



REVIEW ARTICLE

Social capital fosters organisational resilience: Evidence from farmer collectives and farmer producer organisations

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Received: 05 May 2025; Accepted: 13 July 2025; Available online: Version 1.0: 11 September 2025

Cite this article: Shanmuga Priya K, Selvam S, Parimalarangan R, Murugananthi D, Jeyaprakash P, Jona Innisairani P. Social capital fosters organisational resilience: Evidence from farmer collectives and farmer producer organisations. *Plant Science Today*. 2025;12(sp3):01–10. <https://doi.org/10.14719/pst.9295>

Abstract

Although resilience has become a critical focus in strengthening agricultural organisations, there is still limited systematic understanding of how social capital drives resilience in farmers collectives and farmer producer organisations (FPOs), especially during crises. This review article investigates the critical role of social capital mechanisms in enhancing organisational resilience, particularly within farmers collectives and FPOs. The study focuses on various dimensions of social capital and their impact on organisational resilience during economic crises such as the COVID-19 pandemic. Based on a systematic literature review analysis using the PRISMA (preferred reporting items for systematic reviews and meta-analyses) framework, the findings indicate that FPOs with strong social capital can effectively mobilize resources, adapt to market disruptions and maintain supply chain operations. The analysis highlights that structural social capital, through networks, enables collective action, cognitive social capital, through shared values and understanding facilitates strategic adaptation and relational social capital, based on trust and reciprocity, strengthens organisational response and internal cohesion. The article also investigates social capital's evolution across the different stages of FPO lifecycle, observing that while social capital is high in early stages, it tends to decline as organisations grow and become more market oriented. The study provides practical recommendations for policymakers and FPO leaders to preserve and enhance social capital, emphasizing the importance of member engagement, shared values and continuous communication. By understanding and leveraging social capital mechanisms, FPOs can build more resilient and sustainable agricultural enterprises that support smallholder farmers' economic and social well-being.

Keywords: farmer producer organisation; life cycle; resilience; social capital

Introduction

In India, the agricultural sector has long struggled with challenges such as access to markets, credit and input cost faced by the small and marginal farmers, leading to various interventions in institutions over time. The evolution of institutions in India originated with the 19th cooperative movement, with subsequent models including cooperatives, self-help groups (SHG), farmers clubs and commodity groups emerging to make small and marginal farming more economically viable (1). While these traditional models increased outreach and provided cooperative benefits, they achieved limited success in ensuring member participation and moderately improved small farmers' economic wellbeing (2). As a result, there has been a search for new institutional forms. Farmer producer organization (FPO) or farmer producer company (FPC) represents one such innovative model in India, which maintains the cooperative principle but operates with a corporate organizational structure (3, 4).

The concept of FPO gained legal recognition through the 2002 amendment of the companies act, based on recommendations from the Y.K. Alagh committee, which sought to "accommodate the spirit of a cooperative with the operational flexibility of a private company" (5, 6). This amendment introduced a special provision while retaining the cooperative principle of 'one member, one vote' (3). NABARD defines a producer organization as a legal entity formed by primary producers, including farmers, milk producers, fishermen and rural artisans with this legal recognition serving as the essential gateway that allows institutional stakeholders. When specifically composed of farmers, these organizations are termed farmer producer organizations (7). FPOs can take various legal forms such as farmers producer companies (FPCs) under Section 581(C) of the companies act; societies under society registration act, 1860 and public trusts under Indian trusts act, 1882. They can also be registered under cooperative societies under various acts namely cooperative societies act,

mutually aided cooperative societies act and multi-state cooperative society act; section 8 companies (formerly section 25) under companies act.

Among these forms, FPCs have emerged as the most prevalent, combining cooperative principles with corporate governance structures (8). FPCs are formed by aggregating existing collectives like SHGs, producer groups and NABARD's farmers clubs or by establishing new farmer interest groups (FIGs). FPOs serve as "gap fillers and bridge builders" in rural areas, facilitating corporate and collective action (9). FPOs play a significant part in agriculture business as they improve economic interest of farmers through advantages like economies of scale, double marginal elimination, processing gains, assured pipeline retention of product, horizontal and vertical coordination rewards, risk reduction measures and balancing power strategies. FPOs operate through a multi-tier structure, typically consisting of FIGs at the village level, district/block level federations and state-level apex bodies. These organizations provide various services to members, including input supply and procurement, technology dissemination, market linkages, value addition and processing and financial services facilitation (10).

The growth of FPOs has been significant, particularly since 2013. As of 2013, the Ministry of Agriculture and Farmers' Welfare informed that against the target of 10000 FPOs (bringing over one million farmers as members), 7597 FPOs have been registered in 34 states/union territories (11). The evolution of FPOs in India has been marked by several significant milestones starting with the introduction of producer company concept through companies act amendment (2002) followed by the producer organization development fund (2011-12) initiated by NABARD, central sector scheme for FPO promotion (2013) launched by SFAC, incorporation of producer company provisions (2014) in companies act 2013.

The recent milestone in this evolution has been the launch of central sector scheme "formation and promotion of 10000 FPOs" with a budget allocation of ₹6865 crores in 2020 (12). However, some aspects need further exploration regarding their effectiveness at recognizing pre-existing social ties and utilizing them for business growth (13). Specifically, the inclusiveness of small and marginalized farmer's involvement, reaching out into untapped social networks and enhancing overall performance remain largely unexplored in both national and regional contexts (14).

In times of economic crises, agricultural collectives for instance FPOs and cooperatives establish superior performance in offering employment and viable income to individuals and community members (15). Member-based organizations have shown to be more resilient than other business models, even in the face of intrinsic challenges including restricted access to financial capital, capacity growth and market entry (16). Resilience is especially important for member-based organizations located in developing countries since they are more exposed to economic, political and climate-crises than their counterparts in developed nations (17).

FPO being considered as organizations based on social capital (18). With the social foundation of FPO, it has been recognised as their primary advantage compared to other ventures. It is widely stated that social capital, which stems

from interpersonal relationships, holds significant value (19). It is widely acknowledged that all economic activities are rooted in social structures, which cannot be refuted (20). The recent interest in social capital arises from the limitations of traditional economic models which struggle to explain phenomena like wage inequality and cooperation without formal contracts. Here, social norms and networks offer better insights for these areas. Therefore, when traditional economics tends to overlook social factors and it is only through the concept of social capital that these factors can be incorporated into economic analysis.

There has been an increase in scholarly interest in the relationship between social capital and resilience, despite the fact that social capital researchers have emphasized its significance and attempted to link it to organizational development and performance (21). However, the existing research has not shown how organizations should effectively use this resource to build resilient capabilities. Although farmers' collectives are well known to be resilient, not much thought has gone into defining FPOs resilience or how their social capital, which serves as their primary basis, might aid in the development of the necessary resilient capacities (4). In order for FPO to better prepare themselves and develop the required skills to deal with uncertainties and adversities, it is imperative that they obtain a thorough awareness of the interactive relationship between social capital and resilience (22). In order to fill the theoretical gaps mentioned above and investigate our research question: How can FPOs strategically use their social capital in developing resilience? With the aim of understanding how socially based resources like social-capital might be used as strategic assets to achieve higher resiliency (4).

Different terms are used in the literature to describe farmer organization, encompassing terms such as farmer organization, rural producer organization, agricultural producer organization, agricultural cooperative, farmer association, producer group, producer association, farmer producer organization and farmer producer companies (8, 22-29). Despite the diversity in nomenclature, these organizations exhibit shared traits: they are situated in rural areas, operate on a membership-oriented model and feature a democratic structure that grants members to control over organizational functions. Moreover, when integrated into the value chain, they bring an economic role. To maintain consistency in this paper, the term FPOs will be universally employed, encompassing agricultural cooperatives, associations and rural producer organizations. Although research on social capital specific to FPO is limited, this paper draws upon the extensive body of literature on social capital within the cooperative context. This approach is chosen to expound on FPO performance and resilience because of similar characteristics of producer cooperatives and FPO.

This review paper addresses a critical gap in understanding how social capital contributes to FPO resilience. While existing literature acknowledges the importance of both social capital and resilience in agricultural collectives, their interrelationship remains underexplored. This review aims to examine how FPOs can strategically leverage their social capital to develop organizational resilience. Specifically, this paper seeks to analyze the mechanisms through which social capital contributes to FPO resilience.

Materials and Methods

This review was conducted using the PRISMA guidelines to ensure a systematic, transparent and reproducible approach to literature mapping (30). PRISMA was chosen to align with the objective of the study by exploring the relationship between FPO and social capital by thoroughly identifying, screening and synthesizing relevant research across disciplines.

The review followed three phases namely identification, screening and inclusion. In the identification phase, databases such as Scopus and Google Scholar were searched using keywords including “social capital”, “resilience”, “agricultural production organization”, “agricultural cooperatives”, “producer associations”, “farmer producer company” and “farmer producer organisations”. The timeline is specified from 2000-2024. Preference is given to articles published in Scopus ranked and peer-reviewed journals. However, relevant peer-reviewed articles and reports from Google Scholar were also considered if they met quality and relevance criteria. Mapping involves identifying key themes, gaps and trends in the literature.

Through the filtering process, the total of 182 articles were retrieved (42 from Scopus database and 140 from Google Scholar). In the screening phase, duplicate entries were removed. Specifically, 3 duplicate articles were identified and excluded which was found to be appearing in both Scopus and Google Scholar. The remaining articles were then evaluated based on title and abstract for their thematic relevance. Articles that did not focus on reasons of resilience of FPOs, social capital and resilience interrelationship and how social capital mechanisms function in the distinct context of FPOs entities that straddle both social objectives and market-oriented goals were excluded. In the inclusion phase, 89 articles that met the criteria were selected for qualitative synthesis and suitable for the purposes of our review (Fig. 1).

Results and Discussion

FPO resilience

The COVID-19 pandemic highlighted the critical importance of organizational resilience among FPOs in India. According to The Indian Express, the national lockdown severely impacted business operations of 67 % of FPOs across 48 districts, emphasizing the need to understand and strengthen resilience mechanisms within these agricultural institutions (31). Despite these challenges, FPOs played a crucial role in sustaining the food supply chain, ensuring the availability of essential commodities. The sudden disruption of supply chains for both perishable and non-perishable commodities significantly impacted farmers' livelihoods. Many FPOs, particularly those dealing with fruits, vegetables and pulses, seized the opportunity to tap into urban and peri-urban markets, securing better price realizations for their produce. By leveraging direct-to-consumer models, these FPOs reduced their dependency on market channels such as APMC (agricultural produce market committee) mandis. This shift minimized competition from large traders and middlemen and created new market linkages (32). However, the benefits were not universal. Labor shortages, caused by movement restrictions, delayed critical farming activities like harvesting and threshing, leading to financial losses for many farmers. Additionally, the lack of storage facilities and transportation forced some farmers to leave their crops unharvested. In contrast, FPOs with access to storage, aggregation and marketing facilities demonstrated remarkable resilience during the pandemic (33). These organizations were able to aggregate produce from their member farmers, secure transportation and access markets, ensuring continuity in operations. FPOs dealing with essential items such as food grains, fruits and vegetables, dairy and continued to operate despite facing significant hurdles (34).

Recognizing the critical role of FPOs in maintaining agricultural supply chains, the government implemented

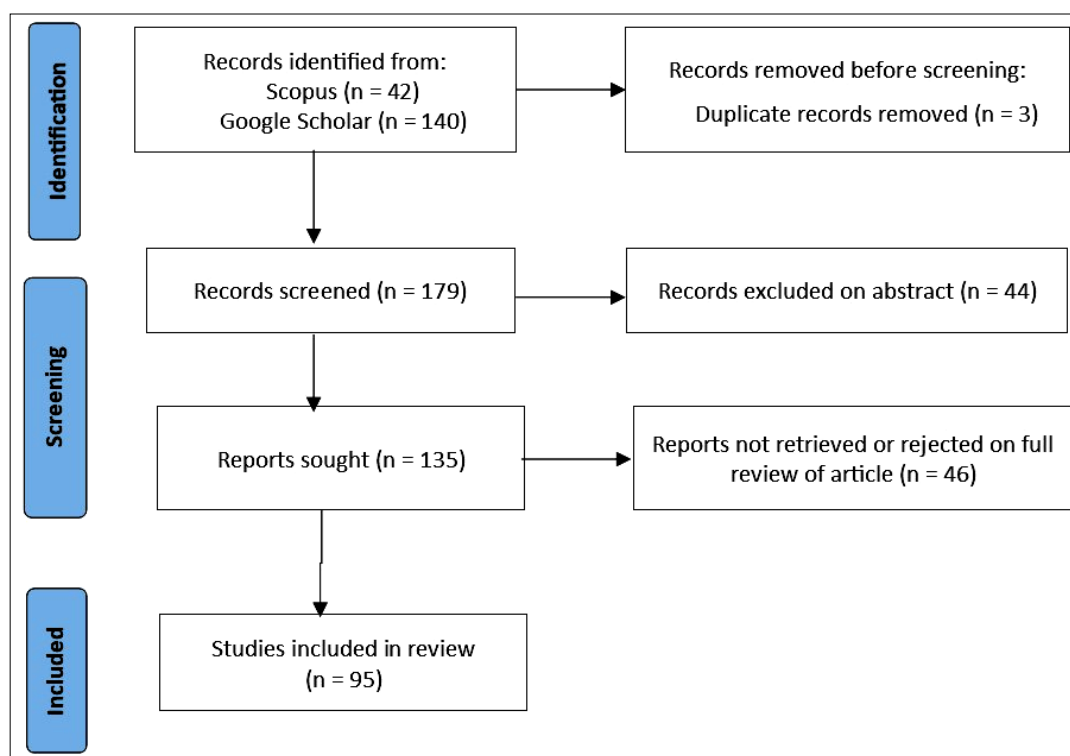


Fig. 1. PRISMA flow diagram for articles screening.

several transformative support mechanisms. The introduction of the FPO trading module by the government on the national agriculture market (e-NAM) platform represented a significant digital intervention. This platform enabled FPOs to upload produce details, including images and quality parameters, facilitating online bidding without physical market interactions. By the end of 2022, 2177 FPOs had been onboarded on the e-NAM platform, signalled a significant move towards digitalization, offering farmers direct market access and reducing transaction inefficiencies (35).

Different states demonstrated unique and innovative approaches such as new supply chain models and direct-to-home delivery to enhance FPO resilience. State governments in Maharashtra, Tamil Nadu and Haryana supported FPCs as collection centers facilitating direct sales to consumers. Maharashtra pioneered the direct-to-consumer model by promoting customized vegetable packet sales (36). Tamil Nadu registered 100 FPCs representing 0.23 million farmers on the national commodity and derivatives exchange (NCDEX), expanding market opportunities. Haryana registered 125 FPOs on e-NAM for horticultural trading, creating digital platforms for agricultural commerce (35). These state-level initiatives showcased the potential for localized innovative solutions in strengthening agricultural ecosystems.

Technological innovations and collaborative strategies by FPCs emerged as critical resilience mechanisms. FPOs embraced digital platforms and strategic partnerships to overcome pandemic-induced challenges. Notable examples include the Nilgiris FPOs' collaboration with Zomato for online sales, demonstrating the potential of technology-enabled market access (37). The Abhinav farmers club provides another exemplary case of innovation and adaptability. By leveraging a mobile app, the organization connected 2.56 lakh farmers across India with urban consumers for the sale of organic products (38). During the lockdown, the club added 56 farmer groups, facilitated direct marketing to housing societies and addressed challenges such as labour shortages and transportation issues.

Direct procurement efforts by FPOs further alleviated supply chain disruptions. For example, 15 FPOs under Maha FPC procured 14000 MT of Tur (pigeon pea) and chickpea from 20000 farmers in Maharashtra at the minimum support price (MSP). These initiatives not only stabilized supply chains but also provided farmers with reliable market access during a period of uncertainty (39). Concepts like "produce locally, consume locally" can strengthen local markets, reduce dependency on external systems and enhance food sovereignty. NABARD and SFAC have already registered over 7000 FPOs under the farmers producers' company act, 2013, demonstrating the potential of these organizations to drive inclusive, democratic and resilient agricultural practices (40).

These experiences highlighted the critical need to understand FPO resilience. As a result, resilience has become a top priority for central and state governments, international donors and the private sector, similarly following the global economic shocks caused by COVID-19 and the impact of the resulting geopolitical crises, leading to further changes in the global supply chain (41).

Organizational resilience is defined very broadly but can be widely accepted as the ability to respond successfully or

"bounce back / forward" after the disaster (42-44). The majority of the literature, with analyses of dynamic capacities, traits and outcomes, focuses on for-profit businesses (45, 46). It is implied that successful organizational responses need to be adaptable and built on decentralized structures, collaborative cultures and employee empowerment (47). These characteristics bear significant resemblances to aspects of the FPO (particularly strong local networks, democratic control and shared social aims).

While the majority of research on resilience has concentrated on responding to crises by for-profit organizations or nonprofit organizations that handling the crises, however these results implied that the resilience of FPOs can be attributed to their democratic power, ownership of member, common social goals and local networks (48, 49). For instance, empowerment and decentralized structures are deep-rooted in various groups such as committees, FIGs and producer groups (50). Similarly, informal networks and abilities for collaborative governance are essential components of FPO. Resilience is a multifaceted idea (51). In terms of its economic output, it is "an organization's ability to absorb shocks and adapt to new circumstances" (52). Thus, in order to stay competitive and take advantage of opportunities, businesses should think beyond recovery and focus more on strategic process innovation (53).

Despite this, because of their dual character as FPO, the resilience of FPO is linked to both their social and organizational economic duties as a means of addressing the demands of their members. Resilience is characterized in developmental studies as a set of behaviours of actors, acquired over time to "lead a lifestyle that they value and have reasons to value" (54). This citation clarifies the concept of resilience in terms of social responsibility of FPO. As a result, in order to attain resilience, FPOs should offer transformative activities that let their members make the most of their resources - both individually and collectively to take advantage of opportunities and protect against risk. Therefore, encouraging member empowerment is directly related to the responsibility of FPO.

The integrated collective feature of FPO can further improve and enhance the member empowerment by providing access to collectively available information, knowledge, resources and opportunities (55). It can be defined as appropriation capacity, which is the ability to leverage collective skills and experience to better prepare for current and future events (56). Therefore, in this study, FPO resilience is defined as the ability of organizations to recover from disruption, maintain dynamic integrity in the presence of ongoing stress and exploit emerging opportunities that society revolves around achieving social and economic goals. This review focused on the critical importance of FPO resilience through technological innovation, state-level support and a focus on member empowerment. As global economic shocks showed the importance of understanding and enhancing FPO resilience, this will be important for nurturing capabilities of the farming communities.

Role of social capital in building resilience

Social capital theories provide persuasive evidence that networks, reciprocity and trust are essential for overcoming obstacles and enabling actions (57). Social capital is an important strategic resource that is necessary for cooperative initiative to be successful (58). A significant advantage that FPO

has over other venture capital organizations is its social foundation (59). Numerous scholars have stressed the significance of social capital and attempted to connect the concept with performance and organizational development (21). Member participation, rooted in reciprocity and mutual trust, plays a significant role in determining organizational performance (60).

Social capital in FPOs manifests through multiple interconnected dimensions. Social capital can be categorized into three dimensions namely bonding, bridging and linking which collectively strengthen organizational resilience. Bonding social capital refers to the trust and reciprocity within homogenous groups, such as members of an FPO or farmer collectives. It enhances group cohesion, enabling members to share resources and address individual challenges collectively. For example, women in India developed strong bonding social capital through kinship networks, which acted as safety nets during crises (61). Bridging social capital denotes connections between heterogeneous groups, fostering collaboration and exchange of knowledge.

In the context of FPOs, bridging social capital facilitates partnerships with neighbouring farmer groups or other FPOs, improving market access and operational efficiency. It is crucial for accessing financial resources, technical expertise and policy support. Notably, few studies emphasized that linking social capital is critical for fostering leadership and ensuring proactive responses to systemic challenges (62). Trust is an important factor for strengthening social capital. Trust enables people to mobilize bridging and linking social capital and facilitates collective action, providing access to the knowledge and resources required to drive change. In the context of FPOs, trust enhances collaboration, reduces conflicts and fosters long-term partnerships among members and with external stakeholders.

FPOs can go beyond their economic and commercial scope to assist poorer sections of society and support the formation of social capital. In a study of 226 farmer members of a FPC, social capital plays a significant role in predicting the performance of FPCs (37). This highlights how FPOs serve as both economic enterprises and social institutions, enabling marginalized groups to access resources, markets and support networks that enhance their resilience.

The existing literature has shed light on how crucial social capital is to FPO survival and success. Social capital can help FPO to recover from unforeseen events since reliable stakeholders and communal partners would handle situations collaboratively (63). Similar to this, social capital in the framework of FPO can serve as a defence against misfortune, fostering teamwork and preserving integrity in the face of unforeseen setbacks (55). The relationships between various facets of social capital and resilience in various circumstances are being studied more and more in existing research. While relational capital enhances Chinese enterprises' reactive resilience, structural capital increases their proactive resilience (63).

Supply chains' level to develop resilience is significantly influenced by several facets of social capital (52). Structural factors such as small network size, cognitive elements like close interpersonal relationships and relational aspects including employee seniority within the organization are key

components of social capital (64). In rural areas, the widespread availability of social networks has been shown to enhance the resilience of rural firms during natural disasters but not urban businesses (65). Moreover, stakeholder engagement acts as a major source of social capital in the entrepreneurial setting, mediating the link between the enterprise's resilience and financial success (50).

These studies assume that social capital, which protects organizations from transient disturbances, provides a set of personal and communal resources that contribute to resilience (66). Trust was considered as a shared cooperative strategy for containing supply chain disruptions (67). Vasundhara agri-horti producer company (VAPCOL) in Maharashtra demonstrates how collective action and shared governance can enhance competitiveness and resilience (36). Similarly, Abhinav farmers club leveraged digital tools and community networks to maintain operations during the COVID-19 pandemic, connecting farmers with urban consumers through innovative marketing strategies. They developed a mobile app named Abhinav cart app through which the demand by the consumers were put and payment also done through apps (38).

These case studies reveal that during crisis, FPOs with strong social capital were able to aggregate resources and pool risks. They also can access new markets and achieve better price realization and strengthen relationships with government institutions and private stakeholders. Thus, recent studies have shown that social capital can be a strategic resource that enables communities, organizations and even individuals to build resilience. There has been some research that investigates FPO resilience during the recent Covid-19 pandemic (41). However, FPO from India present a gap in the research. First, there is a dearth of literature on the resilience of Indian FPOs to shocks as well as long-term adverse conditions, such as that may be prevalent due to policy, market access and resource constraints (68). Second, there are few studies that provide empirical evidence on resilience to shocks as well as the long-term adverse conditions in FPO (69). This review article made attempt to fill this gap by demonstrating that social capital is not just a theoretical construct but a practical tool for building resilient farmer organizations. It highlights the intricate ways in which trust, networks and collective action can transform organizational capabilities.

Generation of social capital in FPO

FPOs are a social enterprise in which collaboration and trust are fundamental pillars. Compared to capitalist organizations, social networks are underpinned by rules of reciprocity and trust, which are the cornerstones of FPOs and accountability (68). This means that social capital is one of the primary features of FPOs. The components that define their roles and give them a particular value, practicality, uniqueness and unique qualities include responsibility, solidarity and democratic involvement. The FPO's main objective within is to satisfy the demands of its members and other internal stakeholders. By offering goods and services and resolving social issues that have an impact on their local communities, they also aim to serve broader societal needs. These values and principles are shared by all FPO members because they promote community, foster human connection and cohesion, provide an open, diverse and democratic organizational

structure and encourage members to forge connections and bridges with one another (69).

FPOs can generate several forms of social capital (70). Internal and external social capital can be used to categorize social capital at the corporate level (71). While external social capital describes the social links between the organization and other external actors and internal social capital describes the general structure and significance of social ties among organizational members (72). Internal social capital refers to the social ties, trust and norms shared among members of an FPO. This includes faith and reciprocity within the organization, which fosters collaboration and collective action. For instance, strong internal social capital allows members to work cohesively, pool resources and address individual challenges collectively (71). It enhances the organization's capacity to produce or sell collectively, thus reducing operational risks (62). External social capital pertains to the relationships between FPOs and external factors such as banks, government agencies, agricultural extension services, input suppliers and marketing boards. This type of social capital enables FPOs to synchronize operations with external service providers, improve market access and leverage financial and technical support. External social capital, often referred to as 'linking social capital,' plays a vital role in extending the reach of FPOs and improving their overall resilience and efficiency (71).

As India transitions from subsistence agriculture to commercial agribusiness, the development of farmer groups has become critical for addressing "coordination failures" (6). Coordination failures occur when fragmented efforts among small-scale farmers hinder collective action and market access. FPOs act as a solution by leveraging social capital to foster internal trust and norms that strengthen collective production and marketing efforts. They also build external linkages with banks, input suppliers and retail companies to synchronize services and reduce inefficiencies (73). These dual dimensions of social capital (internal and external) empower FPOs to overcome operational risks and address systemic challenges (36).

Creation of social capital in FPO through internal dimension

FPOs are commercial organizations that are owned by their members and have inclusive and democratic governance (74). By virtue of their capital and their trading relationships-as suppliers, customers, or workers of the FPO-members of the FPO are owners. Regardless of capital contribution, all members of the FPO have equal access to control under the "one person, one vote" premise. Members' voting rights are divided equally rather than in accordance with capital. This ensures equal power in decision-making and governing body elections at the most fundamental level. This indicates that the organization is controlled by most of its members. Equal rights of members, on the other hand, suggest that FPO governance is a component of a horizontal organization wherein decision-making authority is dispersed equally among all members (75).

As is the case with FPOs, where common ownership of the business implies a higher level of interdependence, organizations with high levels of interdependence are likely to reach larger levels of social capital when established (76). Members' strong mutuality has produced a certain amount of social capital (77). Similarly, the presence of democratic and horizontal ties within the organization is also thought to be a

major factor in the development of social capital and trust (57). Compared to state-owned and private capitalist organizations, membership-based organizations are generally less effective in cultivating trust, largely because of their dependence on horizontally structured governance systems (78).

Organizational justice has been identified as a unique organizational feature of FPO. This includes fairness in organizational procedures, transparency in the sharing of information and equity in employee management (79). Additionally impacted by organizational justice in FPO is the development of social capital and trust (80). By more fairly distributing financial and non-financial costs and rewards among stakeholders, organizational justice fosters expectations of fair future rewards, which is a necessary precondition for the development of beliefs. Furthermore, the degree of equitable decision-making will deter opportunistic conduct inside the business and encourage the building of social capital. In this regard, group pressure-one of the main features of FIG and FPO-amounts to a basic mechanism that mitigates the issue of free riding and encourages the development of trust (78).

In addition to its members' capital engagement, FPO is an organization that emphasizes additional participatory management practices like communication, transparency, training and daily decision-making (75). These procedures and policies offer significant social capital and are presented and executed differently throughout the company. Thus, it was discovered that employee participation and trust-building, which are strongly associated with the development of social capital in businesses have a positive association (72, 81). In a similar vein, member collective identification and education grounded in shared ideals and principles (solidarity, accountability and democracy) are crucial components in building interdependence and trust (82). After analyzing the processes of social capital formation, it demonstrated that membership organizations are better than other business kinds at promoting social capital (83).

On the other hand, it has been discovered that a number of negative and detrimental social capital factors lead to member organizations' dysfunction, poor performance and eventual failure and dissolution (73). These issues include a decline in member loyalty and trust, lack of transparency in decision-making and individualistic and opportunistic behaviour (84). The increasing complexity and scale of organizations, as well as the diversity of organizations and members' interests, have also been highlighted by various authors as internal organizational characteristics that can hinder the creation of social capital. These factors can also make it challenging to forge personal connections between members, which can have an impact on participation, trust, satisfaction and loyalty among members as well as sufficient information flow and knowledge sharing (85).

Creation of social capital in FPO through external dimension

Social capital within FPOs is shaped by both internal organisational traits and external relationships with other local entities. Because FPOs are founded on the idea of inter-cooperation principles, they will be better able to build and sustain strong and lasting social networks with local suppliers and customers, as well as with other FPOs and social organizations (86). This will allow them to generate transformative social capital within their organisations (74). An empirical comparison of several

business models found that, in contrast to traditional capitalist corporations, membership-based organizations produce more social capital as indicated by supplier and local customer ties (86).

Social capital along the FPO lifecycle

The organizational lifecycle reflects the dynamic changes that occur as FPOs evolve through various stages of development (87, 88). Social capital is closely linked to development of FPO and strategy. A five-stage lifecycle model was proposed for member-based organizations which offering a valuable framework for analysing the phases in the member-based organizations (89). This was based on the health of membership-based organizations (performance transformation index includes non-financial measures, such as economic justification and establishment, survival during the infant stage, growth and consolidation, where issues related to vaguely defined property rights often begin to arise, resolve broadly defined property rights issues and exit, restructuring (which may involve adopting a hybrid model, inviting external co-owners) or shifting (choosing to a cooperative structure for individuals with negotiable delivery rights). This model also applies to FPOs. FPOs at each stage of the life cycle exhibit different levels of social capital. FPOs must possess high social capital from the early stages of their life cycle. However, social capital level in FPOs tends to decrease as the organization grows (77). In the later stages of the life cycle, low social capital in FPO is no longer correspond to the economic attributes characterized by the collective governance structure. Imbalances in social capital and governance structures explain the FPOs' common ownership problems and the loss of its overall advantage.

Conclusion

This comprehensive review of social capital mechanisms in FPOs reveals their fundamental role in building organizational resilience and sustainability. The analysis demonstrates that the three dimensions of social capital namely structural, cognitive and relational, work together to enhance FPO capabilities in weathering external shocks, adapting to market changes and maintaining organizational cohesion. Structural social capital, through networks and communication channels, fosters regular interaction, knowledge sharing and resource mobilisation; cognitive social capital, built on shared values and understanding, facilitates collective decision-making; and relational social capital, grounded in trust and reciprocity, reduces transaction costs and enhances cooperation. A critical paradox emerges, however: while social capital peaks in the early stages of FPO formation, it often erodes as market-oriented strategies take precedence, weakening democratic governance and member participation. Strengthening social connections through regular meetings, training and communication initiatives can sustain the structural dimension, while continuous member education about cooperative benefits can enhance the cognitive dimension. Relational bonds must also be nurtured to preserve trust and solidarity. Despite the recognised benefits, empirical evidence on social capital in FPOs remains limited and future research should examine both its advantages and potential downsides, such as reduced access to external resources or slower adaptation to change. Understanding the balance between benefits and drawbacks, as well as the role of leadership networks in building external social capital, is essential. These insights can guide policymakers and

practitioners in designing strategies to maintain and enhance social capital, ensuring that FPOs remain resilient, competitive and capable of advancing smallholder farmers' economic and social well-being. While social capital offers significant benefits for FPO competitiveness, existing research lacks robust empirical evidence, particularly on the role of leadership networks and external social capital. Future studies should also address its potential downsides, such as reduced access to external resources and slower environmental adaptation, to better balance its advantages and limitations.

Acknowledgements

The authors gratefully acknowledge the support of our institution, Anbil Dharmalingam Agricultural College and Research Institute (ADAC & RI), Tiruchirappalli for providing guidance and necessary facilities during the preparation of this review article. Sincere thanks to the advisory committee and colleagues who provided critical feedback and encouragement throughout the process.

Authors' contributions

SPK carried out conceptualization, conducted the literature review, synthesized the findings, design of the study and original draft preparation. SS carried out conceptualization, supervision, validation of results, critical review and substantial revisions to the manuscript. PR, MD, JP and JIP carried out manuscript review and approval of the final version. All authors have read and approved the final manuscript.

Compliance with ethical standards

Conflict of interest: Authors do not have any conflict of interest to declare.

Ethical issues: None.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used ChatGPT (OpenAI) to assist in improving the clarity, grammar and coherence of the manuscript, as well as for rephrasing certain sections. After using this tool, the authors reviewed, edited and validated all content to ensure accuracy and take full responsibility for the content of the publication.

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Publisher information: Plant Science Today is published by HORIZON e-Publishing Group with support from Empirion Publishers Private Limited, Thiruvananthapuram, India.