



Impact of Farmer Producer Organisations (FPOs) on Smallholders' Livelihood Development

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ABSTRACT

Background: Farmer-Producer Organisations (FPOs) are economic entities owned by smallholders that amalgamate resources, enhance market access and offer technical and marketing services in India. They have significant potential for participation in the economic and social welfare of smallholders. However, empirical evidence from northeastern hill states, particularly Tripura, remains scarce. This case study examines the impact of FPOs on smallholder livelihood development in the fruits and vegetables supply chain of Tripura.

Methods: A qualitative case study was used, including interviews with government officials (BDOs, ADOs, Directors) and primary data from 12 FPOs engaged in fruit and vegetable production. Collected information was analysed thematically.

Result: Four major thematic constraints emerged: (1) infrastructure deficits - non-operational cold chains and non-contiguous farmland limiting cluster benefits; (2) financial exclusion - most farmers rely on Kisan Credit Cards with limited institutional credit access; (3) governance weaknesses - leadership and management skill gaps and (4) social barriers - scepticism toward collective action and individualistic cultural norms. However, FPOs have partially reduced their dependence on intermediaries through joint marketing and increased bargaining power.

Key words: FPOs, Fruits, Smallholder, Sustainable development, Vegetables.

INTRODUCTION

Agriculture is a foundational pillar of India's economy (Singh, 2012), sustaining the livelihoods of over half the population (Chadha, 2021), with a substantial share of the population comprising smallholders (Singh, 2012). However, smallholder farmers face persistent challenges in accessing markets, credit, infrastructure, technology, information and training, with intermediaries capturing much of the consumer price (Islam *et al.*, 2022; Kumar, 2020; Sidhu *et al.*, 2024). Further, the absence of robust policy frameworks further hinders productivity and income generation, making it difficult for these farmers to sustain their livelihoods (Islam *et al.*, 2022; Singh, 2012; Kumar, 2020). These inefficiencies across the supply chain result in the annual wastage of nearly 45% of total production (Shannon, 2021). In response, FPOs with blended properties of cooperative and corporate (NABARD, 2022) have been promoted to aggregate resources, enhance bargaining power and improve market access.

In recent years, FPOs have emerged as a promising solution to the challenges faced by smallholders, gaining recognition as farmer-owned economic entities (NABARD, 2022; Salokhe, 2025a). These organisations blend features of traditional cooperatives with modern corporate structures (Department of Agriculture, n.d.; NABARD, 2022; Ramappa and Yashashwini, 2018). Collective action through FPOs can improve bargaining power, technology, infrastructure, market access and access to financial services that smallholders would not be able to afford individually (Hellin *et al.*, 2009; NABARD, 2022; PIB India, 2021b; Bikkina *et al.*, 2018; Desk, 2023; Gurung and Choubey, 2023). While

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FPOs have been studied in plainland states (Gujarat, Maharashtra, Karnataka), limited empirical research exists for the northeastern hill states. Tripura offers a unique case due to its favourable agroclimatic conditions, recent FPO promotion and persistent smallholder livelihood challenges. No published study has systematically examined FPO impacts on fruit and vegetable smallholders in Tripura.

In response, the formation of FPOs has been prioritised in Tripura. Over the last few years, the state has seen a remarkable expansion in FPOs to pool resources and aid access to services, inputs and markets that would otherwise be beyond the reach of individual farmers. This study addresses the following research questions:

1. What are the perceived impacts of FPO membership on smallholders' market access, input availability and bargaining power in Tripura's fruit and vegetable supply chains?
2. What infrastructural, financial and social constraints limit FPO effectiveness in this context?
3. How does Porter's Cluster Theory explain the current limitations and potential pathways for FPO development in Tripura?

The remainder of this paper is organised as follows: Section 2 presents the literature review and theoretical framework, Section 3 describes the methodology, Section 4 reports the results, Section 5 discusses the findings and Section 6 concludes.

Literature review and theoretical framework

FPOs as an intervention

FPOs are collective entities that enable smallholders to access inputs, credit, markets and training that would be unaffordable individually (Hellin *et al.*, 2009; NABARD, 2015; Bikkina *et al.*, 2018). Evidence from plainland India reports increased bargaining power and reduced intermediary dependence (Gummagolmath *et al.*, 2022; Singh and Vatta, 2019). Agencies such as IRMA, NABARD, NAFPO and SFAC support FPOs in accessing institutional finance for storage, processing and marketing (IRMA-NABARD, 2022; NABARD, 2015; NAFPO, 2022; SFAC, 2019). Collective purchasing of inputs and sale of produce can lower transaction costs, though challenges in identifying reliable suppliers and buyers persist, especially in rural areas (Kasrija and Singh, 2023). Training programmes cover integrated pest management, irrigation, organic farming and bio fertilisers, often facilitated by government agencies (Krishnan *et al.*, 2021).

The combined resources and expertise of an FPO can enable smallholders to realise higher economies of scale, lower transaction costs and obtain better prices for their agricultural products (Gummagolmath *et al.*, 2022; Adhikari *et al.*, 2021; Bunte, 2019; Singh and Vatta, 2019). These enhancements are expected to make supply chain processes more efficient, support sustainable livelihoods, enable smarter decision making and foster innovation in the sector (Fig 5).

Smallholders typically cannot benefit from economies of scale due to limited production volumes, but collective efforts through FPOs can help overcome this constraint. However, without transparency and value addition in the pricing chain, intermediaries may capture a larger portion of the consumer price, thereby diminishing the share received by producers (Acharya, 2022).

The presence of FPOs broadens the scope of research required to support the sector's growth, particularly in enhancing the socioeconomic, technological, managerial and ecological capacities of smallholders (Hellin *et al.*, 2009; NABARD, 2022; Salokhe, 2025b). FPOs have become increasingly central to promoting rural

development, empowering farmers and ensuring food security. Recognising their importance, governments and development agencies have adopted various policy frameworks and financial mechanisms to facilitate the establishment and strengthening of FPOs (Bikkina *et al.*, 2018; DACFW, 2020; Hellin *et al.*, 2009; NABARD, 2015).

Consumer demand is shifting toward nutrient rich foods, with fruits and vegetables playing a vital role in food security and ecological sustainability (Pingali *et al.*, 2019; Joosten *et al.*, 2015; FAO, 2020; WHO, 2019). Horticultural crops can generate higher income than staples, supporting poverty alleviation and sustained livelihood improvement (Weinberger and Lumpkin, 2007; Galhena *et al.*, 2013; Rai *et al.*, 2019). However, most evidence comes from plainland states; applicability to hill ecosystems like Tripura remains untested.

Theoretical underpinnings

Michael Porter's cluster theory (1990, 1998, 2000) posits that geographic concentration of firms, suppliers and institutions generates competitive advantages through knowledge spillovers, specialised inputs and agglomeration economies (Fundeanu and Badele, 2014; Newlands, 2003). Clusters reduce transaction costs and enable collective investment in infrastructure. Porter contended that the closeness of firms facilitates exchanges of knowledge, skills and resources and the presence of specialised suppliers and service providers incites efficiency of production (Porter, 1990, 1998, 2000). Theorists of cluster theory have increasingly emphasised agglomeration economies, whereby the spatial proximity of industries generates mutual benefits and enables resource optimisation.

In this regard, FPOs can be understood as administratively constructed clusters: they bring together smallholders and institutions to access input and output markets more easily, share knowledge and jointly invest in infrastructure - contributing to economies of scale, increased productivity and profitability (Newlands, 2003; Porter, 1990, 1998; PNB India, 2021). However, the theory assumes geographic proximity - a condition that may not hold when farmland is non contiguous, as in Tripura. Therefore, implementation of cluster theory into FPO design and execution must account for spatial dispersion and the need for deliberate infrastructure investment.

The Tripura context

Tripura, a developing state in northeast India, possesses favourable agroclimatic conditions for fruit and vegetable cultivation. The state produces 7.86 metric tonnes of fruits (across 60,145 ha) and 6.21 metric tonnes of vegetables (across 36,786 ha), with demand at 2.70 and 4.05 metric tonnes, respectively. Despite a marketable surplus, smallholders face ongoing inefficiencies in cost, time, access to markets, information flow and product quality, receiving a disproportionately small share of the consumer

price (Dastagiri *et al.*, 2012; RBI, 2019; MANAGE, 2017; GoT, 2023).

Under the "Promotion of 10,000 FPOs" and MOVCDNER schemes, 81 FPOs have been established in Tripura (Das and Das, 2022; NSO, 2021). Most FPOs are registered under either the Companies Act or the Cooperative Societies Act. This study focuses exclusively on FPOs engaged in fruit and vegetable production, as these face the most severe post harvest and marketing constraints.

Multiple Implementing Agencies, including SFAC, NAFED, NCDC, NERAMAC, NABARD and various State Government bodies, play a pivotal role in supporting FPOs. Cluster Based Business Organisations (CBBOs) serve as the primary promoting agencies for these FPOs (BMZ India, 2019; DACFW, 2020; NAFED, 2022; PIB India, 2021a).

MATERIALS AND METHODS

A qualitative case study design was employed, as it is well-suited for exploring real world phenomena (Yin, 2014) such as FPOs in their natural setting. This approach allowed an in depth examination of how FPOs influence smallholder livelihoods within the state.

The study covered 12 FPOs engaged exclusively in fruit and vegetable production. These FPOs were selected from across the state of Tripura to capture variation in scheme type, operational duration and geographic distribution. Out of 81 FPOs existing in Tripura (GoT, 2023), 28 were identified as being engaged in fruit and vegetable cultivation. From these, 12 FPOs were purposively selected to maximise diversity across two criteria: the scheme under which the FPO was promoted (7 under the "Promotion of 10,000 FPOs" scheme and 5 under the MOVCDNER scheme) and geographic spread across different districts of the state.

Data were collected through two distinct strands. First, interviews with government officials (BDOs, ADOs and directors of the Agriculture and Horticulture Department) were conducted separately. The interviews focused on policies, schemes, implementation challenges and the overall support system for FPOs in the state. Second, interviews with FPO members were carried out across all 12 selected FPOs. These interviews involved FPO Chief Executive Officers (CEOs), members of the Board of Directors and smallholder farmer members. The number of farmer interviews per FPO varied according to availability and willingness to participate. The interviews explored members' experiences with infrastructure, credit access, input availability, training, market linkages and intermediary relationships. FPO CEOs facilitated initial contact but were not present during the interviews with farmer members to reduce bias.

Data collection took place between January and March 2023. Unstructured question guides were developed based on an extensive review of the existing literature to enhance the understanding level of the topic and form a

strong theoretical basis for the research. All the interview sessions were conducted in Bengali or Kokborok by the first author, with two enumerators taking field notes. In addition to primary data, documentary evidence was collected to triangulate findings. This included scheme guidelines (DACFW, 2020; SFAC, 2019), government statistical reports (GoT, 2023; Das and Das, 2022) and annual reports of the FPOs where available.

The field notes were translated into English for the thematic analysis by the authors manually. Methodological triangulation was achieved by combining interviews with government officials, interviews with FPO members and documentary evidence. Further, Ethical considerations were carefully observed. Verbal and written informed consent were obtained from every participant. All participant identities were anonymised. The authors collected data with proper authorisation from the respective authority and all are aligned with the ethical principles of social research. Relevant photographs documenting the field activities are included in Annexure 1 (Fig 1-4).

RESULTS AND DISCUSSION

FPO Characteristics Table 1 summarises the characteristics of sampled FPOs in Tripura.

Four major thematic constraints and one partial success emerged from the analysis. Table 2 presents themes, sub themes and illustrative evidence.

Crops cultivated by sampled FPO members include pineapple, jackfruit, watermelon, dragon fruit, mango, brinjal, okra, ridge gourd, bottle gourd, bitter gourd, cabbage, cauliflower, chilli, lemon, carrot, beans, pumpkin, banana and corn. Most FPOs use share capital as primary funding; institutional credit (other than Kisan Credit Card) is negligible. Some farmers practise zero budget farming (Integrated farming), but this is not widespread. Training and extension services are provided through collaboration with state and national agencies, but coverage is uneven.

This case study found that FPOs in Tripura face four interconnected constraints - infrastructure deficits, financial exclusion, governance weaknesses and social barriers that limit their impact on smallholder livelihoods. Partial successes in reducing intermediary dependence for some FPOs suggest potential, but current FPOs do not yet deliver the transformative benefits reported from plainland Indian

Table 1: Characteristics of sampled FPOs (n=12).

Characteristic	Value
Total FPOs in Tripura (all sectors)	81
FPOs in fruit/vegetable sector	28
Sampled FPOs	12
Registered smallholders across 81 FPOs	28,115
Primary schemes represented (sampled)	Promotion of 10,000 FPOs: 7; MOVCDNER: 5
Average FPO operational duration	2.3 years

Table 2: Thematic findings on FPO constraints and partial successes.

Theme	Sub theme	Illustrative evidence
Infrastructure constraints	Non operational cold chains	We have cold storage facilities, but not functioning with full capacity or with private organizations. (Govt. officials)
	Non contiguous farmland	Our plots are not close to each other due to hilly terrains, hence cluster benefits don't reach us efficiently. (Reported by all FPO members)
Financial exclusion	Kisan Credit Card reliance	We still use Kisan Credit Card (KCC) from the bank and do not have any access through FPOs (farmers- Mentioned in all FGDs)
	Limited institutional equity	Share capital is our main fund, not received any equity grant (Interview, CEOs).
Governance deficits	Leadership skill gaps	Facing difficulties in managing accounts or negotiate with buyers.
Social barriers	Scepticism toward collective action Individualism	This is my own resource - why should I share? If I get a good price, I won't tell others.
Partial successes	Reduced intermediary dependence	Sometimes we sale our products through TRLM or directly in the market without any middlemen.
	Increased bargaining power	When we sell together, we get a better price than individually.



(a)



(b)



(c)

Fig 1: Hotai Kotor Hukum Agro-Fed Farmer Producer Cooperative Society Limited, Block Belbari, District West-Tripura, Agartala.



Fig 2: Chokhreng Organic FPC, Block Belbari, District West-Tripura, Agartala.



Fig 3: Kabiguru Agro-Fed Farmer Producer Cooperative Society Limited, Block Bamutia, District West-Tripura, Agartala.



Fig 4: Krishak Veej FPC, Block Mohanbhog, District Sepahijala, Agartala.

states. Fig 5 illustrates the theoretical pathway from FPO participation to sustainable livelihoods, though our findings show that in Tripura, most of these benefits are not yet realised.

Comparison with existing literature

The non operational cold chains observed in Tripura contrast with studies from Gujarat and Maharashtra, where FPOs reduced post harvest losses by 15-25% using cold storage (Gummagolmath *et al.*, 2022). This discrepancy likely reflects Tripura's nascent FPO ecosystem.

The reliance on KCCs rather than institutional FPO credit aligns with findings from Sikkim (Gurung and Choubey, 2023), suggesting that northeastern hill states face unique barriers due to terrain, small landholdings

and perceived risk by commercial banks. Leadership and management skill gaps are common in early stage FPOs across India (Bikkina *et al.*, 2018; Ramappa and Yashashwini, 2018). However, in Tripura, these deficits are exacerbated by limited handholding support from implementing agencies. Further, Scepticism toward collectivism and individualistic norms mirrors early FPO challenges in other contexts (Hellin *et al.*, 2009). This suggests that cultural resistance is a universal implementation hurdle, not unique to Tripura.

Theoretical implications

Porter's cluster theory (Porter, 1990, 1998, 2000; Fundeanu and Badele, 2014; Newlands, 2003) assumes geographic proximity generates agglomeration economies. Tripura's non contiguous farmland violates this assumption. Fig 6 presents a framework for strengthening FPOs that highlights the prerequisite roles of institutional support and infrastructure investment before cluster benefits can emerge. Therefore, FPOs in Tripura represent that cluster benefits do not automatically arise from aggregation alone. Instead, deliberate infrastructure investment (e.g., shared transport, mobile cold storage) and governance support are prerequisites. This extends cluster theory to settings where spatial concentration is absent.

The risk opportunity matrix (Fig 7) synthesises our findings: under current conditions, smallholders face high risk and low opportunity. With effective FPO support, they could move to moderate risk and moderate opportunity. Achieving low risk and high opportunity would require the infrastructure and governance investments outlined in Fig 6.

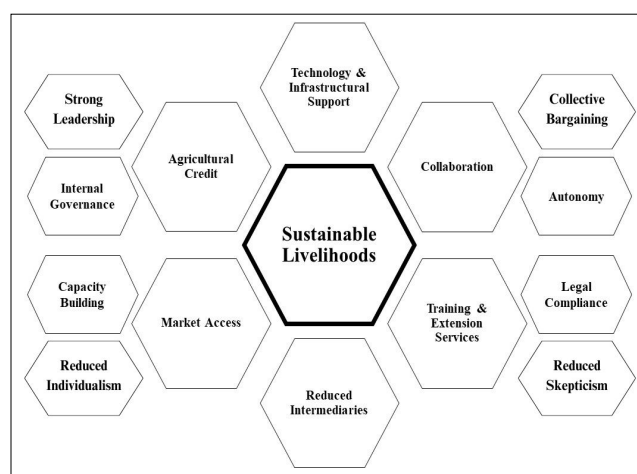


Fig 5: Sustainable livelihoods through FPO, Source: Authors.

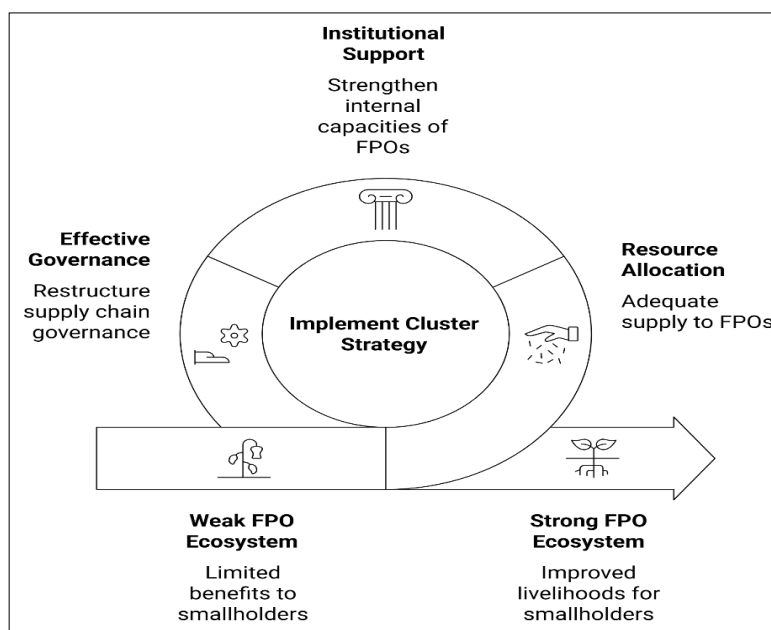


Fig 6: Strengthening FPOs for sustainable livelihoods.

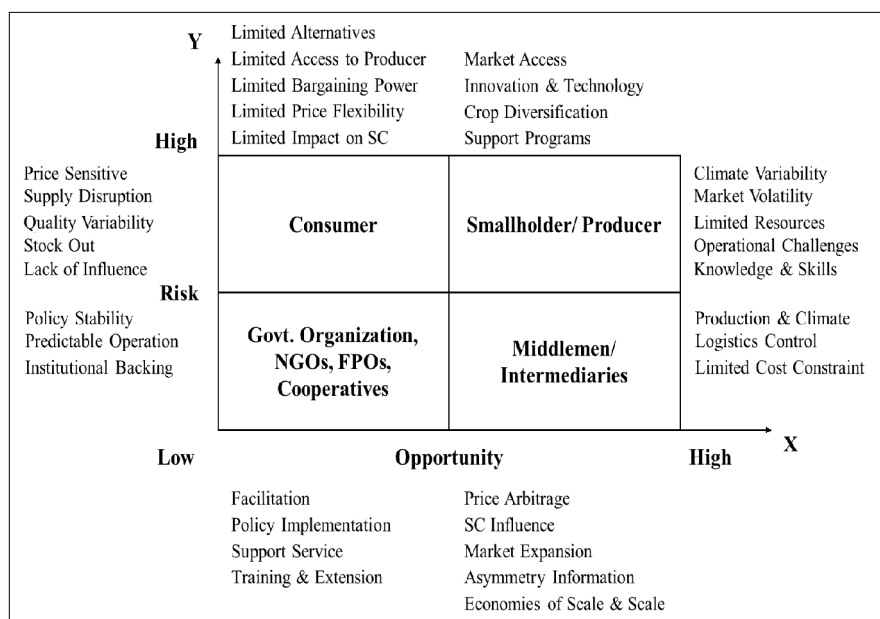


Fig 7: Risk-opportunity matrix. Source: Authors.

LIMITATIONS

The following limitations are acknowledged, which provide direction to the future research and policy development: (1) cross sectional design captures FPO impacts at one time point, precluding causal claims; (2) potential social desirability bias if farmers over reported benefits to please facilitating CEOs; (3) no non FPO farmer comparison group, so not all identified constraints can be attributed solely to FPO membership.

CONCLUSION

This study examined FPO impacts on fruit and vegetable farmers in Tripura. Regarding RQs, FPO membership has partially reduced intermediary dependence and increased bargaining power for some members, but benefits remain limited. Four constraints identified: infrastructure (non operational cold chains, non contiguous farmland), finance (KCC reliance, limited institutional credit), governance (leadership skill gaps) and social barriers (scepticism, individualism). Further, for non contiguous farmland, administrative clustering alone does not generate agglomeration economies without prior infrastructure and capacity investments. Instead of entering the local market with more supply, it would be better to enter the market where the demand is, to have better realisation of prices. The findings in the research would prove to be valuable to policy formulators and developmental practitioners, among other stakeholders who are interested in ensuring sustainability and fairness during agricultural development in Tripura and other locations.

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Disclaimers

The views and conclusions expressed in this article are solely those of the authors and do not necessarily represent the views of their affiliated institutions. The authors are responsible for the accuracy and completeness of the information provided, but do not accept any liability for any direct or indirect losses resulting from the use of this content.

Informed consent

N/A.

Conflict of interest

The authors declare that there are no conflicts of interest regarding the publication of this article.

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