

IMPACT OF FARMER PRODUCER ORGANIZATIONS ON BOOSTING ECONOMIC EMPOWERMENT OF FARMERS

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ABSTRACT

In Assam, more than 80% of the population is involved in agriculture. Lack of proper marketing infrastructure makes it difficult to exploit marketing opportunities and earn revenue from produces. To address this problem, the concept of FPOs was developed and put into practice. The present study was undertaken to investigate the impact of FPO on farmers' economic empowerment in terms of services provided to member farmers, impact of income on members over nonmembers and impact of FPOs in augmenting member farmer's income along with the factors influencing farmers to join FPO in Golaghat district of Assam. A total of 200 respondents were selected (100-FPO members and 100-non FPO members). Primary data was collected through pre-structured schedule. The secondary information was collected from Govt. portals. For analyzing the factors influencing joining farmers in FPO, Logistic Regression Analysis was estimated, the interpretation of impact of services provided by FPOs to their members was done on five-point scale of excellent, very good, good, poor, very poor. To analyze the impact of FPO on farmer's income, Ordinary Least Square Regression was used. The results revealed that member farmers were male of young age, educated having nuclear family with agriculture as main occupation. The younger educated with smaller farm landholdings and farmers having distant markets are more likely to participate in FPOs and finally it was revealed that FPOs help in increasing income of its members by providing market facilities with assured marketing linkages and services like availability of inputs, custom hiring of machineries etc.

Keywords: *small and marginal farmers, farmer producer organization, economic empowerment, logistic regression analysis, ordinary least square regression*

INTRODUCTION

Agriculture is India's largest source of livelihood as 70% of India's rural households remain primarily dependent on agriculture. However, Indian farmers are still unorganized and lack modern tools and techniques in agricultural production, resulting in crop failures. While looking in to the matter, an expert committee headed by Dr. Y. K. Alagh said that the cooperative structure needs to be transformed into a new organizational structure, namely Farmer Producer Organization/Farmer Producer Company/ (FPO/FPC). Therefore, the notion of a Producer Company emerged in India in 2002 as a result of the recommendations of the Y. K. Alagh Committee. The objective of establishing FPOs is to collectivize farmers, especially small farmers at various levels in the state, promote technology penetration, increase productivity, improve access to inputs and services and thereby, increase income and strengthen agricultural livelihoods. Small farmer collectivization is an effective strategy to improve access to technologies, inputs and markets (Kumar *et al.*, 2019). Further, their role is to improve the backward and forward linkages of smallholder farmers by providing the facilities for access to markets as stated by

Yeragorla *et al.*, (2021) & Dechamma *et al.*, (2022). FPOs organize farmers through Farmer Interest Groups (FIGs) to aggregate input demands and output, helping to reduce transaction costs and achieve economies of scale (Patel *et al.*, 2018). The Indian government has been developing and promoting Farmer Producer Organizations by bringing together small and marginal farmers in an effort to improve the standard of living for rural residents (Padaliya *et al.*, 2022). The FIG is made up of 15-20 farmers and coordinates with the appropriate Federation Point (FPOs) to manage and plan activities. The decentralized structure of FPOs enables capacity development, ensures access to high-quality inputs and services for intensive agriculture and promotes cluster competitiveness through access to profitable markets. Various state ministries and central level agencies have launched various initiatives such as *Paramaparagat Krishi Vikas Yojana (PKVY)*, *Rashtriya Krishi Vikas Yojana (RKVY)* and *Vegetable Initiative for Urban Clusters (VIUC)* etc. which are involved immobilizing primary producers to Producer Organizations. Among the central level agencies, SFAC and NABARD are the major agencies dedicated to the task of promoting FPOs in the country.

By June, 2023, India has a total of 6319 registered FPOs. Karnataka has the highest of 578 FPOs, out of which 125 promoted under SFAC, 287 under NABARD and 166 are under other Implementing Agencies which is followed by Maharashtra having 569 FPOs, Press Information Bureau, (2023). Delhi & Goa have lowest 5 nos. of FPOs followed by Andaman & Nicobar (3), Ladakh (3) and Puducherry (2). To develop and promote 10,000 new Farmer Producer Organizations (FPOs) until 2028, the Government of India has authorized and launched a Central Sector Scheme with a budgetary allotment of 6865.00 Crores, Press Information Bureau, (2022).

In case of Assam, more than 80 per cent of the population is directly or indirectly related to agriculture for their livelihood. However, majority of farmers belong to small and marginal categories having limited exposure to market as well as business orientations. Considering their limitations in these aspects, a large number of FPOs were organized in the state by the state government through various promoting organizations with the objectives of improving the livelihood of farmers. Presently, Assam has a total of 185 FPOs out of which 18 are under SFAC, 72 under NABARD and 95 are under other Implementing Agencies and all the FPOs are performing their activities for the economic upliftment of their members.

Since FPO's were playing a unique role in enhancing the socio-economic status of its members and also no in-depth study has been carried out in Assam to evaluate the impact of FPOs on their members.

OBJECTIVES:

- (1) To know the analyze the profile of the member farmers of the selected FPO.
- (2) To know the factors influencing member farmers to join FPO
- (3) To know the impact of services provided by the FPOs to its member farmers.
- (4) To know the impact of income and employment on members over non members of FPOs
- (5) To know the impact of FPOs in augmenting member farmer's income.

METHODOLOGY

The present study was conducted in Golaghat district which is situated at Upper Brahmaputra Valley zone of Assam. *Dhansiri Farmer Producer Company Ltd.* comprising of 640 total members with vegetable cultivation

as their focused activity was selected purposively for carrying out the present study. A total of 200 respondents were selected and out of which, 100 were FPO members and the remaining 100 were non FPO members. They were chosen by taking into account the homogeneity of the cropping pattern, sources of irrigation and their distance from urban markets in order to enable a meaningful comparison of the results of participation in FPCs. The sample respondents were stratified into three groups on the basis of their farm size i.e. Group I (< ha), Group II (1-2 ha) and Group III (> 2 ha).

Stratification of sample farmers	Member farmers (F/ %)	Non member farmers (F/ %)
Group I (< 1 ha)	32 (32.00)	21 (21.00)
Group II (Between 1 - 2 ha)	41(41.00)	38 (38.00)
Group III (> 2 ha)	27(27.00)	41 (41.00)
Total	100 (100.00)	100 (100.00)

(Figures in the parentheses indicate the percentage to the total) (Source: Field survey)

The primary data was collected using a pre-structured schedule & the secondary information was collected from Govt. portals and different research articles. Proper statistical techniques were used for interpretation of the data.

For analyzing the factors influencing to join farmers as members in FPO, Logistic Regression Analysis was estimated using *SPSS*. It is used to model nominal outcome variable in which log odds of the outcomes are modeled as a linear combination of the predictor's variables. A total of nine variables were used as influencing factors i.e age, education, farm size, input availability, easy access to market, extension services, adoption towards market technology, value addition and farm mechanization. The analysis was done as per equation given below:

$M(j,0) = \beta_j X_i + \epsilon_{ij}$, Where, M_j is a vector of the FPO membership ($j=1$ for Group members, $j=0$ for non member), X_i is the factors responsible for the farmers to join as members.

β_j = Constant, ϵ_{ij} =Random error term.

$$M(j,0) = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + X_6 + \epsilon_i$$

X_1 = Age (in years). X_2 =Education (In years). X_3 =Farm size (Area in ha)

X_4 =Input availability (No. of hectares land owned)

X5 = Easy access to market (Yes=1, No=0). X6 = Extension services (Yes=1, No=0)

X7 = Adoption towards production technology (Yes=1, No=0)

X8 = Value addition linkage (Yes=1, No=0). X9 = Farm mechanization (Yes=1, No=0)

Mj = Membership (Dependent variable)

The interpretation of the impact of services provided by FPOs to their members was done on a five-point scale is 0.01 to 1.00 (Very Poor), 1.01 to 2.00 (Poor), 2.01 to 3.00 (Good), 3.01 to 4.00 (Very Good), and 4.01 to 5.00 (Excellent).

To analyze the impact of FPO on farmer’s income, Ordinary Least Square Regression was used where the estimation which leads to biased estimates so, the Inverse Mills Ratio was generated from multinomial logit model and then included as explanatory variable in the impact regression to control selection bias. The inverse mills Ratio (IMR) corrects the error terms in the impact equations to achieve consistent unbiased estimates. The following econometric model was employed for impact of FPO on farmer income.

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + IMR + \mu_i$$

X1= Age (in years). X2= Education (in years). X3=Hired labour (Man days/ha). X4=Family labour (No. of persons engage as labour). X5=Market price (Rs/kg). X6=Share of crop sold (% of crop sold). X7=farm size (Area sown in ha). X8 = Marketing facilities (Yes=1; No=0). X9= Distance to market (in kms). X10= FPO membership (Yes=1; No=0)

RESULTS AND DISCUSSION

The findings of the study revealed that maximum of the FPO members are male of young age, educated than that of non-members having nuclear family of 5 to 6 members with agriculture as the main occupation as revealed from Table 1. Since most of the member farmers are educated, they are well known about the benefits of FPO and have better passage to knowledge and information and thereby, have the tendency to join as members in FPOs. The landholdings of maximum member farmers were less (1-2 ha) than that of non-member farmers which also provoke them to join FPOs to mitigate their agricultural production constraints and limitations (Table 2). These findings are in line with the findings of Bharali *et al.* (2022), Vaishnavi *et al.*, (2023) and Singh *et al.*

(2019) but in contrary with the findings of Sahoo *et al.* (2022) and Chopade *et al.* (2019) where the member farmers were in the age group between 30 to 52 years (middle aged) and farm size more than 3 acres.

Table 1 : Socio economic profile of respondent farmers

(n=200)

Particulars	Members (n=100)	Non members (n=100)
Age		
Young Age (up to 29 years)	51	18
Middle Age (between 30 to 50 years)	22	47
Old Age (Above 52 years)	27	35
Education		
Illiterate	09	14
Can read only	07	5
Can read and write	12	11
Primary	09	09
Middle	32	37
High school	15	14
Graduate and above	16	10
Family type		
Nuclear	62	66
Joint	38	34
Family size		
Small size (Up to 4 members)	25	37
Medium size (between 5 to 6 members)	39	25
Large size (more than 6 members)	36	38
Gender		
Male	89	91
Female	11	09
Occupation		
Agriculture only	33	52
Agriculture + labour	23	08
Agriculture + Animal Husbandry	11	09
Agriculture + Horticulture	15	15
Agriculture + Business	09	10
Agriculture + Service	09	06

Logistic Regression model was used to analyze the factors determining the farmers to join as members in FPO. It can be observed from Table 2 that younger and more educated farmers are more likely to participate in FPOs. Age is negatively related and significant coefficient, indicating that for every unit increase in the age of farmers, the probability to join as group members decreases. Participation of older farmers is less in joining as the group members. On the other

hand, farmers who cultivate on smaller landholdings are more likely to take part in FPOs. This might be due to the reason that the marginal farmers are forced to find a support system that can ease their limitations on agricultural production. Education of farmers, easy access to market, value addition linkage and related infrastructure and farm mechanization were positively related to participation in FPO. The result shows that for every unit increase in the distance to market the tendency to join as members increased because FPOs provided transportation facilities to market their produces. The FPOs also provide market linkage facilities to its member farmers which attracted the attention of others to join as members since marginal & small farmers always look for a support system that can alleviate their motivation to grow more and it is possible as FPOs by eliminating the middle man help them to earn remunerative prices for their produce. It is also the work of FPOs to go for major value addition like sorting, cleaning, packaging and exporting farm produces which in turn help the farmers from harvesting losses. The FPOs can provide and make available quality, low cost and need based production and post-production machineries and equipments like cultivator, tiller, combine harvester etc. which altogether influences a farmer to become a member of FPO. Similar results have been showed by Singh and Bhatta (2019).

Table 2: Factors influencing farmers to join as members in FPO

(n=200)

Independent variables	Coefficient	SE	Marginal effects
Constant	59.235	10.325	
Age	-0.049*	0.047	0.41
Education	0.198**	0.128	0.03
Farm size	-0.625	0.523	
Input availability	0.921	0.178	0.12
Easy access to market	0.895**	0.563	0.01
Extension services	0.128	0.181	
Increase in adoption towards production technology	0.078	0.091	0.27
Value addition linkage and related infrastructure	0.498**	0.137	0.44
Farm mechanization	0.256**	0.058	0.26
LR chi square		35.29	
Pseudo R square		0.725	
P value		0.000	

** denotes 1% level of significance and * denotes 5% level of Significance

As the interpretation of the impact of services

provided by FPOs to its members was done on a five-point scale is 0.01 to 1.00 (Very Poor), 1.01 to 2.00 (Poor), 2.01 to 3.00 (Good), 3.01 to 4.00 (Very Good), and 4.01 to 5.00 (Excellent), the data presented in Table 3 revealed that, the member farmers claimed that availability of inputs at right time and right place was the excellent service provided by FPOs. They get quality inputs timely at a cheaper price than market, while the non-members had to purchase from the retailers or traders at the expense of more time & money. They somehow manage inputs from different line departments like KVK, Research stations, Agricultural Universities etc. The same kind of results was revealed in the study done by Bharali *et al.* (2022) and Vinayakumar *et al.*, (2018.).

In the pre-harvesting period, capacity building services like need based training and awareness programmes, technology demonstration and dissemination etc. are the other important activities provided by the FPO in collaboration with Cluster Based Business Organizations frequently to the member farmers. The same kind of results was revealed in the study done by Konani *et al.* (2024).

The members of FPO have easy access to custom hiring of farm machineries as compare to non-members. This might be due to the reason that FPO provided the custom hiring services to its members at 25 per cent less cost than that of non-members for utilizing their machineries in farming activities followed by receiving more extension support like agricultural advisory services, farm visits by agricultural experts etc. through FPO as compare to non-members.

Table 3: Impact on services provided by FPOs to its member farmers

(n=200)

Particulars	Member (n=100)	Non members (n=100)
Input availability	4.3 (Excellent)	2.1 (Good)
Capacity building services	4.2 (Excellent)	2.0 (Poor)
Custom hiring of machineries	4.2 (Excellent)	2.2 (Good)
Agricultural advisory services	4.1 (Excellent)	2.3 (Good)
Market access services	3.5 (Very Good)	1.1 (Poor)
Storage facilities	2.3 (Good)	1.1 (Poor)
Access to credit services	2.2 (Good)	0.5 (Very Poor)

The member farmers claimed to have benefited from the availability of a guaranteed market for their goods as compared to non-members. Again, one of the key considerations in averting a distress sale was the storage facility supplied by the FPOs, the member farmers are availing storage facilities and finally the FPO members have easy access to credit facilities as FPOs consist of mostly small and marginal farmers, they get interest subvention on crop as well as allied activities under Kisan Credit Card. They also get interest subvention under Agri infrastructure fund.

From Table 4, it was observed that net farm income for FPO members was Rs. 49582.00 per hectare, or nearly 18.47 percent higher than that of non-members. This

difference was statistically significant. Additionally, the FPO members might work for extra man-days by doing tasks like packaging, sorting, loading, and sealing (having an average daily wage of around Rs. 300.00/-) accounting about 24.44 percent more house hold income than non-members. FPO members were questioned during the poll about how they used the additional cash. They claimed that they had used it for other daily expenditures and also on education and health of their family. With the extra income and credit support from FPOs, they could repay their debts. These findings were supported by Srinithi *et al.* (2022), Sahoo *et al.* (2022), Chopade (2019), Kansotia *et al.* (2024), Kujur *et al.* (2019), and Singh *et al.* (2019).

Table 4 : Impact of income and employment on members over non members

(n=200)

Particulars	Member farmers (n=100)	Non member farmers (n=100)	Difference
Net income (₹/ha)	49582.32	41853.98	7728.34 (18.47)
Extra employment (mandays/household)	11.23	2.33	8.90 (381.97)
Total	52951.32	42552.98	10398.34 (24.44)

Note: Figures in parentheses are percentage change

The results of the data presented in Table 5 revealed that age and share of crop sold are non significant and had no impact on income of member farmers of FPO. These findings were contrary to the findings of Sharma *et al.* (2023), Mukherjee *et al.* (2019) and Vedasri *et al.* (2021).

It was observed that FPO assist their educated members to observe and adopt profitable new agricultural technologies as they are quick learners and are likely to implement them faster than others with low educational and also with the skills derived from education, they can able to engage in activities in the non- farm sector that serves as alternative source of income for them which altogether shows that education has positive and significant impact on income. The results were identical with the studies done by Lade *et al.*, (2024), Sharma *et al.* (2023), Verma *et al.* (2019) and Singh *et al.* (2022).

The FPOs help their members to use their family members as farm a labour which is positive and significant and thereby decreases the cost of hired labours and ultimately increases the production and productivity as the family members are doing their job seriously and thus uplift the income from farming. These findings were supported by Vedasri *et al.* (2021). Moreover, the farmers who had hired labour for agricultural operation had negative influence on their income. Labour hiring factor decreased the income of member farmers.

The FPOs help in net increase in production of the farmers produce by providing better quality inputs.

Procurement of input in bulk at lesser cost and selling them in a market at bulk help the member farmers in getting better prices for the produce and thus help in enhancing the income of the farmers. Therefore, market price also found positive and significant on farmer’s income, it means higher them marketing price, the farmers are getting good price and profit for their produces which significantly affects the economic empowerment of farmer members.

The impact of farm size on income is positive and significant. The FPO helps the member farmers to increase their income by diversifying the crops and products they grow or raise. This can involve growing a variety of different crops on the same farm or raising different types of livestock.

Again, the FPOs help in increasing income of its members by providing market facilities with assured marketing linkages which is positive and significant. The members are in a better situation to lessen the transaction costs of accessing inputs and outputs, obtaining the essential market information, securing access to new technologies and to enter into the high value markets and allowing them to participate with larger farmers and agribusinesses. The findings resemble the findings of Singh *et al.* (2018), Yadav *et al.* (2022), Singh *et al.* (2019) and Sahoo *et al.* (2022). But distance to market is found to have a negative impact on farmer’s income as it involves the cost like high quality packaging, cool cargo transportation for perishable produces etc which ultimately increases transportation costs and reduces the effective price which farmers can receive for

outputs. Therefore, overall, we can say that the income of member farmers of FPOs is more and availing more benefits as compare to non-member farmers.

Inverse mills ratio (λ) was an additional explanatory variable which was also observed to be significant, indicates that the income of member was also influenced by unobserved factors like self motivation towards agriculture, getting innovation from other working farmers, availability of more own agricultural resources at farm and unavailability of other government and private jobs etc.

Table 5 : Impact of FPO in increasing farmer's income

(n=200)

Independent variables	Coefficient	Standard error
Age	29.32 (NS)	11.23
Education	425.37 *	217.37
Family labour	2814.21*	1021.55
Hiredlabour	-2321.87 (NS)	1241.21
Market price	132.22**	121.85
Share of crop sold	251.47 (NS)	237.28
Farm size	31238.99**	1251.78
Marketing facilities	152.32**	213.84
Distance to market	-178.23 (NS)	212.14
FPO Membership	18823.71**	12531.21
Inverse mills ratio		0.28
R square		0.92

** denotes 1% level of significance and * denotes 5% level of Significance

CONCLUSION

The new paradigm in agriculture focuses on adding value to agricultural products to capture new opportunities arising from increasing per capita incomes, changing food consumption habits, changing lifestyles, etc. FPOs as grassroots entrepreneurship organizations are in a transition stage from ensuring farmers' welfare to entering commercial activities. By providing improved market connectivity and market information to farmers through capacity building, policy and management support. It focuses on improving the economic situation of farmers. From the study it was concluded that as compared to older farmers, who are less likely to join FPOs, the results of the study show that younger farmers have more information and managing smaller agricultural plots are more interested in joining FPO/FPC. The member farmers are getting advantages to high-quality raw materials at lower prices than on the open market, while the non-members had to spend more time and money purchasing from dealers and distributors. One of the key factors in avoiding a fire sale was the storage facilities provided by the FPO to its members also they get greater support of mechanization compared to non-

members. Because of the general support provided by FPOs, farmers who were members of FPOs had the potential to earn more than non-members. So, we can say that FPOs with the help of local government should organize youth motivation programs towards agriculture and awareness programmes about the extent of earning profit from agricultural business.

POLICY IMPLICATIONS

The extension system of the country is paramount and has a greater role to play for the formation, establishment and sustainability of FPOs. The tasks or functions identified in the establishment of the FPO include locating farming communities, raising awareness and mobilizing communities, organizing community meetings with local leaders, building social capital and facilitating the formation of core groups, capacity building of farmers, promotion of registration and organization of training and also including technical support and ensuring market access. The success of FPOs may not be replicable uniformly across the country. Therefore, it is necessary to identify the region and crop specific factors of the success of FPOs.

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CONFLICT OF INTEREST

No conflict of interest among researchers.

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