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### Trends and policy impact of farmer producer organizations in India: Evidence from Telangana

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#### Abstract

Farmer Producer Organizations (FPOs) have emerged as pivotal institutions in India, facilitating the aggregation of small and marginal farmers to enable collective action for input procurement, credit access and improved returns in output marketing. This study examines the formation of FPOs across Indian states between 2014 and 2024, employing Compound Annual Growth Rates (CAGR) and regression-based significance tests ( $R^2$  and p-values) for 33 states and union territories. The number of FPOs registered across India increased from 494 in 2014 to 43,804 by 2024, reflecting a national CAGR of 29.3 per cent ( $R^2 = 0.74$ ,  $p < 0.001$ ). The average annual rate of formation rose more than fourfold following the introduction of the Central Sector Scheme for the Formation and Promotion of 10,000 FPOs in February 2020, increasing from approximately 1,422 per year during 2014-2019 to 7,055 per year during 2020-2024. Growth, however, was geographically concentrated: Maharashtra, Uttar Pradesh, Madhya Pradesh, Karnataka, and Odisha emerged as the five leading states, together accounting for 64 per cent of all FPOs formed nationally, while the ten largest states accounted for over 81 per cent. Several Union Territories, by contrast, exhibited negative growth trends. Within Telangana, the number of FPOs increased from eight in 2014 to 1,009 by 2024, corresponding to a state-level CAGR of 20.5 per cent ( $R^2 = 0.35$ ,  $p = 0.055$ ), with Nizamabad, Siddipet, Khammam, and Nalgonda recorded as the districts with the highest number of FPOs.

**Keywords:** Farmer producer organisations, India, NABARD, Telangana, CAGR, exponential growth model, growth trends

#### 1. Introduction

India's agricultural sector, employing approximately 44 per cent of the national workforce is predominantly characterized by fragmented landholdings and restricted market access (NCBI, 2024). Over 85 per cent of Indian farmers are classified as small and marginal, possessing landholdings of less than 2 hectares (Agarwal and Goyal, 2022) <sup>[1]</sup>. This situation significantly diminishes their individual bargaining power, rendering them vulnerable to exploitation by market intermediaries. Consequently, collective institutional mechanisms have become essential for enhancing the economic conditions of these farmers (Lalitha *et al.*, 2024) <sup>[11]</sup>.

FPOs were established under Section 581C of the Companies Act 1956 and later under the Companies Act 2013, have become the preferred institutions for collective action in Indian agriculture. These organizations enable smallholders to benefit from economies of scale, lower transaction costs, access institutional credit and high-value markets, and integrate into agricultural value chains (IFPRI, 2025; Biswas *et al.*, 2025) <sup>[3]</sup>. Research indicated that FPO membership is linked to increased farm income, enhanced market efficiency, and decreased indebtedness (Kumar, 2021; Singh and Vatta,

2019) <sup>[10, 19]</sup>. FPOs in India are financially supported by two main organizations: the Small Farmers Agribusiness Consortium (SFAC) and the National Bank for Agriculture and Rural Development (NABARD). NABARD runs its own older subsidiary, the Producers Organisation Development Fund (PODF, 2011), and PODF-Interest Differential for credit facilitation, capacity building, and market linkage, along with NABKISAN Finance Ltd. for FPO-specific credit needs. SFAC separately operates the Equity Grant Fund, matching member equity contributions for smaller and emerging FPCs. Complementary support comes from the Agriculture Infrastructure Fund (3% interest subvention on post-harvest infrastructure loans) and market linkage pushes via NAFED, e-NAM, and NCDEX's FPO platform.

Recently, the National Co-operative Development Corporation (NCDC) had been involved as an agency for the formation and promotion of FPOs (NCDC, 2021). The Government of India formally recognized the promotion of FPOs as a national priority under the Rashtriya Krishi Vikas Yojana, and subsequently launched the landmark Central Sector Scheme for the Formation and Promotion of 10,000 FPOs in February 2020, with a budgetary outlay of ₹6,865 crore (GOI, 2020-21).

## 2. Data and methodology

The study is exclusively based on secondary data collected for the period 2014 to 2024. State-wise annual data on the number of registered FPOs were sourced from the official portal of Tata Cornell Institute, supplemented by the Ministry of Agriculture and Farmers Welfare, Government of India. District-wise FPO data for Telangana were also compiled from the same portal.

**To measure the growth rate, the CAGR was estimated using the following exponential growth model:**

$$Y = ab^t$$

Where,

Y = number of FPOs;

t = time variable (year);

a and b are constants; and

the compound growth rate  $r = (b - 1) \times 100$ .

The goodness of fit was evaluated using the coefficient of determination ( $R^2$ ) and statistical significance was tested using the F-test (p-value). To characterise year-on-year volatility, per centage change from one year to the next was also computed.

Further, choropleth map was prepared using QGIS and R software to depict the state-wise and district-wise CAGR of FPOs in India and Telangana during 2014-2024. States were shaded according to their CAGR values, with darker green colours indicating higher growth rates and red colours indicating lower growth rates (Devi *et al.*, 2025) [16].

## 3. Results and Discussion

### National growth trends

The state-wise variation in the FPOs formed between 2014

and 2024 is illustrated in Figure 1. During this period, a total of 43,804 FPOs were established. The national CAGR was estimated at 29.35 per cent per annum, with a coefficient of determination ( $R^2$ ) of 0.74 and a p-value of 0.0007. These findings indicate a highly significant positive growth trend over the decade.

However, FPO formation was not uniform over time. From 2014 to 2021, formation expanded significantly, rising from 494 FPOs in 2014 to a peak of 9,038 in 2021, an increase of nearly 18-fold over seven years. The most substantial single year growth occurred in 2019, coinciding with the policy momentum leading up to the launch of the 10,000-FPO scheme. Implementation of the scheme after 2020 helped to sustain this growth, with FPO numbers reaching 4,817 in 2020 and 9,038 in 2021. This acceleration during 2020-2021 corresponds with findings from the International Food Policy Research Institute (IFPRI, 2025) [9], which reported that more than 35,000 FPOs were established between 2020 and September 2024 and the target to reach 10,000 FPO formation was achieved in Feb, 2025 (PIB, 2026).

A notable reversal occurred from 2022 onward, with FPO formation declining slightly to 8,848 in 2022 (-2.10%) and 8,702 in 2023 (-1.65%). In 2024, the number fell sharply to 3,870, a decline of 55.53 per cent. This sharp decrease was attributable to a national consolidation phase, as government support shifted from formation toward ensuring viability and compliance (National Policy on FPOs, 2024). The earlier, significant drop in 2017 (-47.08%) was likely a temporary setback related to implementation challenges, dependence on a limited number of promoters, and financial constraints (Prasad, 2019) [16].

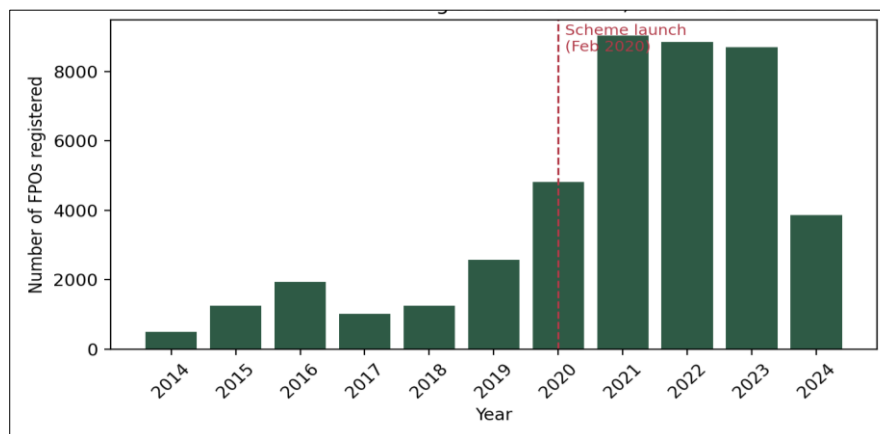


Fig. 1. Year-wise Growth Formation of FPOs in India

### Current status in India

As per the MCA's company compliance records, among the 43,804 FPOs, 61 per cent (26,938) were classified as having active and compliant status. Over 34 per cent (14,982) of FPOs had not updated their status, leaving their compliance status unknown, while 1,346 FPOs were deemed non-compliant. Additionally, a total of 1,082 FPOs had been struck off or were in the process of having their company status revoked. (Policy Brief by TCI, 2025) [25]

### State-wise distribution of FPOs

The CAGR estimated for FPOs across all 33 states and Union Territories. Fig. 2 represents the spatial distribution of state-

wise CAGR of FPOs in India during the period 2014–2024. The map reveals considerable regional variation in the pace of FPO expansion across the country. Maharashtra leads the country with 15,211 FPOs, accounting for 34.73 per cent CAGR of the national total. It is followed by Uttar Pradesh with 6,976 FPOs (34.3%) and Madhya Pradesh with 2,382. This dominance of larger agrarian states aligns with the findings of Agarwal and Goyal (2022) [1]. However, between 2014 and 2024, there had been a notable trend of smaller and northeastern states emerging as high-growth performers in the formation of FPOs.

Among the states with a CAGR above 40 per cent were Assam (55.81%), Arunachal Pradesh (53.37%), Jammu and

Kashmir (47.29%), Himachal Pradesh (45.17%), Nagaland (44.61%), Jharkhand (41.24%), and Manipur (40.35%). These states, characterized by hilly or forested terrain and tribal farming communities, historically had low institutional reach but have significantly benefited from the targeted inclusion agenda of the 10,000 FPO scheme (Biswas *et al.*, 2025) [3]. The high  $R^2$  values observed in north-eastern states such as

Manipur (0.85), Arunachal Pradesh (0.86), and Nagaland (0.84) indicated consistent, exponential growth, in contrast to states like Tamil Nadu ( $R^2 = 0.20$ ) and Rajasthan ( $R^2 = 0.37$ ) where growth was more uneven. The variation in  $R^2$  across states implied that the national CAGR conceals significant inter-state heterogeneity in the quality and consistency of FPO formation.

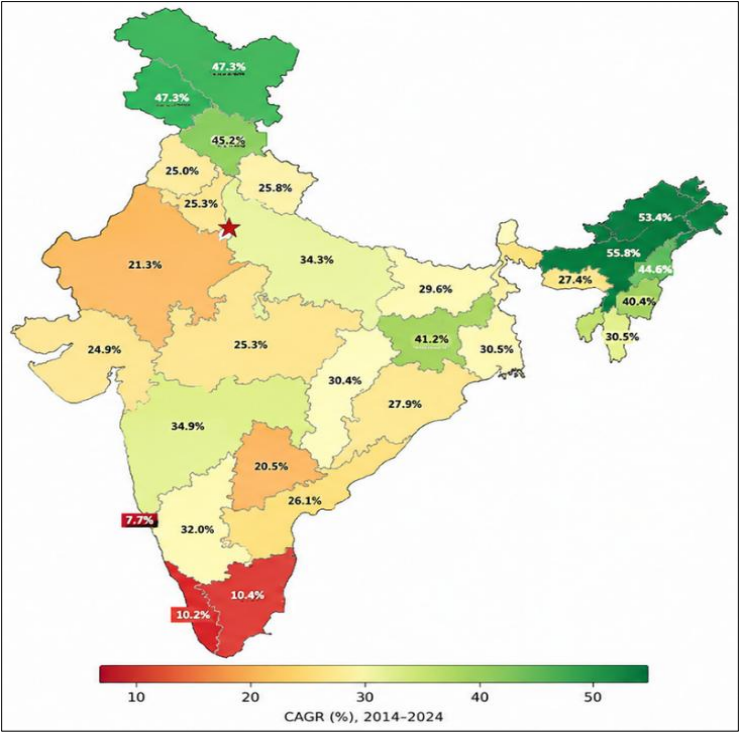


Fig 2: Spatial distribution of FPOs across Indian states (based on CAGR), 2014–2024

**Telangana Growth Trends**

Telangana's FPOs have shown a distinct pattern compared to national trends over the years. Formation increased from 8 in 2014 to 83 in 2016, dipped to 18 in 2017, and then surged to 168 in 2019 before the Central Sector Scheme was launched. This suggests that Telangana built strong momentum independently. Unlike the national trend, which experienced

a rise in 2020, Telangana's formation fell to 99 FPOs during the scheme's launch year, likely due to COVID-19 disruptions. However, FPOs rebounded to 168 in 2021, then settled at 107 in 2022 and 147 in 2023. In 2024, formation declined sharply to 43 FPOs, reflecting a broader tapering as the scheme approached its national target.

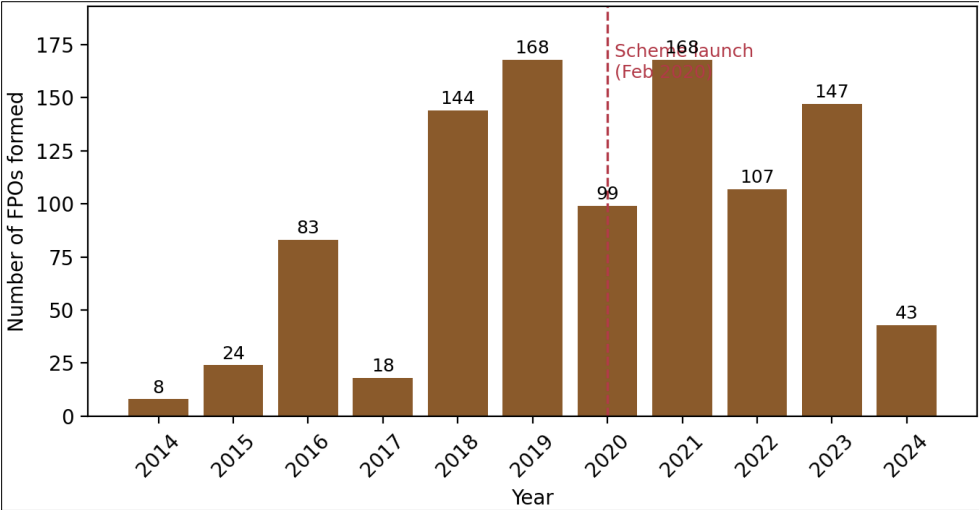


Fig 3: Year-wise Growth in Formation of FPOs in Telangana.

Telangana established a total of 1,009 FPOs from 2014 to 2024, ranking 13<sup>th</sup> nationally. Of these, 953 FPOs are currently active, according to the SOFPO Report (2025). The state's overall CAGR was 20.50 per cent ( $R^2 = 0.35$ ;  $p = 0.054$ ), which is considered significant and reflects considerable year-to-year variability. The state experienced initial growth in 2015 and 2016, followed by a sharp decline in 2017, which saw a decrease of 78 per cent. In 2018 and 2019, there was a notable recovery with an increase of 70 per cent due to the pre-launch of the Central Sector Scheme. However, in 2024, the state faced another severe decline of 71 per cent, indicating an ongoing effort to strengthen and build the capacity of the already established FPOs to ensure their viability and sustainability.

The district-wise analysis revealed significant disparities within the state. Nizamabad had the highest number of FPOs at 52, followed by Siddipet with 44. Khammam, Nalgonda, and Sangareddy each had 43 FPOs. This distribution can be attributed to strong irrigation infrastructure, a strong presence of supporting institutions, and market-oriented farming practices (Archana and Sudha, 2024).

In terms of growth rate, Khammam recorded the highest CAGR at 21.69 per cent ( $R^2 = 0.49$ ,  $p = 0.016$ ), followed closely by Suryapet at 20.83 per cent ( $R^2 = 0.55$ ,  $p = 0.009$ ) and Nirmal at 20.07 per cent ( $R^2 = 0.62$ ,  $p = 0.004$ ). These three districts, which focus on paddy, cotton, and horticultural crops respectively demonstrated sustained and statistically significant formation of Farmers' Producer Organizations (FPOs) with a good model fit. Other districts showing notable positive growth include Karimnagar with a CAGR of 17.82 per cent ( $p = 0.037$ ,  $R^2 = 0.40$ ), Peddapalli at 17.29 per cent ( $R^2 = 0.57$ ,  $p = 0.007$ ), Rajanna Sircilla at 14.42 per cent ( $p = 0.035$ ), Narayanpet at 13.55 per cent ( $p = 0.032$ ), and Ranga Reddy at 13.57 per cent ( $p = 0.045$ ).

The challenges faced by certain districts in forming FPOs are evident, as several reported a negative CAGR. Specifically, Adilabad (-4.78%), Kamareddy (-2.29%), Komaram Bheem (-1.58%), and Medchal (-0.31%) show significant decline rates. Among these, Adilabad and Komaram Bheem Asifabad are predominantly tribal districts with substantial forest cover, which reflects structural barriers to FPO formation, including poor connectivity, low literacy rates among farming communities, and limited access to Community-Based Business Organizations (CBBOs). Meanwhile, Medchal, a peri-urban district adjacent to Hyderabad, has a primarily non-agricultural land use profile, contributing to its low number of FPOs.

The growth patterns in Telangana reveal a significant disparity, with only 8 out of the 33 districts (24.2%) experiencing statistically significant development. In contrast, 72.7 per cent of states across the nation have shown significant growth. This underscores the pronounced variability within Telangana compared to the differences observed among states on a national level. Although some FPOs have achieved viability through credit linkages, market connections, and value addition, many continue to face systemic challenges in scaling their operations and maintaining functionality (NABARD, 2025).

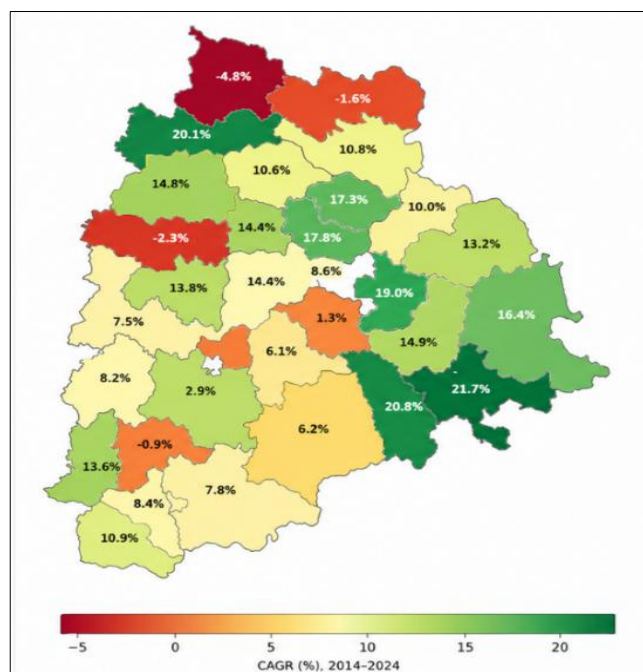


Fig 3: Spatial distribution of FPOs across districts of Telangana (based on CAGR), 2014-2024

#### 4. Conclusion

The decade from 2014 to 2024 marked a transformative period for the institutionalization of collective farming in India. At the national level, 43,804 FPOs were established, achieving a CAGR of 29.35 per cent ( $p < 0.01$ ), largely driven by the Government of India's 10,000 FPO scheme initiated after 2020. Maharashtra, Uttar Pradesh, and Madhya Pradesh led in the absolute number of FPOs, while north-eastern and hilly states such as Assam, Arunachal Pradesh, Jammu and Kashmir, Himachal Pradesh, Nagaland, Jharkhand, and Manipur experienced the highest growth rates, with CAGRs exceeding 40 per cent. This reflects the significant impact of targeted institutional initiatives in previously underserved regions. Among the 33 states and Union Territories, 24 showed statistically significant growth, although three - Delhi, Chandigarh, and Lakshadweep recorded negative CAGRs, highlighting the need for region-specific policy redesign. In Telangana, the overall CAGR of 20.50 per cent masks considerable variation at the district level. Only 8 of 33 districts achieved statistically significant growth, while 4 districts reported negative trends. Khammam, Suryapet, and Nirmal have emerged as model districts, whereas tribal and peri-urban districts such as Adilabad, Komaram Bheem, and Medchal require focused interventions. The sharp national decline in 2024, along with Telangana's ongoing volatility, indicates that the phase of rapid FPO formation is transitioning into a consolidation challenge. It is crucial to ensure that FPOs become functional, financially viable, and farmer-centric institutions.

#### 5. Policy recommendations

1. Transition from formation-driven policies to sustainability-oriented FPO development.
2. Implement region-specific interventions based on spatial growth disparities.
3. Strengthen market integration, value addition, and business capacity of FPOs.
4. Establish an outcome-based monitoring system focusing on FPO functionality rather than registration numbers

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