Policy Paper 40

Farmer Producer Organizations in India

Challenges and Prospects

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Prem Chand

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Contents

List of Tables and Figures

Tables

Figures

Preface

Farmers' collectives such as the FPOs that combine the spirit of cooperation and principles of business can significantly contribute to agricultural growth and rural development by improving the scale economies in the production and marketing of agricultural commodities, especially in agrarian economies dominated by smallholders. Farmers benefit from their association with FPOs in several ways — better and affordable access to technologies, inputs, information, services, finances and markets, higher price realization, less price risk, and reduction in transaction costs. Recognizing these benefits, the Government of India has increasingly focused on establishing and nurturing FPOs to strengthen backward and forward linkages of agriculture for the benefit of the smallholders who are a force to reckon with in Indian agriculture. Currently, there are more than 24000 FPOs registered under the Indian Companies Act, undertaking several agricultural activities, and 10,000 more FPOs are to be nurtured by 2027-28 under the central sector scheme.

However, our understanding of the performance of FPOs in terms of their socio-economic impacts, inclusiveness, governance and financial viability is limited. This paper, based on an extensive review of literature, synthesizes empirical evidence on the impacts of FPOs at the farm, market and society levels, identifies their weaknesses and strengths in terms of financial viability and governance, and assesses the institutional and policy requirements for making FPOs as a preferred vehicle for inclusive agricultural development. I congratulate the authors of this paper for their painstaking efforts in compiling and synthesizing information on different dimensions of FPOs and putting these succinctly in this paper. I hope the findings may serve as evidence-based feedback to policymakers and institutions promoting FPOs, and for FPOs themselves to take corrective measures to improve their outreach and performance.

P S Birthal
Director, ICAR-NIAP

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With all humility, we acknowledge the help and support provided by a number of individuals in the course of this study. We express our gratitude to Dr. P. S. Birthal, Director, ICAR-NIAP for continuous guidance, support and efforts in bringing this paper to its present shape. Our sincere thanks are due to Dr. Ranjit Kumar, Principal Scientist, NAARM, Hyderabad and Dr. K.J.S. Satyasai, NABARD, Mumbai for an extensive and intensive review of its earlier draft. We have immensely benefitted from their observations and comments. Our colleagues, Dr. Shiv Kumar and Dr. Raka Saxena have provided several constructive comments and insights for improving the manuscript.

We hope the findings reported in this paper will be useful for policymakers, development practitioners, and FPOs themselves in taking informed-decisions to make them a vehicle of agricultural development and farmers' welfare. Besides, these findings will also motivate further research on several of the unexplored issues.

Authors

Executive Summary

In smallholder-dominated agrarian economies, Farmer Producer Organizations (FPOs) are claimed to be one of the most effective vehicles to foster rapid growth in agriculture and rural development. In India, 86 percent of farm households cultivate landholdings of less than or equal to two hectares. And, because of the small scale, they have poor access to technology, inputs, information, finances and markets, and often incur higher costs in their search and acquisition. Collectivization of farmers into FPOs eases farmers' access to resources, infrastructure and information at a lower cost, and also improves their bargaining power in the marketplace.

FPOs is an umbrella term used for farmer organizations registered either under the Companies Act 1956 (termed as Farmer Producer Companies or FPCs) or Co-operative Societies Act or the Society Registration Act or the Indian Trust Act. Currently, there are more than 24000 FPOs registered with the Ministry of Corporate Affairs. The Government of India has targeted establishing 10,000 new FPOs by 2023/24 and supporting them till 2027/28. However, our understanding of the economic viability and impacts of FPOs is limited. In this paper, we undertake a meta-analysis of the existing studies to shed some light on their performance and derive institutional and policy lessons for making them an effective means of agricultural development and farmers' welfare.

Empirical studies in India have reported mixed evidence regarding the impact of the FPOs on farm performance. Nonetheless, the meta-analysis indicates that FPOs have considerable potential to contribute towards improving productivity, technical, allocative and scale efficiencies, in agriculture, commodity prices and farmers' income by enhancing farmers' access to improved technologies, quality inputs, markets, finances and information. The key findings emerging from the meta-analysis are:

- FPOs facilitate smallholder farmers' access to domestic and international markets, help them reduce transaction costs and realize better prices for their produce.

- FPOs contribute towards improving technical efficiency in agriculture and hence higher agricultural productivity and farm income.

- Smallholder farmers benefit more from their association with FPOs.
- Financial performance of many FPOs is not satisfactory. They have small paid-out capital, insufficient for their participation in government schemes. Liquidity ratios also do not support their financial viability. Their inability to prepare a sound business plan is identified as one of the main factors for their poor performance.
- Most FPOs are engaged in primary agriculture and do not have the infrastructure for undertaking processing and value-added activities.
- The success of FPOs is crucially determined by (i) their access to markets, inputs, credit, information and modern technologies, (ii) scale of operation, and (iii) members' participation and inclusiveness.

Based on the above findings, the following strategies are recommended to improve the performance of the FPOs.

- FPOs should improve their membership to improve their paid-up capital to the level that enables them to participate in government schemes.
- FPOs should establish institutional linkages with leading management institutions to develop viable business plans.
- Consistent guidance and support to the FPOs beyond the incubation phase, for working capital, capacity building, market access, and regulations is crucial to improve their financial viability.
- FPOs should continuously focus on market research and building their own commodity brands.
- Introduction of high-end technologies such as blockchain, and the digitization of FPO databases can help them to harness their business potential and to gain consumers' confidence.

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1 Introduction

Indian agriculture is dominated by smallholders. More than 86 percent of the total landholdings are of size less than or equal to two hectares. The average landholding size has declined continuously, from 2.3 ha in 1970-71 to 1.37 ha in 2000-01 and further to 1.08 ha in 2016 (GoI 2019). Owing to small holdings, farmers suffer from diseconomies of scale in pre- and post-harvest activities. They lack access to markets, institutional credit, inputs, and technologies. The diseconomies of scale also limit their ability to take appropriate decisions on crop choices, cultivation practices and input use, and participation in markets, resulting in poor returns on investment and higher transaction costs (NCEUS 2008).

One of the best strategies to improve farmers' welfare is their collectivization into Farmer Producer Organizations (FPOs). There are various channels through which FPOs can improve farmers' income, foster agricultural growth and enhance rural development. Farmers' collectives minimize costs by spreading fixed costs associated with production, storage, transportation, and marketing (Herck 2014; Markelova *et al.* 2009). The improvement in scale and access to markets empower smallholders to negotiate better terms of trade in input and output markets. Farmers as members of FPO have also better access to domestic and export markets, which otherwise is not possible for individual farmers producing small amounts for the market (Abokyi 2013; Herck 2014). Accessing institutional finance is easier for the FPO than for individuals, especially smallholders who lack tangible or documented assets to offer as collateral to secure finance from commercial banks and other financial institutions. Collective procurement of inputs reduces transaction costs, and therefore the cost of cultivation. Further, the provision of market support, storage, and processing facilities reduces transaction costs in output marketing (Bhanot *et al.* 2021). Information sharing and coordination are the most important functions of FPOs (Bosc *et al.* 2001; GFRAS 2015). As a social network, FPOs also play an important role in information dissemination (Bachke 2009). They provide information on modern agriculture technologies, inputs, markets, investment opportunities, and government policies (FAO 2007). Accessing extension and advisory services collectively also spreads their acquisition cost which is generally fixed (GFRAS 2015). FPOs serve as an

important link with the research institutions for participatory technology development (Hussein 2001).

Value addition and processing are important functions of FPOs. Value addition reduces post-harvest losses and improves income. FPOs can help farmers get finance for the purchase of costly machineries needed for value addition (FAO 2012). Collective market infrastructure helps small and marginal farmers connect with international markets (Nikam *et al.* 2014), and cope with risk. Collective action can aid in the efficient utilization of natural resources. FPOs have the potential to create jobs for rural youths. In the long run, agricultural growth has been reported as an effective pathway for poverty alleviation (Hazell *et al.* 2010). Moreover, FPOs help spill over benefits of agricultural development to other sectors, and thus promote economic growth and reduce poverty (FAO 2007; World Bank 2008).

Given the dominance of smallholders and fragmented supply chains, strengthening farmers' collectives in the form of cooperatives and FPOs is one of the topmost priorities for the Government of India. This, however, needs evidence-based feedback on various dimensions of FPOs, especially on their impacts, performance and governance for making informed decisions and interventions. We conduct a systematic review of literature and a meta-analysis of studies published on these dimensions. Through this exercise, we attempt to address the following questions:

- How farmers have benefitted from FPOs?
- How have FPOs performed in India?
- What are the conditions for the success of FPOs?

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2 Current Status of FPOs in India

A producer organization is a legal entity formed by primary producers, viz., farmers, fishermen, weavers, etc. A Farmer Producer Organization (FPO) is a type of producer organization with farmers as members (NABARD 2015). FPO is a generic name, that refers to the farmer organization registered either under Part IXA of the Companies Act 1956, part XXI A of the Companies Act 2013, or under the central or state Co-operative Societies Act or the Society Registration Act or the Indian Trust Act. In India, many governmental and non-governmental organizations are instrumental in supporting and facilitating FPOs to emerge as business enterprises. The main supporting organizations are the Small Farmers Agribusiness Consortium (SFAC), the National Bank for Agriculture and Rural Development (NABARD), the National Cooperative Development Corporation (NCDC), the Agricultural Technology Management Agency (ATMA), and the Krishi Vigyan Kendra's (KVKs).

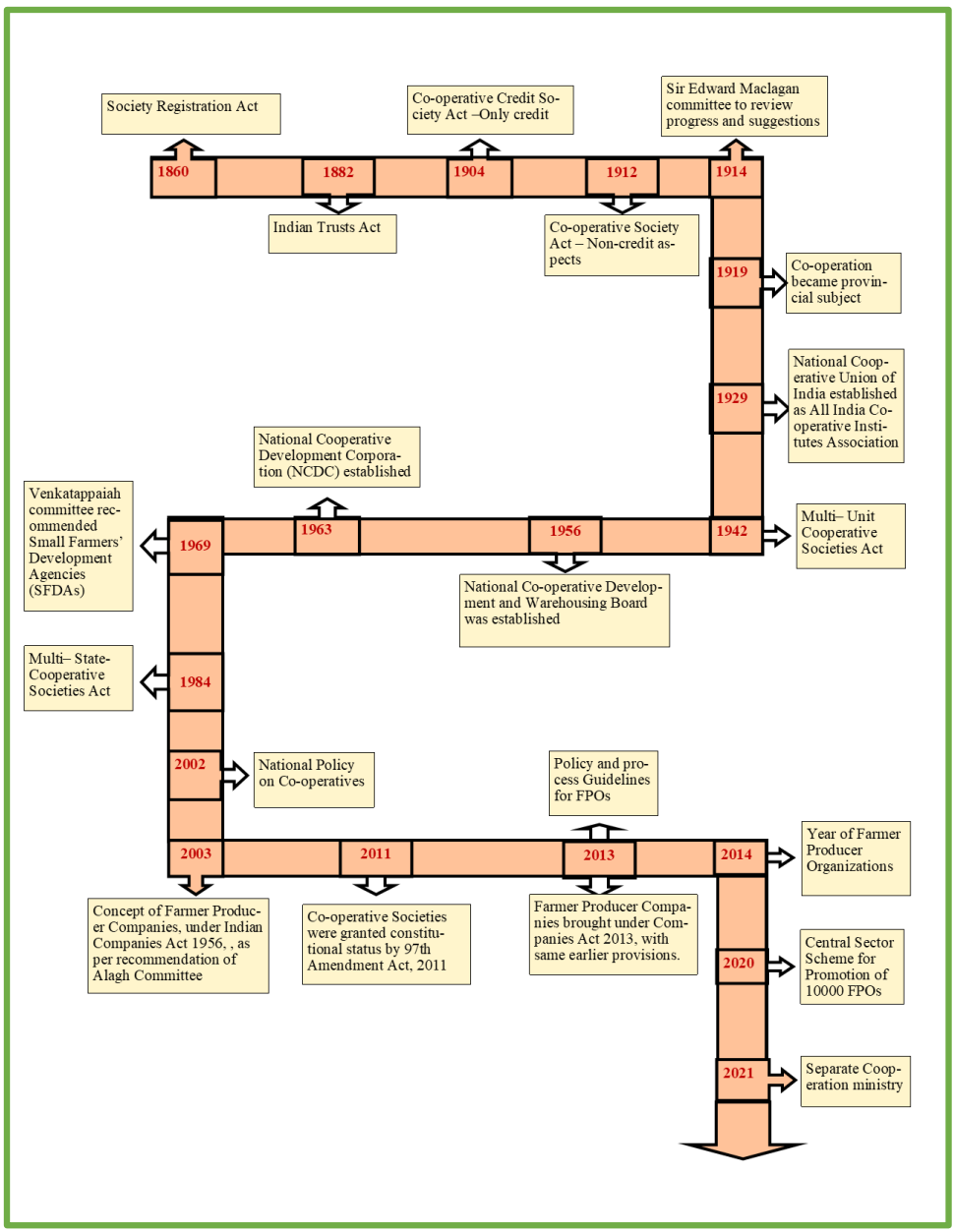
2.1 Evolution

Farmers' collectives in the form of cooperatives have existed in India since the beginning of the twentieth century. Figure 1 narrates the important milestones in the evolutionary process of farmers' collectives. Dairy and sugar cooperatives have been at the forefront of the cooperative movement. The cooperatives did succeed in some parts of the country, but not in others because of several factors such as high government control/ intervention, lack of professionalism, lack of active participation of members in management and undue political and bureaucratic intervention (Shaw *et al.* 2006).

To overcome the limitations of the cooperatives, the Government of India constituted a Committee under the chairmanship of Prof. Y.K. Alagh in 2000. The Committee suggested the formation of new-generation cooperatives or a hybrid between cooperatives and corporates incorporating the spirit of cooperation and principles of business. Consequently, in 2003 the Government of India introduced the concept of Farmer Producer Companies (FPCs) amending the Companies Act 1956. Since then, FPCs have emerged, but few in number. In 2013, the national policy for the

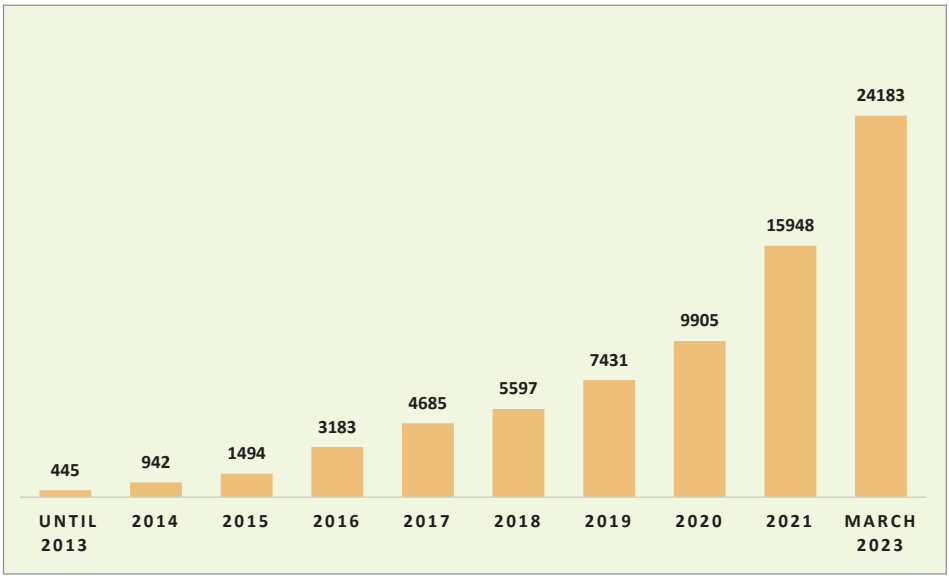
promotion of FPOs was formulated, which provided process guidelines for the establishment of FPOs. Since then, there has been a significant increase in the FPOs (Figure 2).

Figure 1. Important milestones in the Farmers' collectives in India



Source: Authors' compilation

Figure 2. Trend in FPOs in India



Source: Neti and Govil (2022); NAFPO (2023)

2.2 Status of FPOs

The database of the Ministry of Corporate Affairs, Government of India shows the presence of 24183 FPCs as of March 31, 2023 (NAFPO 2023). There are more than 2.14 lakh non-credit cooperatives working in agricultural sector (NCUI 2018). The Government of India has targeted establishing 10,000 new FPOs by 2023-24 under the Central Sector Schemes; and by April 2023, about half of these have come into existence. State-wise details of FPOs are given in Table 1.

Most of the FPOs are concentrated in Maharashtra, Karnataka, Madhya Pradesh, Telangana, and Uttar Pradesh. It is worth mentioning that Maharashtra, Karnataka, and Madhya Pradesh have programs/ policies in place for the formation and promotion of FPOs. Karnataka established a Centre of Excellence for FPOs in 2017 to strengthen the backward and forward linkages through financial support. Maharashtra promotes FPOs through the Maharashtra State Agricultural Marketing Board, Federations like MahaFPC, and projects like the Maharashtra Agricultural Competitiveness Project (MACP), the Maharashtra Project on Climate Resilient Agriculture (PoCRA) and the State of Maharashtra's Agribusiness and Rural Transformation (SMART) Project. In Madhya

Pradesh, the Madhya Bharat Consortium of Farmer Producers Company Limited (MBCFPCL) is a state-level consortium to facilitate the emergence of FPOs as a viable business entity.

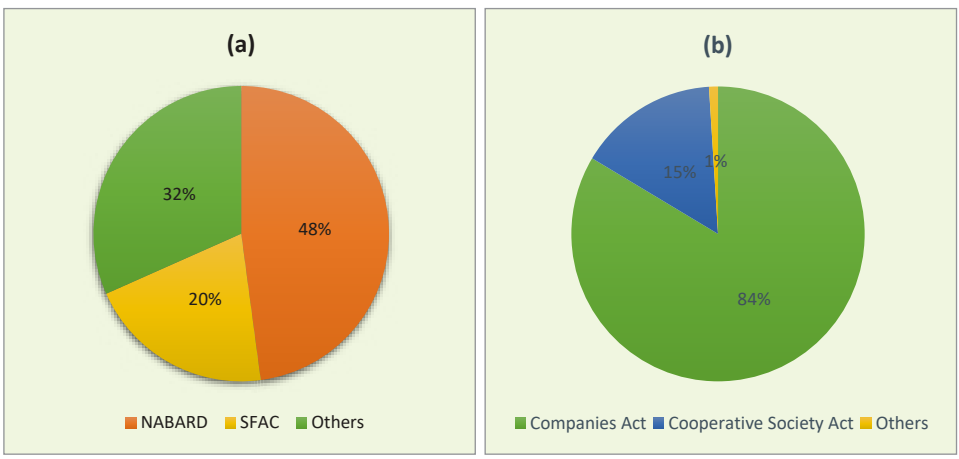
Number of farmers mobilized

The SFAC has mobilized 8.46 lakh farmers from 853 FPOs with an average membership of 992 per FPO (GoI 2020). The NABARD has mobilized 13.8 lakh farmers from 3721 FPOs with an average of 371 members per FPO (NABARD 2021). On the whole, more than 22 lakh farmers have been mobilized by the 4574 registered FPOs.

Promoting institutions and forms of FPOs

The NABARD and the SFAC are the main government agencies for promoting FPOs. Of the total 4308 FPOs whose data is available, 48 percent have been formed by the NABARD, 20 percent by the SFAC, and the rest 32 percent by other agencies (Figure 3a). About 84 percent of the FPOs are Farmer Producer Companies (FPCs) registered under the Companies Act, 15 percent under the Cooperative Acts of the Centre and States, and one percent under the Society Registration Act and the Indian Trust Act (Figure 3b).

Figure 3. FPOs distribution by promoting institutions (a) and type of registration (b)



Source: Authors' computation based on data from the SFAC and NABARD FPO portals.

Table 1. State-wise number of FPOs

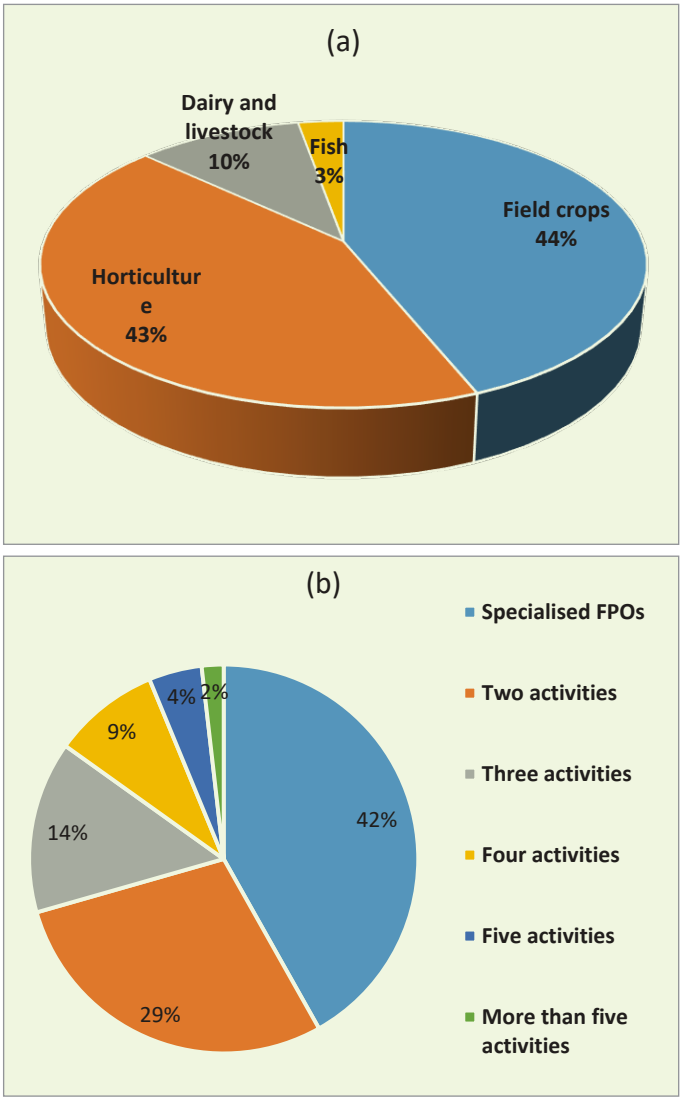
S.N.	State/UTs	FPOs registered [1]				Progress of FPOs registered under the 'Formation and Promotion of 10,000 FPOs' scheme[2]	Number of FPCs registered with Ministry of Corporate Affairs[3]
		SFAC	NABARD	Central Sector Schemes	Total		
1	Andhra Pradesh	16 (1.78)	295 (7.56)	88 (3.90)	399 (5.65)	196 (4.13)	1385 (5.73)
2	Bihar	38 (4.23)	217 (5.56)	101 (4.47)	356 (5.04)	211 (4.44)	962 (3.98)
3	Chhattisgarh	26 (2.90)	57 (1.46)	61 (2.70)	144 (2.04)	114 (2.40)	242 (1.00)
4	Goa	2 (0.22)	2 (0.05)	1 (0.04)	5 (0.07)	7 (0.15)	13 (0.05)
5	Gujarat	25 (2.78)	190 (4.87)	140 (6.20)	355 (5.03)	303 (6.38)	602 (2.49)
6	Haryana	23 (2.56)	85 (2.18)	93 (4.12)	201 (2.85)	142 (2.99)	-
7	Himachal Pradesh	8 (0.89)	99 (2.54)	67 (2.97)	174 (2.46)	96 (2.02)	134 (0.55)
8	Jammu & Kashmir	2 (0.22)	23 (0.59)	64 (2.84)	89 (1.26)	117 (2.46)	123 (0.51)
9	Jharkhand	10 (1.11)	150 (3.84)	96 (4.25)	256 (3.63)	185 (3.90)	386 (1.60)
10	Karnataka	125 (13.92)	287 (7.35)	166 (7.35)	578 (8.90)	230 (4.85)	1069 (4.42)
11	Kerala	0	134 (3.43)	36 (1.60)	170 (2.41)	95 (2.00)	407 (1.68)
12	Madhya Pradesh	149 (16.59)	254 (6.51)	147 (6.51)	550 (7.79)	387 (8.15)	1316 (5.44)
13	Maharashtra	105 (11.69)	291 (7.45)	173 (7.67)	569 (8.06)	362 (7.63)	8212 (33.96)
14	Odisha	41 (4.57)	241 (6.17)	165 (7.31)	447 (6.33)	307 (6.47)	981 (4.06)
15	Punjab	7 (0.78)	93 (2.38)	22 (0.97)	122 (1.73)	40 (0.84)	-
16	Rajasthan	50 (5.57)	166 (4.25)	135 (5.98)	351 (4.97)	358 (7.54)	842 (3.48)
17	Tamil nadu	13 (1.45)	264 (6.76)	133 (5.89)	410 (5.81)	248 (5.22)	1234 (5.10)
18	Telangana	26 (2.90)	335 (8.58)	99 (4.39)	460 (6.52)	162 (3.41)	-
19	Uttarakhand	7 (0.78)	90 (2.31)	57 (2.53)	154 (2.18)	118 (2.49)	98 (0.41)
20	Uttar Pradesh	57 (6.35)	183 (4.69)	210 (9.30)	450 (6.37)	608 (12.81)	3463 (14.32)
21	West Bengal	89 (9.91)	305 (7.81)	10 (0.44)	404 (5.72)	105 (2.21)	891 (3.68)
22	Union Territories	4 (0.004)	4 (0.001)	5 (0.002)	13 (0.002)	8 (0.002)	987 (0.041)
23	North-Eastern states	75 (0.08)	139 (0.04)	188(0.08)	402 (0.06)	348 (0.07)	836 (0.03)
	All India	898	3904	2257	7059	4747	24183

Notes: [1]Up to March 2022 (GoI 2022); [2]Registered FPOs under Central Sector Scheme for Formation and Promotion of 10,000 FPOs up to February 2023, from SFAC website; [3]Upto March 2023 (NAFPO 2023). Figures in parentheses are percent of all India.

Major activities of FPOs

A majority of the FPOs have their focus on field crops (cereals, pulses, millets, oilseeds and cash crops), followed by horticulture (vegetables, fruits, flowers, and spices), and dairy & livestock (Figure 4a). About 42 percent of the FPOs are specialized, engaging in a single activity, and the rest in more than two activities (Figure 4b).

Figure 4. Major crops/activities of the FPOs: Sector wise distribution (a), distribution of activities (b)



Source: Authors' computation based on data from SFAC and NABARD FPO Portal.

Business activities of FPOs

The details of the business activities of FPOs are presented in Table 2. About half of the FPOs are involved in the marketing of produce alone, and about 42 percent provide input services to their members. Procurement of farm produce is undertaken by 22.2 percent of the FPOs, and the value addition and processing by 21 percent. Aggregation of produce from members is practiced by 20.4 percent and production by 7.6 percent. Notably, many of these undertake a combination of business activities including input supply and output sale. Their presence in value-added activities, however, is negligent.

Table 2. Business activities of FPOs

Business activities	Percent of FPOs engaged	Business activities	Percent of FPOs engaged
Marketing	50.2	Input + Marketing	19.7
Input services	42.2	Aggregation + Marketing	12.6
Procurement	22.4	Value addition + Marketing	10.7
Value addition and Processing	21.2	Production + Marketing	5.4
Aggregation	20.5	Input+ Production + Marketing	5.1
Others	11.2	Aggregation + Procurement	4.5
Production	7.6	Aggregation + Value addition	3.6

Source: Authors' computation based on data from the SFAC and NABARD FPO portals.

2.3 Government initiatives for promoting FPOs

The schemes and programs for the promotion of FPOs are mainly implemented through the NABARD, SFAC, centrally sponsored schemes, and state-specific programs. The Government of India has approved and launched a Central Sector Scheme "Formation and Promotion of 10,000 Farmer Producer Organizations (FPOs)" to form 10,000 more FPOs by 2023/24 and support them till 2027-28. The Scheme is implemented as a Produce Cluster Area approach for a specific commodity. The NABARD, SFAC, NCDC, and NAFED are identified as the main implementing agencies. Cluster-Based Business Organizations are empaneled for the

promotion of FPOs. FPOs are being provided financial assistance of up to Rs. 18.00 lakh for three years to cover administrative and management costs. Besides, they get an equity grant of up to Rs. 2,000 per farmer-member with a limit of Rs. 15.00 lakh and a credit guarantee facility of up to Rs. 2 crore of project loan per FPO from an eligible lending institution. A District Level Monitoring Committee (D-MC) under the chairmanship of the District Collector/ CEO/ Zilla Parishad, and a National Project Management Agency (NPMA) at the national level are set up for providing guidance, coordination, and compilation of information related to maintenance of Management Information System (MIS) and monitoring purposes. For capacity development and training, institutions like Bankers Institute of Rural Development (BIRD), Lucknow, and Laxmanrao Inamdar National Academy for Cooperative Research and Development (LINAC), Gurugram, have been identified.

FPOs are also promoted under other schemes, such as the Rashtriya Krishi Vikas Yojana (RKVY) -Remunerative Approaches for Agriculture and Allied Sector Rejuvenation (RAFTAAR), "Vegetable Initiative for Urban Clusters (VIUC)" and 'Integrated Development of 60,000 Pulse Villages in Rainfed Areas'. Under the revamped National Food Security Mission (NFSM), the small and marginal farmers will be grouped into FPOs and assisted in value chain integration. A new Central Sponsored Scheme (CSS) "Operation Greens," aims at integrated development of tomato, onion, and potato (TOP) value chains. FPOs can register on the e-NAM portal and can act as an aggregator of produce to sell through e-trading in single or multiple lots. FPOs can also be promoted under the Pradhan Mantri Formalisation of Micro Food Processing Enterprises (PMFME) Scheme of the Ministry of Food Processing Industry (MoFPI) for agri-food processing and value chain development.

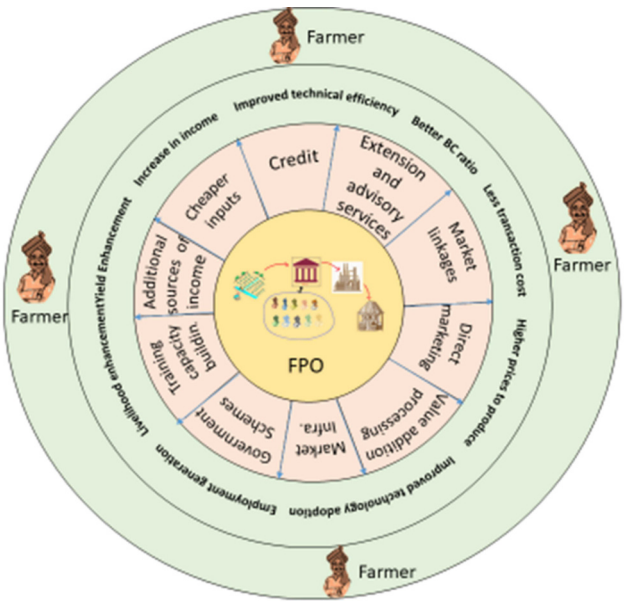
The NABARD extends financial support for the formation of FPOs, their capacity building/handholding, and strengthening market linkages. The NABKISAN has devised new financial products for Farmer Producers Organisations (FPOs) and has emerged as the biggest lender to the FPOs. A Credit Guarantee Fund of Rs. 1,000 crores with an equal share from the Government of India and the NABARD has been set up under NABSANRAKSHAN, a NABARD subsidiary, to incentivize banks to finance FPOs. The SFAC provides support to FPOs through the Venture Capital Assistance Scheme, the Equity Grant Fund Scheme, and the Credit Guarantee Fund Scheme. In addition, state governments have their programs for the promotion of FPOs.

3 Impact of FPOs

There are several channels through which the FPOs can impact farmers' income and agricultural development. Some important channels are.

- Timely provision of quality inputs at lower than market price
- Easy availability of credit
- Provision of extension and advisory services
- Market linkages at national and international levels and remunerative prices
- Provision of post-harvest infrastructure facilities of pre-cooling, cooling, cold storages, warehouses
- Training and capacity building of the member farmers in agriculture and allied sectors.

Figure 5. FPOs Impact pathways and indicators



Source: Authors' compilation

Studies have analyzed the impact of FPOs on various indicators, *viz*., yield, income, technical efficiency, transaction cost, input and output prices, technology adoption, and employment generation, among others. Broadly these impacts can be classified at three levels: farm, market, and society.

3.1 Farm-level impacts

Studies have reported mixed evidence on the impacts of FPOs on the yields of crops and livestock (Table 3). Some studies have found a positive and significant impact on crops and milk yield (Kumar *et al*. 2018; Vandeplas *et al.* 2013). It is understood that with the availability of quality and timely inputs, extension and advisory services, the yields of crops and livestock are likely to be higher. However, other studies do not find significant yield advantages due to farmers' association with FPOs. This is because of the weak or absence of extension and advisory services, and the provision of inputs by the FPOs to its members.

Table 3. Impact indicators and research evidence of the field-level impact of FPOs

Indicator	Impacts	Location	Reference
Technology adoption	Membership in FPOs had a significant impact on the adoption of technologies and Good Agricultural Practices.	Bihar	Verma *et al.* (2019)
	FPO members adopt more artificial insemination and concentrate feeds for dairy animals.	Assam	Bayan (2020)
	A significant positive relationship between dairy cooperative membership and the adoption of food safety measures.	Bihar	Kumar *et al.* (2018)
Technical efficiency	Higher technical efficiency for the members of dairy cooperatives	Gujarat	Mahida *et al.* (2018)
	A higher proportion of cooperative members (48%) had technical efficiency of more than 60 percent as compared to non-members (18%)	Telangana	Manaswi *et al.* (2020)
	Milk producers in cooperative supply chains experienced a higher technical efficiency as compared to those who do not follow modern supply chain practices	Punjab, Haryana, Himachal Pradesh, Uttar Pradesh, and Jammu & Kashmir	Mor and Sharma (2012)

Indicator	Impacts	Location	Reference
Yield	A positive and significant relationship between dairy cooperative membership and milk yield. Membership in the cooperative led to a 39.5 percent increase in income.	Bihar	Kumar *et al.* (2018)
	Dairy farmers selling milk to informal channels had 23 percent lower yields than the cooperatives.	Punjab	Vandeplas *et al.* (2013)
	No significant difference in milk yield for participants in different value chains, but farmers selling milk to cooperatives earned more profit.	Punjab	Birthal *et al.* (2017)
	No significant difference in milk yield between members and non-members of KASAM FPO.	Odisha	Mahapatra (2021)
	No significant contribution of dairy cooperatives in improving milk yield.	Manipur	Priscilla and Chauhan (2019)
Income per unit/ value of output	Mahagrapes farmers earned a significantly higher income.	Maharashtra	Roy and Thorat (2008)
	FPOs had a significant positive impact on the value of cotton output.	Maharashtra	Nikam *et al.* (2022)
	Households associated with FPOs had a higher level of income, lower incidence of indebtedness	Gujarat	Singh and Vatta (2019)
	A significant impact on members' gross income per unit area and price received per quintal.	Odisha	Mahapatra 2021
	Dairy farmers' integration with the modern dairy value chain had a positive and significant impact on net returns and household consumption expenditure.	India	Kumar *et al.* (2019)
	Members could realize 13.86 percent higher gross returns	Telangana	Manaswi *et al.* (2019)
Benefit-Cost ratio	Improvement in the Benefit-Cost ratio of members.	Telangana	Manaswi *et al.* (2020)
	FPO farmer members realized a higher Benefit-Cost ratio.	Andhra Pradesh	Sunisha *et al.* (2019)

Source: Authors' compilation

The impact of FPOs was analyzed synthesizing the evidence from various studies in a meta-analysis framework. A comprehensive literature search was conducted on online databases such as Google Scholar, Scopus, and Science Direct. Studies from India, obtained from 2000 to 2022 considered for analysis. On screening and eliminating outliers, 2980 observations related to crop and animal yield, 18079 to net income per unit area, and 1060 to technical efficiency were considered for analysis. The effect size was estimated as the response ratio for these parameters. Response ratio is a ratio of the outcome variable of FPO members and non-members.

Table 4. Impact of FPOs on yield, income, and technical efficiency

Parameter	Response ratio		Percent change
	Mean	Confidence Interval	
Crop yield	0.04*	0.004 to 0.07	3.59
Milk yield	0.17*	0.16 to 0.18	18.23
Income (crop)	0.3*	0.29 to 0.31	44.16
Income (livestock)	0.37*	0.33 to 0.4	33.80
Income(crop + livestock)	0.29*	0.28 to 0.31	34.52
Technical efficiency	0.09*	0.06 to 0.12	9.66

Note: * Significant at 1% level of significance.

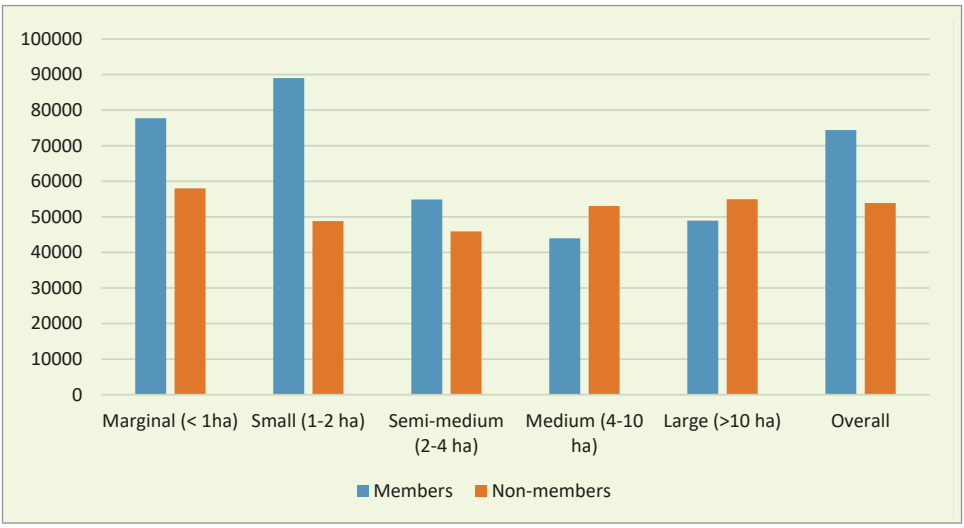
Source: Authors' computations.

The results of the meta-analysis indicate that FPOs have a significant positive impact on the yields of crops and dairy animals. The mean effect size is 3.59 percent for crops and 18.23 percent for milk (Table 4). The higher impact in the case of livestock is possibly due to better provision of extension and advisory services and inputs. However, the mean effect size for the net income is higher for both crops and livestock. This suggests that FPOs play an important role in marketing and the realization of better prices for their members. The impact on the net income is greater for crops possibly due to greater flexibility in the sale of crops. This has also been highlighted by Mahapatra (2021) and Nikam *et al.* (2022).

The data reported in the 77th round of the National Sample Survey Office (NSSO) (GoI 2021) indicate higher net income per unit area for members

of the FPOs (defined as registered farmers' organizations). FPO members earned 38 percent more over the non-members (Figure 6). Furthermore, the data show that marginal, small, and semi-medium farmers (those with land holdings of up to 4 hectares) benefit more from their association with FPOs. The members of FPOs also realized 16 percent more income from livestock over the non-members. Overall, the survey data suggest that FPOs have a positive impact on the income of smallholders.

Figure 6. Net income from crops (Rs/ha) for members and non-members of FPOs, 2018-19



Source: NSSO, 77th round

There is also evidence of higher technical efficiency on farms associated with FPOs. The meta-analysis shows that members of FPOs are technically more efficient than their non-members, with a mean effect size of 9.66 percent (Table 4). FPOs undertake capacity-building activities, provide better technology, and inputs, which lead to improvement in technical efficiency. This is also reflected in the higher Benefit-Cost ratios for the FPO members (Table 3).

3.2 Market-level impacts

Easy access to national and international markets has been reported in some studies (Table 5). Badatya *et al.* (2018) have shown that linkages with cooperatives yield significant returns to seed production. In Maharashtra, FPOs are effective partners of the state and central government agencies for the procurement and aggregation of produce. Bulk procurement by

the central government agencies of produce at minimum support prices (i.e., soybean, gram, and pigeon pea) has contributed to the high turnover of the FPOs (Badatya *et al.* 2018). Thus, FPOs help in decentralized and collective procurement and ease the burden of central and state government agencies.

Most of the studies have found a significant impact of FPOs on the price realization by their members (Table 5) because of their better access to markets and market intelligence through the FPOs. Similarly, studies have reported better prices due to the increased bargaining power of FPO members (Bhanot *et al.* 2021; Birthal *et al.* 2017). A study by the NABARD also reports better price realization and income by farmers due to their association with FPOs. The average price received was 7.5 to 12.5 percent more in Madhya Pradesh, 13.5 percent in Odisha, 25 percent in Rajasthan, and 45 percent in Kerala (NABARD 2021).

Reduction in transaction costs is highlighted in some studies (Table 5). Services like extension and advisory services, and provision of inputs and market infrastructure (cooling unit cold storage, etc.) help to reduce transaction costs. Input supply by FPOs is an effective means of gaining the trust and confidence of the members. This helps to save input costs and assures quality inputs. FPOs can be an effective medium for establishing market infrastructure at the local level. Mahagrapes, a grape growers association in Maharashtra, had established precooling, cooling, and cold storage at the Cooperative Society level. Funds from government schemes can be obtained by FPOs to create market infrastructure including transportation services. During the Covid-19 pandemic, it has been seen that FPOs having this basic market infrastructure could cope with the lockdowns imposed to contain the spread of the pandemic (Nikam and Kale 2020) as the availability of transport facilities helped to establish direct linkages with consumers.

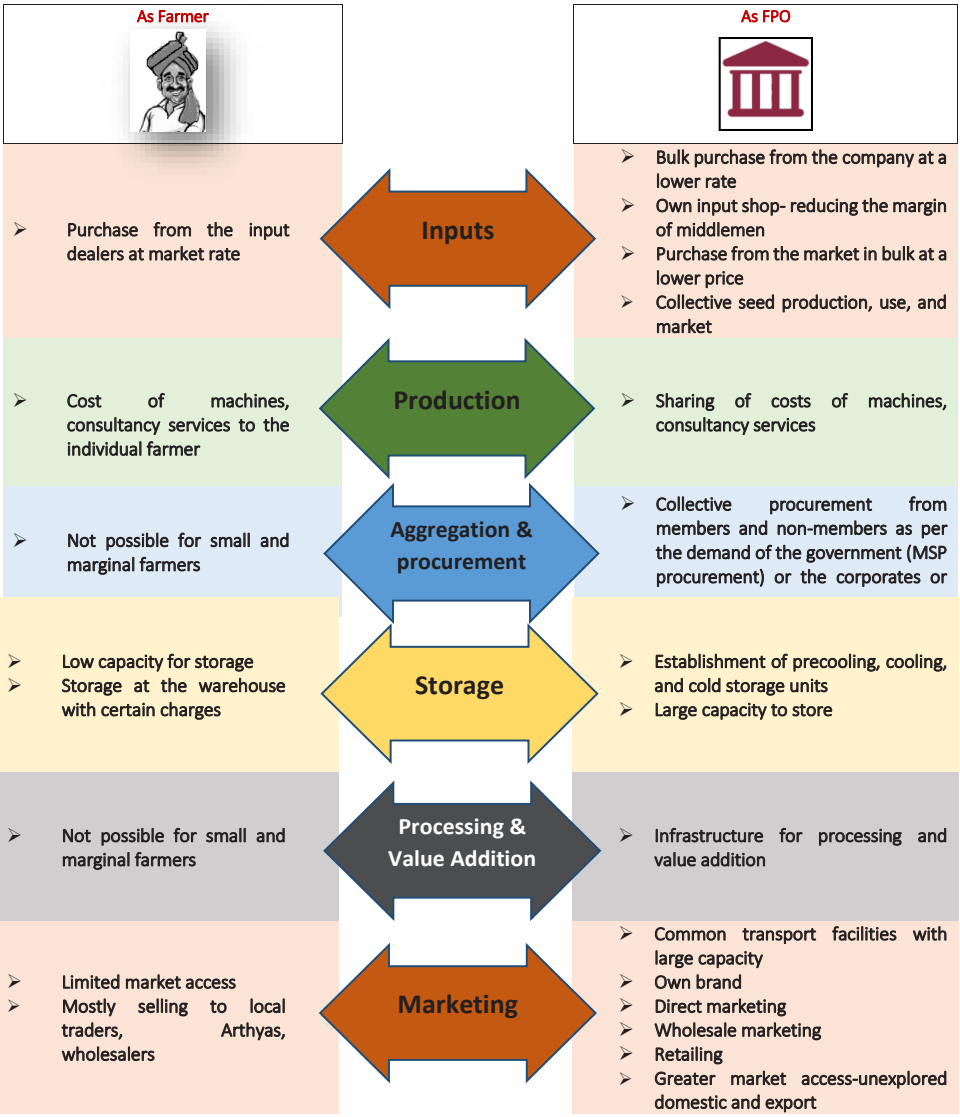
Table 5. Impact of FPOs at market-level

Indicator	Impacts	Location	Study
Market access and linkages	Small and marginal farmers were linked to international markets by FPOs in Maharashtra.	Maharashtra	Roy and Thorat (2008)
	Collectivization and development of diversified value chains strengthened market linkages of land-constrained farmers.	West Bengal	Bagchi *et al.* (2021)
	Benefits arose mainly because of an increase in market access, marketable surplus, and bargaining power for producer organizations.	Uttarakhand and Kerala	Cherukuri and Reddy (2014)
	Direct marketing by FPOs had the highest marketing efficiency in organic chili, among other channels.	Telangana	Manaswi *et al.* (2019)
Higher prices	Collective marketing through FPC improved farmers' bargaining power, thereby better prices for their produce.	Maharashtra	Bhanot *et al.* (2021)
	Farmers associated with the cooperative value chain earned more profit because of better price realization.	Punjab	Birthal *et al.* (2017)
Reduction in transaction costs	FPOs reduce the multiple intermediaries, thereby reducing the transaction costs for small farmers.	Maharashtra	Bhanot *et al.* (2021)
	FPOs were instrumental in reducing transaction costs and the number of intermediaries and a higher proportion of the producer's share in the consumer's rupee.	Telangana	Manaswi *et al.* (2020)
	Lower transaction costs for members of the FPOs.	Tamil Nadu	Parthiban *et al.* (2015)

Source: Authors' compilation

The establishment of processing and value-addition facilities at the FPO level helps reduce post-harvest losses and price risk, giving additional income to farmers (Naik *et al*. 2019). The role and benefits of FPOs to the small and marginal farmers in marketing operations in comparison with the individual farms are depicted in Figure 7.

Figure 7. Benefits of FPO in comparison to an individual farmer in different stages of the value chain



Source: Authors' compilation

3.3 Impact at society level

The benefits of FPOs are also realized beyond the farm boundaries (Table 6). Value addition and marketing generate income and employment and improve the livelihood of small and marginal farmers. Women also benefit from FPOs in terms of social, political, economic, and human capital formation. Some female-only FPOs have been established to empower farm

women. Social cohesion and social capital are important functions served by FPOs. FPOs can also promote entrepreneurial culture at the village level. FPOs have also helped reduce farmers' dependence on informal credit (NABARD 2021).

Table 6. Impact of FPOs at society level

Indicator	Impacts	Location	Reference
Employment generation	FPOs helped employment generation for dairy households.	Manipur	Priscilla and Chauhan (2019)
	Members realized more income and employment.	Rajasthan	Yajamanya and Singh (2021)
Livelihood enhancement	Due to their involvement in FPO, the resource-poor women could enhance their social, political, economic, and human capital.	Madhya Pradesh and Uttar Pradesh	Mukherjee *et al*. (2019a)
Innovations	The dynamic capabilities (i.e. resource orchestration, co-value creation) enabled the FPO and their member to reconfigure resources and apply new practices on farms in innovative ways, resulting in sustainable business outcomes	Tamil Nadu	Krishnan *et al*. (2021)

Source: Authors' compilation

4 Financial Performance of FPOs

The financial performance of FPOs (those registered under the Companies Act or FPCs) was assessed through a meta-analysis of studies conducted with 126 FPOs in India. Paid-up capital, liquidity ratios, solvency ratios, profit ratios, and turnover ratios are the main indicators to assess their performance. Most studies have focused on the latter four indicators, and only a few have considered paid-up capital, which is an important prerequisite for availing benefits of different government schemes. Liquidity and profit ratios are important for knowing their operational efficiency; paid-up capital and solvency ratios for their long-term stability.

4.1 Paid-up capital

Paid-up capital is an important indicator of the progress of an FPC. It represents the amount of money the shareholders have invested in the FPC. A higher paid-up capital indicates shareholders' confidence in the company. Therefore, monitoring changes in the paid-up capital over time provides insights into the FPC's financial stability and growth potential. A recent study by Neti and Govil (2022), using data from 15948 FPCs found that for close to 80 percent of them registered in the last four years, the paid-out capital was less than Rs. 5 lakhs. This is less than the prescribed minimum equity required to start trading and value-addition operations prescribed by the Institute of Cost Accountants of India. Grassroots-level studies (e.g. Badatya *et al*. 2018) also corroborate this. The government has initiated schemes to promote and strengthen FPOs through different schemes such as the Equity Grant Fund and the Agricultural Infrastructure Fund, but due to low paid-up capital most of the FPCs are ineligible to avail benefits of these schemes. As of March 2020, less than one percent of the FPCs could avail the benefit of the Equity Grant Fund, and close to three-fourths of these are concentrated in Maharashtra, Karnataka, Tamil Nadu, Uttar Pradesh, and West Bengal (GoI 2020). It necessitates efforts from FPOs to increase their paid-up capital.

4.2 Liquidity ratios

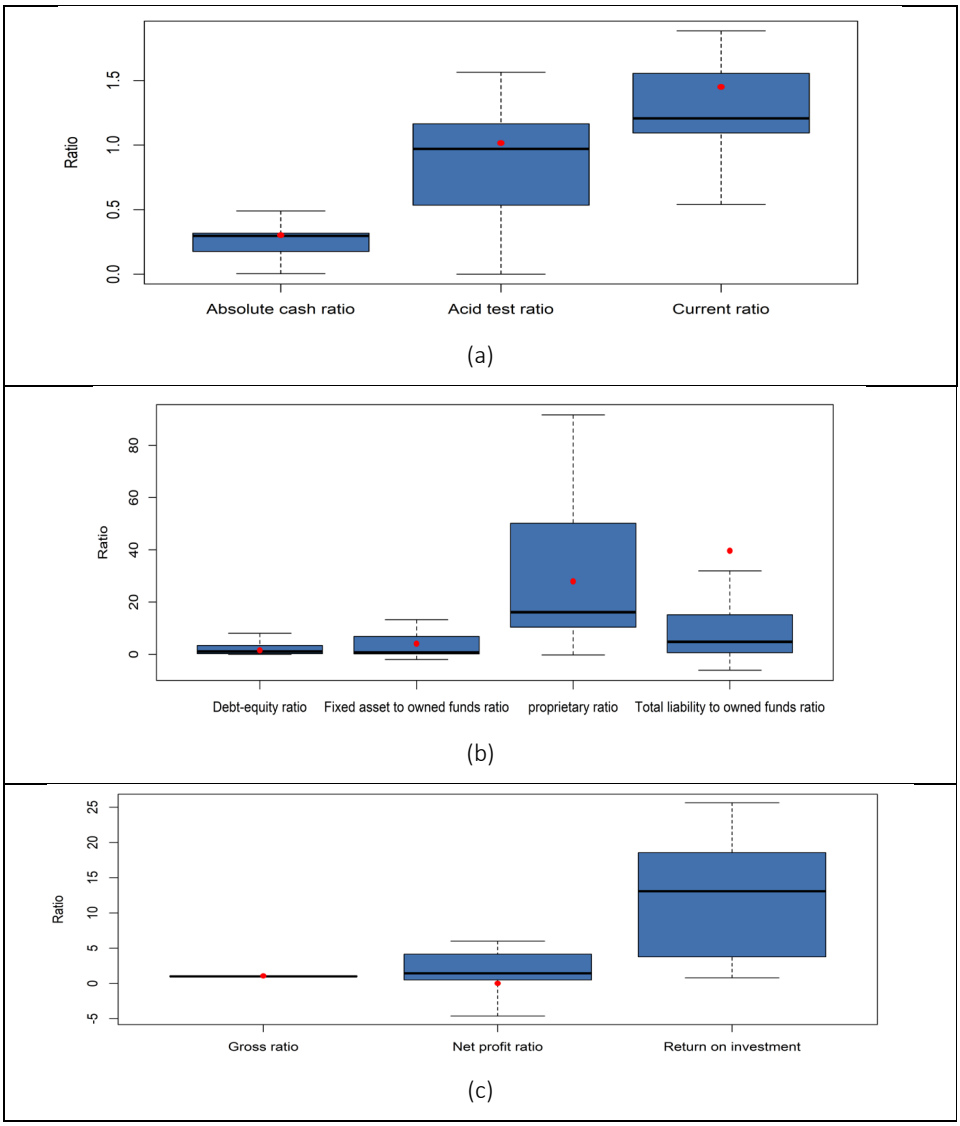
Liquidity ratios indicate the ability of the FPO to pay off its debt as and when it becomes due. The higher liquidity ratio indicates that the FPO

has a strong ability to pay its bills and debts, and has enough cash and liquid assets to operate and expand its business, while the lower liquidity ratio indicates financial strain and the possibility of default. Three types of ratios – current ratio, acid test ratio, and absolute cash ratio – are used to test the liquidity of a business entity. The current ratio measures the company's ability to pay off its short-term liabilities from its current assets. The absolute cash ratio is the most stringent measure of liquidity and considers only cash and cash equivalents as assets. The acid test ratio, also known as the quick ratio, is a moderately conservative test of liquidity, which excludes inventory from the current assets. The meta-analysis indicates an average current ratio of about 1.5:1, which is lower than the ideal 2:1, but closer to the acceptable 1.5:1 (Figure 8a). Further analysis shows that for two-thirds of the FPOs, the current ratio is less than the acceptable level, and it is higher only for 15 percent (>2.5:1). The analysis further shows that some FPOs start with a good current ratio, but it turns out unfavorable within a short period of three years, which indicates their inability to generate sufficient cash. The average acid-test ratio is close to the ideal ratio of 1:1, but it is less than one for half of the FPOs. The average absolute cash ratio is 0.30, indicating that 30 percent of the current liabilities are met through cash alone.

4.3 Solvency ratios

Solvency ratios measure a company's ability to pay long-term debt obligations and are used to assess its financial health and stability. Four types of solvency ratios are the debt-equity ratio (total liabilities to its fund), the fixed asset-to-own fund ratio, the proprietary ratio (shareholders' equity to total assets ratio), and the total liabilities to owned fund ratio (Figure 8b). The debt-equity ratio is one of the most important measures to test the solvency of the business. The average debt-equity ratio is in the comfortable range of 1 to 1.51. However, for 36 percent of the FPOs, the debt-equity ratio is more than two, suggesting that they face significant financial distress and are unable to pay their debts. This is mainly due to their inability to raise sufficient funds through shareholding. The low paid-up capital also reflects this. The proprietary ratio measured in percentage terms was also low (~ 30). Therefore, more emphasis is needed on strengthening the existing FPOs in raising and managing the funds. The interest coverage ratio (FPO's ability to pay its interest expenses) is another important measure but has not been analyzed in most studies.

Figure 8. Financial performance of FPOs: liquidity ratios (a), solvency ratios (b) and profitability ratios (c)



Note: Red dots indicate the average value of the ratio
Source: Authors' computations

4.4 Profitability ratios

Profitability ratios provide important insights into how efficiently the organization is managing its operations, how profitable it is, and how well it is utilizing its assets, and managing debt. Different types of profitability ratios have been used to assess the performance of FPOs. The average

gross ratio (total expenses/gross income) approaches one, indicating that the total expenses of the FPOs are close to their gross income (Figure 8c). The average net profit ratio is pegged at 0.01 and the return on investment is negative which may have significant implications for FPOs' financial health, competitiveness, and ability to generate returns for shareholders.

Of course, these financial ratios are used to assess the performance of the companies in the corporate sector. Applying these to FPCs has limitations as the purpose and activities of the FPCs are different from those of companies, and these may not always be profit-oriented. Increasing the income and livelihood of farmer members is the major motive of FPOs. Nonetheless, these measures throw light on the weaknesses and strengths of FPOs.

5 Constraints and Conditions for Success

5.1 Constraints faced by FPOs

FPOs face several challenges and constraints, which are discussed below.

Marketing: The poor or absence of market linkages is a major constraint faced by several FPOs. Lack of assistance in post-harvest activities and marketing is also reported in some studies. During the peak season, there is pressure on markets. The lack of market awareness, information, and intelligence (Singh *et al*. 2022) and the procurement of produce of non-members has also been reported in some studies (Mahapatra 2021). Marketing constraints, along with technology and policy constraints, significantly affect the sustenance of FPOs in the value chain activities (Thamban *et al*. 2020).

Group dynamics: India is a diverse country, in terms of castes, religions, and political affiliations. Bringing people from different backgrounds together is a big challenge for FPOs. The poor participation of members in FPO activities is also a big constraint (Kumar *et al*. 2021). The dominance of some members in the group affects the functioning and participation of other members. Lack of team spirit and conflict resolution mechanisms/ skills are important group-related constraints (Mukherjee *et al*. 2019b).

Inadequate infrastructure: Lack of marketing infrastructure like pre-cooling, cooling, and cold storage facilities is a major challenge (Verma *et al.* 2021). The availability of such infrastructures helps reduce post-harvest losses and increase exports. Most FPOs lack processing facilities (Mukherjee *et al.* 2019b; Singh *et al*. 2022). The lack of transport facilities is another constraint.

Figure 9. Word cloud showing major FPOs-related constraints

Source: Authors' compilation using NVivo

Inadequate access to finance/credit: FPOs are constrained by the terms and conditions of implementing agencies and financial institutions in availing finance from commercial banks. For example, because of the condition of a minimum number of members in the FPO, the small-sized FPOs are not able to access finance for investment in processing and value addition (Verma *et al*. 2019). Sometimes, agencies facilitating FPOs also put conditions of profitability for obtaining credit. Most FPOs find it difficult to arrange working capital in time (Singh *et al*. 2022).

Problems during the initial phase: Complex registration procedures, high fees/charges, insufficient training, lack of support, and handholding in the initial stage/incubation period are also reported by FPOs (Mukherjee *et al*. 2019b). Failure to prepare a business plan is the major cause of the non-performance of FPOs (Shah 2016). FPOs lack technical and procedural knowledge, and on occasions, the promoting institutions also withdraw after handholding.

Technical services and capacity building: Inadequate availability of inputs and their poor quality are some technical problems faced by FPOs. The lack of advisory services is a limitation. Further, there is a lack of capacity-building programs for officials and members of FPOs (Venkatesan *et al*. 2020). Farmers lack the awareness and technical skills to comply with market requirements or consumer preferences. There is also a lack of technical and legal knowledge among the staff to comply with the various provisions/regulations of the government.

Management and organizational constraints: There is a lack of experienced and qualified professionals for the efficient management of FPOs. Lack of communication between office bearers of FPOs and their members, linkages with other organizations and transparency are major organizational and management-related constraints (Mahapatra 2021).

These major challenges along with other circumstantial challenges have a major bearing on the performance of FPOs. A study has pointed out that only 30 percent of the FPOs are operating viably, while 20 percent have been struggling to survive, and the remaining 50 percent are in the phase of mobilization, equity collection, and business planning (Mukherjee 2020). Similar findings have been reported by the Maharashtra Agriculture Department (Indian Express 2022).

5.2 Conditions for success

From an extensive review of the literature, a few good practices of successful FPOs have been identified and listed in Table 7. These factors are broadly classified into the following sub-headings (Figure 10).

A well-established infrastructure: A well-established marketing infrastructure that includes pre-cooling, cooling, cold storage, and transport facilities enhances the adaptiveness of the FPOs to climate and marketing risks. This would aid market access to small and marginal farmers both at domestic and international levels. Processing facilities generate additional income and employment for FPO members.

Scale and efficiency: The main purpose of establishing FPOs is to improve the scale of operation through collective action. FPOs strive to increase their membership base, area coverage, and volume of output. They also strive to increase efficiency, reduce transaction costs, and attain an optimum scale in production, processing, and marketing.

Provision of quality inputs and technology to members: The third important factor is the provision of quality inputs and technology. Quality inputs

help to reduce the cost of cultivation, and the adoption of technology puts FPO members in an advantageous position vis-à-vis their counterpart non-members.

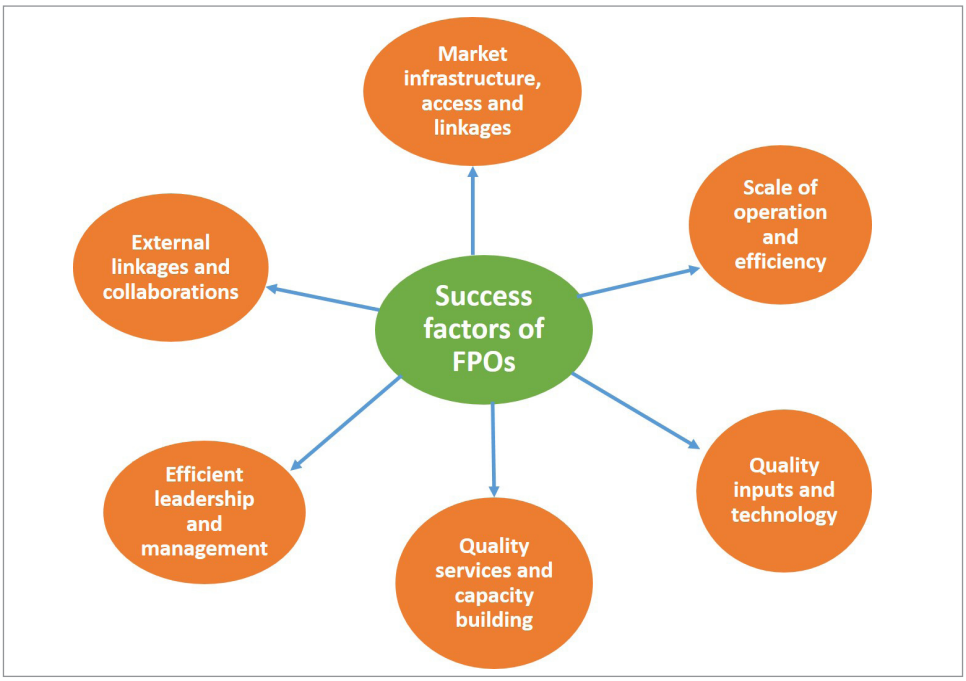
Table 7. Success strategies and good practices of FPOs

FPOs and States	Success strategies	References
Mahagrapes	• Good infrastructure for pre-cooling, cooling, storage of produce, etc. • Boosting the global competitiveness of Indian grape farmers and linking them to the export market	Nikam *et al*.(2014)
79 FPOs in Andhra Pradesh	• Emphasizing marketing interventions of the focus commodity • Reducing the transaction cost and improving the incentives • Providing good quality inputs at reasonable prices • Expanding the operational area	Raju *et al*. (2017)
22 FPOs from 11 states of India	• Involving a large number of shareholders • Input supply services to create goodwill at the beginning	ILRT (2016)
Avirat Agro Business Producer Company Limited	• Focus on enhancing the bargaining power for lower input prices, getting training, and accessing information, etc. • Strengthening the internal cohesion in the organization	Bikkina *et al*. (2018)
6 FPOs (2 each from Maharashtra and Kerala, 1 each from West Bengal and Madhya Pradesh)	• Enabling aid from supporting agencies having objectives consistent with the organization's primary stakeholders	Padmaja *et al*. (2019)
5 FPOs in Tamil Nadu	• Ensuring heterogeneity in membership to avoid domination of a specific group and promote cohesiveness among members • Elimination of political interference • Proper maintenance of records and transparency in activities of the organization	Venkatesan and Sontakki (2017)

FPOs and States	Success strategies	References
12 FPOs in different states	• Faster, safer, technology-enabled, and transparent financial transactions • Demonstrating new technologies that reduce input cost, increase yield and mitigate the potential risk of crop loss • Establishing strong marketing networks across the country, promoting certified products, and focusing on both backward and forward marketing linkages • Providing infrastructure and doorstep support in the collection, storage, transportation, and primary processing of the produce • Improving the social interaction and developing communication skills and leadership skills of the farmers • Capacity-building interventions such as training, exposure, etc. to members and staff	GoI (2013)

Source: Authors' compilation

Figure 10. Important success factors of FPOs



Source: Authors' compilation

Capacity building of members and staff: The provision of quality services and capacity building is another factor in the success of FPOs. Capacity building of members in the adoption of new technology, GAP standards, certifications, etc. helps in changing the orientation towards better compliance for cleaner and quality production.

Good leadership: Successful organizations are established and grown by capable and trusted leaders. This helps forge linkages with other stakeholders including input manufacturers and suppliers, marketing agents, and research and government organizations for transparently running the organization.

Best management practices: Transparency, proper record keeping, participation of members in FPO activities, timely payment, proper communication, proper compliance, etc. are the important management-related factors that affect the success of FPOs. This also ensures the trust and confidence of the members in FPOs.

Linkages and collaborations: Linkages with public and private sector organizations including other FPOs facilitate knowledge and experience sharing, and collaboration for marketing save transaction costs.

The success stories of two prominent FPOs in the country are described in Boxes 1 and 2.

Box 1: Sahyadri FPO in Maharashtra

"Alone we can do little; together we can do so much".

Mr. Vilas Shinde, an agricultural engineer started Sahyadri Farmers Producers Company in 2011 with only four smallholder farmers. Now, it has 18000 registered farmers spread over 252 villages. Sahyadri FPO helps farmers access the latest technology and processing infrastructure. It follows global best practices and offers the highest quality fresh and processed products to global consumers. It has established modern facilities of pre-cooling, cooling, processing, storage, and transport. Constant innovations are the success of Sahyadri. Right from developing or importing crop varieties preferred by foreign consumers to traceability of the product it is constantly innovating with improving compliance with the food safety standards of the importing countries. The product basket of Sahyadri includes field crops, vegetables, fruits, processed foods, and dry fruits. It has also established retail shops in Nashik and Mumbai. Sahyadri has also a license to establish a private APMC market. It is the largest exporter of grapes.

Box 2: KASAM: A wave of change for the tribal turmeric growers in Odisha

Farmers belonging to the "Kandha" tribe in the Kandhamal district of Odisha have been growing a special kind of aromatic turmeric called "Kandhamal Haladi" since time immemorial. Though turmeric is a high-value crop, farmers have not been following appropriate crop management practices, and hence could not realize remunerative prices. To improve their socioeconomic condition, 61 Spice Development Societies (SDSs) were established in five blocks of Kandhamal under the Innovative Jawahar Rojgar Yojana in 1995. Although the crop yield improved, procurement and marketing remained a challenge. To solve this, Kandhamal Apex Spices Association for Marketing (KASAM) was formed in 1998 to serve as a marketing partner of the SDSs. Every SDS has a President and a Secretary chosen amongst its members. KASAM procures, processes, packages, and sells turmeric. KASAM also empowers farmers through training, organic certification, inputs, and services. As a result, 'Kandhamal Haladi' received a Geographical Indication tag in 2019. Organic products including turmeric fingers, and ginger slices are exported.

6 Lessons Learnt and Implications

FPOs contribute to agricultural development, improving scale economies and bargaining power. They improve farmers' access to markets and finance, reduce transaction costs, augment the flow of information, technology and services, and improve value chain efficiency. Although there are a large number of FPOs, only a small proportion of these are economically viable. This necessitates looking into various aspects of FPOs in terms of their performance, impacts, value chain contribution, success factors and constraints, and accordingly provide solutions.

Empirical studies in India have reported mixed evidence on the impact of FPOs on farm performance. Nonetheless, the general conclusion is that FPOs help improve farm performance.

Most of the FPOs suffer from low paid-out capital, which restricts them from availing benefits of the government schemes. Some FPOs start with a good current ratio, but it turns out unfavourable within a short period. Additionally, more than one-third of the FPOs face significant financial distress and are unable to pay their debts. The inability to raise sufficient funds through shareholding, working capital and lack of business skills are the important reasons. Development of a viable business plan and business acumen of key members of FPOs and strengthening their capacity to raise and manage the funds is necessary. An institutional mechanism needs to be developed to link the FPOs with leading business management institutions. Further, continuous handholding of FPOs for post-incubation support for working capital, capacity building, market access and regulations is needed till they achieve financial stability. For that, objective criteria/index can be developed.

Most FPOs lack infrastructure for processing and value addition, necessary for farmers to benefit from the growing demand for value-added products. A well-established infrastructure, including pre-cooling, cooling, cold storage, and transport facilities would enable farmers to adapt to changing market requirements and improve the value chain efficiency. This can be done through the convergence of resources for FPOs from various schemes. It's high time for the introduction of high-end technologies like

blockchain and digitization of FPOs databases to harness the business potential of FPOs and to gain consumers' confidence.

To improve the group dynamic and participation of farmers in FPOs activities, FPOs should have clear objectives, known to the board of directors, members and promoting institutions. A good ecosystem (taxes, regulations, penalties, etc.) for FPOs for spontaneous emergence and prospects for growth is essential.

Successful FPOs have better scale of operation, and better access to finance, information and technologies, market linkages, leadership, participatory decision-making and inclusiveness. An appropriate scale in terms of membership, commodity volumes and turnovers is crucial to minimize the transaction costs and marketing risks.

Innovations, market intelligence and brand creation are major limiting factors in the success of FPOs. Federations or Cluster-Based Business Organisations (CBBOs) need to extend their support for market research and brand creation.

Studies on the optimum size of FPOs are almost absent. Hence, more research is required on determining their optimum size, membership, area coverage and turnover.

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