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COMMERCIALISING INDIAN AGRICULTURE THROUGH
FARMER-PRODUCER ORGANIZATIONS: A CRITICAL REVIEW

KOMERCJALIZACJA INDYJSKIEGO ROLNICTWA ZA
POŚREDNICTWEM ORGANIZACJI ROLNIKÓW I PRODUCENTÓW:
KRYTYCZNY PRZEGLĄD

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Abstract

Subject and Purpose of the Work: This study seeks to address three core questions: the current status of Farmer Producer Organizations (FPOs) in India based on empirical evidence, the state of academic literature on FPOs, and potential directions for future research.

Materials and Methods: A systematic review was conducted in line with PRISMA guidelines. An initial pool of 250 peer-reviewed articles was retrieved from Scopus, Web of Science, ResearchGate, and Google Scholar. After removing duplicates and applying inclusion criteria-empirical focus, Indian context, and English language-a final set of 140 articles was selected for analysis.

Results: Findings indicate that FPOs are crucial institutional mechanisms for smallholder farmers, nearly 89.4 percent of whom operate holdings below two hectares. They enhance access to inputs, markets, credit, and capacity-building opportunities, resulting in higher farm incomes, reduced transaction costs, and greater bargaining power.

Conclusion: FPOs significantly promote agricultural commercialization and rural livelihoods. However, their long-term sustainability requires sound governance, financial resilience, and supportive policy environments. Future research should prioritize longitudinal and region-specific studies, particularly in underrepresented hilly and horticultural areas, to assess enduring impacts on farmer resilience.

Key words: Farmer, Commercialization, farmer producer organization, fpo, small-holders

Streszczenie

Przedmiot i cel pracy: Niniejsze badanie ma na celu odpowiedź na trzy kluczowe pytania: obecny status organizacji producentów rolnych (FPO) w Indiach w oparciu o dowody empiryczne, stan literatury naukowej na temat FPO oraz potencjalne kierunki przyszłych badań.

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Materiały i metody: Przeprowadzono przegląd systematyczny zgodnie z wytycznymi PRISMA. Wstępną pulę 250 recenzowanych artykułów pobrano z baz Scopus, Web of Science, ResearchGate i Google Scholar. Po usunięciu duplikatów i zastosowaniu kryteriów włączenia – skupienia empirycznego, kontekstu indyjskiego i języka angielskiego – wybrano do analizy ostateczny zestaw 140 artykułów.

Wyniki: Wyniki wskazują, że FPO stanowią kluczowe mechanizmy instytucjonalne dla drobnych rolników, z których prawie 89,4% prowadzi gospodarstwa o powierzchni poniżej dwóch hektarów. Zwiększają one dostęp do środków produkcji, rynków, kredytów i możliwości budowania potencjału, co przekłada się na wyższe dochody gospodarstw rolnych, niższe koszty transakcyjne i większą siłę przetargową.

Wnioski: Organizacje FPO znacząco promują komercjalizację rolnictwa i rozwój obszarów wiejskich. Jednak ich długoterminowa stabilność wymaga sprawnego zarządzania, odporności finansowej i sprzyjającego otoczenia politycznego. Przyszłe badania powinny priorytetowo traktować badania longitudinalne i regionalne, szczególnie w niedostatecznie reprezentowanych obszarach pagórkowatych i ogrodniczych, w celu oceny trwałego wpływu na odporność rolników.

Słowa kluczowe: rolnik, komercjalizacja, organizacja producentów rolnych, FPO, drobni rolnicy

1. Introduction

Agriculture is one of the most influential human activities, involving crop and animal husbandry, food security, and economic steadiness. The agricultural sector's importance cannot be overstated. This also provides the food supply and raw materials for the secondary sector. It is a source of income and provides employment to millions of people. However, its contribution to the overall GDP is 2.7 percent only when 2.6 billion people worldwide typically rely on agricultural activities for their livelihood and over half of the global working population is engaged in this sector (Wagh, Dongre, 2016). This gap between workforce engagement and GDP contribution happened due to various factors such as poverty among farmers, low living standards, poor macroeconomic conditions, shifting farmers into non-agricultural activities, low productivity, and fragmented and marginal land holdings. These problems persist in India as well, where a larger proportion of the total population depend on farming and experiences such challenges along with limited access to technologies and low productivity (Dey et al., 2022). Further, Aubron, Lehoux, Lucas, (2015) conclude that principal factors contributing to this problem are poor access to reliable market information, marginal land holdings, fragmentation, and difficulties in predicting commodity prices. Climatic variations, landholding size, and fragmented landholdings exacerbate this situation, making it difficult for small-scale farmers to earn a sustainable income (Birthal, Joshi, Chauhan, Singh, 2008). "Landholding size trends in India clearly show negative growth, as landholding size decreased from 2.28 hectares in 1970-71 to 1.84 hectares in 1980-81, 1.41 hectares in 1995-96, and 1.08 hectares in 2015-16" (Gulati, Ganguly, Wardhan, 2021). Edrisi, Abhilash (2016) reported that, in the future, these trends are expected to follow past trends of negative growth due to an increasing population. Moreover, this problem is not limited to India; many countries of the world are facing the same challenge. And adversely affecting food security and the sustainability of agricultural practices worldwide. It is necessary to implement policies like crop diversification and the use of a yielding variety of inputs, and mitigate the role of middlemen. Strategies for mitigating this problem involved land consolidation programs and cooperative/collective farming practices that promote optimum land use. The government policies of several countries focus on cooperative farming or collective farming practices to mitigate this problem (Leder, Sugden, Raut, Ray, Saikia, 2019). Co-operative movements in the past focused on such challenges, but they could not succeed. So, the policymakers of various countries are focusing on the concept of another form of collective action in farming, i.e., farmer producer organizations (FPOs). An FPO is a Producer Organization (PO) where the members of the organization are a farmer (Vahoniya, Vahoniya, Halpati, 2022). A Producer Organization (PO) is an authorized venture of the primary producers of goods like fishermen, crop growers, artisans, milk producers, craftsmen, weavers, etc." (Producer Company ACT, 2013). Farmer Producer Organization (FPO), is the phenomenon of collectivization of small farmers to increase their negotiation control to access financial and other inputs, services, and technologies; tap high-value markets; decrease transportation costs; and cooperate with public and private bodies on more reasonable

terms (Sinyolo, Mudhara, 2018; Vahoniya et al., 2022). The aim behind their formation is to counter one of the agricultural sector's biggest problems, i.e., small farm holdings. Today small landholders are experiencing low margins and less bargaining power in the product market. This poor bargaining power of the farmers tempts mediators to exploit the farmers (Prabhakar, Manjunatha, Nithyashree, Hajong, 2012). Due to this exploitation farmers' net margins in the final price of products are very low, especially in perishable goods in addition to this poor storage, and poor infrastructure facilities were complimenting to this problem (Shingi, Gaikwad, Sulaiman, Vasanthakumar, Jeyarajan, 2004). In India, the supply chain of agricultural produce is very large and lengthy, which is responsible for the high cost of agricultural produce (Gulati et al., 2022). To provide remunerative prices to farmers, it is necessary to reduce the lengthy supply chain. Farmer Producer Organization: by collective action, farmers decrease this long value chain and increase their margins (Shiferaw, Obare, Muricho, 2008).

Since 2013, after the amendment of FPOs in the Indian Company Act, 10,000 FPOs were opened across the country by the government through SFAC (Small Farmers' Agribusiness Consortium). These were set up with a directive to enact regulation to 'promote the essence of cooperation through functional flexibility.' According to this act, FPOs are the producer companies in which members of organizations are farmers. FPOs aim to provide small and marginal farmers with institutional support and extensive services for their financial upliftment and bargaining powers in the markets (Vahoniya et al., 2022). Government institutions like NABARD, SFAC, and state government departments are supporting better market linkages, access to inputs, technology, and procurement assistance, all considered to enhance farmers' production, productivity, and profitability. FPOs had the biggest strength in providing good margins to farmers because these organizations set up better backward and forward linkages to farmers through collective action. These direct linkages provide a larger proportion to the farmer in the final price of their produce. So, the profitability of farmers increases and also brings transparency and impartiality within the agricultural marketplace (Srinivas, S. G, 2022).

As previously mentioned, farmer producer collectives are providing numerous facilities to farmers. That's the reason farmer producer collectives are gaining popularity among policymakers and governments. The rationale behind this article is to seek a deeper understanding of the current research scope in this area. Basically, this article seeks to answer the three questions. First, what is the current status of FPO in India by analysing the results of empirical studies in India? Second, what is the current status of literature on FPOs in India? And finally, what could be the future path for new research?

2. Materials and Methods

The present paper employed a systematic approach to identify and evaluate relevant literature on agricultural commercialization and collective action. An initial pool of 250 articles was retrieved from Scopus, Web of Science (WoS), ResearchGate, and Google scholar focusing exclusively on peer-reviewed publications. The selection process involved several inclusion and exclusion criteria: (i) studies had to be empirical in nature; (ii) only articles pertaining to the Indian context were considered; (iii) duplicate entries were removed; and (iv) only publications in English were included. After applying these criteria, a refined set of 140 articles was finalized for analysis, thereby ensuring the reliability of the dataset and reducing the risk of database-related omissions.

3. Result and Discussion

In this review, types of FPOs include agricultural cooperatives, farmer associations and groups, rural self-help groups and women's groups, dairy cooperatives, and producer groups. All the studies were published between 2011 and 2024. "Indian Journal of Extension Education," "Economic Affairs New Delhi," "Economic and Political Weekly," "Indian Journal of Economics and Development", and "Indian Journal of Agricultural Sciences" are the top contributors. We had 140 papers that have been reviewed by the authors for the screening process. Every article discusses FPOs or FPCs that the Indian government has

started. To analyze the impact of FPOs on income, empowerment, agricultural output, and food security in light of commercialization, we precisely analysed the results of 140 studies.

3.1 State-wise position of FPO studies

Farmer Producer Organizations (FPOs) in India have significantly impacted small and marginal farmers by pooling resources, establishing direct connections with buyers, and reducing reliance on intermediaries. However, the performance and impact of FPOs vary across different states. SFAC-endorsed FPOs saw a compound growth proportion of 15.22% per year, while NABARD-endorsed FPOs saw a 1.34% growth proportion per year. On average, there are 582 farmers per FPO at the country level, with around 50% of the total FPO members from five states: Karnataka, Madhya Pradesh, Tamil Nadu, Maharashtra, and West Bengal. The inconsistency and composite yearly growth rate are highest in the north-eastern and eastern regions. The present study includes a literature review from almost the entire union of India. The following diagram shows that studies from various states were included in this review.

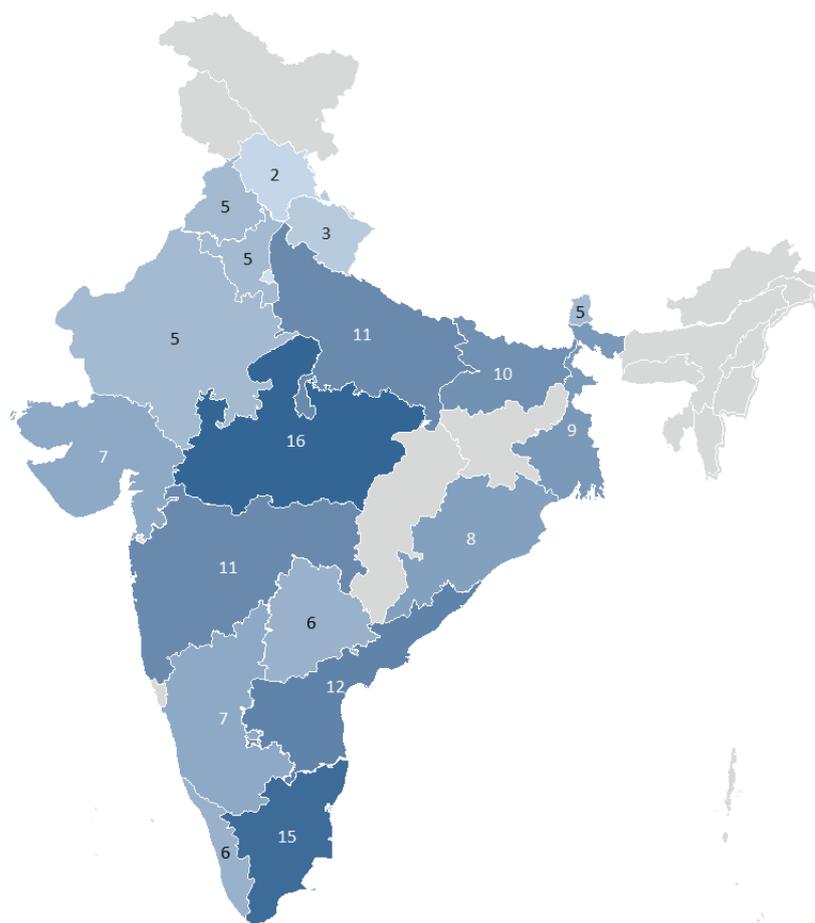


Figure 1. Studies included by states. The map shows the number of studies analyzing FOs included in the review by states ($n = 140$) in each of the 18 states considered

Source: Authors' calculation based on review.

3.2 Key Services Provided by Farmer-Producer Organizations (FPOs)

Literature finds that Farmer-producer organizations (FPOs) provide vast services to farmers to commercialize their farming. This study finds the following services included in the existing literature:

- 3.2.1 Marketing and market linkage:** Linking farmers to market is one of the most significant aspects of the FPOs business model of farm households. Existing literature shows that the FPOs model enhances farming returns by streamlining marketing channels, resulting in better prices and reduced transaction costs (Kumari, Bisht, 2023). By selling in bulk, FPOs reduce intermediaries, lower transaction costs, and enhance the profits and bargaining power of member farmers. FPO members experience improved market access and economic security (Kumar et al., 2019a) however, delayed payments remain (Lalengkima, Lalmingsangi, Mahasamudram, 2023). Also, dairy farming experiences positive results through collective farming by achieving economies of scale. This proficiency can be further exacerbated through the enclosure of 'second-class shareholders'¹, which can boost the overall productivity and sustainability of dairy farms (Dave, Sajja, 2024; Kakati, Roy, 2022). Basavaraj (2022) and Bhanot, Kathuria, Das, (2021) indicated that FPOs improve marketing efficiency for maize and can alleviate distress selling by the farmers. Further in Telangan effective marketing channels, like the FPO-consumer method, have proven beneficial for selling organic chilli (Kumar et al., 2019b), and FPO members tend to incur lower transactional costs compared to non-members (Sakthi, Nain, Singh, Kumar, Chahal, 2015).
- 3.2.2 Collective procurement of inputs:** Das, Singh (2024a) indicate that Farmer Producer Organizations (FPOs) facilitate and support farmers by collective procurement of agricultural inputs like seeds, fertilizers, and pesticides, as well as providing access to machinery and advisory services. Singh (2023a) points out that, unlike traditional cooperatives, Producer companies improve access to inputs and enhance output linkages of farmers, as demonstrated by the Sufal Bangla supermarket franchise. FPOs help reduce production costs for small farmers by leveraging bulk purchasing and providing additional support through training and scientific farming methods (Sharma, Singh, Chiphang, Prasad, 2023). In line with this, Chintala, Mani (2022) and Hussain, Baruah, Das, (2021) found that FPOs have been shown to lower input purchase costs. Further, Sakthi et al. (2015) have also shown that FPO members typically incur lower transactional input costs per hectare than non-members. Encouraging farmers to form FPOs can enhance input quality and productivity, ultimately benefiting their profitability (Kumar et al., 2021).
- 3.2.3 Processing and Value Addition:** Processing agricultural products is crucial for enhancing efficiency, increasing shelf life, adding value, and reducing waste. FPOs play a key role in product development, e-commerce integration, strategic pricing, and branding, as noted by Kavin et al. (2023). Gurung, Choubey, Rai, (2023) highlight that these organizations empower farmers by providing better access to quality inputs, value-added services, production technology, and marketing avenues, ultimately boosting their earnings. However, both FPO members and non-members face challenges such as limited processing facilities, low knowledge of packaging and grading, high labor costs, and price fluctuations (Shree, Shree, 2022). Despite these challenges, value addition through FPOs can enhance market access and increase farmers' incomes (Saini et al., 2022; Panda, Lund, Pattanayak, 2023; Verma, Singh, Asha, Dubey, Verma, 2021).
- 3.2.4 Training and capacity building:** To enhance agricultural productivity and raise income levels, farmers must participate in training and initiatives aimed at building capacity. In this regard, the training that Farmer Producer Organizations (FPOs) members receive helps them execute enhanced production and farm management practices than their non-member counterparts, which improves the overall outcome. Additionally, as stated by Mathuabirami, Kalaivani (2021) and Kumar, Hegde (2023), FPO member farmers can improve soil quality by implementing appropriate soil management techniques. The sustainable use of nutrients can be encouraged by improving the use of soil data and training initiatives offered by Farmer-Producer Organizations. This will ultimately increase agronomical long-term viability and farm profitability. But it's crucial to

¹ Individuals or entities providing finance or resources without full ownership rights.

remember that these organizations. However, it is important to note that these organizations often encounter challenges in accessing guidance for soil quality testing due to their remote locations.

3.2.5 More access to government programs and schemes: The objective of several government initiatives is to “commercialize farming.” And farmer-producer associations are helping the government in this by playing an intermediary role between the government and the farmers. Many studies in recent examined access to government schemes and have concluded with positive results. According to Mathuabirami, Kalaivani (2021), Tamuly et al. (2023), and Venkatasubramanian et al. (2023), FPOs provide significantly greater access to government schemes for their members compared to non-members. They offer financial support and Kisan Mandis to link FPOs with market opportunities. Furthermore, it was recommended by Malik, Kajale (2024) and Bharti, Kumari (2024) that an inclusive database of FPOs be created, performance metrics be established, and programs to promote social capital within these organizations be started.

Table 1. Key Services Provided by Farmer-Producer Organizations (FPOs)

Service Area	Studies
Marketing and Market Linkage	Kumari, Bisht (2023); H et al. (2019); Lalengkima et al. (2023); Dave, Sajja (2024); Kakati, Roy (2022); Basavaraj (2022); Bhanot et al. (2021); Kumar et al. (2015)
Collective Procurement of Inputs	Das, Singh (2024a); Singh, Tiwari, Sharma, Rana, (2023); Sharma et al. (2023); Chintala, Mani (2022); Hussain, et al. (2021); Sakthi at al. (2015); Kumar el al. (2021)
Access to Credit and Financial Services	Mathuabirami, Kalaivani (2021); Vijayakumar (2020); Saini et al. (2022)
Processing and Value Addition	Kavin et al. (2023); Gurung, et al., (2023); Sangappa, Laxmi, Charishma, Srinivasa Babu, (2023); Da, Singh (2022); Saini et al. (2022); Panda et al. (2023); Verma et al. (2021)
Training and Capacity Building	Anithakumari, Jayasekhar (2019); Mohanasundari, Khangar, Das, (2023); Kumar, Hegde (2023); Mathuabirami, Kalaivani (2021)
Government Schemes Access	Venkatasubramanian et al. (2023); Tamuly et al. (2023); Mathuabirami, Kalaivani (2021); Malik, Kajale (2024); Kumari, Bisht, (2024)

Source: Authors' calculation based on review.

3.3 Impact of Farmer-Producer Organisations (FPOs) on Livelihoods and Sustainable Agriculture

To assess the impact on farmer livelihoods is the core objective of most of the studies reviewed. Based on this, it is reported that the members of the Farmer Producer Organisation (FPO) show a significant and positive impact on their livelihoods, by providing various forms of support, mentioned in the previous section (Anand, Ghosh, Mukherjee, 2023a; Ganeshkumar, Sivakumar, Venugopal, 2023; Mukherjee et al., 2018). The structural benefits derived from collective action mechanisms help participants in higher agricultural income, as well as diversified revenue streams from allied activities. By the collective procurement and production, FPOs provide “Economies of Scale” that reduce per-unit input costs and enhance operational efficiency. These “Economies of Scale” include improved cropping patterns, adoption of resource-smart practices, and measurable increases in yields and marketable surplus (Chintala, Mani, 2022; Hussain et al., 2021). The impact of FPO engagement tends to be heterogeneous across farm size categories; marginal and smallholders often realize disproportionate benefits, largely due to the reduced transaction costs and enhanced market access facilitated by collective platforms (Manaswi et al., 2020; Nikam, Singh, Ashok, Kumar, 2019). The emergence of cooperative behavior and income stability not only among FPO members but also, to some extent, among non-members in adjacent rural networks (Das, Singh, 2024; Lalitha, Viswanathan, Vinayan, 2024; Verma et al., 2021).

Jayasekhar, Thamban, Chandran, Thomas, Thomas (2024) highlight that the Farmer Producer Organisations have massive potential to strengthen smallholders, and their success depends on professional

leadership, financial support, and market-oriented strategies. Strengthening capacity, branding, and self-sufficiency is essential for their long-term viability. But, FPO faces challenges in capacity building and awareness.

Apart from this, FPOs serve as institutional intermediaries that connect primary producers with higher-order market actors, including processors, wholesalers, and exporters. This integration strengthens farmer linkages with post-harvest value chains, enabling improved market penetration and value realization (Chowdary et al., 2023; Fischer, Qaim, 2012; Singh et al. 2023; Trebbin, 2014). In both input and output markets, FPOs contribute to enhanced bargaining power, which has demonstrably led to higher price realization and improved profit margins for smallholder farmers (Cherukuri, Reddy, 2014; Kumar et al., 2022).

Recent studies have also emphasized the mediating role of psychosocial factors-particularly self-efficacy-in shaping the relationship between social capital and organizational performance. Studies by Lalitha et al. (2024), Pant, Kumar, Joshi, (2024), and Sahoo, Sahoo, Das, (2024) demonstrate that higher levels of self-efficacy among members positively influence FPO functioning and contribute to sustained livelihood improvements. FPOs have begun to play a critical role in promoting ecologically sustainable agricultural practices. According to Suresh, Ss (2024), FPOs are actively addressing issues of soil degradation and groundwater depletion, which have been exacerbated by the overuse of chemical fertilizers and pesticides. By promoting integrated nutrient and water management practices, FPOs contribute not only to ecological conservation but also to the long-term viability of agricultural production systems.

Table 2. Impact of Farmer Producer Organisations (FPOs) on Livelihoods and Sustainable Agriculture

Thematic Area	Key Findings
Livelihood Improvement & Income Gains	FPOs improve livelihoods via access to training and resources; better income observed (Anand et al., 2023; Ganeshkumar et al., 2023).
Economies of Scale & Cost Reduction	Collective action leads to smarter practices, better productivity, and reduced input costs (Chintala, Mani, 2022; Hussain, et al 2021).
Effect by Farm Size (Smallholder Benefits)	Smallholders benefit more due to reduced transaction costs; larger impact on net income equilibrium (Manaswi et al., 2020; Nikam et al. 2019).
Market Linkages & Network Building	FPOs build networks from small farmers to secondary markets, improving access and cooperation (Chowdary et al., 2023; Trebbin, 2014).
Bargaining Power Enhancement	Improved bargaining power in input and output markets increases profit margins (Cherukuri, Reddy, 2014; Kumar et al., 2022).
Challenges	Challenges in professional leadership, financial support, and market-oriented strategies (Jayasekhar et al., 2024).
Role of Social Capital & Self-Efficacy	Social capital and self-efficacy positively affect FPO performance and farm income (Pant et al. 2024; Sahoo et al. 2024).
Environmental Sustainability & Resource Use	FPOs address degradation and water scarcity from chemical use; promote sustainable practices (Suresh, SS, 2024).

Source: Authors' calculation based on review.

4. Methodological Overview of Reviewed Studies

This review encompasses a total of 140 empirical studies published subsequent to the enactment of the Indian Companies Act of 2003. The primary focus of these studies is to evaluate various dimensions of Farmer Producer Organizations (FPOs) and Farmer Producer Companies (FPCs), specifically their impacts, performance metrics, governance structures, and contributions to agricultural commercialization. Among the 140 studies analyzed, 30 employed quantitative methodologies, 66 utilized mixed-method approaches, and 44 relied on qualitative techniques to assess the aforementioned aspects.

The literature delineates six predominant themes within the quantitative studies. The first theme pertains to the assessment of the impact on farmer income, market participation, livelihoods, and the determinants influencing participation in FPOs. For this evaluation, researchers utilized a range of econometric tools, including logit and probit models, propensity score matching (PSM), difference-in-difference

(DiD) estimations, regression analyses, paired t-tests, and descriptive statistics (Gurung, et al., 2024; Mukherjee et al., 2020; Pani et al., 2023; Rout et al., 2023).

The second theme involves the application of Data Envelopment Analysis (DEA) and financial ratio analyses, which provide insights into the technical and economic efficiencies of FPOs, optimal resource utilization, and operational sustainability (Kappil, Kumar Sahoo Samuel, 2022; Singh, 2023b; Vavilala, Singh, Singh, Singh, 2024). Third, the assessment of employee engagement has been conducted using regression analysis by Gurung, Choubey (2023c), while Anithakumari, Jayasekhar (2019) employed the Leadership Practice Inventory (LPI) to evaluate the socio-personal variables of farmer leaders in Coconut Producers Societies (CPS).

The fourth theme entails an examination of complex relationships between FPO engagement, productivity, social change, broader socioeconomic considerations, and empowerment outcomes, utilizing logistic regression, Cobb-Douglas production functions, and Structural Equation Modelling (SEM) (Gurung, et al., 2023; Pani et al., 2023). In the fifth theme, Nikam, Ashok, Pal, (2022) and Saini et al. (2022) applied the probit model along with the Theil Index to investigate issues surrounding information access and income inequality, particularly among socially disadvantaged demographics.

Lastly, researchers have examined institutional constraints and membership dynamics through the application of Tobit models, multiple regression analyses, bivariate correlation, and logistic regression, thereby identifying key predictors such as caste, education, and infrastructural accessibility that significantly influence farmer participation. Collectively, these quantitative methodologies offer a robust empirical framework for assessing the operational, economic, and social performance of FPOs within the Indian agricultural landscape.

Table 3. Objective-wise Methodology Distribution (Quantitative)

Objective	Quantitative Methods Used	Key References
Impact on farmer income, market participation, livelihoods	Logit/Probit Models, Propensity Score Matching (PSM), DiD, Regression, Paired t-tests, Descriptive Statistics	Gurung, et al., (2024), Mukherjee et al. (2020), Muthulakshmi, Ponnarasi, Gangadharan, (2024), Pani et al. (2023), Rout et al. (2023)
Organizational performance and technical efficiency	Data Envelopment Analysis (DEA), Financial Ratio Analysis	Kappil et al. (2022), Singh et al. 2023b), Vavilala et al. (2024) Muniyoor, Pandey, (2024).
Leadership and employee engagement	Regression Analysis, Leadership Inventory	Anithakumari, Jayasekhar (2019), Gurung, Choubey (2023c).
Socioeconomic and empowerment outcomes	Logistic Regression, Structural Equation Modeling (SEM), Cobb-Douglas Production Function	Gurung, et al. (2023), Pani et al. (2023)
Access to information and inequality	Probit Model, Theil Index	Nikam et al. (2022), Saini et al. (2022)
Institutional and membership dynamics	Tobit Model, Multiple Regression, Bivariate Correlation, Logistic Regression	Manaswi et al. (2019), Sharma et al. (2023), Kumar, Kumar, Meena, & Kumar, (2023), Gurung, Choubey (2023b), Qi, Ma, Hu, (2016)

Source: Authors' calculation based on review.

Qualitative techniques play a crucial role in uncovering dimensions of organizations that are not easily quantifiable, such as organizational challenges and strategic positioning, member satisfaction, operational gaps, and insights into perceptions and behaviors. For assessing these organizational challenges and strategic positioning, tools such as SWOT Analysis, Garet Ranking, Analytic Hierarchy Process (AHP), and Descriptive Statistics were used in the literature. These tools effectively facilitate the evaluation of internal management structures, strategic planning, the prioritization of operational challenges in Farmer Producer Organizations (FPOs), and the systematic identification of institutional bottlenecks, market access constraints, and resource allocation issues, ultimately providing a comprehensive understanding of the factors that influence FPO performance.

While Likert scale-based assessments generate quantifiable data, they are fundamentally rooted in qualitative research and have been used to evaluate member satisfaction, service delivery, and perceived organizational effectiveness (Kumar, Pandey, Kumar, Sivaramane, 2020). Furthermore, various studies have employed descriptive analyses, key informant interviews, and focus group discussions to gain in-depth insights into governance practices, collective decision-making, and the socio-cultural dimensions of FPO engagement. These qualitative techniques enhance statistical methods by contextualizing numerical findings within the real experiences of FPO stakeholders, thereby enriching the depth and interpretative quality of impact evaluations.

Table 4. Objective-wise Methodology Distribution (Qualitative)

Objective	Qualitative Methods Used	Key References
Organizational challenges and strategic positioning	SWOT Analysis, Garet Ranking, Analytic Hierarchy Process (AHP), Descriptive Statistics	Anand et al., (2023), Bhuyan, Das, Khound, (2024), Harrington et al. (2023), Lalengkima et al. (2023), Roye, Basu (2023), Singh, (2023), Venkatasubramanian et al. (2023) Mor, Bhardwaj, Singh, (2019).
Member satisfaction and operational gaps	Likert Scale-based Evaluation	Kumar et al. (2020)
Perception and behavioural understanding	Structured Interviews, Focus Group Discussions	Inferred from qualitative assessments where used; typically accompany SWOT/AHP assessments.

Source: Authors' calculation based on review.

5. Directions for future research

Forthcoming research should emphasize longitudinal studies that track the long-term impact of Farmer Producer Organisations (FPOs) on farming sustainability and farmer livelihoods. In addition, comparative studies should be conducted across regions and states; this could provide larger insights into the literature on FPOs.

Malik, Mishra, Paul, Noronha, (2022) recommended that the optimal size of the cooperatives and the ancestor of success can be future areas of research. In the current Indian literature on this area, it appears that research tends to favour certain states such as Karnataka, Madhya Pradesh, Tamil Nadu, Punjab, Maharashtra, and West Bengal, along with specific agricultural products. In contrast, other states, especially hilly regions where the majority of products are horticultural, have significantly fewer studies conducted.

Further, comparative studies across different regions and crops could offer valuable insights into the factors influencing agricultural efficiency and sustainability. Assessing the impact of Farmer Producer Organization (FPO) interventions on small farm-holders is also crucial. A future area for investigation is the price differences between FPO members and non-members in mountainous regions. Many FPOs in India are either inactive or defunct. Therefore, research should aim to identify the reasons behind this issue and propose strategies to address these challenges.

6. Conclusion

In summary, the existing literature underscores the significant contribution of Farmer Producer Organisations (FPOs) in promoting agricultural commercialization and enhancing rural livelihoods. FPOs facilitate collective access to inputs, markets, credit, training, and value addition, thereby improving income levels, reducing transaction costs, and strengthening the bargaining power of smallholder farmers. Evidence also highlights their role in fostering social capital, encouraging environmentally sustainable practices, and enabling adaptive changes in cropping patterns and production strategies. While the benefits are particularly pronounced for marginal and small farmers, challenges such as limited access to certification, traceability mechanisms, and resource management persist. Nonetheless, FPOs represent

a transformative institutional model with substantial potential to advance inclusive and sustainable agricultural development in India.

Aiming to deliver lucrative amounts to farmers, there is a need to cut middle players' roles, and producer organizations have the potential to cut the large chain in the traditional marketing system by linking the small farmers directly to product markets. Also, FPOs, through collective action, can uplift small farmers' income by increasing their margins. After participating in FPO, farmers earn more income from farming and its allied sector activities. Through economies of scale in agricultural practices in terms of smarter farming practices, savings in the buying of the inputs, diverse cropping patterns, an increase in production and productivity of the crops, and other activities, FPOs can enhance farming outcomes. However, the farming sector is confronted with myriad difficulties: restricted access to investments, inputs, skills, and markets. The study recommends collective action in agriculture as an option for these challenges. The literature strongly indicates that small individual farmers cannot bargain because of their limited market reach and output size. But when they join hands, farmers can improve their bargaining position, thereby abrogating the above-mentioned problems.

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