positive influence in the participation of farmers [8, 9]. But considering the amount of credit, the more the farmers are debted, they are less likely to buy a share in these FPOs. The coefficient of ONFARIN was positive and significant at 5 percent level. This indicates that level of membership of farmers increases with increase in on-farm income. This may be accounted by the fact that higher on-farm income improves the economic status of the farmers and are able to meet out the financial obligations for the membership in the FPOs. This result is supported by the related studies where increased income was found to positively influence farmers' membership decisions [10, 11]. The coefficient of EXTCON was found to be positive and significant at 1 percent level. Further the odds ratio was calculated to be 12.214 which indicates that increase in one extension contact per year increases the probability of membership of farmers by 12.214 times. This finding is supported by several studies [9-12]. Thus, extension agency contact was found to be a major determinant of membership of farmers in FPOs. This may be due to the fact that the farmers having more extension agency contact are likely to attend more trainings and exposure visits which make them more knowledgeable on the benefits of the collective action through FPOs. The positive and significant coefficient (1 percent level) of MEMOTHR indicates that the probability of membership in FPOs increases with increase in membership of farmers in other organizations or associations or groups. The reason could be that membership in associations or farmers groups expose the farmers to various information sources and allows them to analyse both the risks and comparative advantages of collective action and makes them to take the membership in the farmer producer organizations. This finding was substantiated by similar study where membership in farmers group was found to significantly influence farmers' decision in participation [13].

Conclusion

This paper examined the factors influencing membership of farmers in the farmer producer organizations. The findings showed that educational level of the farmer, number of dependents, credit availed per year, on-farm income, extension agency contact and membership in other associations or farmers groups were found to significantly influence farmers' decision on membership in the FPOs. Of which, number of dependents and credit availed per year were found to have negative influence on the membership. Membership of farmers in FPOs can be increased by increasing their on-farm income and improving their extension agency contact. The on-farm income of the farmers can be increased through improved awareness on new production technologies. Farmers should be motivated to organize into farmers' interest groups or farmer associations which in turn will pave way for their incorporation into FPOs. More emphasis should be laid on the intensity and reach of the extension programmes and frequent contacts between the farmers and extension personnels should be ensured. Efforts should be taken to ensure maximum participation of the farmers in the trainings and exposure visits conducted by the extension personnels of the governmental or non-governmental organizations.

References

[1] Agriculture Census Division (2019) *All India Report on Number and Area of Operational Holdings, Agricultural Census 2015-16. Government of India, New Delhi.*

[2] Mercoiret M.R. and Mfou'ou J.M. (2006) *Rural Producer Organizations (RPOs), empowerment of farmers and results of collective action, Workshop on Rural Producer Organizations in Paris, World Bank, Oct,* 30-31.

[3] Hedge N.G. (2010) *Financing Agriculture*, 42(7), 26-28.

[4] Verma S., Sonkar V.K., Kumar A. and Roy D. (2019) *Agricultural Economics Research Review*, 32, 123-137.

[5] Penrose-Buckley C. (2007) *Producer organisations: A practical guide to developing collective rural enterprises, Oxfam*.

[6] Singh S. (2008) *Economic and political weekly*, 22-4.

[7] SFAC (2019) *Strategy Paper for promotion of 10,000 Farmer Producer Organisations (FPOs), New Delhi*.

[8] Mariano M.J., Villano R. and Fleming E. (2012) *Agricultural Systems*, 110, 41-53.

[9] Etwire P.M., Dogbe W., Wiredu A.N., Martey E., Etwire E., Owusu R.K. and Wahaga E. (2013) *Journal of Economics and Sustainable Development*, 4(10), 36-43.

[10] Omotesho K.F., Ogunlade I., Lawal M.A. and Kehinde F.B. (2016) *Journal of Agricultural Faculty of Gaziosmanpasa*, 33(3), 21-7.

[11] Datta P., Datta J. and Shil S. (2018) *South Asian Journal of Social Studies and Economics*, 1-6.

[12] Ekepu D., Tirivanhu P. and Nampala P. (2017) *South African Journal of Agricultural Extension*, 45(1), 118-30.

[13] Suvedi M., Ghimire R. and Kaplowitz M. (2017) *The Journal of Agricultural Education and Extension*, 23(4), 351-71.