

RESEARCH PAPER

Efficacy of Farmer Producer Organizations (FPOs): A Study in Assam State

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ABSTRACT

The present study assesses the socio-economic impact of Bhergaon Agro Organic Producer Company Ltd., an FPO based in Udalguri district, Assam, on its member shareholders. A sample of 700 member farmers was randomly selected from the total 1,000 shareholders during the year 2022-23. Data were collected through a pre-structured schedule and analysed using descriptive statistics, paired *t*-tests, binary logistic regression and Garrett's ranking technique. Results showed significant increases in income (₹ 97,254.33/ha to ₹ 275,566.87/ha), productivity (75.23 q/ha to 125.42 q/ha), employment days (125.37 to 176.19) and savings (₹ 23,855.78 to ₹ 56,528.91) after joining the FPO. Logistic regression revealed that education, family size, marketing support, capacity building and access to credit through KCC had positive effects on income, while age, gender, farm size and use of hired labour or machinery showed negative or insignificant influence. Major constraints included lack of knowledge on pest and disease management, poor extension support, low produce prices and the involvement of market intermediaries. The study concludes that FPOs can play a transformative role in enhancing farmers' livelihoods through collective action, though targeted interventions are needed to address knowledge, technical, economic and social barriers.

HIGHLIGHTS

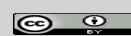
- ① For analyzing the factors affecting in increasing the income of member shareholders, binary logistic regression was estimated and to identify the different constraints faced by the members, Garrett's ranking technique was used.
- ② The family size and income act as an important factor affecting the income of members as FPOs. The problems faced were insufficient knowledge of pest management, poor extension support and linkage, low price of produce and involvement of market intermediaries.

Keywords: Farmer Producer Organization, Socio-economic impact, Binary logistic regression, Garrett's ranking, Assam

Agriculture remains central to India's economic growth and is the primary occupation of the majority of its population (Adhikari *et al.* 2021). In the era of globalization and free trade, there is a pressing need to transform farmers from mere

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producers to producer-cum-sellers through rural entrepreneurship and collectivization (Chauhan *et al.* 2021). Farmer Producer Organizations (FPOs) have emerged as an effective institutional mechanism to address multiple challenges faced by small and marginal farmers aiming to enhance their livelihood standards (Navya *et al.* 2022). FPOs, operating as farmer-owned and governed micro-enterprises, combine features of cooperative societies and private companies, focusing mainly on marketing and input supply (Venkatta Kumar *et al.* 2019). In India, the formation of FPOs is supported by nine implementing agencies, with SFAC and NABARD as the leading institutions (Manaswi *et al.* 2020). As of 2022, India has 6,319 registered FPOs, with Assam hosting 185 (Anonymous, 2022).

Bhergaon Agro Organic Producer Company Ltd., registered in October 2019, operates in the North Bank Plain Zone of Assam with over 1,000 members cultivating 200 ha. The organization promotes organic farming, supplies quality inputs, facilitates market linkages and provides training programmes. Despite its prominence, no in-depth study has been performed in the Udalguri district to examine the impact of FPOs on its member stakeholders. Therefore, the present study was undertaken to analyze the socio-economic impact of the FPO on its member shareholders, factors affecting their income and various problems encountered by the FPO members.

METHODS

The present study was conducted in Bhergaon Agro Producer Company Ltd., located in Udalguri district, Assam. This particular Farmer Producer Company was purposively selected because Krishi Vigyan Kendra, Udalguri has been actively involved with it since its inception, thereby ensuring consistent technical support and record maintenance. This long-term association provided a unique opportunity to evaluate the socio-economic impact of FPC interventions on member-shareholders. The FPC had a total of 1,000 registered member-shareholders during the study period (2022-2023). Following simple random sampling, 70 percent of the members were selected, resulting in a sample size of 700 respondents. This proportion was chosen to ensure adequate statistical power and to represent the diversity of socio-economic

characteristics within the population. Primary data were collected using a pre-tested, structured interview schedule designed specifically for the study objectives. The interview schedule included both closed and open-ended questions, covering demographic characteristics, agricultural practices, FPC services availed and perceived changes in income, productivity, employment and savings. Secondary data were obtained from official government portals, annual reports of the FPC, records from KVK Udalguri, and relevant research publications. The study examined the influence of eleven independent variables on the socio-economic impact of the FPC: X_1 : Gender, X_2 : Education level, X_3 : Age of members (years), X_4 : Family size (number of household members), X_5 : Farm size (hectares), X_6 : Input availability through the FPC, X_7 : Marketing support provided by the FPC, X_8 : Capacity-building and training programs provided by the FPC, X_9 : Use of hired labour, X_{10} : Use of agricultural implements and machinery, X_{11} : Access to credit through the Kisan Credit Card (KCC) scheme. The dependent variable was the perceived increase in annual household income due to FPC membership, coded as a binary outcome: 1 = Increase in income, 0 = No increase in income. For analyzing the factors affecting increasing the income of member shareholders, Binary Logistic regression was calculated using SPSS as per the equation:

$$P(0,1) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \mu_i P(0,1) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \mu_i$$

Where:

$P(0,1)$ $P(0,1)$ $P(0,1)$ = probability of income increase (1) or no increase (0)

β_0 β_0 = intercept

β_1 β_1 to β_{11} β_{11} = slope coefficients of independent variables

μ_i μ_i = error term

To analyse the constraints faced by members from production to marketing, Garrett's ranking technique (Garrett & Woodworth, 1971) was employed. Respondents were asked to rank various

identified constraints under four broad categories i.e. Knowledge constraints, technical constraints, economic constraints and social constraints. The ranks assigned by respondents were converted into percent positions using the formula:

$$\text{Percent Position} = \frac{100(R_{ij} - 0.5)}{N_j} \text{Percent Position} = \frac{100(R_{ij} - 0.5)}{N_j}$$

Where: R_{ij} = rank given to the i^{th} factor by the j^{th} respondent and N_j = total number of factors ranked by the j^{th} respondent

The percent positions were then transformed into Garrett scores using the conversion table provided by Garrett and Woodworth (1971). Mean scores for each constraint were computed, and constraints were ranked in descending order of severity.

RESULTS AND DISCUSSION

Socio-economic impact of the FPO on its member shareholders

The analysis presented in Table 1 clearly indicates that membership in the FPO had a substantial and statistically significant positive impact on the socio-economic status of its member shareholders. The average income per hectare increased sharply from ₹ 97,254.33 before joining the FPO to ₹ 2,75,566.87 after becoming members. This growth was significant at the 5 percent level, reflecting nearly a threefold rise. The increase can be attributed to the cultivation of high-value organic crops such as turmeric, black rice, cole crops, strawberry, stevia and various vegetables.

Table 1: Socio-economic impact of the FPO on its member shareholders (N=700)

Particulars	Before	After	SE	t stat
Income (₹/ha)	97254.33	275566.87	0.4585	22.89*
Productivity (q/ha)	75.23	125.42	5.1289	8.27*
Employment (man-days/household)	125.37	176.19	4.2512	7.12*
Savings (₹)	23855.78	56528.91	2.0122	15.23*

*Significant at 5 % level of significance, SE: Standard Error.

In addition, value addition activities (e.g., processing black rice, turmeric and vermicompost production) and organized marketing linkages through contract

farming, buyback agreements, independent distributors and company-owned retail outlets, ensured better price realization. By bypassing middlemen, the FPO enabled farmers to sell directly to traders or consumers, thereby maximizing profits, consistent with the findings of Salokhe *et al.* (2017), Nain *et al.* (2019) and Gorai *et al.* (2022). The average productivity of crops rose from 75.23 q/ha to 125.42 q/ha. This significant improvement was largely due to timely access to high-quality inputs, the adoption of scientific cultivation practices, and continuous technical guidance provided by the FPO. Average employment days per household increased from 125.37 to 176.19 man-days annually, showing the FPO's ability to generate more on-farm and allied employment opportunities. This reflects not only increased labour requirements due to intensified crop production but also the FPO's role in creating year-round engagement for its members. Similar impacts on farmer empowerment and livelihood improvement have been reported by Mukherjee *et al.* (2020). Household savings showed a remarkable increase, rising from ₹ 23,855.78 to ₹ 56,528.91 on average. This improvement highlights the cumulative effect of higher incomes and reduced marketing costs. Similar trends have been reported by Yadav *et al.* (2022), Sahoo *et al.* (2022), Kumar *et al.* (2023), Sahu *et al.* (2017), Bharali & Gogoi (2022) and Sharma *et al.* (2023).

Factors influencing income of member shareholders of the FPO

The binary logistic regression analysis in Table 2 identifies which socio-economic and institutional factors significantly influence the income of member shareholders. Age shows a negative and significant effect on income ($\beta = -0.049$, $p = 0.040$). This implies that, holding other factors constant, older members tend to have slightly lower income levels compared to younger members and possibly due to reduced capacity to adopt modern practices or engage in physically intensive agricultural activities. Education has a positive and significant effect ($\beta = 0.237$, $p = 0.011$). Educated members are more likely to adopt profitable agricultural technologies, diversify into non-farm income sources, and respond effectively to training, leading to higher income. Gender does not significantly influence income ($p = 0.790$), indicating that male

and female members have comparable income levels within the FPO framework. Family size shows a positive but non-significant relationship ($p = 0.361$). While larger families can contribute more family labour, the variation is not statistically strong enough to confirm a consistent impact on income. Farm size is negatively associated with income, though not significantly ($p = 0.113$). This may be due to inefficient use of large holdings without corresponding adoption of high-return technologies. Input availability through FPOs has a positive but non-significant effect ($p = 0.189$).

Table 2: Factors affecting income of the member shareholders (N=700)

Factors	Coefficient	SE	p-value
Age	-0.049	0.031	0.040
Education	0.237	0.086	0.011
Gender	-0.021	0.061	0.790
Family size	0.177	0.189	0.361
Farm size	-0.409	0.576	0.113
Input availability	0.815	0.621	0.189
Marketing support	0.927	0.341	0.009
Capacity building	0.758	1.81	0.001
Use of hired labour	-0.182	0.814	0.058
Use of implements and machinery	-0.414	0.417	0.279
Credit through KCC	0.150	0.872	0.181

Although timely and bulk procurement of inputs can improve yields and reduce costs, the data indicates that this alone may not guarantee a significant income boost without complementary factors like market access. Marketing support has a strong positive and significant effect ($\beta = 0.927$, $p = 0.009$). Access to better market linkages, price information and reduced transaction costs helps members sell produce more profitably. Capacity building (training, demonstrations, skill enhancement) shows a highly significant positive effect ($\beta = 0.758$, $p = 0.001$), highlighting the role of continuous learning in improving farm productivity and income diversification. Use of hired labour has a negative but marginally significant effect ($\beta = -0.182$, $p = 0.058$). This suggests that dependence on hired labour may increase costs and reduce net farm income compared to using family labour. Use of implements and machinery shows a negative but non-significant effect ($p = 0.279$), possibly reflecting higher operational costs or under-utilization of

machinery. Credit through Kisan Credit Card has a positive but non-significant effect ($p = 0.181$). While access to credit helps meet working capital needs, its direct impact on income depends on how effectively the borrowed funds are utilized.

Various constraints faced by the members of Bhergaon Agro Producer Company Ltd

The constraints faced by member shareholders were grouped into four categories i.e. knowledge, technical, economic and social constraints. These limitations as mentioned in table 3 can significantly affect farmers' income and livelihood opportunities.

Table 3: Various constraints faced by the members of Bhergaon Agro Producer Company Ltd (N=700)

Knowledge Constraints			
Sl. No	Constraints	Garrett Score	Rank
1	Lack of knowledge of pest and disease management	63.82	I
2	Lack of computer knowledge	61.73	II
3	Lack of packaging knowledge	60.32	III
4	Lack of knowledge of business plan	60.16	IV
5	Lack of proper market information	59.21	V
6	Lack of risk management quality	58.33	VI
7	Poor knowledge of professional management	56.25	VII
Technical Constraints			
Sl. No	Constraints	Garrett Score	Rank
1	Poor extension support and linkage	67.03	I
2	Lack of infrastructure facilities	65.32	II
3	Crop insurance facilities not available	64.59	III
4	Lack of cheap and good quality inputs	64.08	IV
5	Low use of ICT	63.71	V
6	Lack of capacity-building programmes	61.55	VI
Economic Constraints			
Sl. No	Constraints	Garrett Score	Rank
1	Low price of produce	60.70	I
2	Low access to credit facilities	58.32	II
3	Low profit sharing	57.89	III
4	Low productivity	55.87	IV

Social Constraints			
Sl. No	Constraints	Garrett Score	Rank
1	Involvement of market intermediaries	67.56	I
2	Low involvement of stakeholders	65.78	II
3	Low gateway to new technology	64.59	III
4	No democratic governance	64.17	IV

1. Knowledge Constraints: The most serious challenge reported by members was a lack of knowledge on pest and disease management (Garrett score 63.82, Rank I). This was followed by limited computer literacy (61.73, Rank II), which can restrict access to digital agricultural resources. Other important issues included inadequate knowledge of packaging (60.32, Rank III), lack of understanding of business planning (60.16, Rank IV), insufficient market information (59.21, Rank V), poor risk management skills (58.33, Rank VI) and limited knowledge of professional management practices (56.25, Rank VII). These findings align with earlier studies by Chandegara *et al.* (2023) and Amitha *et al.* (2021) which also reported knowledge gaps as a major obstacle to improving farm profitability.

2. Technical Constraints: From a technical perspective, the most pressing problem was poor extension support and linkages (67.03, Rank I), indicating a need for stronger farmer extension service connections. This was followed by lack of infrastructure facilities (65.32, Rank II) and the absence of crop insurance (64.59, Rank III), which increases farmers' vulnerability to climate and market shocks. Other significant issues included limited access to affordable, good quality inputs (64.08, Rank IV), low adoption of ICT tools (63.71, Rank V), and inadequate capacity-building programmes (61.55, Rank VI). These results are consistent with the findings of Chauhan *et al.* (2021), Marbaniang *et al.* (2019) and Prajapati *et al.* (2023).

3. Economic Constraints: The leading economic barrier was the low price of produce (60.70, Rank I), which directly impacts farm profitability. This was followed by limited access to credit facilities (58.32, Rank II). Low profit-sharing (57.89, Rank III) and low productivity (55.87, Rank IV) also emerged as significant issues. Similar patterns were reported by Kumar *et al.* (2023) and Chandegara *et al.* (2023) emphasizing the importance of price support mechanisms and financial inclusion for farmers.

4. Social Constraints: Social challenges also played a notable role in hindering members' growth. The most significant was the involvement of market intermediaries (67.56, Rank I), which can reduce farmers' bargaining power. This was followed by low involvement of stakeholders in decision-making (65.78, Rank II), limited access to new technology (64.59, Rank III) and the absence of democratic governance in operations (64.17, Rank IV). These findings are supported by Venkattakumar *et al.* (2022).

CONCLUSION

Improving the livelihood of farmers by serving them with novel opportunities and chances for raising income, changing dietary habits, changing lifestyles etc. are the new models or strategies in agriculture in the present-day context. Here FPOs play a significant role as grassroots entrepreneurial organizations for ensuring farmers' welfare by providing market connectivity and market information to farmers through capacity development, policy and management support. Overall, it mainly focuses on improving the economic situation of farmers. The country's extension offers a remarkable involvement in the formation, establishment and sustainability of FPOs. The success of FPOs is not consistently replicated across the country. Therefore, region and culture-specific factors need to be identified for FPO success which will finally lead to fulfilling the objectives of establishing FPOs and ensuring better livelihood for the farming community.

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