***Review Article***

**FPOs: Institutional Measures for Revamping Indian Agriculture**

**Abstract**

Enhancing farmers' income and understanding the necessity for institutional measures to revamp the agricultural sector are the top priorities of the Indian government,. The 2021 recommendations of Y. K. Alagh Committee led to revisions in the Companies Act of 1956, which allowed for the official establishment of Farmer Producer Organizations (FPOs) . FPOs have emerged as a vital tool to promote agricultural commercialization, foster economic growth, improve farmers' socio-economic status, and enable small and marginal farmers to access organized value chains, strengthen their bargaining power, and mitigate market risks. Despite agriculture's importance, declining landholdings and production uncertainties pose challenges, which FPOs help address by facilitating collective resource procurement and improving market access. Since 2020, FPOs have grown significantly, particularly in states like Maharashtra and Bihar, with women-led organizations demonstrating notable success. Evidence indicates that FPO membership enhances farmers' income and financial efficiency. However, challenges like limited technology access and governance issues persist during FPO development. Consequently, FPOs may play an important role for achieving Sustainable Development Goals related to poverty reduction and gender equality, necessitating enhanced institutional support and a conducive policy framework for sustained impact in Indian agriculture.

**Keywords: Farmers' income, FPOs, Institutional support, Socio-Economic Status, SDGs,**

**Introduction**

The most effective way to alleviate poverty in developing countries is to support agriculture, as a significant portion of the world's poor are farmers who rely on agriculture for their livelihoods. Agricultural transformation has historically been a key driver of economic growth, job creation, income enhancement, and food security. Nearly all industrialized nations, including Brazil, China, and Vietnam, have doubled the value of their agricultural sectors within two decades of initiating transformation efforts. Many countries in Africa, Asia, and Latin America are also progressing along this path. In India, where agriculture has traditionally played a central role in economic development, its importance remains critical for ensuring rural prosperity and national food security.

At the time of India's independence, agriculture was the primary contributor to the national economy, accounting for nearly 50 per cent of GDP, with approximately 72 per cent of the workforce engaged in the sector. These figures reflected an agrarian-based economy trapped in a cycle of poverty. Over the years, structural changes have led to a decline in agriculture's contribution to the economy, with its share in Gross Value Added (GVA) dropping to 19.0 per cent in 2021-22 and further declining to 18.3 per cent in 2022-23 (MoSPI, 2023). Despite this, agriculture remains the primary source of employment, with around 46.1 per cent of India's population dependent on agriculture and allied sectors for their livelihoods (Economic Survey, 2025). The role of agriculture in economic growth and sectoral linkages remains significant, making it a focal point of government policies aimed at enhancing farmers' welfare and achieving national development goals.

However, agricultural transformation in India has faced multiple challenges, including stagnation in productivity, market access barriers, and climate change vulnerabilities. While the government has prioritized agricultural investment, many transformation goals remain unachieved. In addition to traditional economic development and poverty reduction objectives, current agricultural policies align with Sustainable Development Goals (SDGs), incorporating climate-smart strategies, gender equity, and biodiversity conservation.

Structural changes in the sector have shifted economic dominance from agriculture to industry and services. As of 2023-24, agriculture's share in India's Gross Value Added (GVA) stood at approximately 18.2 per cent, while the industrial and service sectors contributed 30 per cent and 51.8 per cent, respectively. This transformation reflects a structural shift in the economy, driven by rapid industrialization, urbanization, and expansion of the services sector, which now serves as the largest contributor to GDP. Agriculture remains the backbone of rural employment despite this shift, engaging around 46.1 per cent of the population. Small and marginal landholders, who constitute 86.1 per cent of total operational holdings, play a crucial role in national economic development and poverty alleviation (Saini and Chowdhury, 2023).

As per the reports of the Agriculture Census (2015-16), the total number of operational holdings increased from 138.35 million in 2010-11 to 146.45 million in 2015-16, showing an increase of 5.86 per cent, with the average operational landholding size declining to 1.08 ha. Population growth, modernization, globalization, and changing consumer preferences for hygienic and high-value agricultural products reshape farming output and trade patterns (Bisht *et al*., 2020; Nandi and Nedumaran, 2021). Farmers are expected to meet the demands of the markets. The business expansion helps farmers enhance food production and make better profits(Giller *et al*..2021). Adversely, small and marginal farmers struggle to sustain their livelihoods amid rising production costs and shifting consumer trends (LaRue *et al*., 2021). India has developed several institutional mechanisms to address these challenges, including promoting Farmer Producer Organizations (FPOs). The concept of FPOs emerged following the Y. K. Alagh Committee's recommendations in 2001, leading to amendments in the Companies Act of 1956 and the establishment of Farmer Producer Companies (FPCs) in 2003 (source?).

Small farmers with limited negotiating leverage depend more on formal contracts for cultivation and monopolistic exploitation (Bachke, 2009). FPOs aim to integrate small and marginal farmers into structured market systems, improve access to quality inputs and services, and enhance economies of scale. The collective model (FPOs) provides efficacy and professional management, such as a corporate structure combined with cooperative ideals that demand producer ownership, engagement, and governance (Harikrishna *et al*., 2022). By facilitating collective action, FPOs provide farmers with better bargaining power, financial support, and technology adoption opportunities, thus fostering commercial orientation and sustainable agricultural development. Despite their potential, FPOs face multiple challenges, including financial constraints, governance issues, and market linkages. The success of these organizations depends on institutional support, policy interventions, and access to business ecosystems that enable sustainability. The farmer's group, which got the necessary support from the business ecosystem, sustained their activities, and the rest of the group either became ideal or completely shut down due to the different socio-economic and political vulnerabilities in their business ecosystem (Suresh & Sreejith, 2024).

Several studies highlight the critical role of FPOs in improving farmers' income, promoting financial and social stability, and achieving SDGs. However, a comprehensive understanding of their impact on agricultural transformation, particularly in the context of climate-smart strategies, women's empowerment, and biodiversity conservation, is still needed. The present study aims to examine the initiatives undertaken by FPOs in India, assess their progress, and analyze their role in enhancing farmers' socio-economic conditions.

**Historical background and growth of FPOs**

The evolution of Farmer Producer Organizations (FPOs) in India has been a progressive journey aimed at addressing the challenges small and marginal farmers face. The concept of farmers' collectivization has its roots in the cooperative movement, which began in the early 20th century (Source?). However, traditional cooperatives faced challenges, including excessive government control, political interference, and lack of financial sustainability​. To overcome these limitations, the Government of India took significant steps to establish a new model of farmer collectives that combined cooperative principles with corporate efficiencies.

Farmer Producer Organisations (FPOs) are regarded as a transformative initiative in the agricultural and agri-food sectors throughout the country. In 2000, a committee led by Y.K. Alagh put forward the concept of a producer business model. This led to the Companies Act, 1956 amendment, in 2002, introducing Part IXA for "Producer Companies". Producer organizations (POs) are legally recognized companies formed by primary producers. The membership of Farmer Producer Organisations (FPOs) consists solely of farmers. The amendment specifies that particular groups can operate producer businesses, requiring all members to be "primary producers." This new structure provided a corporate-like framework for primary producers while retaining cooperative benefits, allowing small and marginal farmers to form legal business entities based on mutual assistance and shared profits​. The official recognition of FPOs came in 2003 with the establishment Farmer Producer Companies (FPCs) as a distinct legal entity under the Companies Act. This step aimed to enable small farmers to achieve economies of scale, enhance market access, and integrate with modern agricultural value chains. Despite this development, the growth of FPOs remained slow in the initial years. Recognizing the potential of FPOs, the Government of India introduced a national policy directive in 2013 to promote their formation. This policy laid down the terms and conditions for FPOs at national and state levels.

**Support from Agencies and Institutions**

A diverse range of agencies and institutions play a crucial role in supporting the financial, managerial, and marketing needs of Farmer Producer Organizations (FPOs). Key organizations involved in FPO promotion and support include NAFED, FCI, ATMA, SFAC, WDD, NABARD, NCDC, and NFSM Nutri-Cereals. Small Farmers Agribusiness Consortium (SFAC) was established as a nodal agency for promoting and supporting FPOs through financial assistance, credit linkages, and capacity-building programs. Additionally, NABARD launched the Producers' Organisation Development and Upliftment Corpus (PODF) Fund to provide financial assistance for promoting FPOs. National Cooperative Development Corporation assisted in the formation of cooperative-based FPOs with a focus on improving governance and business viability.

Various state agriculture, horticulture, and animal husbandry departments, along with Krishi Vigyan Kendras (KVKs) and Indian Council of Agricultural Research (ICAR) institutions, supported FPO mobilization at the grassroots level​. Additionally, several alternative funding sources contribute to the growth and sustainability of FPOs, including Corporate Social Responsibility (CSR) initiatives, Self-Help Groups (SHGs), philanthropic investments, private capital, Microfinance Institutions (MFIs), Community-Based Business Organizations (CBBOs), and Non-Governmental Organizations (NGOs). Table 1 provides an overview of the business activities and commodities handled by FPOs under different implementing agencies.

**Table 1. Business Activities of FPOs Supported by Implementing Agencies**

|  |  |
| --- | --- |
| **Implementing Agencies** | **Commodities** |
| SFAC | Millets, Pulse magic, Chickpea magic and seeds |
| WDD | Millets, Oil, Jaggery and Rawa |
| NABARD | Fertilizers |
| NCDC | Millets and Vegetables |
| NFSM Nutri-Cereals | Millet noodles, Papad, Rawa and Millet Dosa mix Flour |

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Over four consecutive financial years, from 2019–20 to 2022–23, there has been a significant increase in the number of FPOs receiving financial assistance and the total funding allocated. Table 2 highlights the financial assistance provided by four major financial institutions: Samunnati, NABKISAN, FWWB, and Caspian Debt. The data reveal a substantial growth in the number of supported FPOs and the funds allocated over time. 2019-20, 292 FPOs received Rs. 1,894 million in financial support. The number of FPOs funded increased to 2683 in 2022–23, with financial assistance reaching Rs. 6,860 million.

**Table 2. Progression in Access to Finance to FPOs**

**(Rs in MM)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **2019–20** | **2020-21** | **2021-22** | **2022-23** |
| **No. of FPOs** | **Amount (Rs?)** | **No. of FPOs** | **Amount** | **No. of FPOs** | **Amount** | **No. of FPOs** | **Amount** |
| **Samunnati** | 98 | 1044 | 165 | 2,427 | 379 | 2162 | 1941 | 5,130 |
| **NABKISAN** | 162 | 560 | 262 | 784 | 410 | 965 | 700 | 1,400 |
| **FWWB** | 29 | 220 | 16 | 188 | 20 | 105 | 40 | 280 |
| **Caspian Debt** | 3 | 70 | 1 | 30 | 1 | 50 | 2 | 50 |
| **Total** | **292** | **1,894** | **444** | **3,429** | **810** | **3,282** | **2,683** | **6,860** |

The number of FPOs funded increased dramatically in the following years, reaching 444 in 2020–21, 810 in 2021–22 and 2,683 in 2022–2023. In line with this, the funding provided to these FPOs also increased significantly, reaching a peak of Rs. 3,429 million in 2020–21, Rs. 3,282 million in 2021–22 and Rs. 6,860 MM in 2022–23. The steady increase in financial support underscores the growing confidence in the FPO model and its potential to enhance market access, input procurement, and income generation for smallholder farmers. Strengthening financial linkages and expanding institutional support will be key to ensuring the long-term sustainability of FPOs and their contribution to inclusive agricultural development in India.

**Growth of FPOs in India**

The expansion of FPOs gained significant momentum after 2020, following the government's ambitious plan to establish 10,000 new FPOs under the Central Sector Scheme (CSS). As of March 2023, India had 24,183 registered FPOs, showing rapid growth in recent years​. Maharashtra, Karnataka, Madhya Pradesh, Telangana, and Uttar Pradesh lead in FPO formation, with active state-level policies facilitating their development​. Additionally, SFAC and NABARD have mobilized over 22 lakh farmers into FPOs, with an average membership of 992 farmers per SFAC FPO and 371 farmers per NABARD FPO (Nikam *et al*., 2023)​. This collective approach has provided small farmers better access to markets, institutional credit, and technology.

Figure 1 shows the findings of a linear analysis that was conducted to examine the expansion and growth trajectory of active Farmer Producer Organizations (FPOs) in India from 2004 to 2022. The findings indicate that the number of active FPOs increased at a compound annual growth rate (CAGR) of 58.88 per cent during this period, reflecting a significant transformation in the country's agricultural cooperatives and communal farming systems. In 2004, only four active FPOs were recorded. The number gradually increased to six in 2005 and 2006. A slight decline was observed in 2007, with the number dropping to three. However, this was followed by a notable surge in FPO formations, reaching nine in 2008, eleven in 2009, and twenty-one in 2010. This upward trend continued, with active FPOs rising to twenty-eight in 2011 and thirty-eight in 2012. The period from 2011 onward marks a phase of exponential growth in establishing FPOs. In 2013, the number of active FPOs increased to 121, and by 2021, it had reached an unprecedented 7,385, demonstrating the impact of various policy interventions and institutional support mechanisms. Financial and policy support from the Government of India is one of the key drivers behind this exponential growth in 2021.

**Fig. 1. Growth of active FPOs in India over time**

Under the Central Sector Scheme for the Promotion of 10,000 FPOs, launched in 2020, significant financial incentives were introduced to strengthen FPOs. These include the financial assistance of up to Rs. 18.00 lakh per FPO over three years for operational and management costs. To guarantee that FPOs can access institutional credit, provisions have also been made for matching equity grants of up to Rs. 2,000 per farmer-member, with a maximum cap of Rs. 15.00 lakh per FPO, and a credit guarantee facility of up to Rs. 2 crore per FPO for securing project loans from eligible lending institutions. These financial provisions have been instrumental in accelerating FPO formation and ensuring long-term sustainability. Looking ahead, sustained policy intervention, enhanced financial support, and targeted capacity-building programs will be essential to ensuring the long-term viability of FPOs in India.

Additionally, integrating innovative agro-food networks presents a strategic opportunity to enhance FPO efficiency and increase farm incomes. Approximately 25,000 Farmer Producer Companies (FPCs) are registered nationwide, demonstrating the growing momentum of producer organizations. Many FPOs have collaborated with the 10,000 FPO Initiative to establish a skilled human resource pool dedicated to FPO management and development. Moreover, more FPOs are adopting digital services and exhibiting a greater willingness to collaborate, enhancing industry awareness and professionalized FPO operations. Strengthening these digital and cooperative linkages will further solidify the role of FPOs as key drivers of agricultural transformation in India.

**State-wise distribution of FPOs in India**

Figure 2 provides an overview of the state-wise and union territory-wise distribution of FPOs across India, offering insights into their geographical spread and prevalence. Maharashtra leads with 8,212 FPOs, followed by Uttar Pradesh (3,463) and Andhra Pradesh (1,385), reflecting the strong emphasis on farmer collectivization in these states. The high concentration of FPOs in these regions can be attributed to favourable government policies, institutional facilitation, and proactive stakeholder engagement in promoting sustainable agricultural practices. Other states with significant FPO presence include Madhya Pradesh (1,316), Tamil Nadu (1,234), Karnataka (1,069), and Bihar (962). These figures underscore the broad acceptance of the FPO model across diverse agro-climatic conditions and socio-economic settings, demonstrating its adaptability and effectiveness in enhancing farmers' access to markets, financial services, and input procurement systems.

**Fig. 2. Total number of FPOs in different states of India (till Feb 2023)**

Conversely, the data indicate a relatively lower adoption of FPOs in certain regions, with Pondicherry (5), Andaman and Nicobar Islands (2), and Goa (13) recording the fewest FPOs. Addressing these disparities through targeted policy interventions, capacity-building efforts, and enhanced financial support will be critical in expanding the reach and impact of FPOs nationwide. This distribution highlights the importance of state-level policy frameworks and institutional mechanisms in shaping the growth trajectory of FPOs. Strengthening these structures can further enhance the role of FPOs in improving smallholder farmers' resilience, income generation, and agricultural sustainability across India.

**Promotion of FPOs by SFAC and NABARD**

Institutional collaborations provide essential resources such as credit facilities, technical expertise, market access, and business development services, empowering smallholder farmers to adopt sustainable agricultural practices and enhance income generation. To ensure inclusive and resilient agricultural growth across India, it is imperative to focus on continuous coordination, tailored interventions, and policy-driven financial support. Strengthening these linkages plays a crucial role in addressing the unique challenges farmers and FPOs face, ultimately contributing to a more robust and sustainable agribusiness ecosystem in the country. Figure 3 illustrates the state-wise distribution of farmers and Farmer Producer Organizations (FPOs) supported by the National Bank for Agriculture and Rural Development (NABARD) and the Small Farmers' Agri-Business Consortium (SFAC) across India's states and union territories. The data reinforce the critical role of strategic partnerships between FPOs, farmers, and financial institutions like SFAC and NABARD in fostering agricultural growth and rural development, reflecting regional variations in institutional support and agribusiness development. Jammu, Kashmir, and Karnataka stand out as states with significant institutional involvement, with 554 farmers/FPOs affiliated with NABARD and 4,781 farmers/FPOs associated with SFAC. This indicates a strong partnership between farmers and financial institutions, facilitating access to credit, market linkages, and capacity-building initiatives.

Other states with robust collaborations include Bihar, Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, Maharashtra, and Rajasthan, where NABARD and SFAC actively contribute to the growth of FPOs and rural enterprises. A notable trend is observed in Tamil Nadu, Uttar Pradesh, and Mizoram, where a high concentration of farmers and FPOs are linked with SFAC. This underscores the need for targeted investments and policy support to strengthen agribusiness development in these regions further. Conversely, states like Delhi, Kerala, Lakshadweep, Nagaland, and Sikkim exhibit minimal or no engagement with SFAC, suggesting potential areas for enhanced collaboration and institutional assistance to improve rural livelihoods and agricultural productivity.

**Fig. 3.** **Promotion of FPOs by SFAC & NABARD**

**State-Wise Performance in the Promotion of FPOs**

Table 3 presents a comparative assessment of state performance in FPO promotion, analyzing the number of FPOs per unit of Agricultural Gross Domestic Product (Ag GDP) and the corresponding financial investments allocated. This classification highlights high-performing and low-performing states based on FPO density relative to their agricultural economic output. Among the low-performing states, Tripura has the lowest number of FPOs per Ag GDP (0.14), followed by Jammu & Kashmir (0.16), Uttar Pradesh (0.16), Arunachal Pradesh (0.20), Goa (0.20), and Punjab (0.21). Despite their agricultural contributions, these states exhibit a comparatively lower prevalence of FPOs, indicating suboptimal investment and institutional support for FPO development.

Conversely, high-performing states such as Sikkim (8.27), Mizoram (1.53), Uttarakhand (0.94), Himachal Pradesh (0.80), and Madhya Pradesh (0.74) demonstrate a significantly higher number of FPOs per Ag GDP, reflecting strong institutional frameworks, targeted policy interventions, and robust financial backing for FPO development.

The data reveal a notable disparity between states regarding FPO density and financial investment. While some regions benefit from well-established FPO ecosystems, others face challenges related to inadequate funding, institutional inefficiencies, and low adoption rates. Addressing these imbalances requires strategic interventions, enhanced policy support, and optimized resource allocation to promote equitable agricultural development across all states. By bridging the gap in FPO distribution and financial investment, policymakers can foster sustainable rural development, enhance agricultural productivity, and improve farmer incomes. Strengthening institutional mechanisms in underperforming states will be critical for expanding FPO coverage, ensuring financial sustainability, and maximizing the economic potential of small and marginal farmers.

**Table 3. Low and high-performing states of India in terms of FPOs per Agricultural GDP**

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| --- | --- | --- | --- | --- |
| **Low Performing States** | **FPOs (No per Ag GDP, Rs billion)** |  | **High performing States** | **FPOs (No per Ag GDP, Rs billion)** |
| Tripura | **0.14** | Sikkim | **8.27** |
| Jammu & Kashmir | **0.16** | Mizoram | **1.53** |
| Uttar Pradesh | **0.16** | Uttarakhand | **0.94** |
| Arunachal Pradesh | **0.20** | Himachal Pradesh | **0.80** |
| Goa | **0.20** | Madhya Pradesh | **0.74** |
| Punjab | **0.21** | Meghalaya | **0.69** |
| Andhra Pradesh | **0.23** | Karnataka | **0.65** |
| Haryana | **0.26** | Manipur | **0.63** |
| Gujarat | **0.28** | Odisha | **0.63** |
| Maharashtra | **0.31** | Jharkhand | **0.58** |
| Assam | **0.32** | Kerala | **0.55** |
| Rajasthan | **0.37** | Tamil Nadu | **0.54** |
| West | **0.38** |  |  |
| Bihar | **0.42** |  |  |

**Sectoral Participation of FPO Members in Business Activities**

FPOs catalyze agricultural transformation and rural development by fostering collective action, resource aggregation, and enhanced market integration. Their role in enhancing farmer livelihoods, improving agricultural productivity, and ensuring sustainable rural economies is instrumental. Ensuring continued financial and policy support, particularly in regions with a lower FPO presence, strengthens smallholder farmers' access to resources, capacity-building initiatives, and market linkages. Figure 4 illustrates the distribution of Farmer Producer Organizations (FPOs) across different business sectors, highlighting the extent of member participation in agricultural and non-agricultural enterprises.

**Fig. 4. Involvement of FPO members in different business activities (**Source: Mukherjee *et al.* (2018)

The data underscore the pivotal role of FPOs in fostering rural economic diversification and inclusive development. Notably, 56 per cent of FPO members are engaged in agriculture, reaffirming its dominance as the primary sector benefiting from FPO support. Beyond agriculture, FPOs facilitate business operations in multiple industries, demonstrating adaptability in addressing diverse economic opportunities. The analysis reveals that 23 per cent of FPO-affiliated individuals are involved in various enterprises, followed by 8 per cent in fruits and vegetables, 4 per cent each in dairy and handicrafts, 3 per cent in bioenergy, 1per cent in fishing, and 0.2 per cent in forestry. Although poultry accounts for just 0.8 per cent, its inclusion exemplifies the broad spectrum of business activities that FPOs support, catering to the varied needs of rural communities. By leveraging the collective strength of FPOs, stakeholders and policymakers can advance inclusive agricultural development strategies, thereby enhancing the overall economic resilience and well-being of farming communities.

**Economic Impact of FPOs in India**

India is a developing nation with a predominantly small and marginal farming population. These farmers face numerous challenges, including low risk-bearing capacity, high transaction costs, limited access to input and output markets, outdated production technologies, low yields, high transportation expenses, and inadequate profits, all of which contribute to persistent rural underdevelopment (Meemken & Bellemare, 2020).

Table 4 presents a comparative analysis of chilli cultivation in Telangana between FPO members and non-members. The data indicate that FPO members benefit significantly from resource efficiency, economies of scale, and improved returns. The results confirm that FPO membership provides higher net returns, efficient resource utilization, and economic advantages through collective action.

**Table 4. Economic comparison of chilli cultivation in Telangana**

|  |  |  |
| --- | --- | --- |
| **Particulars** | **Member Farmer** | **Non-Member** |
| **Cost of cultivation per hectare** | Rs. 1,40,568 | Rs. 1,54,578 |
| **Gross returns per hectare** | Rs. 3,79,398 | Rs. 3,33,233 |
| **Net returns per hectare** | Rs. 2,38,800 | Rs.1,78,655 |
| **B: C ratio** | 2.70 | 2.15 |

Source: Manaswi *et al.* (2020)

 Gurung *et al*. (2023) reported that FPO members earn 30 per cent higher net returns per acre annually than non-members. Furthermore, Return on Investment (ROI) and profit margins were significantly higher among FPO members. Using advanced analytical techniques such as Nearest Neighbor Matching (NNM), Kernel-Based Matching (KBM), and Covariate Matching (CM), the Average Treatment Effect of the Treated (ATT) was calculated, revealing an increase in ROI by 46.3 per cent, 48 per cent, and 46 per cent under the respective methods. FPO membership was also associated with 8.0 per cent, 8.4 per cent, and 8.1 per cent higher profit margins than non-members.

Singh and Vatta (2020) highlighted the broader economic benefits of FPO participation. Farmers engaged in FPOs reported a 30 per cent increase in net income, in addition to an average 25-man-day employment opportunity generated through activities such as packing, sorting, loading, and selling. The additional income was primarily allocated to healthcare and education, demonstrating the far-reaching socio-economic impact of FPO membership.

Sahoo *et al*. (2022) quantified the economic impact of FPO membership by reporting key improvements such as 50.74 per cent increase in income, 44.11 increase in savings, 17.73 per cent increase in expenditure, 8.24 per cent reduction in debt, 43.57 per cent increase in the number of earning members per household and also 24.48 per cent overall improvement in economic empowerment was observed.

Hussain *et al*. (2021) investigated the impact of FPO participation in potato production. The study found that the total operational cost for non-FPO members was Rs. 15,054.82 higher compared to FPO members. Additionally, the returns per rupee invested were significantly better for FPO members (1.82) than non-members (1.38). This implies that while non-members gained a profit of Rs. 0.38 per rupee investment, FPO members realized a substantially higher profit of Rs. 0.82 per rupee invested.

The above evidence underscores the transformative economic impact of FPOs in India, particularly in enhancing farmers' income, reducing production costs, improving profitability, and generating employment. Strengthening policy frameworks and institutional support for FPOs will expand their reach, ensure financial sustainability, and foster inclusive rural development.

**Economic impact of women participation in FPOs**

The participation of women in FPOs has been a crucial factor in fostering gender-inclusive agricultural development. Women-led FPOs have emerged as a transformative force in rural agribusiness, offering increased economic opportunities, income stability, and financial inclusion. A recent study analyzing 75 women-led FPOs found that approximately 92 per cent of these organizations are profitable. However, despite their success, women-led FPOs constituted only 3.1 per cent of the total FPOs in 2022 (Neti & Govil, 2019). To address gender disparities, the Gender-Friendly Initiative (GFI) introduced a gender inclusion strategy in collaboration with 40 FPOs in the backward regions of Uttar Pradesh. This intervention resulted in a 40 per cent increase in female shareholders, demonstrating the positive impact of targeted policy measures.

Women's involvement in FPOs has significantly enhanced their economic empowerment and income levels. In Bhumigadi Mahila Krushak Farmer Producer Organization (BMKFPO) in Bastar district, Chhattisgarh, tribal women shareholders experienced a 34.71 per cent increase in overall income during 2021–2022. Their earnings from various FPO-driven income-generating activities grew by 61.22 per cent to 493.70 per cent, reflecting the profound socio-economic transformation of FPO participation. Additionally, a direct correlation between income growth and length of membership was observed, with long-term members benefiting more significantly than newer members (Rathour *et al*., 2022).

The Self-Help Group (SHG) model, which has demonstrated a 98 per cent loan recovery rate, underscores women's financial discipline and accountability. Integrating FPOs with SHGs presents a strategic opportunity to leverage the established SHG ecosystem to strengthen women's agribusiness initiatives. It is recommended that at least 70-80 per cent of FPOs in livestock sectors (goat farming, dairy, and poultry) be women-led, while 20-30 per cent representation in other sectors such as fisheries, cereals, pulses, and horticulture would facilitate greater gender inclusivity. This approach aligns with the national objective of ensuring that 40 per cent of all FPOs are led by women, enhancing their agricultural role.

**Case studies of successful women-led FPOs**

* **Nisargraj Farmer Producer Company:** The FPC, which was incorporated in Maharashtra in 2015, had a notable increase in revenue from Rs. 14 lakh to Rs. 4.5 crore, driven by greater female participation in economic activities.
* **Bhumigadi Mahila Krushak Farmer Producer Organization (Bastar district, Chattisgarh):** The organization witnessed a 37.28 per cent increase in membership over the previous four years based on the length of their membership since its incorporation in 2021-22, demonstrating the growing engagement of women in collective farming.
* **Savitribai Phule Goat Farmer Producers Company Ltd.":** Established in Sinnar block of Nashik district with support from Yuva Mitra (A local NGO), this women-led FPO expanded its turnover from Rs. 3.34 lakh in 2016–17 to Rs. 178 lakh in 2020–21.

Additionally, there are notable cases such as the NSPDT initiative, where women producers earn a minimum of Rs. 40,000 annually, and collective poultry farming initiatives in Madhya Pradesh, Jharkhand, Odisha, West Bengal, and Assam, where 13,000 women have been organized into 25 producer organizations. These entities recorded sales of Rs. 518.81 crores and profits of Rs. 42.62 crores in 2018-19, accumulating a total equity base of Rs. 82.75 crores. Furthermore, organizations such as SEWA (dairy sector), Mann Deshi (fresh fruit and vegetable sector), and MSRLM (soy, gram, and cotton sector in Wardha and Yavatmal, Maharashtra), supported by UNDP, have played an instrumental role in empowering women through FPOs. Strengthening policy frameworks, facilitating SHG-FPO integration, and providing targeted financial and technical support will ensure the sustained growth and success of women-led FPOs, thereby contributing to gender equity and agricultural resilience in India.

**Adoption level among FPO members and Non-members**

Education plays a crucial role in determining participation in FPOs. Their educational background significantly influences the decision of a household head to join an FPO. Individuals with a high school education are 30 per cent more likely to become FPO members than those without formal education. Additionally, female-led households exhibit a 22 per cent higher likelihood of FPO membership, reflecting the growing role of women in collective agricultural enterprises. Households engaged in primary farming occupations are 15 per cent more likely to be FPO members, as these organizations primarily focus on agricultural services, input accessibility, training programs, and market linkages. Moreover, access to credit facilities increases the probability of joining an FPO, as members anticipate better input availability and improved price realization for their produce.

Furthermore, households receiving technological knowledge and extension services from institutions such as the Agricultural Technology Management Agency (ATMA), Indian Council of Agricultural Research (ICAR), Krishi Vigyan Kendras (KVK), and government extension officers demonstrate a higher likelihood of FPO membership. The impact of FPOs on technology adoption is statistically significant, as FPO members adopt 1.5 times more agricultural technologies than non-members (Verma *et al*., 2019).

A comparative assessment was conducted between FPO members and non-members to evaluate the adoption of advanced agricultural practices, crop management techniques, and sustainability measures. Figure 5 illustrates the disparity in adoption rates between these two groups, underscoring the positive influence of FPO membership on agricultural productivity and sustainability. Across all categories of agricultural practices, FPO members exhibit significantly higher adoption rates than non-members. Notably, FPO members demonstrate a 78.1 per cent adoption rate in crop management, compared to only 26.1 per cent among non-members. Similar trends are observed across various domains, including enhanced pesticide and insecticide application (16.8% vs 2.9%), pest management through Integrated Pest Management (IPM) techniques (11.3 vs 1.5%), water management practices (7.7% vs 0.7%), and adoption of enhanced post-harvest techniques (2.9 vs 0.5%).

FPOs serve as catalysts for adopting modern agricultural techniques, facilitating access to collective resources, knowledge-sharing platforms, and technical support. The significantly higher adoption rates among FPO members indicate the positive impact of these organizations in fostering agricultural sustainability and productivity. By encouraging innovative farming practices, FPOs create resilient, efficient, and environmentally sustainable agricultural systems, ultimately benefiting farmers and the broader agricultural sector.

**Fig. 5. Change in adoption level between FPO and non-FPO members**

**Socio-economic upliftment through FPOs**

FPOs and FPCs are pivotal in driving socio-economic transformation in agricultural communities. By enhancing income generation, fostering financial stability, and promoting collective action, these organizations contribute to inclusive rural development and sustainable farming practices. A thorough examination of various agricultural programs and interventions reveals that participation in these initiatives significantly enhances financial stability and employment opportunities. The average annual income of individuals prior to FPO involvement was Rs. 1,07,125, which increased to Rs. 1,33,250 after program participation, indicating a substantial improvement in earning potential. Furthermore, the rise in annual expenditure from Rs. 74,988 to Rs. 90,613 suggests increased investments in livelihood-enhancing activities. Concurrently, higher annual savings reflect enhanced financial resilience, demonstrating the broader economic benefits of FPO participation. Additionally, FPO-led initiatives contribute to job creation within rural communities, further expanding economic opportunities.

A comparative analysis between high-performing and underperforming FPOs underscores the importance of organizational factors such as member engagement, role clarity, and mutual trust in determining success. High-functioning FPOs exhibit stronger organizational structures, fostering a collaborative and efficient operational environment. Conversely, underperforming FPOs struggle with low member participation and unclear governance structures, highlighting areas that require targeted improvements to enhance organizational effectiveness (Gorai *et al*., 2022).

A further comparison between FPO members and non-members indicates that FPO participation positively influences economic outcomes. Member farmers benefit from reduced cultivation costs, higher yields, and increased profitability, primarily due to economies of scale, collective bargaining power, and improved market access (Gurung *et al*., 2023). These advantages highlight the transformational potential of FPOs in strengthening farmers' financial security and economic viability. An evaluation of FPCs reveals significant social and economic advancements among their members. Participation in FPCs results in tangible improvements in income levels, savings, employment generation, self-confidence, and communication skills. These metrics underscore the role of FPCs in empowering farmers, enhancing their economic resilience, and fostering sustainable agricultural practices.

**Constraints faced by FPOs**

One of the primary challenges for FPOs is integrating smallholder producer groups into larger, stakeholder-driven agricultural value chains. Limited productivity, low awareness of FPCs, and societal factors related to caste and community dynamics further hinder the effective functioning of these organizations. Farmers often struggle with FPO formation and registration complexities, requiring external facilitators for guidance. However, promoters must provide supportive assistance without overriding farmers' decision-making autonomy. Additionally, emphasizing short-term financial disbursements to sustain initial operations can be counterproductive, as it reduces the opportunity for reinvesting profits into capital formation. The lengthy and intricate documentation process required for FPC registration further complicates participation, as many farmers lack the expertise to navigate these administrative procedures.

Financial constraints are another significant barrier to FPO sustainability. Many members are reluctant to make financial contributions toward capital investment, leading to inadequate funding for infrastructure, technology adoption, and operational expansion. The requirement for advance payments to procure agricultural inputs puts additional financial strain on members. Also, smallholder farmers rely on local traders and input dealers for working capital and agricultural inputs, often at high costs. These intermediaries, who act as buyers, offer lower prices for produce while maintaining control over a substantial portion of the value chain. The dominance of traders in government-regulated mandis further restricts market access for small farmers, limiting their ability to secure competitive prices (Singh & Singh, 2013).

The lack of access to modern technology, technical expertise, and knowledge-sharing mechanisms hampers FPOs' ability to enhance productivity and streamline operations. Insufficient processing and storage facilities present additional marketing challenges, as inadequate infrastructure limits value addition and increase post-harvest losses. These logistical shortcomings further reduce the competitiveness of FPOs in agricultural markets.

Governance issues, such as limited participation in Board of Directors (BOD) activities and low engagement of younger generations, threaten the long-term sustainability and innovative potential of FPOs. A lack of active leadership restricts the ability of FPOs to implement strategic decision-making, financial planning, and market expansion initiatives.

Addressing these challenges requires targeted policy interventions, capacity-building programs, and enhanced financial support to strengthen FPOs' operational capabilities. Facilitating easier market access, improving governance structures, investing in storage and processing facilities, and promoting youth participation will be essential in ensuring the long-term sustainability and success of FPOs in India's agricultural landscape.

**Conclusion**

The noteworthy existence of FPOs across multiple sectors highlights their adaptability and effectiveness in addressing the diverse challenges and opportunities within rural economies. By facilitating cooperative action, resource pooling, and enhanced market access, FPOs play a critical role in empowering farmers and entrepreneurs, fostering economic resilience and sustainable development. These organizations provide access to financial resources, technical expertise, market linkages, and capacity-building programs, supporting smallholder farmers and promoting sustainable agribusiness growth nationwide. To effectively address the region-specific challenges farmers and FPOs face, continuous coordination, targeted interventions, and policy support are required. Strengthening these initiatives will contribute to inclusive, resilient, and regionally balanced agricultural development across India.

Additionally, FPOs serve as key drivers of agricultural innovation, enabling farmers to adopt best practices and modern technologies. By fostering collaboration, capacity-building, and access to diversified markets, FPOs contribute to developing resilient and sustainable agricultural systems, benefiting both farmers and the broader agricultural sector. Continuous investment and institutional support are imperative to sustain their current growth trajectory and maximize their contributions to equitable and sustainable agricultural development.

Reducing disparities in FPO penetration and financial investment will help ensure sustainable and equitable agricultural progress across diverse geographical regions. By utilizing financial performance indicators, FPOs can identify areas for improvement, optimize resource allocation, and drive business expansion. Membership in FPOs enables farmers to leverage shared resources, access valuable market information, and enhance productivity and profitability.

 Thus, it can be concluded that the FPO/FPC members experience higher profitability, improved return on investment (ROI), and reduced production costs compared to non-members. Therefore, it is essential to encourage more farmers to join FPOs, as membership enhances income generation, employment opportunities, and economic stability. The findings emphasize that participation in FPOs significantly improves farmers' financial Performance, reinforcing the need for continued promotion and strengthening of these organizations within India's agricultural landscape.

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