

REVIEW ARTICLE

The Farmer Producer Organizations (FPOs): Building Bridges to Prosperity for India's Agri-Fish Farming

Abhay Kumar Chandegara¹, Jitendra Kumar Chauhan², A.D. Upadhyay³,
Biswajit Lahiri⁴, S.S. Mahanand⁵, Kohima Noopur⁶ and Halpati Reena⁷

ABSTRACT

The agriculture and fisheries sectors hold immense significance in India's economy, gradually playing a vital role in livelihoods and food security for millions of farms and non-farm populations. However, emerging challenges like market instability, limited access to modern technologies, and inadequate infrastructure affect the farmers' socio-economic and agricultural development. In this context, Producer Organizations have emerged as a solution. This study aims to comprehensively analyze the current status and role of Farmer Producer Organizations (FPOs) in uplifting the agriculture and fish farming community. In the country, from 2010 to 2022 over 15,984 FPOs were registered with the 58 per cent exponential growth rate per annum, connecting about 1.5 million farmers. FPOs have empowered marginal and small farmers by providing enhanced market access, bargaining power, economies of scale, value chain integration, diversification opportunities, etc. They facilitate farmers' access to various modern market channels, financial services, risk mitigation, and reduced reliance on informal lenders. FPOs also play vital roles in extension, demand articulation, service provision, capacity building, and finance. Integration of FPOs into the Sustainable Development Goals (SDGs) can further amplify their impact. However, challenges, including capacity gaps, policy constraints, infrastructural limitations, and sociocultural factors, have restrained FPO effectiveness. The legal and policy frameworks influence FPO structure, and successful FPOs establish strong external connections for sustainable growth. These organizations can catalyze positive change by aligning policies, resources, and innovations with FPOs' needs, ensuring sustainable and inclusive development in agriculture and fisheries.

Key words: Farmer Producer Organizations (FPO); Agriculture; Fisheries.

1. Ph D Scholar,
2. Professor,
3 & 4. Asso. Professor,
5. Asstt. Prof. (SG)
College of Fisheries (CAU-I),
Lembucherra Tripura west
6. SRF, ICAR-IIFSR,
Modipuram, Uttar Pradesh,
7. PG Scholar,
ICAR-CIFE, Mumbai, India
Corresponding author e-mail:
chandegaraabhaykumar@gmail.com

The agriculture and fisheries sectors are paramount to India's economy, providing livelihoods to millions of people. Agriculture employs over 50 per cent of the workforce and contributes around 18.3 per cent to the GDP in 2021-22. The fisheries are also emerging as a key sector, contributing to 1 per cent of India's GDP and exporting 1.36 MMT of seafood worth US \$ 7.76 million (Anonymous, 2021a; Anonymous 2022; FAO, 2022). Together, these sectors play a vital role in ensuring food security, rural livelihoods, and economic development in India. Small and marginal farmers and fishers often face significant challenges in their agricultural and fisheries activities. One critical

issue is limited market access, which leads to lower price realization for their produce. Additionally, many individuals lack access to financial services like credit, insurance, and savings facilities (Akanchha Singh and Kameswari, 2023; Chauhan et al., 2022).

These constraints restrict their capacity to invest in farming and fishing activities and manage risks effectively. Another notable challenge is the technology gap prevalent among small-scale producers (Kamala et al., 2018). Adopting modern agricultural and fisheries technologies remains limited due to a lack of knowledge and resources in these communities. Moreover, inadequate infrastructure, encompassing aspects such

as storage, transportation, and processing facilities, further complicates the efficient handling and marketing of agricultural and fisheries products (Noopur et al., 2023). Cultural and social factors are potential barriers to progress in these sectors. Sociocultural practices and norms sometimes prevent the adoption of new technologies and farming or fishing practices (Morgan et al., 2017). These multifaceted challenges collectively impact the livelihoods and economic prospects of small and marginal farmers and fishers in India.

Historically, cooperative societies were promoted in agriculture to address these challenges and uplift the farming community. However, it has become evident that this traditional cooperative model faced several limitations, including difficulties accessing capital, complex management structures, limited specialization, mismanagement risks, and dependency on government support. Inequality among members, a lack of entrepreneurship, and vulnerability to external factors are also concerns (Singh et al., 2003). Effective management and support systems are crucial to address these limitations and ensure long-term success. Addressing political and bureaucratic hindrances that impeded farmer cooperatives became pivotal for the new approach. A supportive legal and policy environment is crucial to foster the growth of farmer collectives and bridge the gap between farmers and consumers.

Farmer Producer Organizations (FPOs) have emerged as potential drivers to overcome these challenges. According to the Ministry of Agriculture and Farmers Welfare, a Farmer Producer Organization (FPO) is a type of Producer Organisation (PO) where farmers are its members. The PO is a producer-run organization that includes all kinds of products, including artisanal, agricultural, and non-farm items.

The existing literature has explored various aspects of FPOs, including their formation, objectives, and potential benefits. However, a comprehensive review is needed to critically assess how effectively FPOs address these challenges and contribute to the prosperity of India's agri-fish farming. This study aims to provide a holistic understanding of FPOs, their strengths and limitations, and their role in promoting inclusive growth and sustainable development in these critical sectors.

METHODOLOGY

The study conducted an in-depth analysis using secondary data sources to investigate the role and impact of Farmer Producer Organizations (FPOs) in

India's agriculture and fisheries sectors. The study employed a systematic search strategy, primarily utilizing databases like PubMed, Google Scholar, ResearchGate, and Indian repositories such as the Indian Council of Agricultural Research (ICAR). Inclusion criteria focused on studies published between 2010 and 2023, specifically related to FPOs in the Indian context. The Exponential Growth Model was used to quantify the growth of FPOs over the year. The study synthesized data thematically, highlighting key findings regarding the benefits, challenges, policy implications, and prospects of FPOs in these sectors. The following formula was used to calculate the Exponential Growth of FPOs:

$$x(t) = x_0 \cdot \left(1 + \frac{100}{r}\right)^t$$

Where -

$x(t)$ represents the number of FPOs at time 't'.

x_0 is the initial count of FPOs.

'r' is the growth rate (expressed as a percentage).

't' denotes the time in years.

RESULTS AND DISCUSSION

Evolution and current status of FPOs in India : The Government of India, recommended Farmer Producer Companies (FPCs) as an alternative to traditional cooperatives, under committee led by Mr. YK Alagh. FPCs, characterized as hybrids between cooperative societies and private limited companies, were considered the optimal choice to protect farmers' interests and benefit consumers (NABARD, 2015). Various organizations, including SFAC, NABARD, State Government Agricultural/Fisheries Departments, and NGOs/CSOs supported by the Government of India, promote FPOs in rural areas. Financial and technical support is provided by NABARD, SFAC, Government Departments, Corporates, and Domestic and International Aid Agencies to Producer Organisation Promoting Institutions (POPIs) and Resource Institutions (RIs) for FPO promotion until 2018–19. The transition from Resource Institutions (RIs) to Cluster-Based Business Organizations (CBBOs) addresses FPOs' skill gaps by unifying promoting organizations to provide holistic incubation support. Over the last ten years, Farmer Producer Organizations (FPOs) have reported remarkable growth in India. The latest data from "Farmer Producer Companies, Report II: Inclusion, Capitalization and Incubation 2022" indicates that there are currently more than 15,984

registered FPOs in India. Notably, the distribution of FPOs across geographical regions is uneven. Among the states, Maharashtra holds the highest share at 27 per cent, followed by Uttar Pradesh (10%), Tamil Nadu (7%), and Madhya Pradesh (6%). Collectively, these four states account for approximately half of the total registered FPOs in the country. Key organizations such as the Small Farmers' Agribusiness Consortium (SFAC) and the National Bank for Agriculture and Rural Development (NABARD) have played crucial roles in facilitating India's agricultural transformation by supporting the growth and success of FPOs (MANAGE, 2019a; NAFPO, 2022).

Figure 1 illustrates a remarkable growth trajectory in India's Farmer Producer Organizations (FPOs). Starting with a mere 29 FPOs in 2010, this number has skyrocketed to an impressive 7,059 by 2022, reflecting an exponential growth rate of approximately 58.07 per cent per year. This growth rate signifies a substantial shift in India's agriculture and fisheries sectors. FPOs have emerged as crucial for enhancing farmers' and fishers' empowerment, fostering sustainable development, and strengthening their collective market influence. The surge from 978 FPOs in 2015 to 7,059 in 2022 highlights the increasing salutation of their significance in the agricultural and fisheries landscape, underlining the potential for continued progress, community upliftment, and economic advancement through FPOs in India (NABARD, 2015; Ramappa and Yashashwini, 2018).

Types of FPOs in the agricultural sector : Farmer Producer Organisations (FPOs) in the agricultural sector exhibit diverse forms and structures tailored to address the specific needs and characteristics of different agricultural value chains. Research in India underscores the significance of categorizing FPOs based on their focus, membership, and operational scope. This categorization helps us understand the distinct roles that various FPOs play in fostering agricultural development.

FPOs share similarities with FPCs; however, FPCs have a formal legal framework, are established under the Companies Act, and primarily concentrate on increasing member farmers' incomes through enhanced manufacturing and marketing of certain agricultural goods. FPOs, on the other hand, registered under state-specific laws and usually engage in a variety of operations including processing and marketing. Self-Help Groups (SHGs) are another type of agricultural organization seen in rural areas. These organizations, which often involve women, contribute significantly by combining their funds to create a community fund. SHGs participate in a variety of income-generating activities that are essential to microfinance and rural development initiatives. A Joint Liability Group (JLG) is also formed to secure bank financing, particularly microfinance. These organizations provide easier access to the financial assets required for agricultural loans (NABARD, 2021; Anonymous, 2022).

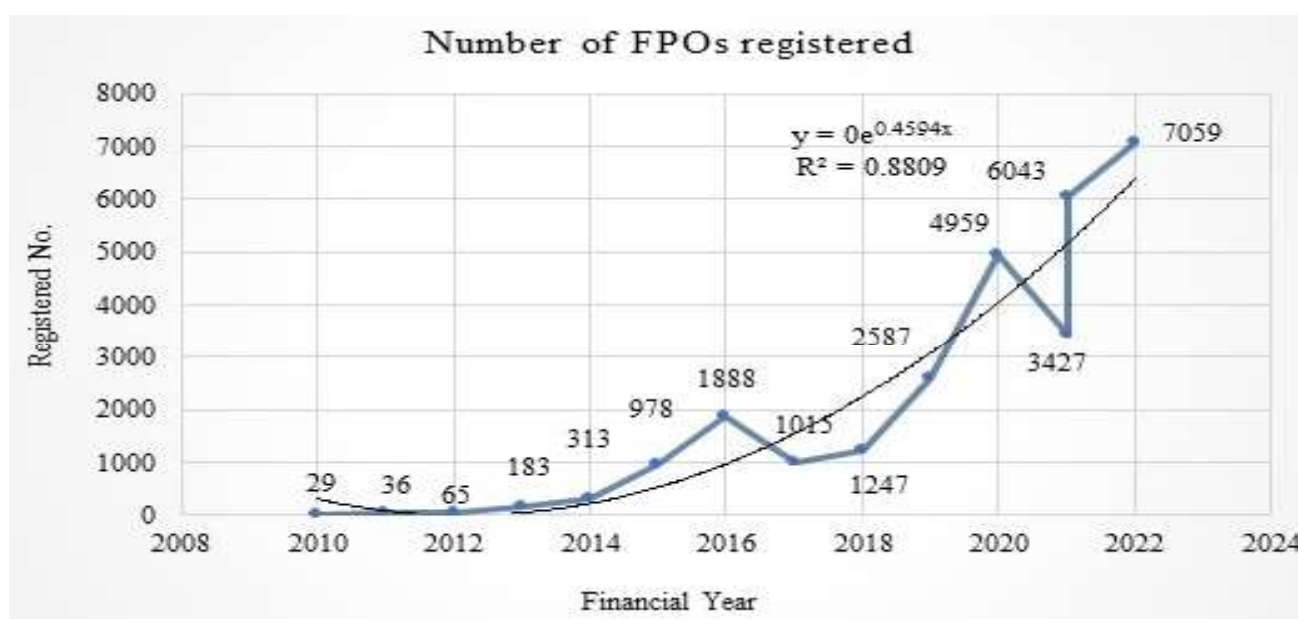


Figure 1. Chronological evolution of the Farmer Producer Organizations (FPOs)

Based on activities, FPOs are classified into commodity-specific and multipurpose FPOs. Commodity-specific FPOs primarily concentrate on a single agricultural product to enhance production, processing, and market access. On the other hand, multipurpose FPOs engage in various agrarian activities, spanning multiple products and value chains (Kumar et al., 2019).

Furthermore, FPOs can be classified based on the membership profile, such as those focused on women farmers, landless labourers, or small and marginal farmers. Gummagolmath and Lakshmi (2021) explore the role of FPOs exclusively formed by women farmers, addressing gender disparities and promoting women's participation in agriculture.

India had many registered FPOs, with a considerable proportion falling under commodity-specific categories, focusing on products like cereals, fruits, vegetables, and dairy. Moreover, NABARD highlights the importance of location-based FPOs catering to specific agroecological zones or regions. These FPOs consider local agroclimatic conditions and market demands, enabling farmers to adopt contextually appropriate practices.

The types of FPOs in the agricultural sector encompass various dimensions, including their focus on commodities, membership profiles, and geographic areas. These diverse categories enable FPOs to effectively address the unique challenges and opportunities in different agricultural value chains and regions. The classification facilitates targeted interventions, policy formulation, and resource allocation, thereby enhancing the overall impact of FPOs on agricultural development and rural livelihoods in India.

Functions and Objectives of FPOs: Specific functions and objectives drive Farmer Producer Organisations (FPOs) intending to improve the socio-economic status of their members. The following factors help to clarify the role of FPOs in empowering farmers:

FPOs increase the collective bargaining power of farmers by pooling resources and goods to secure better pricing for inputs, machinery, and agricultural products so that farmers can get more income (Dhaka et al., 2019). Second, FPOs support bulk purchases of necessary farm inputs, including seeds, fertilizer, and machinery, through economies of scale for savings and quality assurance (Laha et al., 2020). Thirdly, FPOs give farmers technical training and support by providing more efficient procedures, modern

techniques, and sustainable practices, increasing productivity and lowering production costs (Swamy and Gopinath, 2018). FPOs can assist farmers' market access by pooling their goods and negotiating with purchasers. They provide marketing assistance by linking with value chains and help with packaging, branding, and quality certification.

Furthermore, FPOs focus on value addition through grading, packing, and processing, improving product marketability and enabling farmers to gain more significant shares in the value chain (Nagaraj and Desai, 2021). FPOs help develop crucial infrastructure for agriculture, such as irrigation systems, storage facilities, and processing facilities, as well as build fish ponds, upgrade fishing methods, and enhance cold storage capabilities in fisheries (Anonymous, 2021b).

FPOs are particularly critical in risk management due to their ability to handle price fluctuations, weather uncertainty, and pest outbreaks. They advocate for crop diversification, insurance systems, and efforts to protect farmers' livelihoods (Kumar and Kar, 2018). FPOs improve accessibility to financial services for their members by providing a collective creditworthy profile, providing loans and funds at more favourable conditions. FPOs help farmers create a strong network by providing a place for interaction, experience sharing, and learning. They share information about best practices, scientific innovations, and market trends, empowering farmers with helpful information (Bali et al., 2019).

When discussing the objectives of FPOs, economic empowerment takes center stage. These organizations aim to improve their members' financial well-being by enhancing income and livelihood opportunities through better pricing, reduced costs, and improved market chances. Another goal of FPOs is to promote cooperation and awareness among farmers. FPOs also develop the capacity building of farmers through training, technical assistance, and skill development. Furthermore, Sustainable agriculture is an important objective, with many FPOs promoting sustainable farming techniques, soil conservation, water management, and organic agricultural methods.

Organisational structure and governance of FPOs: The organizational structure and governance of Farmer Producer Organizations (FPOs) in the agriculture and fisheries sectors are crucial for their successful functioning and impact. These aspects determine how FPOs are organized, how decisions are made, and how members participate in their activities. A



Figure 2. Organizational structure and governance of FPOs

detailed explanation of the organizational structure and governance of FPOs (Fig. 2) in the agriculture and fisheries sectors is given below:

FPOs mainly follow a democratic and member-centric organizational structure, in which decisions are made cooperatively; it helps for transparency, accountability, and active participation among members (Singh and Dey, 2018). Moreover, FPOs often adopt a cooperative structure, forming clusters or associations of smaller groups. This federated approach strengthens the bargaining power of FPOs by encouraging them to pool resources and negotiate better with buyers and suppliers. Federated FPOs can benefit through economies of scale, enhancing their access to markets and services (Yadav and Sharma, 2020).

Effective governance mechanisms are essential for transparent and accountable practices as they build trust among members and stakeholders (Amitha et al., 2021). Proper record-keeping, regular meetings, and financial transparency contribute to the credibility and sustainability of FPOs. Furthermore, strong governance structures tend to perform better financially and operationally in FPOs. FPOs with transparent governance structures have a higher loan repayment rate and more efficient utilization of funds for development initiatives. (NABARD, 2021).

The organizational structure and governance of FPOs in the agriculture and fisheries sectors involve a well-defined hierarchy of decision-making bodies, including the Board of Directors, Executive Committee, General Body, sector-specific sub-committees, and functional departments (Mysore et al., 2019). FPO governance is guided by transparency, inclusiveness, and sector-specific expertise. The constitution,

professional management, frequently specific to the sector meetings, and members' active participation all support FPO operations, proving effective and fulfilling their goals in agriculture and fisheries.

Benefits of FPOs in agriculture and fisheries enhanced market access: Farmer Producer Organisations (FPOs) are essential in improving market access and economic opportunities for agricultural and fisheries enterprises, particularly benefiting small and marginal farmers and fishers who often face challenges in reaching broader markets and securing fair prices. Numerous studies have demonstrated the substantial impact of FPOs in enhancing market access, thereby contributing to economic upliftment and sustainability in the agriculture and fisheries sectors.

A key advantage of FPOs is their ability to increase farmers' and fishermen's bargaining power by pooling produce with buyers, processors, and intermediaries (Shree and Vaishnavi, 2022). FPOs contribute to farmers' income through this collective approach while helping small producers capitalize on economies of scale by aggregating their output. This addresses the bulk supply demands of specific markets, reducing transaction costs and opening up new market opportunities (Verma et al., 2019).

FPOs engage in processing, packaging, and marketing in addition to the primary production process. According to this value addition, members have been encouraged to reach high-value markets and boost their revenue. Market connection and diversity are key FPO components as well. (IFAD, 2015; Sahoo et al., 2022) They link with well-known marketplaces, retail chains, and even worldwide exports. Furthermore, maintaining quality standards and certifications is crucial for

gaining access to premium markets. FPOs help its members achieve quality and safety requirements, boosting their capacity to compete in the international export market (*Dave and Sajja, 2023*). FPOs also serve as a valuable source of market intelligence and information. It has provided crucial insights into market dynamics, including demand trends, prices, and consumer preferences (*IFPRI, 2012*).

FPOs serve as a vital bridge connecting farmers and fishers to markets. They enhance bargaining power, promote value addition, and support sustainable growth in the agriculture and fisheries sectors. FPOs significantly contribute to improvement in India's agricultural and fisheries sectors by drastically improving the economic security of rural populations through these mechanisms.

Access to financial services : Farmer Producer Organisations (FPOs) play a pivotal role in addressing the financial needs of farmers and fishers in the agriculture and fisheries sectors. They offer a comprehensive array of financial services that empower these producers in various ways:

- *Credit facilities*: FPOs are intermediaries between farmers and formal financial institutions, making credit more accessible. FPOs positively affect formalized financing availability, enabling farmers to invest in more productive and efficient farming methods. Moreover, FPOs bridge the gap between farmers and banks and expand loan availability (*Adhikari et al., 2021; Kumar et al., 2020*). Around 45 per cent of surveyed FPOs faced challenges in accessing credit, underscoring the significance of this service. Furthermore, FPOs encourage diversification into various agribusiness ventures, such as processing, value addition, and marketing and also promote entrepreneurship by facilitating access to markets and credit for these ventures (*Khandave, et al., 2019*).
- *Savings and Investment Opportunities*: The International Fund for Agricultural Development (IFAD) reported that FPOs enable members to pool their savings, creating a common fund that can be invested in income-generating activities. This collective approach to finance contributes to the economic development of rural communities. FPOs provide platforms for farmers and fishers to systematically save their earnings and invest in productive assets (*Nuthalapati et al., 2020*).
- *Risk Mitigation through Insurance*: In Indonesia,

FPOs worked with insurance companies to provide weather-based insurance coverage, preventing crop losses caused by adverse conditions. FPOs are also essential in boosting insurance protection for rural areas. They serve as intermediaries, providing crop insurance more accessible and lowering farmers' susceptibility to agricultural losses. (*Bikkina et al., 2018*).

- *Access to Government Schemes and Subsidies*: According to IFPRI research, FPOs assist farmers in participating in government programmes, ensuring they receive necessary subsidies and inputs for improved agricultural practices.
- *Reduced Dependency on Informal Lenders*: FPOs reduce farmers' reliance on informal moneylenders who charge exorbitant interest rates. FPOs assist members in getting official loans in more favourable conditions, reducing the financial load on farmers and fishermen (*Shah and Soni, 2022*). Furthermore, FPOs were found to increase farmers' income by 20-30 per cent through better market linkages and reduced dependency on intermediaries (*Kumar and Joshi, 2018*).

FPOs allow farmers and fishermen to utilize formal financial services, loans, savings, insurance, government assistance, and risk management, giving up opportunities for growth and development.

Technology adoption and capacity building : Farmer Producer Organizations (FPOs) have emerged as important catalysts for increasing technological adoption and strengthening the skills of stakeholders in agriculture and fisheries. This effect is significant for small and marginal farmers and fishermen, who often have limited access to modern techniques and resources. The integration of many research revealed the essential part that FPOs play in bridging the technological divide and improving these producers' skill sets, eventually supporting sustainable growth and holistic development. In this context, several key dimensions highlight the transformative impact of FPOs in this domain:

- *Technology Dissemination*: FPOs are a bridge for disseminating innovative agricultural and fisheries technologies. FPOs support the transfer of modern cultivation methods and advanced technologies to their members by providing knowledge about how to use agriculture and digital tools in farming and encouraging farmers to optimize inputs and maximum outputs. (*Kumari et al., 2023*).

- *Access to Inputs and Machinery:* FPOs empower smallholders by providing access to modern inputs and machinery. FPOs have an essential role in procuring quality seeds, fertilizers, and advanced equipment in bulk quantities, leading to increased efficiency and productivity (Anonymous, 2020).
- *Training and skill development:* FPOs offer workshops, demonstrations, and knowledge-sharing sessions as part of their substantial focus on capacity building. The training and extension services provided by FPOs, increase farmers' and fishers' understanding of modern approaches (Ramappa and Yashashwini, 2018). In addition to addressing the capacity gap, Khan et al. (2020) also demonstrate the importance of training and skill development.
- *Adoption of sustainable practices:* Adopting sustainable fishing and farming methods is a top priority for FPOs. The Food and Agriculture Organization (FAO) emphasizes how FPOs train their members about sustainable agricultural practices, promoting good soil health, water conservation, and integrated pest control. FPOs promote organic farming practices, increasing members' adoption by 35 per cent and helping members obtain organic certifications, leading to an average price premium of 20 per cent for organic produce. FPOs also contribute to sustainable agriculture, reducing carbon footprint by 30 per cent compared to conventional farming (Reddy, 2018; Singh and Dey, 2020).
- *Enhancing value addition:* FPOs utilize modern technology to help farmers in processing, grading, and packaging agricultural products. This value addition improves farmers' marketability and price realization. (Khan et al., 2020).

The results support how FPOs promote adopting new technology and the development of capacity in agriculture and fisheries, eventually fostering sustainable growth and development. These methods empower FPOs to dramatically increase the knowledge, abilities, and practices of farmers and fishermen, improving their revenue and production.

Successful case studies in agriculture and fisheries:

Case study of greenfield farmers' FPO in agriculture
The Greenfield Farmers' FPO's effectiveness demonstrates the revolutionary power of FPOs in the Indian agriculture industry. This FPO, founded

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in Maharashtra in 2016, shows how collective effort may result in significant gains for small and marginal farmers. Various important indicators that indicate the beneficial influence on the well-being of its members underlie its performance. Before its construction, local farmers involved in horticulture had an annual revenue of INR 80,000. Within just two years of the FPO's operation, this amount increased to an outstanding average of INR 1,50,000 or an 87.5 per cent increase. This significant rise in revenue demonstrates the FPO's capacity to improve the financial well-being of its members.

Greenfield Farmers' FPO was successful by building strong market relationships, signing contracts with local buyers, and using modern farming methods like drip irrigation and integrated pest control, resulting in a 30 per cent increase in crop yields. Furthermore, the FPO focused on capacity-building through training sessions, which provided farmers with information and skills for better decision-making and financial management. This multidimensional strategy has dramatically increased farmers' income, market access, technology uptake, and capability, demonstrating FPOs' revolutionary potential in Indian agriculture.

The inspiring success story of the "*KrishiSakhi FPO*" highlights the significant impact FPOs can have on the agricultural landscape in India. Founded in 2017 in the state of Karnataka, this FPO has demonstrated remarkable improvements in the lives of its members through its strategic initiatives. A comprehensive study conducted by the National Institute of Agricultural Extension Management titled "Empowering Women Farmers through KrishiSakhi FPO" provides insights into the quantifiable advancements achieved by this FPO (Gummagolmath et al., 2022).

Case study of MatsyaSahay FPO in fisheries : The "MatsyaSahay FPO" case study in India's coastal state of Kerala exemplifies the transformational impact of FPOs in the fisheries sector. This case study demonstrates how FPOs can revitalize fisherfolk livelihoods and create a more sustainable and economically viable fishing ecology. The success of MatsyaSahay FPO has been documented by the National Fisheries Development Board (NFDB) in collaboration with the Kerala State Fisheries Department titled "Empowering Fisher Communities through MatsyaSahay FPO"

The development of MatsyaSahay FPO significantly improved the income and livelihoods

of fishermen. Initially, their annual revenue was approximately INR 1,50,000. However, after three years of working with the FPO, their revenue increased by 87 per cent to an average of INR 2,80,000. This valuable expansion was achieved by direct market connections, removing intermediaries, and providing better pricing for their catch, which resulted in a 20 per cent rise in fish product prices. Furthermore, the FPO's emphasis on capacity building and technology adoption resulted in a 35 per cent increase in average fish harvest per member due to improved fishing methods and sustainable practices (NFDB, 2022).

Challenges and limitations :

Institutional and policy constraints : Complicated registration processes and governing obstacles could hinder the growth and operation of FPOs. For example, a survey conducted in many Indian states discovered that almost 40 per cent of FPOs had difficulty acquiring necessary permits and clearances because of administrative red tape (Singh and Kumar, 2019). Approximately 45 per cent of FPOs face problems getting permissions and licenses due to bureaucratic impediments impacting operational efficiency. Furthermore, present agricultural policies only provide adequate support to 30 per cent of FPOs, indicating an inconsistency between policy inception and execution. These limitations constrain FPOs' access to resources and motivations, preventing potential collaboration and limiting their impact (Swaminathan et al., 2019).

Limited managerial skills and a lack of business expertise among FPO members restricted their ability to manage operations efficiently. According to the study, around 60 per cent of FPOs struggle with financial management, marketing, and value chain integration because of insufficient training and capacity-building. Furthermore, just 40 per cent of FPOs were provided with financial management training, with even fewer getting marketing (25%) and value chain integration (18%) training (Pattnaik and Mishra, 2018). Similarly, the majority of FPO members lacked training in modern agricultural methods and technology. Khan et al. (2020) highlights the critical problem of capacity and skill gaps within Farmer Producer Organizations (FPOs) and emphasize the importance of overcoming these gaps through training and skill development.

Lack of financial and infrastructural facilities: FPOs often face difficulty in obtaining funding for their operations. Over 70 per cent of these organizations

struggled to receive sufficient finance, limiting their capacity to invest in new technology and inputs. Furthermore, inadequate storage and processing facilities affect value addition and timely market access, reducing FPOs' effectiveness (Jain and Bhati, 2020). Approximately 45 per cent of FPOs had issues accessing loans and financing. Due to a lack of resources, FPOs cannot grow their operations, buy high-quality inputs, or invest in advanced technologies (Kumar and Dey, 2017). Many research stress that lack of appropriate infrastructure, which includes storage facilities, transportation, and processing units, critically affects FPOs' ability to manage and promote their products in the market. The consequences of these infrastructure limitations are reduced product quality, which results in losses and decreased market attractiveness (Singh and Singh, 2018).

Many FPOs struggle to get enough credit, with only 38 per cent having access to official credit sources. Therefore, nearly 63 per cent of FPOs perceive inadequate infrastructure as a significant constraint, with storage and transportation being the most critical issues. These findings support the urgent need to solve infrastructural deficiencies and financial conditions to support the growth and potential of FPOs (Gurung and Choubey, 2023).

Social and cultural barriers : Social and cultural factors significantly affect FPOs in India's agriculture and fisheries sectors. These factors present considerable difficulties as they've become prominent in rural areas. Modifying conventional cultural practices for modern farming and fishing methods might be challenging. Gender norms and disparities in rural regions may constrain women's participation in FPOs. Only 10-15 per cent of FPO members are women; this data indicates the gender imbalance within FPOs and the need for gender-specific efforts that promote women's engagement. (Bahta et al., 2022). In rural India, caste-based divisions and power imbalances can restrict effective cooperation and collaboration among FPO members. There is a need to address social dynamics inside FPOs to promote equal participation (Verma and Rathore, 2018). Furthermore, Cultural norms may impact on how information is shared inside FPOs. Traditional knowledge transfer methods may coexist with more modern ways of exchanging information.

The challenges and limitations faced by Farmer Producer Organizations (FPOs) in agriculture and

fisheries encompass a range of factors, including institutional, capacity, financial, infrastructural, and sociocultural aspects. These complexities underline the necessity for tailored strategies to enhance FPO functionality and ensure sustainable growth. Institutional and policy challenges highlight the importance of creating an enabling environment for FPOs to thrive. Capacity gaps lend weight to the significance of providing training and skill development. Financial and infrastructural constraints call for improved access to credit and essential facilities. Sociocultural factors stress the need for inclusive approaches.

Policy implications and future prospects

Strengthening institutional support : Farmer Producer Organizations (FPOs) in agriculture and fisheries need strong institutional support and forward-thinking policies to succeed and thrive. Several crucial policy implications and opportunities must be carefully investigated to maximize FPOs' potential and ensure long-term growth.

NABARD proposed the widespread development of FPOs by emphasizing the necessity of simplified registration processes and decreased regulatory obstructions. These regulations can help to spread across regions. Another critical factor is access to credit and financing; FPOs' accessibility to credit significantly influences their performance and growth. Collaborations with financial institutions and credit guarantee agreements can benefit the financial security of FPOs (*Nadu, 2021; Venkattakumar and Narayanaswamy, 2022*).

Capacity-building strategies improve FPO members' management and technical capacities through training and skill development programs (*Singh and Singh, 2022*). Moreover, such government-backed efforts can improve FPOs' ability to execute complicated operations. Governmental initiatives supporting technology adoption can have a transforming impact, and governments may also help FPOs by purchasing new equipment and stimulating technical expenditures (*Ajgaonkar and Mankodi, 2023*). Furthermore, improving market links through supporting policies enhances market access and price realization for FPOs through cooperation with agribusinesses (*Das and Mandal, 2021*). Policies that emphasize the development of accessible information networks can ensure that FPOs have access to

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critical information and data for better decision-making (*Bikkina et al., 2018*). In addition, Inclusive policies that encourage women's participation in FPOs, contributing to gender equity and community development, can harness different points of view for holistic development (*Srinivasan, 2023*).

According to *Khandewal et al. (2022)*, collaborative research projects promote innovation when academic institutions collaborate with FPOs, and policy support for research may lead to sector-specific solutions. Identifying and expanding effective FPO strategies is crucial while such initiatives promote information exchange and collaborative learning among FPOs, positively impacting various sectors (*Krishnan et al., 2021*). Last, intense monitoring and evaluation systems are necessary for constant assessment and policy modifications to maintain FPOs in line with sector developments (*Singh and Dey, 2018*).

These policies set an example for establishing FPOs, empowering them to contribute to improvements and cross-sector sustainable development. Governments can help FPOs bring about positive changes, supporting comprehensive progress and sustainable development, by creating an environment that aligns with these organizations' needs and objectives.

Encouraging research and innovation :

It is crucial to promote research and innovation to shape the prospects of Farmer Producer Organizations (FPOs) in the agricultural and fisheries sectors. Policymakers may drive FPOs toward greater efficiency and effectiveness by creating an atmosphere that promotes continual learning, technological progress, and flexible practices. This strategy supports focused governmental interventions aiming to encourage research collaboration, create incentives for innovation, and enable the adoption of modern technology.

FPOs that engage with research-driven practices get more robust connections to the market and higher profits for their members (*Ullaguari et al., 2023*). Similarly, *Verma et al. (2019)* show a favourable relationship between the adoption of new technology by FPOs and their economic outcomes. FPOs prioritizing research-based methods see an average 15 per cent gain in total revenue compared to conventional methods (*NABARD, 2022*). Research and innovation can also result in creating context-specific approaches that meet specific challenges encountered by FPOs. Moreover, innovative FPOs can address challenges,

including post-harvest losses and value addition, improving market access and profitability (Kumar and Dey, 2017).

In this instance, policy implications should focus on supporting research and innovation ecosystems compatible with the requirements of FPOs. This might involve encouraging relationships between FPOs and research institutes, awarding funding and incentives for FPO-led research efforts, and encouraging technology-driven solutions. Policymakers can create a more resilient and prosperous future for India's agricultural and fisheries sectors by making research and innovation essential building blocks of FPO growth. Significant modifications may be accomplished through promoting research and innovation within the framework of FPOs in the agricultural and fishing industries. Policymakers need to recognize the potential of these initiatives to improve market connectivity, revenue production, and overall sustainability. FPOs may become important drivers of good change in India's agricultural and fisheries sectors by connecting policies with research-driven initiatives and developing an innovative culture. *Integrating FPOs into sustainable development goals (SDGs): Integrating Farmer Producer Organizations (FPOs) within the SDGs framework emerges as a strategic approach for ensuring their integration with larger development goals and enhancing their holistic development involvement. Policymakers could boost the impact on poverty eradication, food security, gender equality, and environmental sustainability by incorporating FPO initiatives into the SDG framework (Mourya and Mehta, 2021). Similarly, FPOs may significantly advance SDGs by encouraging sustainable agricultural methods and reducing economic gaps (Rao and Lenka, 2020).*

The Sustainable farming techniques used by FPOs have resulted in an average 20 per cent increase in the yield of crops, helping to achieve the SDGs of eliminating hunger and eradicating poverty (MANAGE, 2019b). Additionally, including FPOs within the SDGs may encourage collaboration and mobilize resources to achieve global development goals. According to Das et al. (2022), FPOs may increase their influence on improving livelihoods and sustainable growth by attracting investment and collaborations from various stakeholders when connected with the

SDGs. By aligning policies and resources with SDG priorities, FPOs can become influential organizations for positive change within India's agriculture and fisheries sectors.

CONCLUSION

Farmer Producer Organisations (FPOs) face many challenges and limitations in agriculture and fisheries, and these complex factors influence their growth and development. Issues like bureaucratic hurdles, lack of skills, financial constraints, and cultural norms collectively impact the effectiveness of FPOs. Overcoming these challenges requires specific approaches, such as simplifying registration, providing better training, improving access to funds and facilities, and ensuring equality and fairness for all members. For the growth and development of FPOs, policymakers must create an environment that supports them through better policies. This involves encouraging research and innovation, making FPOs a part of Sustainable Development Goals (SDGs), and providing them with the resources needed. These strategic pathways can potentially unleash the transformative impact of FPOs in uplifting the agriculture and fisheries sectors, paving the way for sustainable development, equitable growth, and enhanced livelihoods within rural communities.

CONFLICTS OF INTEREST

The authors have no conflicts of interest.

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