

A Comparative Cost–Benefit Analysis of Member and Non-Member Farmers of Farmer Producer Organisations: With Special Reference to Mahabubnagar and Nalgonda Districts, Telangana State

Mr. K. Rambabu., Dr. K. Sridevi

Department of Commerce, Mahatma Gandhi University

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ABSTRACT

Farmer Producer Organisations (FPOs) have emerged as an important institutional mechanism for improving the economic position of farmers through collective input procurement, better market access, improved price realisation and enhanced bargaining power. The present study examines the economic performance of FPO member and non-member farmers, with special reference to Nalgonda and Mahabubnagar districts of Telangana State. The study assesses farmers' perceptions towards FPO functioning and compares their cost, revenue and profitability. Primary data were collected from 800 farmers, comprising 400 FPO members and 400 non-members, during July to December 2025. Six FPOs, three from each district, were purposively selected, while member farmers were selected through systematic random sampling and non-member farmers from the same geographical areas as the respective FPOs. Descriptive statistics, Cronbach's Alpha, Chi-square test and independent-samples t-test were employed for analysis. The reliability analysis yielded a Cronbach's Alpha of 0.86 for 31 perception statements, indicating high internal consistency. The results showed that 67.0 per cent of member farmers had moderate perception towards FPO functioning, compared with 26.3 per cent of non-members, while 61.0 per cent of non-members had low perception. The Chi-square test revealed a significant association between membership and perception levels ($\chi^2 = 134.584$, $df = 2$, $p = 0.001$). Member farmers recorded higher average revenue per acre (₹2,17,058.73) and lower accounting cost (₹1,37,414.74) than non-members (₹2,11,150.65 and ₹1,39,458.33, respectively). Accounting and economic profits were also higher among members at ₹79,643.99 and ₹9,643.99 per acre, respectively, compared with ₹71,692.32 and ₹1,692.32 among non-members. The t-test indicated significant differences in accounting and economic profits ($t = 3.692$, $p = 0.001$), but not in revenue or accounting costs. The study concludes that FPO membership is associated with better farm-level profitability, although the revenue advantage remains modest. Strengthening governance, professional management, value addition, processing, market linkages and infrastructure utilisation is essential for enhancing the effectiveness and sustainability of FPOs.

Keywords: Farmer Producer Organisations, Cost-Benefit Analysis, Reliability, Farmers Perception, Economic Profit.

INTRODUCTION

Agriculture continues to be the most significant sector in India, with nearly 60 percent of the population dependent on it for livelihood. Despite this centrality, agriculture has long struggled to achieve economic feasibility. The sector is characterized by fragmented landholdings, with the majority of cultivators being small and marginal farmers, alongside tenant farmers and sharecroppers who remain highly vulnerable. Rising costs of cultivation, limited access to remunerative markets, and persistent risks from climate variability have further constrained profitability.

Recognizing these challenges, the Government of India has sought to strengthen farmers through supportive policies and institutional mechanisms, particularly by promoting formal organisations such as Cooperative Societies, Primary Agricultural Credit Societies (PACS), and Farmer Producer Organisations (FPOs). These institutions aim to provide collective bargaining power, access to credit, quality inputs, and improved market

linkages. While a large proportion of farmers have become members of such organisations, the paradox remains that they are still largely unorganised in practice, and agriculture continues to be economically precarious.

Against this backdrop, the present study focuses on the role and performance of Farmer Producer Organisations in Mahabubnagar and Nalgonda districts of Telangana State, examining how membership has influenced farmers' economic outcomes and whether these collective structures have succeeded in addressing the persistent challenges of smallholder agriculture.

REVIEW OF LITERATURE

A review of literature is essential because it situates the present study within the broader academic context, highlighting what has already been explored and where gaps remain. It provides a foundation for framing objectives, refining methodology, and drawing meaningful conclusions, thereby ensuring that the research is both relevant and contributes to advancing knowledge.

The literature on Farmer Producer Organisations (FPOs), Farmer Producer Companies (FPCs), Producer Organisations (POs) and other farmer collectives indicates that collective institutional arrangements have emerged as an important mechanism for improving the economic position and market participation of small and marginal farmers. Early studies mainly focused on the conceptual foundations and institutional significance of collective action. Ortmann and King (2007) discussed the history, theory and problems of agricultural cooperatives, while Challuri Babu et al. highlighted the potential of Farmer Producer Companies in improving the position of small and marginal farmers. Dubey et al. (2009), Trebbin and Hassler (2012), Abraham (2016) and Tagat and Tagat (2016) emphasised the role of collective organisations in improving access to markets, credit, inputs, extension services, technology and bargaining opportunities. Ragasa and Golan (2012) further indicated that external institutional linkages, member financial contributions, management capacity, governance and organisational conflicts influence the performance of producer organisations. These studies suggest that the formation of a collective organisation alone may not ensure benefits; its effectiveness depends on governance, member participation, financial strength, managerial capability and linkages with external institutions.

Subsequent studies examined the formation, functioning and organisational performance of FPOs. Sankri and Ponnusamy (2015a, 2015b) highlighted the importance of awareness creation, capacity building, training, demonstrations, exposure visits and stakeholder interaction in the formation and development of FPOs. Their work also indicated the importance of technical, managerial and marketing capabilities for successful collective production and marketing. Aditya (2015) emphasised organisational structure, internal controls and forward and backward linkages for effective value-chain participation, while Kandeegan (2015) examined the market competitiveness and financial aspects of FPOs in Telangana and Karnataka. Sawairam (2015) demonstrated the potential of producer organisations to support production and marketing activities and to improve the position of small and marginal farmers. Navaneetham et al. (2017) reviewed the status and development of Farmer Producer Companies in India, indicating that their performance depends considerably on managerial, financial and institutional factors. Similarly, Dey (2018) identified governance, external networks, capital, technology, member contribution and financial performance as important determinants of the viability of Farmer Producer Companies.

Several studies have specifically examined the benefits associated with membership in farmer organisations. Tolno et al. (2015), in their study of smallholder potato farmers in Middle Guinea, reported that farmer-organisation membership was associated with improved farm income and livelihood outcomes. Neupane et al. (2015) examined farmers' perceptions of cooperatives and highlighted the role of collective institutions in agricultural practices and livelihood improvement. Huang et al. (2015), comparing farmer organisations in China and India, observed that producer organisations can provide substantial benefits to farmers, particularly those producing marketable surpluses. Abraham (2016) and Nikam et al. also emphasised the role of producer organisations in improving access to markets, credit, inputs, research, extension and collective services. These studies provide a conceptual basis for examining whether membership in FPOs is associated with differences in the economic performance of member and non-member farmers.

The income and economic-performance dimensions of FPO membership have received increasing attention. Sahoo et al. (2022) reported that FPOs can contribute to the economic empowerment of member farmers. Srikar et al. (2022), studying Farmer Producer Groups among tribal farmers in Andhra Pradesh, reported improvements in income and broader dimensions of empowerment. Dudekula et al. (2025) found that millet FPO participation was associated with improvements in annual income, occupational days, savings, expenditure, access to credit, debt management and repayment behaviour. Nirosha et al. (2024), focusing on women Farmer Producer Organisations, reported improvement in income and empowerment among participating women farmers. Das and Singh (2024) also highlighted benefits of farmer collectives in terms of income, input and service access, market participation, collective marketing, networks, efficiency and livelihood outcomes. Malaisamy et al. (2025) reported positive contributions of FPOs to farm income, market access and the adoption of modern agricultural practices. These findings indicate that the potential benefits of collective membership extend beyond income to financial access, employment, savings, empowerment and livelihood security.

Studies directly comparing FPO members and non-members are particularly relevant to the present research. Manaswi et al. (2019), in a study of organic chilli production in Telangana, compared 60 FPO members with 60 non-members. The study reported lower input use among member farmers but higher gross returns, with members recording approximately 13.86 per cent higher gross returns than non-members. The study also found higher technical efficiency among members and indicated that FPO participation reduced transaction costs and the number of intermediaries. The FPO marketing channel provided a producer share of approximately 65 per cent in the consumer's rupee. These findings are particularly relevant to the present study because they demonstrate the importance of comparing members and non-members in terms of input costs, returns, efficiency and market participation.

Verma et al. (2021), in Uttar Pradesh, compared member and non-member farmers and identified differences in social participation, mass-media exposure, extension contact and annual income. Veda Sri and Mishra (2021) reported that group membership, hired labour, cultivated area, proportion of produce marketed and market size were positively associated with farmers' income. Munde et al. (2025) directly compared member and non-member farmers using Data Envelopment Analysis and reported higher technical and allocative efficiency among several categories of FPO members. Gurung et al. (2024) provided further evidence on the economic impact of FPO membership, reporting positive effects on net returns, return on investment and profit margins, although the magnitude of benefits varied across farmer characteristics. Collectively, these studies suggest that FPO membership may be associated not only with income differences but also with differences in efficiency, profitability, resource allocation and returns on investment.

Marketing and value-chain participation constitute another important dimension of FPO performance. Darshan et al. (2017) reported that collective action could improve farmer income and savings through reductions in input, transportation and labour costs and through better access to market information. Singh et al. (2018) examined the sustainability of FPOs under agricultural value networks and highlighted the importance of value-chain linkages, operational efficiency and market networks. Rani Nidhi et al. (2017) reported higher production and net income associated with FPO participation while also identifying weaknesses in market-price information and production practices. Salokhe (2016) emphasised the importance of linking small producers with markets through farmer producer organisations. Huang et al. (2015) similarly noted that collective organisations can strengthen farmers' participation in markets, particularly when farmers produce marketable surpluses. These studies indicate that the economic benefits of FPO membership may arise through both improvements in production efficiency and better marketing arrangements.

Access to institutional finance and services is another important area of FPO intervention. Ragasa and Golan (2012) emphasised the role of producer organisations in agricultural service provision, while Nikam et al. highlighted collective service provision and capacity building. Shaik et al. (2025) specifically examined farmers' access to agricultural finance through FPOs and highlighted the potential of FPOs to facilitate access to financial services. This dimension is important because improved access to finance and institutional services can influence input use, investment capacity and farm-level economic performance.

The literature also demonstrates that FPO membership may generate social and livelihood benefits beyond direct farm profitability. Kumar and Babu (2018) highlighted the role of Farmer Producer Groups and Companies in

supporting women farmers and collective capacity building in Telangana. Nukala et al. (2018) demonstrated the importance of collective economic activity through the Mulkanoor Women's Cooperative Dairy experience. Sharma et al. (2023) found that FPOs and training can contribute to livelihood improvement and encourage rural youth towards agriculture and income-generating activities. Das and Singh (2024), Nirosha et al. (2024), Srikar et al. (2022) and Dudekula et al. (2025) similarly reported broader outcomes relating to empowerment, employment, savings, access to services and livelihood improvement. These studies indicate that the benefits of collective action may be multidimensional and may extend beyond conventional measures of farm income.

At the same time, the literature identifies several constraints that may limit the effectiveness of FPOs. Kathiravan et al. (2017) identified coordination-related bottlenecks among FPOs. Dixit and Nayaji (2021) highlighted organisational and operational challenges affecting FPO effectiveness. Shanmugam et al. (2024), based on member and non-member perspectives, reported concerns relating to awareness, infrastructure, financial resources, technical knowledge and institutional support. Malaisamy et al. (2025) also identified credit, infrastructure and technical knowledge as important constraints. Patel et al. (2023) reported that small holdings, indebtedness and limited institutional support can constrain the performance and benefits of FPO members. These findings indicate that membership alone does not guarantee economic benefits and that the quality of FPO services, institutional support, member participation and financial capacity are important determinants of outcomes.

Governance and institutional support are also important determinants of FPO performance. Jain and Naranware (2018) emphasised the importance of local institutional conditions in determining the success of farmer collectives. ShriKushankurDev (2018) identified organisational and financial factors influencing the performance and viability of Farmer Producer Companies. Yang et al. (2018) demonstrated the role of cooperative capacity building in improving smallholder participation in changing agri-food systems. Posner (2017) provided a Telangana-specific perspective on the participation of small farmers in an FPC and highlighted the practical challenges associated with collective marketing. These studies reinforce the view that organisational quality, management, capital availability, member participation and institutional linkages influence the extent to which farmers can realise benefits from collective membership.

Telangana-specific studies are particularly relevant to the present research. Manaswi et al. (2019) provided direct evidence of differences between FPO members and non-members in organic chilli production, including input use, gross returns, technical efficiency and market participation. Amitha et al. (2022) evaluated three FPOs in erstwhile Medak district and found considerable variation in organisational performance, with performance ranging from good to poor across the selected organisations. The authors associated these differences with institutional support, knowledge of the FPO business concept, leadership and members' participation. Navya et al. (2022), studying 360 farmers across five districts of Telangana, including 180 FPO members and 180 non-members, reported that a substantial proportion of respondents perceived FPO performance as average, followed by poor and good categories. The study also found significant differences in performance across FPOs. These findings indicate that considerable variation may exist across FPOs even within the same state.

Research Gap

Existing scholarship consistently highlights the role of Farmer Producer Organizations (FPOs) in improving farmers' income, productivity, efficiency, market access, and overall profitability. Although prior research has examined FPOs from multiple angles—including institutional functions, market integration, and individual economic outcomes—there remains a pressing need for more district-level empirical investigations to capture localized realities. In particular, the districts of Nalgonda and Mahabubnagar in Telangana call for deeper empirical inquiry to reveal multidimensional variations in farm-level economic performance. Within this context, the present study, “A Comparative Cost–Benefit Analysis of FPO Member and Non-member Farmers: With Special Reference to Nalgonda and Mahabubnagar Districts, Telangana State”, aims to strengthen the literature by offering a district-specific comparative evaluation of cost, revenue, and profit indicators, thereby advancing understanding of the differential economic outcomes experienced by member and non-member farmers.

Need For The Study

There is a pressing need to systematically explore the contribution of Farmer Producer Organisations (FPOs) in promoting economic upliftment and in making agriculture more economically viable for small and marginal farmers. Despite the expansion of formal organisations such as cooperatives, PACS, and FPOs, agriculture continues to face challenges of fragmented landholdings, rising input costs, and limited profitability. In this context, the present research study has been undertaken to examine the perceptions of both member and non-member farmers regarding the functioning of FPOs. By focusing on their experiences and economic outcomes, the study seeks to provide district-specific empirical insights into whether FPO membership has translated into tangible improvements in agricultural feasibility and farmer livelihoods."

Objectives Of The Study

The main Objective of this study is to examine whether membership in Farmer Producer Organizations (FPOs) has contributed to the economic upliftment of farmers by providing additional benefits in comparison with Non-member farmers.

- To analyze the concept and structural framework of Farmer Producer Organizations (FPOs), highlighting their intended role in enhancing collective action and farmer welfare.
- To assess the perceived benefits of FPO membership by comparing the economic conditions of member and non-member farmers.

RESEARCH METHODOLOGY

In pursuit of above mentioned objectives the following methodology is adopted.

Sources of Data

Both Primary and Secondary sources are used for collecting the Data for the Study.

Primary Data: A structured questionnaire is used for the purpose of the study. The structured questionnaire is prepared based on the objectives, services and activities of the FPO. Nalgonda and Mahabubnagar districts are the most backward districts in Telangana State (based on economic and social parameters, Census 2011). Hence these two districts are selected for the collection of primary data.

Secondary Data: The Secondary Data are collected from the Reports published by the FPO Implementing Agencies, Reports published by the Ministry of Agriculture & Farmer Welfare, Government Policy on FPOs, Working Papers, Annual Reports of the select FPOs working in the Nalgonda & Mahabubnagar Districts, published theses, dissertations, Research Articles, Newspapers, and other related published material

Sample Selection

The total population of farmers in Nalgonda (10,51,174) and Mahabubnagar (8,99,843) districts (11th Agricultural Census, Government of Telangana), taken together, exceeds 10,00,000. Therefore, the sample size was determined using the Krejcie and Morgan model. According to this model, for a finite population of 10,00,000 or more, a minimum sample size of 384 respondents is required. Considering the convenience of data collection and to ensure adequate representation of both categories of farmers, the sample size was rounded to 400 member farmers and 400 non-member farmers, resulting in a total sample of 800 respondents.

In the erstwhile Nalgonda district, a total of 61 FPOs were registered, of which 11 FPOs had completed five years of operation and had a membership of more than 500 farmers. Similarly, in the erstwhile Mahabubnagar district, 48 FPOs were registered, of which 8 FPOs had completed five years of operation and had a membership exceeding 500 farmers. Based on the suggestions and guidance provided by the NABARD District Development Managers of Nalgonda and Mahabubnagar, six FPOs, three from each district, were purposively selected for the study.

The six selected FPOs were: Kattangoor Farmer Producer Company Limited, Kattangoor, Nalgonda District; Dheesali Raithu Mahila Producer Company Limited, Bommala Ramaram, Yadadri Bhuvanagiri District; Athmakur (S) Farmer Producer Company Limited, Thummalpenpahad, Suryapet District; Nawabpet Farmer Producer Company Limited, Mahabubnagar District; Kashimnagar Farmer Producer Company Limited, Anjanagiri, Wanaparthi District; and Nagarkurnool Farmer Producer Company Limited, Bondal Pally, Nagarkurnool District.

A total of 400 member farmers were selected from these six FPOs to assess their perceptions regarding the functioning and performance of the FPOs and to examine their economic performance. A quota of 66–67 member farmers was allocated to each selected FPO, resulting in a total sample of 400 member farmers. The respondents were selected using a systematic random sampling technique. For this purpose, the membership list of each FPO was obtained, and the sampling interval was determined by dividing the total number of registered members by the required sample size for the respective FPO. For example, Kattangoor Farmer Producer Company Limited had approximately 1,100 registered members. Based on the required sample of 66–67 respondents, a sampling interval of approximately 16–17 was obtained, and approximately every 16th farmer on the membership list was selected. This procedure provided a systematic and transparent method of respondent selection and helped minimize selection bias.

The remaining 400 respondents were selected from farmers who were not members of any Farmer Producer Organization (FPO). To ensure comparability between FPO members and non-members, the non-member farmers were selected specifically from the respective geographical areas served by the six selected FPOs. Thus, non-member farmers were drawn from the same mandals or villages from which the member farmers of the respective FPOs were selected.

For this purpose, the researcher regularly attended the farmers' meetings conducted by the Agricultural Officers at the mandal or village level during the research period from July to December 2025. The Researcher sought the list of farmers from the Agricultural Officers. Based on the list on a random basis the non-member farmers were identified. The researcher visited the farmers at their convenience and collected their responses. From the geographical area of each selected FPO, approximately 66–67 eligible non-member farmers were selected, corresponding to the number of member farmers selected from each respective FPO, resulting in a total sample of 400 non-member farmers. Consequently, a total of 800 farmers were included in the study, comprising 400 FPO member farmers and 400 non-member farmers, with approximately 66–67 respondents from each selected FPO area in both categories.

The selection of non-member farmers from the same geographical areas as the corresponding FPO members was intended to ensure greater comparability between the two groups. Since the farmers belonged to the same or similar local agricultural environment, they were likely to be exposed to comparable agro-climatic conditions, agricultural practices, input and output markets, and local institutional arrangements. This approach enabled the researcher to compare the economic performance of FPO members and non-members while reducing the influence of geographical differences.

Scope Of The Study

The present study is confined to evaluating the performance of select Farmer Producer Organizations (FPOs), operating in the districts of Nalgonda and Mahboobnagar. The Scope of the Study is limited to only such FPOs who have completed at least 5 years and have a minimum of 500 members. The names of the 6 FPOs, 3 from each district, identified for the study are, Kattangoor Farmer Producer Company Limited, Dheesali Raithu Mahila Producer Company Limited, Athmakur(S) Farmer Producer Company Limited, Nawabpet Farmer Producer Company Limited, Kasheemnagar Farmer Producer Company Limited, and Nagarkurnool Farmer Producer Company Limited.

The assessment is carried out through an analysis of member and non-member farmers perceptions and economic conditions, with particular attention to differences in their economic status, market access and farm-level performance. This approach enables a comparative understanding of the extent to which FPO membership is associated with improved livelihoods, market access and overall economic well-being of farmers.

Period Of The Study

For the collection of the Primary Data from the members of the Farmer Producer Organizations (FPOs) the Period of the Study is limited to 6 months from July 2025 to December 2025. For the collection of Secondary Data, the year of FPO Policy declaration by the Government of India and the date of establishment of the select FPOs is considered for their performance analysis.

Hypotheses

The following Hypotheses are framed for conducting the Research Study:

1. **H₀:** There is no significant difference in the perceptions of Member and Non-member Farmers towards the functioning of FPOs;
2. **H₀:** There is no significant difference in the Economic Profit Per Acre of Member and Non-member Farmers of FPOs.

Tools For Data Analysis

Appropriate descriptive statistics such as frequencies, percentages, mean and standard deviation were used to analyse the data. Cronbach's Alpha was employed to assess the reliability and internal consistency of the perception scale. To test the hypotheses, an independent samples t-test was used to examine the differences in the economic performance of FPO member and non-member farmers, particularly in terms of cost, revenue and profitability. The Chi-square test was used to examine the association of membership of farmers and their perceptions towards the functioning of FPOs

Limitations Of the Study

The following are the limitations of the present study

1. The study is geographically confined to selected areas of Nalgonda and Mahabubnagar districts; hence, the findings may not be generalised to all regions.
2. Only six FPOs were purposively selected, limiting the representation of all FPOs in the study area.
3. Primary data were collected during a limited period from July to December 2025 and may not reflect long-term changes in FPO performance.
4. The study relies partly on farmers' responses, which may be subject to recall errors and subjective perceptions.
5. Differences between member and non-member farmers cannot be attributed entirely to FPO membership, as other socioeconomic, farm-level and market factors may influence their performance.
6. The study mainly focuses on farm-level cost, revenue and profitability and does not comprehensively examine broader outcomes such as empowerment, employment and livelihood diversification.
7. Variations in climatic conditions, input prices, output prices and market conditions may have influenced the economic performance of farmers.
8. The availability and consistency of secondary information may have limited the scope of historical and comparative analysis.

RESULTS AND DISCUSSION

The following section gives the Statistical test results and its analysis for understanding the performance of the FPOs through the perceptions of the Member and Non-member Farmers.

Table 1 presents the results of the reliability test conducted to assess the internal consistency of the 31 perception-related questions included in the FPO questionnaire. The questions were designed to capture the perceptions of FPO Member and Non-member farmers regarding various aspects of FPO functioning and the benefits derived from FPO membership. The reliability of these questions was assessed using Cronbach's Alpha.

Table 1: Reliability Test of Perception Statements of the FPO Questionnaire

Cronbach's Alpha	Number of Questions
0.86	30
Source: Compiled and Analyzed from Primary Data	

The Cronbach's Alpha value was found to be 0.86. Since the value is above the generally accepted threshold of 0.70, the perception statements demonstrate a high level of internal consistency and reliability. This indicates that the 30 questions are consistently measuring the underlying perception-related aspects of FPO membership. Therefore, the questionnaire can be considered reliable and suitable for further statistical analysis including descriptive analysis.

The table 2 presents the classification of mean scores derived from a five-point Likert scale, which is commonly used in social science and management research to measure attitudes, perceptions, and satisfaction levels. The Likert scale ranges from 1 (Strongly Disagree) to 5 (Strongly Agree), and the table provides a systematic categorization of mean scores into five distinct response levels. This classification serves as a guideline for interpreting aggregated mean values obtained from survey data, thereby enabling researchers to translate numerical averages into meaningful qualitative judgments about respondents' opinions.

Table2: Classification of Mean Scores Based on the Five-Point Likert Scale

Mean score	Original response
1.00–1.80	Strongly Disagree
1.81–2.60	Disagree
2.61–3.40	Neutral
3.41–4.20	Agree
4.21–5.00	Strongly Agree
Source: Compiled and Analyzed from Primary Data	

As it can be observed that, a mean score ranging from 1.00 to 1.80 signifies strong disagreement, while scores between 1.81 and 2.60 indicate disagreement, reflecting a generally negative perception. Scores falling between 2.61 and 3.40 are categorized as neutral, suggesting that respondents neither agreed nor disagreed or held balanced views. Mean values from 3.41 to 4.20 represent agreement, showing a positive inclination toward the statement, and scores between 4.21 and 5.00 denote strong agreement, highlighting a highly favorable perception.

The table 3 provides a classification framework for farmers' perception levels towards the functioning of Farmer Producer Organizations (FPOs), based on the mean scores derived from a five-point Likert scale. It categorizes responses into three distinct levels—Low, Moderate, and High—by grouping the original Likert scale ranges into broader interpretive categories. This structured classification enables researchers to translate numerical mean scores into meaningful qualitative insights, thereby offering a clear understanding of how farmers collectively view the performance and effectiveness of their FPOs.

Table 3: Classification of Farmers According to Their Perception Level Towards the Functioning of FPOs

Perception level	Mean-score range	Interpretation
Low	1.00–2.60	Strongly Disagree + Disagree
Moderate	2.61–3.40	Neutral
High	3.41–5.00	Agree + Strongly Agree
Source: Compiled and Analyzed from Primary Data		

As it can be observed that, Farmers whose mean scores fall within the 1.00–2.60 range are classified under the Low perception level, which corresponds to responses of Strongly Disagree and Disagree. This indicates dissatisfaction or negative views regarding the functioning of their FPOs. Scores between 2.61–3.40 are categorized as Moderate perception, aligning with Neutral responses, and suggest that farmers hold balanced or indifferent views, neither strongly supporting nor opposing the functioning of their organizations. Finally, mean scores in the 3.41–5.00 range are grouped under the High perception level, corresponding to Agree and Strongly Agree, which reflects positive attitudes and satisfaction with FPO performance.

Table 4 presents the perception levels of member and non-member farmers towards the functioning of the selected Farmer Producer Organizations (FPOs). The perception of farmers was classified into three categories—low (1–2.60), moderate (2.61–3.40), and high (3.41–5.00).

The findings reveal a clear difference between member and non-member farmers in their perception towards the functioning of FPOs. Among the 400 non-member farmers, a majority (61.0%) had a low level of perception, followed by 26.3% with a moderate level and only 12.8% with a high level of perception. In contrast, among the 400 member farmers, the majority (67.0%) reported a moderate level of perception, while 28.8% had a low level and only 4.3% had a high level of perception.

Table 4: Member and Non-member Farmers Perception Levels Towards Functioning of the FPO

S. No	Name of the FPO	Status	Perception Level			Total
			Low (1-2.60)	Moderate (2.61-3.40)	High (3.41-5)	
1.	A(S)FPCL	Non-Member Farmer	30	36	0	66
			45.5%	54.5%	0.0%	100.0%
		Member Farmer	18	46	2	66
			27.3%	69.7%	3.0%	100.0%
2.	DMRPCL	Non-Member Farmer	33	5	29	67
			49.3%	7.5%	43.3%	100.0%
		Member Farmer	3	49	15	67
			4.5%	73.1%	22.4%	100.0%
3.	KTFPCL	Non-Member Farmer	13	32	22	67
			19.4%	47.8%	32.8%	100.0%

		Member Farmer	24	43	0	67
			35.8%	64.2%	0.0%	100.0%
4.	NFPCL	Non-Member Farmer	34	32	0	66
			51.5%	48.5%	0.0%	100.0%
		Member Farmer	21	45	0	66
			31.8%	68.2%	0.0%	100.0%
5.	KFPCL	Non-Member Farmer	67	0	0	67
			100.0%	0.0%	0.0%	100.0%
		Member Farmer	21	46	0	67
			31.3%	68.7%	0.0%	100.0%
6.	NGFPCL	Non-Member Farmer	67	0	0	67
			100.0%	0.0%	0.0%	100.0%
		Member Farmer	28	39	0	67
			41.8%	58.2%	0.0%	100.0%
Total		Non-Member Farmer	244	105	51	400
			61.0%	26.3%	12.8%	100.0%
		Member Farmer	115	268	17	400
			28.8%	67.0%	4.3%	100.0%
Source: Compiled and Analyzed from Primary Data						

At the individual FPO level, considerable variation was observed. In Athmakur (S) Farmers Producer Company Limited (A(S) FPCL), 45.5 per cent of non-member farmers had low perception and 54.5 per cent had moderate perception, whereas among members, 69.7 per cent had moderate perception and 3.0 per cent had high perception. In DMRPCL, 49.3 per cent of non-members had low perception, while 73.1 per cent of members had moderate perception and 22.4 per cent had high perception, indicating a relatively favourable perception among members.

For KTFPCL, 47.8 per cent of non-members had moderate perception and 32.8 per cent had high perception. However, among members, 64.2 per cent had moderate perception and none were in the high category. In NFPCL, both groups predominantly reported low or moderate perception, with 51.5 per cent of non-members and 31.8 per cent of members falling in the low category. The majority of members (68.2%) had moderate perception.

In KFPCL, all non-member farmers (100.0%) had low perception, whereas among members, 68.7 per cent had moderate perception and 31.3 per cent had low perception. Similarly, in NGFPCL, all non-member farmers (100.0%) had low perception, while 58.2 per cent of members had moderate perception and 41.8 per cent had low perception.

Overall, the results indicate that membership in an FPO is associated with a more favourable perception of its functioning. The predominance of moderate perception among members suggests that direct participation and exposure to FPO activities may have improved farmers' understanding and assessment of FPO functioning. Conversely, the high proportion of non-member farmers with low perception may be attributed to their limited exposure to FPO activities and services. Nevertheless, the relatively small proportion of members reporting a high level of perception across most FPOs indicates that there is scope for strengthening FPO services, communication, transparency, member participation, and delivery of benefits to improve farmers' perceptions further.

To examine whether there is a statistically significant association between the perception levels of member and non-member farmers towards the functioning of Farmer Producer Organizations (FPOs), a Chi-Square test of independence was applied. The test was used to determine whether the observed differences in perception levels between member and non-member farmers are statistically significant or merely due to sampling variation. The results of the Chi-Square test are presented in Table 5.

Table 5: Chi-Square Test for Member and Non-member Farmers Perception Levels Towards Functioning of the FPO

	Value	Degrees of Freedom	Asymptotic Significance (2-sided)
Pearson Chi-Square	134.584	2	0.001
Source: Compiled and Analyzed from Primary Data			

The results shows that the Pearson Chi-Square value is 134.584 with 2 degrees of freedom, and the corresponding p-value (Asymptotic Significance 2-sided) is 0.001. Since the p -value of 0.001 is less than the 0.05 level of significance, the null hypothesis that there is no significant difference in perception levels of member and non-member farmers towards functioning of the FPO is rejected and concluded that there is a significant difference in perception levels of member and non-member farmers towards functioning of the FPO.

The high Chi-Square value of 134.584 further indicates a substantial difference between the observed and expected frequencies across the perception categories. Therefore, FPO membership appears to be significantly associated with farmers' perception towards the functioning of the FPO. The findings imply that membership and direct involvement with FPO activities influence farmers' understanding and assessment of its functioning.

Table 6 presents the descriptive statistics of member and non-member farmers in terms of total revenue, accounting/explicit cost, accounting profit, economic/implicit cost, and economic profit per acre across the selected Farmer Producer Organisations (FPOs). The table compares the average financial performance of the two groups based on a sample of 400 member farmers and 400 non-member farmers. Mean values are presented along with standard deviations and standard errors to indicate the central tendency and variability of the observed costs, revenues, and profits. The comparison provides an initial assessment of whether FPO membership is associated with differences in the economic performance of farmers.

The implicit cost was estimated uniformly for both member and non-member farmers at ₹70,000 per annum, comprising ₹60,000 as foregone wages and ₹10,000 as the imputed rental value of farmland.

Table 6: Descriptive Statistics of Member and Non-member Farmers on Cost, Revenue and Profit per Acre across Selected Farmer Producer Organisations (FPOs)

Particulars	Status	Sample Size	Mean	Standard Deviation	Standard Error Mean
	Member farmers	400	217058.73	181489.839	9074.492

Total Revenue Per Acre (In Rs/-)	Non-member farmers	400	211150.65	181458.804	9072.940
Total Accounting / Explicit Cost (In Rs/-)	Member farmers	400	137414.74	157914.604	7895.730
	Non-member farmers	400	139458.33	155062.675	7753.134
Total Accounting Profit (In Rs/-)	Member farmers	400	79643.99	33928.896	1696.445
	Non-member farmers	400	71692.32	26542.466	1327.123
Total Economic/Implicit cost (In Rs/-)	Member farmers	400	70000.00	.000 ^a	0.000
	Non-member farmers	400	70000.00	.000 ^a	0.000
Total Economic Profit (In Rs/-)	Member farmers	400	9643.99	33928.896	1696.445
	Non-member farmers	400	1692.32	26542.466	1327.445

Source: Compiled and Analyzed from Primary Data

It can be observed that the average total revenue of member farmers was ₹2,17,058.73 per acre, compared with ₹2,11,150.65 per acre for non-member farmers, indicating that member farmers generated approximately ₹5,908 more revenue per acre. At the same time, member farmers incurred a lower average total accounting/explicit cost of ₹1,37,414.74 per acre, compared with ₹1,39,458.33 per acre for non-member farmers. This indicates that member farmers incurred approximately ₹2,044 less explicit cost per acre. Consequently, the average total accounting profit was substantially higher among member farmers at ₹79,643.99 per acre, compared with ₹71,692.32 per acre among non-member farmers, resulting in a difference of approximately ₹7,952 per acre. The total economic/implicit cost was ₹70,000 per acre for both member and non-member farmers. After considering this implicit cost, member farmers earned an average total economic profit of ₹9,643.99 per acre, whereas non-member farmers earned only ₹1,692.32 per acre. Thus, member farmers obtained approximately ₹7,952 higher economic profit per acre than non-member farmers. Overall, the descriptive results concludes that FPO member farmers had a relatively better economic performance, characterized by higher revenue, lower explicit costs, and higher accounting as well as economic profits compared with non-member farmers.

Assumptions Of Independent Sample T-Test

In the present study comparing member and non-member farmers of FPOs in Nalgonda and Mahabubnagar, the independent samples t-test was applied to examine differences in economic profit per acre and perceptions of FPO functioning. For this test to be valid, several assumptions must hold true. First, the independence of observations is satisfied since member and non-member farmers were selected separately using systematic random sampling and random selection from the same geographical areas, ensuring that each farmer's response is not influenced by another. Second, the normality assumption is reasonably supported because the dependent variables—profit per acre and perception scores—are continuous, and with a large sample size of 400 respondents in each group, the Central Limit Theorem ensures approximate normal distribution even if the raw data deviate slightly. Third, the assumption of homogeneity of variances requires that the variability in profit or perception scores be similar across the two groups. Fourth, the scale of measurement is appropriate since economic indicators such as cost, revenue, and profit are ratio-scale variables, and perception scores are treated as interval data derived from the Likert scale. Finally, representativeness is reasonably ensured by purposive selection of six FPOs with more than 500 members and five years of operation, though the geographical confinement to two districts limits generalization.

Table 7 presents the results of an independent-samples t-test conducted to compare the cost, revenue and profit per acre between member and non-member farmers. The analysis was undertaken to determine whether the

observed differences in economic performance between the two groups of farmers are statistically significant. The test compares the mean differences in total revenue, total accounting/explicit cost, total accounting profit and total economic profit per acre. The t-statistics, degrees of freedom and corresponding two-tailed significance (p) values are used to assess whether the differences between member and non-member farmers are statistically meaningful.

Table 7: Independent-Samples t-Test for Comparison of Cost, Revenue and Profit per Acre between Member and Non-member Farmers

Particulars	Mean Differences	t	Degrees of Freedom	Significance (2-tailed)
Total Revenue Per Acre (In Rs/-)	5,908.08	.460	798	.645
Total Accounting / Explicit Cost (In Rs/-)	-2,043.59	-0.185	798	.854
Total Accounting Profit (In Rs/-)	7951.67	3.692	798	.001
Total Economic Profit (In Rs/-)	7951.67	3.692	798	.001

Source: Compiled and Analyzed from Primary Data

As it can be observed that the mean difference in total revenue per acre between member and non-member farmers was ₹5,908.08, with a t-value of 0.460 and a significance value of 0.645. Since the p-value is greater than 0.05, the difference in revenue between the two groups is not statistically significant. Although member farmers recorded higher average revenue, the difference is not sufficient to conclude that FPO membership has resulted in a perceived significant difference in revenue generation.

Similarly, the total accounting/explicit cost per acre showed a mean difference of –₹2,043.59, with a t-value of –0.185 and a significance value of 0.854. As the p-value is greater than 0.05, the difference in accounting cost between member and non-member farmers is not statistically significant. This indicates that the explicit production costs incurred by the two groups are broadly comparable.

In contrast, a statistically significant difference was observed in total accounting profit and economic profit per acre. The mean difference was ₹7,951.67, with a t-value of 3.692 and a p-value of 0.001. Since the p-value is less than 0.05, the difference is statistically significant at the 5 per cent level. This indicates that FPO participation can contribute to improved economic outcomes.

Overall, the independent-samples t-test indicates that FPO membership does not result in a statistically significant difference in either total revenue or accounting/explicit cost per acre; however, it is associated with a statistically significant difference in both accounting profit and economic profit. Member farmers earned approximately ₹7,952 more profit per acre than non-member farmers. Therefore, the findings suggest that the economic advantage associated with FPO membership is reflected positively in profitability than in revenue or production cost alone. The results indicates that FPO membership is associated with differences in the economic outcomes of farmers.

CONCLUSION

Although a statistically significant difference is observed between member and non-member farmers in terms of accounting and economic profits, these differences may not be attributable solely to FPO membership. The profitability can also be influenced by a range of interrelated factors, including cropping patterns, farm size, crop selection, production and cultivation practices, input use, access to resources and technology, prevailing market conditions, and variations in climatic and weather conditions. Therefore, the observed differences in profitability should be interpreted with due consideration of these other factors that may also influence the economic performance of farmers.

The promotion of Farmer Producer Organisations (FPOs) is an important policy intervention aimed to doubling farmers incomes through collective input procurement, improved productivity, better market access, value addition, and stronger bargaining power. However, the findings of the present study indicate that the desired improvement in farmers' income has not yet been achieved to the expected extent. The average revenue of FPO member farmers is only about ₹5,980 per acre higher than that of non-member farmers, indicating a relatively modest difference in revenue between the two groups. Thus, the findings suggest that FPOs have contributed to some improvement in farmers' economic outcomes, but their impact remains limited in terms of achieving the broader objective of substantially increasing, and ultimately doubling, farmers income. Greater emphasis may therefore be required on productivity enhancement, value addition, market linkages, collective marketing, and better price realisation to strengthen the income-generating potential of FPOs.

The findings of the present study indicate that the majority of farmers belong to the middle-aged and older age groups, while the participation of younger people in agriculture remains relatively limited. This trend indicates a gradual decline in the involvement of youth in farming and may have implications for the future sustainability and continuity of the agricultural sector.

The findings of the present study reveal that several FPOs facing critical challenges, particularly in terms of effective leadership and management, limited value-addition activities, inadequate processing and conversion of agricultural produce into finished or market-ready products, and weak market linkages. These constraints restrict the ability of FPOs to generate higher value for their members and improve farmer's income. The absence of strong leadership and effective business management further limits their capacity to identify market opportunities, develop value-added products, and establish sustainable marketing channels.

Overall, the present study concludes that FPO membership has contributed to some improvement in farmers' economic performance, particularly in accounting and economic profitability; however, the overall impact on revenue remains relatively modest. The findings also indicate that profitability is influenced by several factors beyond FPO membership, while limited youth participation and weaknesses in leadership, value addition, processing, and market linkages continue to constrain FPO performance. Therefore, strengthening the managerial and business capabilities of FPOs, promoting value addition and effective marketing, improving market linkages, and encouraging greater youth participation are essential for enhancing farmers' incomes and ensuring the long-term sustainability and effectiveness of FPOs.

Contribution Of The Study

The study makes a useful contribution by providing empirical evidence on the economic performance of FPO member and non-member farmers and identifying the factors that influence the effectiveness and sustainability of FPOs. For farmers, it highlights the potential benefits of membership and the need for stronger value addition, market linkages and collective marketing. For society, it emphasises the importance of strengthening agriculture as a sustainable livelihood and encouraging greater youth participation. For policymakers, the findings provide evidence for improving FPO-support programmes, particularly through capacity building, financial support, infrastructure, processing facilities and market development. For FPOs and other stakeholders, the study identifies critical areas such as leadership, management, value addition and marketing that require greater attention to improve profitability, competitiveness and long-term sustainability.

Suggestions

The following suggestions emanate from the Research Study:

I. Suggestions to the Select FPOs

- a) Athmakur (S) FPCL: Focuses on paddy, cotton, and maize. Provides input services and soil testing, but lacks value-generating activities.
- Recommendation: Expand into value addition, processing, and collective marketing to improve price realisation and farmer income.

- b) Dheesali Raithu Mahila PCL (DRMPCL): Cultivates paddy and vegetables; has market linkages for vegetables but not for paddy.
 - Recommendation: Strengthen market linkages across all crops, introduce collective marketing, post-harvest management, processing, and packaging to reduce losses and enhance income.
- c) Kattangoor FPCL (KTFPCL): Deals with paddy, lemon, cotton; owns substantial infrastructure (machinery, vehicles, cold storage) but faces underutilization due to weak leadership and political interference.
 - Recommendation: Improve governance, transparency, and equitable access; ensure effective use of existing infrastructure; expand collective marketing and value addition.
- d) Nawabpet FPCL (NFPCL): Engages in paddy, maize, groundnut; provides input and soil-testing services but lacks marketing and processing initiatives.
 - Recommendation: Secure institutional and financial support (Govt. /NABARD) to build market linkages, processing facilities, and managerial capacity for comprehensive farmer support.
- e) Kashimnagar FPCL (KFPCL): Focuses on groundnut, paddy, maize; limited to input services.
 - Recommendation: Gradually expand into collective procurement, marketing, value addition, and processing to unlock economic benefits.
- f) Nagarkurnool FPCL (NGFPCL): Deals with paddy, groundnut, red gram; has NABARD-supported groundnut processing machinery but underutilised due to weak management.
 - Recommendation: Strengthen leadership and management, ensure equitable use of facilities, and expand processing, value addition, and collective marketing across commodities.

In summary these FPOs are confined to input services, with limited progress in value addition, processing, and marketing. Strengthening institutional capacity, governance, infrastructure utilisation, and market linkages is critical for enhancing farmer empowerment, price realisation, and income.

Drawn from the findings on the performance of Farmer Producer Organizations (FPOs) in Telangana, the following suggestions can be made to strengthen their functioning and enhance farmer welfare:

1. NABARD bears the responsibility of promoting and nurturing Farmer Producer Organizations (FPOs) through financial support, capacity building, infrastructure development, and policy guidance. Its interventions are intended to strengthen collective farming, improve market access, and enhance farmers' income through sustainable institutional models. However, in practice, NABARD's role has largely remained confined to financial assistance, with limited progress in advancing the broader dimensions of institutional development, leadership strengthening, and market integration.
 - Suggestion: There is a need to handhold the FPOs until they reach their intended objectives.
2. Most FPOs have not yet taken up value addition as a core activity, and this significantly limits their ability to generate higher returns for farmers.
 - Suggestion: The Mulkanoor Cooperative Society in Telangana is a strong example of how farmer collectives can succeed when they move beyond input supply and embrace value addition and market linkages. Founded in 1956, it has grown into one of India's most successful cooperatives, with thousands of women members. Unlike many FPOs that remain confined to distributing seeds and fertilizers, Mulkanoor has established rice mills, dairy units, oil extraction facilities, and collective marketing systems. These initiatives allow farmers to process their produce, brand it, and sell directly to markets, thereby securing better price realisation and reducing dependence on intermediaries.

3. Leadership and governance remain among the most pressing challenges confronting Farmer Producer Organizations (FPOs). Weak or ineffective leadership has led to the underutilization of resources, poor decision-making, and limited advancement in farmer empowerment. This problem is further compounded by the negligible participation of youth and educated farmers, whose absence deprives FPOs of innovation, professional management, and long-term sustainability.
 - Suggestion: Leadership and governance challenges in FPOs can be effectively addressed through a blend of capacity building, democratic processes, professional management, and accountability mechanisms. Leaders must be trained in management, finance, and collective decision-making, while transparent elections and rotation of leadership are essential to prevent elite capture. The appointment of professional managers or CEOs alongside farmer representatives can enhance operational efficiency, and independent audits with regular reporting will strengthen accountability. Equally important is empowering members—particularly smallholders and women—through awareness programs that foster active participation in governance. In this context, institutions such as NABARD must play a proactive role, while government policy interventions should incentivize training programmes. Crucially, such initiatives should move beyond mere publicity and ensure tangible outcomes that deliver real change in FPO governance and farmer empowerment.
4. Monitoring the progress of Farmer Producer Organizations (FPOs) is a crucial mechanism to ensure accountability, sustainability, and farmer empowerment.
 - Suggestion: Governments at both the central and state levels should institute continuous monitoring mechanism of FPOs through their respective administrative offices. Well-functioning FPOs must be incentivized to sustain and scale their performance, while those facing operational challenges should be provided with structured guidance and corrective support. Such a dual approach—rewarding efficiency and addressing deficiencies—will ensure accountability, strengthen institutional sustainability, and enhance the overall impact of FPOs on farmer empowerment and income generation.
5. At the very least, the Ministry of Agriculture and Cooperation should move beyond its current emphasis on merely increasing the number of FPOs established. Rather than focusing on quantity, greater attention must be directed toward the quality of their performance. Prioritizing institutional effectiveness, governance standards, and measurable farmer outcomes will ensure that FPOs evolve into sustainable organizations capable of delivering genuine empowerment and economic upliftment.
6. The foremost objective of Farmer Producer Organizations (FPOs) lies in the empowerment of farmers. Such empowerment can only be realized when the farming community achieves collective organization.
7. Political interference should be completely eliminated.

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