

Farmer Producer Organizations as Catalysts of Rural Transformation: A Multidimensional Framework from Punjab, India

Saurav¹, Jyoti Garg^{2*}

Abstract

Farmer Producer Organizations (FPOs) have evolved as an important institutional mechanism for resolving the socio-economic challenges of small and marginal farmers by fostering collective action, expanding market access, and boosting bargaining power. In the broader context of sustainable rural development, FPOs are increasingly acknowledged as catalysts of rural transformation by contributing to numerous dimensions of farmer well-being. However, current study has generally analyzed FPOs through economic and operational indicators, with minimal attention on their multifaceted developmental impacts. The present study proposes a multidimensional framework for evaluating rural transformation through FPOs. The study is based on primary data collected from 390 farmer-members of selected FPOs in Punjab, India, using a structured questionnaire comprising 43 items measured on a five-point Likert scale. Reliability and construct validity were examined using Cronbach's alpha, Kaiser-Meyer-Olkin (KMO) measure, Bartlett's Test of Sphericity, and Exploratory Factor Analysis (EFA). The KMO value (0.864) and significant Bartlett's test ($\chi^2 = 8171.233$; $p < 0.001$) confirmed the adequacy of the data for factor analysis. The EFA extracted six dimensions—Economic Impact, Habitat Security, Educational Security, Health Security, Social Empowerment, and Institutional Support—collectively explaining 59.951 percent of the total variance. The findings demonstrate that FPOs contribute significantly to inclusive rural development, social resilience, institutional strengthening, and key Sustainable Development Goals (SDGs), particularly poverty reduction, quality education, good health, and reduced inequalities. The study offers important policy implications for strengthening FPOs as integrated institutions for sustainable rural transformation.

Keywords: Farmer producer organizations, sustainable rural development, rural transformation, social inclusion, institutional development

INTRODUCTION

Indian agriculture makes up 17.4 percent of the nation's "Gross Domestic Product" and supports the lives of more than half of population. More than 85% farmers are categorized as small and marginal, possessing a standard agricultural property of 1.16 hectares. The industry's disorganized state shows why these farmers struggle to get better value for their products. The Government of India acknowledged the continued significance of agriculture by formulating an action plan in the Union Budget for 2016-17. They allocated 35,984 crores to this sector [1]. The budget focused on improving rural infrastructure and food security, while also addressing the financial stability of the struggling agricultural sector, to achieve a twofold increase in farmers' income within a five-year period.

*Author for Correspondence

Jyoti Garg
E-mail: jyoti11724@gmail.com

¹Research Scholar, Punjabi University, Patiala Punjab

²Assistant Professor in Economics, University College
Miranpur, Bahadurpur Miranwala, Punjab

Received Date: July 02, 2026

Accepted Date: July 14, 2026

Published Date: August 10, 2026

Citation: Saurav, Jyoti Garg. Farmer Producer Organizations as Catalysts of Rural Transformation: A Multidimensional Framework from Punjab, India. Research & Reviews: Journal of Agricultural Science and Technology. 2026; 15(2): 116–122p.

India confronts a significant problem in ensuring food and nutritional security for its population exceeding one billion [2]. The agricultural sector's contribution to GDP has dropped significantly. Meanwhile, the number of operational landholdings rose from 71 million in 1970-71 to 137.8 million in 2010-11. This growth shows a decrease in the average size of landholdings, from 2.28 hectares to 1.16 hectares during this period. The country has about 92 million small holdings, which is roughly 21 percent of the global total of 450 million, making it the second largest after China [3]. Although smallholder agriculture is vital for economic development and poverty reduction in developing countries, its growth is constantly hampered by the need for institutional reforms to fix market issues. Consequently, financiers, governments, and scholars are showing more interest in cooperative producer groups as a way to boost smallholder agricultural performance. This approach aims to encourage greater market participation [4].

A "FPO" is a group formed by farmers to improve agricultural productivity, marketing, and profit. It is usually registered under the 'Companies Act or Cooperative Act' and is managed by the farmers themselves. The main goal of an FPO is to strengthen the bargaining power of marginal and small farmers. It does this by helping them buy supplies together, using modern farming methods, and allowing them to sell their products directly. The FPOs offer services such as storage, transportation, processing, finance, training, and access to government programs. They also cut out middlemen, helping farmers receive fair prices. FPOs promote teamwork in decision-making and improve the living conditions in rural areas. An extensive analysis of many agricultural programs and interventions indicates that involvement in these projects markedly improves financial stability and job prospects. The mean yearly income of persons before the FPO involvement was Rs. 1,07,125, which rose to Rs. 1,33,250 following program participation, signifying a significant improvement in earning capacity. The increase in yearly expenditure from Rs. 74,988 to Rs. 90,613 indicates heightened investments in activities that enhance livelihoods [5]. Farmer Producer Organizations (FPOs) have increasingly been recognized as effective institutional mechanisms for improving the socio-economic conditions of small and marginal farmers. Existing studies indicate that FPOs enhance farmers' resilience by reducing transaction costs, improving market integration, and strengthening collective bargaining, thereby enabling farmers to better cope with market and production uncertainties [6]. Farmer Producer Organisations (FPOs) offer a variety of services to their members, including input supply, procurement, marketing, technical help, and financial services. This study looks at the current literature and policy framework of FPOs and how they affect the economic growth of small and marginal farmers in India [7]. FPOs are different from earlier forms of collectives because they have legal rules for profit sharing through dividends. Farmer Producer Organisations can choose a suitable legal framework for their group based on their needs. FPOs can reduce the large gap between retail prices and manufacturers' prices [8]. High-functioning FPOs demonstrate robust organizational frameworks that promote a collaborative and efficient operational atmosphere [9]. FPCs have made the farmers economically empowered, more resilient, especially in the adaptation of sustainable agriculture, which is the positive FPOs that made the farmers more economically empowered and resilient while adopting sustainable agriculture [10].

Punjab has been slower to adopt FPOs as compared to the rest of India. Interestingly, it has the lowest registered FPOs, with other states with similar agricultural profiles having much higher numbers. This could be a factor of the strong cultural inclination towards individual, private farming, set market mediation, and the state emphasis on wheat and paddy monocultures. The inequitable distribution of FPOs is considered poor, with several districts having high concentrations of FPOs, while other districts have little to none. This discrepancy lights the considerable reluctance with which most of the districts within Punjab continue to avoid modelling community farming, despite the historical dominance of the wheat-paddy rotation in the district's farming practice [11].

Comparative research of high-performing and failed FPOs highlights the significance of organizational characteristics, including member involvement, role clarity, and mutual trust, in influencing performance [12]. Although previous studies have established the economic and operational benefits of FPOs, the existing literature predominantly evaluates their performance using

isolated indicators such as income, market access, or financial sustainability. Limited attention has been given to conceptualizing rural transformation as a multidimensional construct encompassing economic, social, educational, health, habitat, and institutional dimensions.

RESEARCH METHODOLOGY

The present study aims to develop and validate a multidimensional framework for assessing rural transformation through FPOs by identifying the underlying dimensions of farmer upliftment using Exploratory Factor Analysis (EFA). A descriptive and exploratory research design was adopted, and the study was conducted in Punjab, India, owing to its strong agricultural base and expanding network of FPOs. Primary data were collected through a field survey conducted between August and December 2024 from 390 farmer-members of selected FPOs using a purposive sampling technique to ensure representation of active members across different agricultural backgrounds.

A structured questionnaire comprising 43 statements was developed following an extensive review of the literature on farmer empowerment, rural livelihoods, collective institutions, and FPO performance.

Data analysis was performed using both descriptive and multivariate statistical techniques. Descriptive statistics were used to summarize the socio-economic characteristics of the respondents. The reliability of the measurement instrument was assessed using Cronbach's alpha, while the suitability of the data for factor analysis was examined using the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity. Subsequently, Exploratory Factor Analysis employing Principal Component Analysis (PCA) with Varimax rotation was performed to identify the underlying dimensions of farmer upliftment. Factors with eigenvalues greater than one and factor loadings above 0.50 were retained for interpretation.

RESULTS AND SCALE VALIDATION

The study comprised 390 farmer-members of selected Farmer Producer Organizations (FPOs) in Punjab. Male respondents constituted 58.7% of the sample, while 41.3% were female. The largest proportion (32.3%) belonged to the age group of 42 years and above. In terms of landholding, marginal farmers represented the largest category (34.6%), followed by large (30.8%), small (20.3%), and medium farmers (14.4%), indicating representation across different farm-size categories.

The reliability of the measurement instrument was assessed using Cronbach's alpha. The extracted dimensions exhibited acceptable to excellent internal consistency, with Cronbach's alpha values ranging from 0.718 to 0.872, confirming the reliability of the scale. Furthermore, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.864, indicating excellent sampling adequacy, while Bartlett's Test of Sphericity was statistically significant ($\chi^2 = 8171.233$, $df = 903$, $p < 0.001$), confirming the suitability of the data for Exploratory Factor Analysis.

EXPLORATORY FACTOR ANALYSIS

The exploratory factor analysis (EFA) revealed a significant factor in Table 1 which is Economic Impact that encompasses a set of eight related variables. This factor emerged with an eigenvalue of 5.927, indicating its substantial contribution to explaining the variance in the data. The factor explains 14.531% of the total variance, with a Cronbach's Alpha value of 0.719, suggesting a good level of internal consistency and reliability among the items grouped under this dimension. The factor primarily captures the perceived economic benefits experienced by members of Farmer Producer Organizations (FPOs).

The Exploratory Factor Analysis (EFA) identified "Habitat Security" as the second significant factor, reflecting improvements in housing and living infrastructure associated with FPO (Farmer Producer Organization) membership. Table 2 represents that this factor holds an eigenvalue of 3.686, accounts for 13.531% of the total variance, and raises cumulative variance explained to 28.062%. The internal consistency of this factor is supported by a Cronbach's Alpha of 0.718, indicating acceptable reliability of the grouped items.

The Exploratory Factor Analysis (EFA) identified “Educational Security” as the third significant factor influencing the lives of Farmer Producer Organization (FPO) members. This factor has an eigenvalue of 3.118, contributes 10.391% to the total variance, and brings the cumulative variance explained to 38.543% as shown in Table 3. With a Cronbach’s Alpha of 0.777, the factor demonstrates strong internal consistency, suggesting that the items reliably measure the underlying concept of educational support and empowerment through FPOs.

Table 1. Exploratory factor analysis results for the economic impact dimension.

Factor wise dimension	Mean	Standard deviation	Factor loading	Extraction
Factor 1. Economic Impact (Eigen value- 5.927 alpha- 0.719 variance explained-14.531 cumulative variance explained-14.531)				
My income has increased since joining the FPO	3.24	1.51	0.779	0.733
The size of my landholding has expanded	3.45	1.41	0.788	0.738
My savings have improved since becoming a member of the FPO	3.49	1.43	0.708	0.808
Being a member, FPO has reduced my cost of agricultural inputs	3.48	1.45	0.766	0.798
I receive better prices for my produce since joining the FPO	3.13	1.50	0.799	0.718
The FPO has made it easier for me to access credit or loans	3.20	1.55	0.713	0.757
My financial stability has improved as a result of FPO membership	3.61	1.45	0.868	0.653
I have been able to invest more in farm technology and equipment since joining the FPO	3.21	1.50	0.729	0.727

Table 2. Exploratory factor analysis results for the habitat security dimension.

Factor wise dimension	Mean	Standard deviation	Factor loading	Extraction
Factor 2. Habitat security (Eigen value-3.686 alpha- 0.718 variance explained- 13.531 cumulative variance explained- 28.062)				
The condition of my dwelling has improved since joining the FPO	3.39	1.51	0.768	0.745
The FPO has helped me in improving or upgrading the type of housing I live in	3.94	1.55	0.826	0.756
The FPO has made housing more affordable or accessible to me	3.13	1.49	0.880	0.743
My access to reliable electricity supply has improved due to FPO initiatives	3.40	1.45	0.680	0.847
The FPO has contributed to better water supply facilities for my household	3.20	1.47	0.785	0.877
The FPO has contributed to the improvement of community infrastructure around my home	3.92	1.53	0.780	0.706

Table 3. Exploratory factor analysis results for the educational security dimension.

Factor wise dimension	Mean	Standard deviation	Factor loading	Extraction
Factor 3: Educational security (Eigen value- 3.118 alpha- 0.777 variance explained- 10.391 cumulative variance explained- 38.543)				
The FPO has provided better educational opportunities for my children	3.07	1.51	0.840	0.858
The FPO has played a role in enabling my children to pursue collegiate education	3.96	1.47	0.759	0.858
The FPO has increased awareness about available scholarships for higher education	3.45	1.20	0.802	0.714
The FPO has facilitated access to vocational training or skills for my children	3.85	1.16	0.784	0.642
The FPO has raised my awareness of the importance of education for my children	3.18	1.40	0.629	0.865
My children have more opportunities for extracurricular activities (sports, arts) due to the support of the FPO	3.68	1.51	.831	0.875

The Exploratory Factor Analysis (EFA) identified “Health Security” as the fourth key factor, capturing the impact of Farmer Producer Organizations (FPOs) on the health-related aspects of members’ lives. Table 4 shows that factor has an eigenvalue of 2.716, contributes 8.135% to the total variance, and increases the cumulative variance explained to 46.589%. With a high Cronbach’s Alpha value of 0.872, the factor demonstrates excellent internal reliability, confirming that the set of items consistently represents the construct of health security.

The Exploratory Factor Analysis (EFA) identified “Social Empowerment” as the fifth significant factor presented in Table 5. This factor has an eigenvalue of 2.286, accounts for 7.203% of the total variance, and raises the cumulative variance explained to 53.792%. The internal consistency of this factor is supported by a high Cronbach’s Alpha value of 0.830, indicating that the grouped items reliably measure the underlying construct of social empowerment.

The Exploratory Factor Analysis (EFA) identified “Institutional Support” as the sixth key factor, explaining how Farmer Producer Organizations (FPOs) influence the perceptions, trust, and engagement levels of their members. This factor has an eigenvalue of 2.115, contributes 6.160% to the total variance, and brings the cumulative variance explained to 59.951% as shown in Table 6. The internal consistency is acceptable, with a Cronbach’s Alpha of 0.729, indicating a reliable grouping of related items that collectively measure the Institutional Support.

Table 4. Exploratory factor analysis results for the educational security dimension.

Factor wise dimension	Mean	Standard deviation	Factor loading	Extraction
Factor 4. Health security (Eigen value- 2.716 alpha- 0.872 variance explained- 8.135 cumulative variance explained- 46.589)				
In order to get better health services, we travel to outside town	3.22	1.52	0.883	0.748
We can’t afford the health care facilities available	3.36	1.46	0.753	0.897
The FPO has facilitated access to affordable health insurance for my family	3.01	1.44	0.690	0.737
Emergency medical services have become more accessible through FPO support	3.86	1.50	0.741	0.731
The FPO organizes health awareness programs that educate us about various health issues	2.98	1.46	0.827	0.738
The FPO has improved access to clean water and sanitation, reducing health risks	3.03	1.46	0.843	0.758
The FPO has provided nutritional support or guidance that has improved our family’s health	3.85	1.50	0.752	0.833

Table 5. Exploratory factor analysis results for the educational security dimension.

Factor wise dimension	Mean	Standard deviation	Factor loading	Extraction
Factor 5. Social empowerment (Eigen value- 2.286 alpha- 0.830 variance explained- 7.203 cumulative variance explained- 53.792)				
Participate in social activities	3.66	1.49	0.777	0.662
Participate in village administration	3.18	1.54	0.637	0.755
Get recognition in my neighborhood/society	3.19	1.48	0.771	0.761
Aware of socio-economic development programmes	3.22	1.48	0.830	0.783
Actively involved in addressing social issues and problems	3.30	1.46	0.720	0.747
Have a sense of leadership	3.15	1.48	0.784	0.736
Feel self-confident in decision making	3.09	1.51	0.824	0.776
Help other people in solving their problems	3.20	1.51	0.704	0.780

Table 6. Exploratory factor analysis results for the educational security dimension.

Factor wise dimension	Mean	Standard deviation	Factor loading	Extraction
Factor 6. Institutional support (Eigen value- 2.115 alpha- 0.729 variance explained- 6.160 cumulative variance explained- 59.951)				
The support between the farmers and Agricultural/ Agricultural Marketing/ Agricultural Engineering and other related departments has increased due to FPO	3.89	1.52	0.758	0.649
Farmers ensure the good profits due to common sale of their agricultural produce by FPOs	3.34	1.52	0.712	0.628
Participation in FPOs saves labour, time and money of farmers	3.76	1.56	0.749	0.777
FPOs helps to build confidence among the farmers	3.57	1.53	0.884	0.673
FPOs provide updated necessary agricultural information	3.85	1.50	0.643	0.655
FPOs provide financial management support by linking with financial institutions/banks	3.75	1.47	0.617	0.719
Small and Marginal farmers get encouragement for doing farming as a professional business due to FPO	3.20	1.33	0.839	0.845
FPOs is the good concept for the development of small and marginal farmers	3.91	1.65	0.739	0.742

DISCUSSION

The findings of the Exploratory Factor Analysis (EFA) demonstrate that FPOs contribute to farmer upliftment through six interrelated dimensions, indicating that their role extends beyond economic gains to broader rural transformation. The dominance of Economic Impact (14.531% variance explained) suggests that improved income, savings, access to credit, and reduced input costs remain the primary benefits of FPO membership. The emergence of Habitat Security, Educational Security, and Health Security indicates that the benefits of FPO participation extend to improvements in living conditions, educational opportunities, and healthcare access. These findings suggest that increased economic stability enables farmers to invest in household welfare and human capital, thereby supporting long-term rural development. Similarly, Social Empowerment and Institutional Support highlight the broader developmental role of FPOs in strengthening community participation, leadership, and institutional linkages. Improved interaction with government agencies, access to agricultural information, and collective marketing enhance farmers' confidence and encourage professional farming practices. Overall, the extracted dimensions confirm that FPOs function as multidimensional institutions promoting inclusive rural transformation rather than merely economic organizations.

CONCLUSION

The present study developed and validated a multidimensional framework for assessing rural transformation through FPOs using EFA. Six dimensions—Economic Impact, Habitat Security, Educational Security, Health Security, Social Empowerment, and Institutional Support—were identified, collectively explaining 59.951% of the total variance, with Economic Impact emerging as the most influential dimension. The findings establish that FPOs contribute to rural transformation beyond economic gains, providing a validated framework that can support evidence-based policy formulation and future assessment of FPO performance.

REFERENCES

1. Singh R, Singh H, Raghubanshi AS. Challenges and opportunities for agricultural sustainability in changing climate scenarios: A perspective on Indian agriculture. *Trop Ecol.* 2019;60(2):167-85.
2. Prasad CS. Farming as an enterprise: Ten years of FPO movement in India. In: *State of India's Livelihood Report*. New Delhi: Access Development Services; 2019. p. 37-48.
3. Mazid M, Khan TA. Future of bio-fertilizers in Indian agriculture: An overview. *Int J Agric Food Res.* 2014;3(3):10-23.

4. Jain A, Ganesh A. Empowering Farmer Producer Organizations: A Pathway to Sustainable Agricultural Growth in India. In Proceedings of the International Conference on Economic Growth and Sustainable Development 2025 (pp. 1-7).
5. Marbaniang EK, Chauhan JK, Kharumnuid P. Farmer Producer Organization (FPO): The need of the hour. Agric Food e-Newsl. 2019;2581-8317.
6. Arahant A, Nayak D, Jindal L, Batra G, Dash DN, Kondasani RKR, et al. Farmer producer organization: An ecosystem for building socio-economic resilience of farmers in India. Curr Agric Res J. 2025;13(1).
7. Malik S, Kajale D. Empowering small and marginal farmers: Unveiling the potential and addressing obstacles of farmer producer organizations in India. Res World Agric Econ. 2024;5(1):32-47.
8. Ramappa KB, Yashashwini MA. Evolution of farmer producer organizations: Challenges and opportunities. Res J Agric Sci. 2018;9(4):709-15.
9. Panda CK, Singh SR. Role of extension in leveraging FPOs for small and marginal farmers. Int J Farm Sci. 2016;6(1):243-54.
10. Likhi A. Strengthening market access for small and marginal farmers through farmer producer companies in India. MANAGE Knowl Ser. 2020;1.
11. Padmanand V, Kalsi NS, Sood K, Reddy MC, Singh S. Capacity-building of FPOs in Punjab. SEDME. 2017;44(3):71-92.
12. Mukherjee A, Kumar U, Singh DK, Shubha K, Sinha PK, Singh P. Assessing performance of horticultural farmers producer companies: Comparative case study. J Horti Sci. 2022;17(2):520-9.