International Journal of Global Business and Competitiveness
https://doi.org/10.1007/s42943-025-00128-7

PERSPECTIVE

Transforming the Food System Through PACS: A Policy-Driven Path Toward Sustainable and Fair Value Chains

Sagar Wadkar[1] · **K. K. Tripathy**[2] · **Vaishali Goswami**[1] · **Naveen K. Singh**[3]

Received: 1 May 2025 / Accepted: 5 September 2025

Abstract

This study explores the potential of Primary Agricultural Credit Societies (PACS) in improving livelihoods of millions of member farmers by addressing major challenges of the India's food systems viz. equity, competitiveness and sustainability through the spirit of cooperation and coordination right at the grassroots. Historically credit-centric institutions—PACS are now all set to drive agri-value chain integration by becoming multipurpose and multi-dimensional profitable community-based enterprises. Grounded in the Cooperative Life Cycle Framework, this paper traces the institutional evolution of PACS through phases of justification, design, growth, introspection, and strategic choice using a qualitative methodology encompassing stakeholder consultations across eight states, namely, Chhattisgarh, Jharkhand, Karnataka, Kerala, Maharashtra, Odisha, Punjab, and West Bengal. While identifying key enablers for repositioning PACS as seed producers, organic aggregators, and export facilitators, this paper highlights structural bottlenecks, including fragmented governance, human resource limitations, and role overlap with Farmer Producer Organizations (FPOs) and Self-Help Groups (SHGs). The study proposes six strategic business pathways for PACS transformation, advocating convergence with sectoral cooperatives, district-level federations, and rural credit institutions. Ultimately, the findings reconceptualize PACS as hybrid institutions balancing social purpose with market orientation and offer actionable policy recommendations to enhance rural competitiveness, inclusion, and climate resilience. The study contributes to cooperative development theory and provides a roadmap for utilizing PACS along with FPOs and SHGs in India's broader agricultural transformation with their collective strengths.

Keywords Community-based enterprises · PACS · LAMPS · FSS · Cooperative business · Community development · Food system

JEL Classification J54 · P13 · Q13

Introduction

Primary Agricultural Cooperative Societies (PACS) are farmer-centric, village-level financial institutions that uphold democratic values and are guided by cooperative principles. They serve as socio-economic institutions established to protect rural communities, particularly small and marginal farmers, from exploitative moneylenders and landlords (Bose & Nagarajan, 2018; Ghosh et al., 2023; Umamaheswari & Manivel, 2021). Functioning at the grassroots, PACS play a central role in delivering agricultural credit and allied services to marginalized communities (Anand 2024; Goswami & Jindal, 2021; Sahoo et al., 2020).

India has a deep-rooted tradition of cooperation, especially in agriculture, dairy, and fisheries. As of 31 December 2024, the country had 823,909 cooperatives, with 629,009

✉ Sagar Wadkar
sagarkwadkar@gmail.com

K. K. Tripathy
tripathy123@rediffmail.com

Vaishali Goswami
goswamivaishali07@gmail.com

Naveen K. Singh
naveen.vamnicom16@gmail.com

[1] National Cooperative Union of India, Delhi, India

[2] Economic Advisory Council to Prime Minister, Delhi, India

[3] International Cooperative Alliance-Asia and Pacific, Delhi, India

Published online: 07 October 2025

functional, spanning national to sub-district levels (Appendix—Table A1). These cooperatives support their members, community and society at large through their respective sector-specific federal structure (Wadkar & Dubey, 2024).

PACS alone account for 98,026 functional societies across the country. Their geographic distribution is provided in Appendix Table A2, reflecting their penetration in both agriculturally advanced and backward states. States such as Maharashtra (20,953), Gujarat (9737), and Bihar (8315) lead in PACS presence, indicating the importance of regional dynamics in cooperative success.

Despite their significant reach and potential, PACS face several limitations. These include small operational sizes, inadequate infrastructure, over-reliance on credit functions, inadequate staff, lack of necessary funds, poor industrial relations, poor market connections, lack of professional management, political interference, change in economic conditions, over dues, government interventions, and weak integration with higher cooperative tiers (Banerjee & Banerjee, 2021; Bansal et al., 2012; Dharmaraj, 2024; Yashoda, 2017). Thus, to develop cooperatives as the leading member-driven business organization at the grassroot level, there is a need to transform PACS to multipurpose or multifunctional institutions (Anand, 2024; Dharmaraj, 2024; Vijayan et al., 2022). Many scholars and committees have also recommended reforms to make PACS multifunctional and financially viable (All India Rural Credit Survey Committee, 1954 by RBI; Anand, 2024; Capoor Committee, 2000; Chawala, 2022; Government of India, 2009; Mehta Committee, 1937; Mridha Committee, 1965; Singh, 2016).

The urgency of reforming PACS is underscored by the global challenge of food and nutritional insecurity as well. Over 820 million people remain undernourished globally (FAO 2019), and with the world population projected to reach 9.8 billion by 2050 (UN DESA, 2017), ensuring access to safe, sufficient, and nutritious food has become a priority. In this context, community-based institutions such as cooperatives, Self-Help Groups (SHGs), and Farmer Producer Organizations[1] (FPOs) are uniquely positioned to contribute to food security through inclusive governance and localized action.

Studies have demonstrated that cooperatives and similar institutions can reduce transaction costs, expand access to markets and finance, improve smallholder productivity, and strengthen forward and backward linkages in agriculture enhances ability to manage natural resources, improves access to agri-infrastructure, information and knowledge, strengthens voice and power in policy processes, and enhance and expand livelihoods opportunities, particularly in developing economies. They also contribute to enhanced resilience, sustainability, and equitable distribution in food systems (Birchall & Ketilson, 2009; Gruere et al., 2009; Gyau et al., 2012; Kruijssen et al., 2009; Narrod et al., 2009; Singh, 2008; Smart & Ernest, 2017; Tripathy et al., 2020; Wadkar, 2018).

The term *"food systems"* refers to the interconnected processes of food production, aggregation, processing, distribution, and consumption, including their economic, social, and environmental outcomes (von Braun et al., 2023). Within this ecosystem, PACS are increasingly envisioned as institutional anchors that can integrate smallholders into structured value chains. Value chains, in this context, include the coordinated flow of goods, services, and information from producers to consumers, encompassing inputs, production, storage, processing, and marketing.

India's agri-food system is experiencing ecological, economic, and institutional transitions. These demand a shift from input-centric models to inclusive and climate-resilient value chains. PACS, along with LAMPS[2] and FSS[3] (hereafter referred together as PACS), as foundational and fundamental institution of rural cooperative banking structure,[4] offer a vast grassroots network capable of aligning smallholder production with national and global agri-food priorities (Ministry of Cooperation, 2023). However, their potential is limited by fragmented value chains and lack of integration with sectoral and global markets. Lack of coordination between each credit cooperative societies (Kumara & Bhat, 2022). Moreover, upper tiers of the cooperative structure primarily support credit functions, neglecting non-credit activities a design flaw that constrains the evolution of PACS into multifunctional institutions.

Recent reforms initiated by the Ministry of Cooperation (MoC), Government of India, have placed renewed focus on PACS. Through the adoption of model bye-laws in 2023 and associated policy support, all States/UTs are now facilitating the transformation of PACS from credit-only institutions into multi-service entities (MoC). These transformations are critical for ensuring competitiveness and innovation.

[1] FPO is a generic term that follows the philosophy and principles of cooperatives. Producers come together and registers their organisation under either the State/ Multi-State Cooperative Societies Act or the Companies Act, 1956 as amended by the Producers Companies Provision in 2003, further amended in 2013. FPOs registered under the Producers Companies Act are known as Farmer Producers Companies (FPCs).

[2] **LAMPS:** Large Area Multipurpose Cooperative Societies; formed in the schedule 5 and 6 tribal areas of the country.

[3] **FSS:** Farmer Service Societies; formed for providing non-credit agriculture services to the farmers, prominently exist in the southern India.

[4] Rural Cooperative Banking structure consists of PACS at the village level institutions, federated at the district level as District Central Cooperative Banks (DCCBs) and at the state level as State Cooperative Banks (StCBs).

Innovation capabilities are essential for PACS to remain relevant and globally competitive. Bhat and Momaya (2020) highlights the need for cooperative institutions to enhance their innovation ecosystems. Momaya (2020, 2022) emphasizes competitiveness as a function of institutional resilience and long-term sustainability. In parallel, FAO (2021) and UNCTAD (2022) call for inclusive value chains that empower smallholders to access certification and high-value markets areas, where Indian cooperatives have had limited success.

In response, the MoC has established three national-level cooperative societies viz. Bharatiya Beej Sahakari Samiti Limited (BBSSL), National Cooperative Organic Limited (NCOL), and National Cooperative Export Limited (NCEL). These entities aim to replicate the success of cooperatives such as Indian Farmers Fertilizer Cooperative Limited (IFFCO) and Krishak Bharati Cooperative Limited (KRIBHCO) which democratized fertilizer access during the Green Revolution by developing national ecosystems for seed, organic products, and exports, with PACS serving as the last-mile delivery agents.

This shift is particularly significant given India's agro-ecological constraints. The country must feed 18% of the global population with just 11% of the world's cultivable land. Though India achieved a food grain production of 311 MMT in 2021, storage capacity lags behind at only 145 MMT, resulting in a 166 MMT shortfall (MoC, 2022). Cooperatives, with their community-led storage and distribution models, are essential in bridging this gap (Karmakar, 2013).

Furthermore, cooperative-led food systems offer sustainable solutions to climate challenges, such as erratic rainfall, soil degradation, and rising input costs (IPCC, 2022). Their operations align with India's National Action Plan on Climate Change and Sustainable Development Goal (SDG) 12 on responsible consumption and production (Arpith & Ishwara, 2023).

Thus, this paper builds upon cooperative theory and global best practices to develop a policy-driven framework for positioning PACS as multifunctional institutions and critical anchors in India's evolving and inclusive food systems.

Review of Literature

Origins and Development of Cooperatives in India

Cooperation in India began in the late nineteenth century to free farmers from moneylenders, gaining formal recognition through the Cooperative Credit Societies Act of 1904. By 1911, there were 5300 societies with over 3 lakh members, mainly focused on credit (MoC, 2022). As cooperatives expanded, the Cooperative Societies Act of 1912 was introduced to include both credit and non-credit services and allow for federations (Chawla, 2022). The Mehta Committee (1937) recommended converting credit societies into multipurpose ones. During World War II, cooperatives aided government procurement, with grassroots societies helping farmer's clear debts from the Great Depression. To support these, National Agricultural Cooperative Marketing Federation of India (NAFED) and National Cooperative Consumers' Federation of India (NCCF) were established in 1958 and 1965, respectively.

The evolution of India's cooperative movement has been closely interwoven with the country's Five-Year Plans, reflecting its changing priorities over time. Beginning with the First Plan (1951–56), cooperatives were seen as vital for rural credit and community development, with significant allocations made for short-, medium-, and long-term loans (Rao, 2007). The Second Plan (1956–61) advanced institutional infrastructure, including marketing federations and a long-term credit fund, while the Third Plan (1961–66) led to the creation of key institutions, such as the Agricultural Refinance Corporation and the National Cooperative Development Corporation (NCDC). The Fourth Plan (1969–74) emphasized support to small cultivators and cooperative bank rehabilitation, while the Fifth Plan (1974–79) focused on strengthening cooperatives in credit, supply, marketing, and processing. The Sixth Plan (1980–85) introduced NABARD to boost rural credit. The Seventh Plan (1985–90) prioritized Primary PACS and equitable credit access. The Eighth Plan (1992–97) advocated for self-managed, democratic cooperatives, with enhanced roles for marginalized groups. The Ninth (1997–2002) and Tenth (2002–07) Plans focused on poverty reduction, employment, and revival of rural cooperative credit institutions. The Eleventh Plan (2007–12) saw initiatives, such as computerization and HRD, while the Twelfth Plan aimed at revitalizing PACS/LAMPS and linking cooperatives with SHGs, especially women's groups. Across all plans, cooperatives remained central to India's rural development and credit architecture (Banerjee & Banerjee, 2021; Dhananjaiah, 2015; MoC, 2022; Sapovadia, 2012).

PACS and Evolution of Other Community-Based Organizations

In the 1960s, PACS played a key role in distributing inputs and credit to small farmers. The Bawa Committee recommended large multipurpose cooperatives in tribal areas (Shah, 2020), and the National Commission on Agriculture (1976) suggested Farmers Service Cooperative Societies with bank partnerships. The shift from agriculture to agribusiness brought challenges in balancing business viability and member welfare.

FPOs in India started to emerge as drivers of growth in rural economy after the recommendations of Alagh Committee (1999), which recommended amendments to the Indian Companies Act, 1956 for incorporating provisions for producer companies which would possess the spirit of a cooperative and the operational flexibility of a private company (Bikkina et al., 2018; Patil et al., 2025; Prasad, 2019; Ramappa & Yashaswini, 2018). The Small Farmers' Agribusiness Consortium (SFAC) was initially designated as the nodal agency for promoting FPOs in India. With the issuance of FPO Formation Guidelines in 2013, support from both SFAC and NABARD further accelerated their growth through funding assistance (Kumar et al., 2022).

Meanwhile, SHGs also emerged as drivers of economic growth giving women the platform to get involved in the mainstream of rural economy (Ramesh, 2007). The evolution traces back to the mid-1980s when NABARD initiated pilot efforts to link informal groups with formal banking systems, building on a model developed by MYRADA. This led to the launch of the SHG–Bank Linkage Program (SBLP), formally supported by the Reserve Bank of India in 1991 and regional rural banks in 1993 (Singh et al., 2011). The approach marked a shift from traditional, collateral-based lending to social collateral, where group responsibility underpinned access to credit (Kropp & Suran, 2002). In 1999, the Swarnajayanti Gram Swarojgar Yojana (SGSY) integrated SBLP into its anti-poverty and self-employment goals, later replaced by the National Rural Livelihood Mission (NRLM) in 2011, renamed DAY-NRLM in 2015. These programs expanded the SHG network significantly, particularly among rural women (Patil & Kokate, 2017; Sinha & Chattopadhyay, 2024; Sinha & Navin, 2021).

Over the period, FPOs has more evolved as a business entity with more focus on developing commodity specific FPOs as also being promoted under 10,000 FPO program and SHGs more of evolved as drivers of uplifting the social status of women and small and marginal farmers by providing credit (Birthal & Saxena, 2025; Rao, 2007), linking to different livelihood streams. Still, the major challenge which arises here is the duplicity of members in PACS, FPOs, and SHGs.

Apart from this, FPOs face numerous challenges hindering their growth, such as poor capitalization limiting funding access, difficulties in marketing, lack of understanding about business model, governance issues, and a shortage of managerial expertise due to financial constraints (Anand et al., 2025; Chandre Gowda et al., 2018; Kumar et al., 2022; Prasad, 2019). Similarly, SHGs face issues like financial limitations, necessitating external aid (Kumawat & Bansal, 2018). Capacity building, especially in management and entrepreneurship, is lacking. Market access and institutional support for training, credit, and market connections are challenging. Governance struggles with leadership conflicts and unequal participation.

Socio-economic Impact and Need for Reform

Cooperatives have played a significant role in the socio-economic landscape of India, reflecting the principles of growth, participatory decision-making, and collective accountability addressing the challenges faced by marginalized and vulnerable populations (Madugu, 2025; Sapovadia, 2012). Almost 27% of all cooperatives worldwide are based on India. Compared to the global average of 12%, it is believed that over 20% of Indians are involved in the cooperative movement (NABARD, 2023–24).

In many developing countries, a significant portion of the population continues to live below the poverty line (Yadav, 2018). Effectively organizing these groups is essential for combating poverty, promoting gender equity, expanding access to education and employment, ensuring food security and clean water, and managing natural resources in a sustainable manner for future generations (ILO & ICA, 2014). Rooted in local contexts, community-based models have proven to be powerful mechanisms for driving development, as they align with the specific priorities, needs, and cultural characteristics of the communities they serve (Cervantes, 2023). Cooperatives have immense potential to deliver goods and services in areas, where both the state and the private sector have failed (Ashtankar, 2015; Singh, 2016; Verma, 2004).

Vaidyanathan (2013) offers a critical examination of the long-standing governance and financial issues that have undermined the performance of cooperatives, particularly PACS. He argues that meaningful revitalization requires deep-rooted institutional and structural reforms, not merely the expansion of functional roles (Singh, 2016). Similarly, Shah (1995) and Baviskar (2007) highlight how excessive state control and political interference have significantly constrained cooperative autonomy and operational efficiency. Shah notably characterizes the cooperative movement as expansive yet lacking strength, emphasizing the urgent need to reorient cooperatives around member-driven principles. Cooperative societies' structures must adapt to the shifting global landscape, but their ability to flourish is hampered by antiquated laws and regulations as well as overbearing government supervision (Dhananjaiah, 2015).

The need for professionalization of cooperatives (Carvalho, 2012; Vijaya, 2025), especially PACS (Yashoda, 2017), became a repeated recommendation in committee reports, such as the Capoor Committee (2000) and the Vaidyanathan Task Force (2005), which emphasized structural reforms in governance, autonomy, and service delivery.

Liberalization Challenges and Repositioning PACS and the FPO/FPCs Model

The liberalization, privatization, and globalization reforms of 1991 transformed India's agricultural landscape (Anand et al., 2025; Singh, 2016). The deregulation of markets, entry of private agribusiness firms, and decline in state procurement shifted the focus from agriculture to agribusiness and value-added production (Kavithambika et al., 2024). While these reforms created opportunities for competitive market engagement (Asif et al., 2012), they also exposed PACS to new market risks, for which they were unprepared. Moreover, during this period, political interference in cooperative institutions deepened, particularly in the management of cooperative banks and societies. Positions of leadership in PACS and DCCBs were increasingly captured by political actors, turning cooperatives into patronage institutions rather than community-run enterprises (IRMA, 2020).

PACS are one of the most traditional types of producer associations. FPOs are rooted in the idea of collective action and cooperation. (Arahant et al., 2025). With the introduction of the model bye-laws, a clear pathway has now been institutionalized to address overlaps and gaps.

The recent policy push now positions PACS as central integrators of rural economies, enabling them to operate like FPOs. PACS being born FPOs (NAFSCOB, 2023), financial assistance on the lines of FPOs may be extended to PACS as well. However, critiques such as (Shah, 2016; Singh, 2008, 2021, 2023; Singh & Singh, 2013) argue that FPOs are often just "*old wine in new bottle*" or new generational cooperatives. Empirical studies (Prasad et al., 2023) show that FPCs have made significant strides in enhancing autonomy, promoting member participation, and improving access to markets. While PACS have the advantage of historical presence and state support, FPCs exhibit higher flexibility and entrepreneurial energy, although they too face challenges in scaling and professionalization.

Moreover, the promotion and formation of FPOs is currently being driven by target-based approaches, with limited emphasis on community mobilization and the identification and realization of members' needs, which is the foundational elements of any sustainable community-based institution. Overall, the literature indicates that gaps in member engagement, ownership, and sense of belonging undermine effective governance, thereby hindering the prospects for sustainable business development.

Methodology

This study adopts a qualitative approach to examine how policy-driven transformation of PACS can support sustainable and competitive agri-value chains in India. The study is grounded in field-level perspectives and institutional insights, supported by policy and document analysis. The approaches used for data collection are:

Stakeholder Consultations: The primary qualitative data were collected through structured consultations and telephonic discussions with PACS stakeholders across eight selected states, namely, Chhattisgarh, Jharkhand, Karnataka, Kerala, Maharashtra, Odisha, Punjab, and West Bengal chosen for their regional diversity and varied progress in PACS diversification. The chairpersons, secretaries, and officials associated with PACS were purposively selected based on their institutional roles and familiarity with cooperative reforms and value chain integration efforts. Discussions were semi-structured in nature, allowing respondents to elaborate on operational challenges, governance mechanisms, financial linkages, and diversification strategies. Inputs from cooperative department representatives and district central cooperative banks and PACS development cell officials further enriched the data.

In the discussion, a set of broad thematic points/questions was used in shaping the strategic transformation pathways proposed in this study. This includes:

- Role of PACS in enabling member participation and inclusion;
- Experiences and opportunities for PACS in scaling up agribusiness functions beyond credit;
- Views on institutional linkages with newly formed MSCS (BBSSL, NCOL, NCEL), besides membership with IFFCO and KRIBHCO and the feasibility of cooperative-driven value chain models;
- Existing gaps in agri-marketing, processing, and distribution infrastructure;
- Potential for PACS to collaborate with other sectoral cooperatives to strengthen value chains and market access; and
- Practical challenges and institutional readiness for expanding PACS into long-term credit.

Document Analysis: Policy documents and official reports were selected based on their relevance to ongoing PACS reforms and the evolving role of cooperatives in agri-value chains. Key sources included the Model Bye-Laws of PACS (2023), guidelines issued by the MoC, circulars from NABARD, and state-level cooperative policy frameworks. The document review focused on identifying policy enablers, institutional bottlenecks, and strategic opportunities emerging from national and state-level reforms.

Literature Review: A targeted review of literature was carried out to position the study within the context of cooperative transformation, rural credit systems, and agri-value chain development. The review provided a theoretical lens to evaluate PACS evolution as part of an integrated rural financial and institutional model.

Theoretical Framework: PACS Model Through the Lens of Cooperative Life Cycle Framework

To critically assess the evolution and transformation of PACS, this study applies the Cooperative Life Cycle Framework. This framework, consisting of five sequential phases: economic justification; organizational design; growth–glory–heterogeneity; recognition and introspection; choice, which offers a dynamic perspective to understand institutional trajectories, internal tensions, and strategic decision points in cooperatives.

Phase 1 = Economic Justification

PACS originated in response to acute rural credit market failures in the early twentieth century. The Cooperative Credit Societies Act, 1904 provided a legal foundation to counter exploitative moneylending, promote rural savings, and support smallholder farmers (Ghosh et al., 2023; MoC, 2022; Umamaheswari & Manivel, 2021). The Mehta Committee (1937) envisioned PACS as multipurpose institutions beyond credit, capable of anchoring rural economies. This aligns with the first phase of the life cycle, where cooperatives emerge to address member-driven economic justifications.

During this phase, PACS successfully functioned as grassroots financial institutions, bridging the formal–informal divide in rural credit. The continued reliance of rural households on PACS for seasonal finance, procurement services, and fertilizer distribution during the Green Revolution and thereafter reinforces the sustained economic rationale for their existence. Consultations indicate that, in many states, PACS still serve as first-point access for credit and basic agri-input services, especially in remote and tribal regions.

Phase 2 = Organizational Design

In the second phase, PACS were structured as grassroot-level institutions within the three-tier cooperative credit system. Their design reflected cooperative principles, such as open membership, democratic control, and limited return on equity, but also introduced constraints. Operational decisions were often shaped by state legislation and departmental oversight, which limited financial autonomy and innovation. Cook (2018) describes this phase as critical for building internal rules that either support or hinder future adaptation. In the case of PACS, the heavy reliance on external funding and top–down governance models arguably set the stage for governance rigidities and operational silos.

Phase 3 = Growth–Glory–Heterogeneity

Following formalization, PACS expanded significantly in number and scale, particularly during 1960s for Green Revolution and 1980s for Integrated Rural Development Program. Many began offering complementary services, including fertilizer distribution, procurement, and public distribution systems. This era corresponds with the "glory" sub-phase, as cooperatives experienced relevance and institutional embedding in rural economies.

However, this growth also introduced heterogeneity in member profiles, service expectations, and geographical operations. Cook and Burress (2009) emphasize that heterogeneity across members, regions, and economic functions tends to increase organizational complexity and "ownership costs," leading to internal tensions and declining collective alignment. In PACS, such heterogeneity became visible through varied financial health, service outreach, and governance performance across states.

Phase 4 = Recognition and Introspection

The introspective phase is marked by widespread recognition both by policymakers and stakeholders of PACS' stagnation and need for reform. Several expert committees have examined systemic weaknesses in PACS and proposed revitalization strategies. The Capoor Committee (2000) highlighted foundational issues, including small size, poor infrastructure, and weak governance, recommending expansion of borrowing membership and local leadership to strengthen democratic functioning. Vyas Committee (2004) pointed to high interest rates, fund scarcity, and delayed credit access especially in areas with underperforming DCCBs as major constraints affecting PACS' effectiveness at the grassroots.

The Vaidyanathan Committee (2005) diagnosed deep-rooted impairments in governance, audit regularity, staff capacity, and financial viability. It called for recapitalization, autonomy, and professionalization of PACS to revive rural credit delivery. High-Power Committee (2009) emphasized active member participation and recommended statutory reforms to define "active members," remove dormant ones, and restructure the multi-tier system which were inefficient. The Prakash Bakshi Committee (2012) noted that less than half of PACS members accessed credit, with ~ 40% of PACS still loss-making. It proposed repositioning PACS as Business Correspondents (BCs) of banks and diversifying into fee-based services (Senapati & Bhatia, 2018).

Stakeholder consultations echoed this recognition. Across states, PACS officials acknowledged gaps in digital capacity, member participation, long-term credit provisioning, and integration with marketing systems. There is also growing awareness of the competitive and policy overlap with FPOs and SHGs, raising concerns about institutional redundancy. This phase marks a pivotal moment of introspection, where PACS face the necessity of realigning their mandates and delivery models with contemporary rural realities.

Phase 5 = Choice

The current trajectory of PACS situates them at the fifth phase, where cooperatives must select a path between degeneration and regeneration. The formation of the MoC in July 2021 marked a significant inflection point. Key national-level initiatives now aim to modernize PACS and expand their institutional capacities beyond traditional credit delivery.

Among the notable developments is the creation of the world's largest decentralized grain storage infrastructure, which envisions the establishment of 1469 units with a cumulative capacity of 700 lakh metric tons. This initiative seeks to strengthen post-harvest value chains and address critical gaps in rural storage and logistics. Parallel efforts include promoting green energy through the PM-KUSUM scheme, expanding access to healthcare via Jan Aushadhi Kendras, and introducing digital infrastructure to bridge the rural–urban technology divide.

At the regulatory level, the Model Bye Laws for PACS introduced by the ministry outline a framework for diversified, business-ready cooperatives. These bye laws enable PACS to undertake a wide array of economic activities, allowing them to evolve into multi-service institutions. While more than 25 business categories are officially defined, the scope for localized adaptation based on needs, extends this number to over 30 activities offering significant opportunities to PACS (Table 1).

But, feedback from *stakeholder consultations* conducted in Jharkhand, Odisha, Punjab, and Maharashtra revealed cautious optimism among PACS leadership regarding diversification due to the structural limitations of PACS. While some saw the potential in diversifying into seed marketing (with BBSSL), organic clusters (via NCOL), and even export aggregation (through NCEL), concerns were raised about role ambiguity and possible duplication with FPOs and SHG federations. Doubt was most pronounced by the stakeholders around certification processes in organic farming, digital readiness of PACS, and whether ground-level functionaries had adequate skills for non-credit functions. In West Bengal and Odisha, dissenting voices highlighted fears that rapid diversification without institutional strengthening could overstretch already limited human and financial resources.

Amidst this context of cautious optimism and structural limitations, certain PACS have already begun to exemplify the potential of successful diversification. There are many such stories of PACS transformation from the selected states in the study. One such case is the Madhusudankati Agricultural Credit Society (SKUS) in North 24 Parganas, West Bengal. Established in 1957, this PACS has transitioned from a basic credit provider into a full-service, multifunctional cooperative enterprise. It offers Kisan Credit Card and SHG-linked loans, operates as a wholesale and retail distributor of fertilizers and pesticides (including IFFCO and West Bengal State Cooperative Marketing Federation products), and has developed forward and backward linkages through a Custom Hiring Center, Agricultural Produce Procurement Center, and a large-scale godown supported under the Rural Infrastructure Development Fund (RIDF) scheme. The Society also manages a Rural Water Project and retail stores supplying consumer goods. In addition to economic services, it undertakes social initiatives, such as organizing health camps, operating a medical center, and facilitating community development through a children's park and community hall. This example illustrates how, with localized leadership, community trust, and operational autonomy,

Table 1 PACS—single window for credit and non-credit services

Credit and financial services	Agriculture-based services	Allied sector-based services	Consumer-based services
Credit services:	Backward linkages	Fisheries	Common service centers
short/medium- and long-term loans	Supply of inputs—seeds, fertilizers, pesticides, organic inputs, etc.	Dairy	Distributorship/supply of LPG
Financial services:	Seed production	Floriculture	Dealership of LPG/petrol/diesel
banking correspondents	Custom hiring centers	Bee keeping	Green energy
Locker facility	Forward linkages	Plantation	Supply of consumable and durable goods
Micro insurance agent	Aggregation and trading	Piggery	Health services
	Warehouse, silos and cold storages	Poultry	Data Center
	Primary and secondary processing centers	Goat rearing	Rural tourism
	Packhouse	Rabbits rearing	Education
	Reefer van	Sheep rearing	

Source: Author's representation adapted from the MoC Model Bye-Laws for PACS (2023)

PACS can evolve into decentralized, business-ready institutions delivering integrated services across credit, input supply, marketing, and welfare.

Operational Business Pathways for PACS Transformation

PACS, long associated with farmers, can serve as pivotal business hubs. It has potential to diversify their business operations (Tripathy & Wadkar, 2021). However, collectives such as FPOs and SHGs, integral to the ecosystem, must also be included in any comprehensive business plan. PACS should craft community-oriented business pathways that embrace diverse sector players (Fig. 1).

Pathway 1: Member Centricity

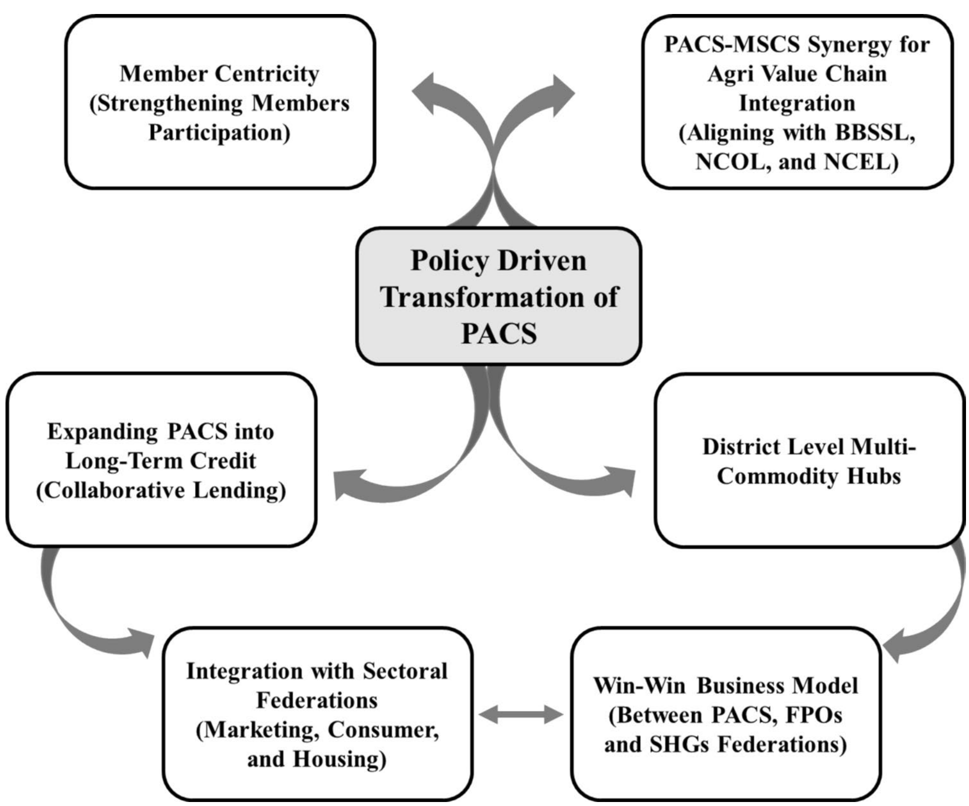
To ensure sustainable growth and member engagement, cooperative societies must first analyze their own members based on their participation. This aligns with the Cooperative Principle 3, "*Member Economic Participation*," which emphasizes members, as both owners and consumers/users.

The State and MSCS Act support active member participation in business affairs. Typically, members must avail a minimum level of services over two to 3 years to retain membership, a requirement to be clearly defined in the society's bye laws. For example, AMUL's benchmark of 800 L of milk supply and the seasonwise supply criteria set by the National Dairy Development Board—National Dairy Services for milk producer companies highlight the importance of participation. To engage members effectively, societies can classify individuals in their operational area into four categories:

(i) **Member user (active members):** These are individuals who hold membership in the cooperative society and actively use its services.
(ii) **Member non-user (passive/non-active members):** Individuals who hold membership but do not avail themselves of the society's services.
(iii) **Non-member user:** Individuals who are not members but utilize services.
(iv) **Non-member non-user (potential members):** Individuals who neither hold membership nor use services, though they reside within its area of operation.

Societies should aim to incentivize active participation by offering bonuses or dividends, diversify their services to meet evolving local needs, and carry out awareness campaigns targeting potential members. Equally important is conducting a detailed analysis to identify the causes of non-participation and taking proactive steps to convert

Fig. 1 Policy-driven transformation of PACS



passive or potential members into active contributors to the cooperative's growth.

Pathway 2: PACS–MSCS Synergy for Agri-value Chain Integration

India's food and agriculture sector is rapidly evolving due to domestic changes, global market demands, and climate challenges. Although cooperatives have traditionally supported credit and input delivery, they remain marginal in three critical areas: quality seed production, organic agriculture, and agri-exports. These domains are now dominated by private and corporate entities, limiting cooperative involvement in R&D, certification, and market access, and marginalizing smallholders. To address these gaps, the ministry has launched three new MSCS: BBSSL for seed sovereignty, NCOL for organic value chains, and NCEL to strengthen cooperative participation in global agri-markets.

Through BBSSL, PACS can be developed into localized seed production clusters supported with breeder seeds, technical guidance, and assured buyback mechanisms, ensuring both seed quality and economic viability. NCOL can assist PACS in organizing organic farming clusters by facilitating access to certified organic inputs, traceability tools, and branding platforms. Simultaneously, NCEL can enable PACS and affiliated cooperatives to participate in export markets by aggregating, grading, and standardizing produce, thereby bypassing corporate intermediaries. This integration can unlock better prices for farmers and promote local agrobiodiversity on a global scale. As of March 31, 2025, NCEL has onboarded 8863 PACS/cooperatives and exported about 13.08 LMT of agricultural produce worth ₹5239.5 crore to 27 countries. NCOL has enrolled 5185 PACS/cooperatives, launched 21 products under the 'Bharat Organics' brand worth ₹167.1 lakh, and signed MoUs with nodal agencies in 10 states. Meanwhile, BBSSL has gained membership from 19,171 PACS/cooperative societies and secured seed licenses in 13 states (Farmer's Welfare, PIB, 2025). This integrated pathway from inputs to exports, positions PACS as business-ready institutions embedded in both national and global agri-economies. By synergizing with MSCS, PACS can replicate the IFFCO–KRIBHCO model and lead the next wave of cooperative-driven food system transformation.

Pathway 3: District-Level Multi-commodity Hubs—A Strategic Integration Model for Agro-processing and Marketing

India's rural cooperative marketing system remains fragmented, especially at the district level, where many marketing societies are defunct or underperform due to inadequate infrastructure, limited financing, and weak institutional coordination. Although some state-level marketing federations exist, their limited reach leaves many PACS without effective forward linkages. In some states, PACS have diversified into value addition and agribusiness services, but small scale and high production costs hinder competitiveness and member gains. To bridge these gaps, the creation of district-level Multi-Commodity Hubs is proposed functioning as federations of PACS for non-credit activities and potentially registered as Agro-Processing Cooperatives, aiming to:

- Aggregate produce across PACS for economies of scale in processing, packaging, logistics, and branding.
- Bridge the disconnect or 'design flaw' in the federal cooperative credit structure, which inadequately supports post-harvest, processing, and marketing functions beyond credit for infrastructure.
- Provide shared infrastructure and services such as cold chains, storage, branding, export facilitation, and quality certification either independently or in collaboration with BBSSL, NCOL, and NCEL.

Recognizing that PACS are by default FPOs, anchored in community trust, governed democratically, and embedded in local economies, there is a strong case for a synergistic institutional framework that integrates PACS and FPOs/FPCs minimizing duplication and enhancing value chain sustainability. Integrated district hubs would align PACS with MSCS, monetize local agrobiodiversity, and promote scalable, community-led transformation of India's food systems.

Pathway 4: Integration with Marketing and Consumer Federations

As PACS diversify beyond credit, aligning their growth with sectoral cooperative ecosystems particularly marketing, consumer, and housing cooperatives can significantly enhance their value chain impact. India's extensive cooperative network includes over 170,000 housing societies, 9382 primary marketing cooperatives, 31 marketing federations (including NAFED), and 22,239 primary consumer societies under 33 federations coordinated by NCCF (National Cooperative Database, 2024). This infrastructure provides deep market access, distribution support, and resource pooling opportunities that can complement PACS' transition.

Integrating with Marketing Cooperatives for Aggregation and Value Addition

Primary marketing cooperatives and federations like NAFED can serve as aggregation and marketing partners for PACS. Such linkages can open access to larger and more stable markets, reducing reliance on local traders. Moreover, value-added products such as processed foods or agro-inputs developed by PACS can be marketed through these federations. This model promotes efficient forward and backward linkages while minimizing redundancy in service delivery.

Collaborating with Consumer Cooperatives for Perishable Goods Distribution

Consumer cooperative networks offer a retail-ready platform, especially for perishable and value-added agricultural products. Through integration with these societies, PACS can connect farmers to urban and semi-urban markets, enhancing market reach. This partnership also enables the creation of price stabilization mechanisms in perishable value chains, benefiting both producers and end-consumers. Furthermore, consumer cooperatives can source organic and specialty products from PACS clusters engaged with NCOL, adding value to farmer incomes.

For instance, NCOL has entered into Memorandum of Understanding (MoU) with the Uttarakhand Organic Commodity Board (UOCB) and procured 40 MT of premium organic Basmati Paddy from Uttarakhand. Farmers received a ₹5 per kg premium above the market price. BBSSL is establishing the retail outlets to distribute "Bharat Beej" via all accessible marketing channels, including private ones.

Tapping Housing Cooperatives for Direct Market Access

Housing cooperatives present concentrated demand for daily essentials, such as fresh produce, dairy, and groceries. PACS can collaborate with marketing and consumer cooperatives to create direct supply chains that link producers to consumers. Subscription-based delivery models can ensure regular supply and build consumer trust in cooperative-sourced goods. Traceability systems, branding initiatives, and loyalty programs can further enhance the market value of PACS products.

Creating Multi-sectoral Integration Hubs

To operationalize these inter-cooperative linkages, District Cooperative Integration Hubs or Multi-Commodity Federations can be empowered to coordinate activities. These hubs can facilitate MoUs and joint business plans between PACS, marketing, and consumer federations. They can also promote shared infrastructure development, such as cold chains, community storage, processing units, and mobile retail vans. In addition, digital platforms can be introduced for demand forecasting, supply planning, and payment tracking.

Institutionalizing such collaboration is essential. As Shivmaggi (1996) emphasized, cooperative marketing infrastructure must be built on public–private–cooperative partnerships. Rather than operating in silos, cooperatives should adopt a networked model with PACS as production bases and sectoral cooperatives as service and market channels. This can also significantly improve resource availability and knowledge exchange (Wadkar et al., 2024). This boosts PACS' income and also improves value chain efficiency, ensures fair farmer returns and consumer prices, and strengthens cooperative federalism.

Pathway 5: Expanding PACS into Long-Term Credit with a Cooperative Synergy Approach

Despite the proliferation of rural financial institutions, ranging from PACS, Agricultural and Rural Development Banks (ARDBs), State Cooperative Agriculture and Rural Development Banks (SCARDBs), Regional Rural Banks (RRBs), Public Sector Banks (PSBs), Microfinance Institutions (MFIs), to newer models, such as SHGs and FPOs; the goal of comprehensive financial inclusion in rural India remains elusive. Fragmented service delivery, overlapping jurisdictions, and unmet financial needs of farmers, particularly for long-term investments, continue to hinder the development of a sustainable rural credit ecosystem.

Traditionally, India's cooperative credit system has been bifurcated PACS provide short-term credit for seasonal agricultural needs, while ARDBs and SCARDBs cater to long-term financing for infrastructure and asset creation. This division has resulted in fragmented service delivery, forcing farmers to navigate between multiple institutions for different credit types, leading to duplication, inefficiencies, and elevated transaction costs while failing to comprehensively address their diverse financial requirements.

To address this, MoC through model bye laws, has empowered PACS to extend long-term credit alongside short-term lending. However, this expansion demands strategic coordination. With 526 ARDBs in 7 states and SCARDBs in 14 states specializing in long-term finance, overlapping functions with PACS risk creating competition and undermining the rural credit system, contradicting the principle of "Cooperation among Cooperatives." A cooperative synergy model is needed one that promotes collaboration rather than competition. This includes clearly defined credit boundaries, joint lending products, co-financing models, and shared risk frameworks. Enhancing interoperability through inter-cooperative training and digital systems will further streamline delivery.

Pathway 6: Win–Win Business Model Between PACS, FPO and SHG Federations

India's rural development landscape is increasingly populated by community-based institutions, such as PACS, FPOs, and SHGs. While all aim to empower smallholders, foster inclusion, and improve livelihoods, they often operate in silos, causing confusion at the grassroots and weakening collective bargaining against organized private players. To overcome this, a "win–win" institutional model is proposed one that utilizes the comparative strengths of PACS, FPOs, and SHG federations through convergence, coordination, and collaboration, rather than competition.

Tripathy and Wadkar (2021) highlight that PACS, SHGs & their federations, and FPOs function as social enterprises, combining social goals with entrepreneurial approaches to address rural livelihood challenges. While FPOs and SHGs engage in activities, such as collective marketing, input supply, and financial services, PACS differ in their statutory status, deeper outreach, stronger asset base, and integration with state and central cooperative banks. Unlike FPOs and SHGs, which often depend on external facilitation, PACS operate democratically with established legal backing and community trust. Under the 2023 model bye laws, PACS are now legally empowered to offer a wide range of credit and non-credit services, including input supply, storage, processing, and marketing; many of which align with the functions of FPOs and SHGs (Tripathy et al., 2020). The goal is not to replicate these models but to build synergies by leveraging PACS's institutional capacity while preserving their cooperative character.

Future Research Directions

This study primarily relies on secondary data, policy announcements, and limited stakeholder consultations. The pathways proposed are conceptual and not based on long-term field evaluations, limiting their predictive validity. Consultations were confined to selected states and may not reflect national diversity in PACS structures and capacities.

The transformation of PACS into multipurpose agribusiness entities is a promising policy agenda, yet several research gaps require focused study:

- Comparative efficiency studies to evaluate PACS/FPCs and other private agribusiness models in rural credit and non-credit services delivery.
- Analytical study on extent of adoption of principles of cooperatives by cooperatives and collectives.
- Impact assessments of PACS diversification on farmer incomes, rural employment, and value chain integration.
- Examine how governance structures, regulatory compliance, and financial prudence are maintained across new business verticals of PACS.

Conclusion and Implications of the Study

The transformation of PACS into multipurpose, technology-enabled business entities is a critical step toward strengthening India's rural economy and food systems. While there are existing grassroots models such as SHGs and FPOs actively contributing to input access, marketing, value addition, and financial inclusion, PACS hold a distinct statutory identity, organizational strength and structural depth. The proposed shift toward multifunctional PACS is not intended to duplicate the functions of FPOs or SHGs, but rather to enhance institutional convergence. PACS can serve as anchor entities that federate and coordinate with FPOs and SHGs, utilizing their democratic governance, credit linkage, and physical infrastructure to facilitate last-mile service delivery. This layered approach ensures that the unique cooperative character of PACS is preserved while expanding their relevance in a changing agri-food landscape.

However, this transformation is not without challenges. Many PACS face constraints, including limited technical and managerial capacity, outdated infrastructure, poor digitization, and financial stress due to non-performing assets. In addition, regulatory overlaps and weak coordination with SHGs and FPOs further impede effective integration. Overcoming these barriers will require coordinated action. The government must continue to support PACS through enabling policies, model bye laws, and targeted funding. Institutions such as NABARD, SFAC, and cooperative federations must take the lead in capacity building, business planning, and digital upgradation. Internally, PACS must strengthen governance, adopt professional management, and promote inclusive local participation to enhance efficiency and trust.

The findings of this study have key implications for policymakers, cooperative planners, and rural development practitioners. Positioning PACS as multifunctional institutions in synergy with SHGs and FPOs offers a pathway to build inclusive, climate-resilient, and competitive rural value chains. Importantly, PACS can serve as mechanisms for social inclusion, ensuring that women and marginalized communities are not left behind (Arpith & Ishwara, 2023). This paper contributes to cooperative development theory by presenting PACS as hybrid institutions that blend social objectives with commercial functions.

Key Questions Reflecting Applicability in Real Life

1. How can PACS effectively balance their social mandate with commercial viability while integrating into sustainable and competitive agri-value chains?
2. What mechanisms are needed to ensure seamless collaboration between PACS with three new MSCS and other sectoral cooperatives as well as FPOs and SHGs Federations?
3. Do ground-level PACS have the technical and human resource capacity to engage in organic certification, seed

licensing, and export compliance, as envisioned in the MSCS integration model?

4. How can existing rural cooperative banking structure (DCCBs at district level and StCBs at state level) support PACS in actual transformation from single purpose to multipurpose institution?

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s42943-025-00128-7.

Acknowledgements We would like to sincerely thank all of the stakeholders for their constant help and helpful recommendations during stakeholders' consultations. Their advice has enabled us to increase the reliability of our findings. We also acknowledge the anonymous reviewers and the Editor-in-Chief for their unwavering encouragement and support of our research.

Author Contributions All authors contributed to the study conception and design. The work is our original contribution and has not been taken from anywhere. K. K. Tripathy: provided conceptual guidance, developed the theoretical framing, editing, and contributed to policy-level insights. Sagar Wadkar: coordinated stakeholder consultations, institutional review, designed methodology, and final editing of the manuscript. Vaishali Goswami: conducted literature review, substantial contributions to strategic pathways, writing and drafting major sections, and supported final revision of the manuscript. Naveen Kumar Singh: assisted with institutional review, inputs to strategic pathways, and ensured submission compliance.

Funding We declare that no external funding was received for this study.

Data Availability The data that support the findings of this study are available from the corresponding author upon reasonable request. No data sets were generated or analyzed during the current study.

Material Availability Materials used in this study are available from the corresponding author upon reasonable request.

Declarations

Conflict of interest The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethics approval This study is based on policy review, institutional analysis, and stakeholder consultations. No human or animal experiments were conducted, and hence separate ethical approval was not required.

Informed consent Informed consent was obtained from all participants involved in the conduct of the study.

References

Alagh Committee: Government of India. (1999). Report of the High-Powered Committee on Model Cooperative Law (Chair: Y. K. Alagh). New Delhi: Planning Commission

Anand G. M. (2024). Revitalizing rural credit cooperatives in India: Challenges, opportunities, and the role of NABARD. *Journal of the Austrian Society of Agricultural Economics (JASAE), 20* (2), 2015–2019 **(ISSN: 18158129)**.

Anand, G., Kalaiselvi, P., Sebastian, S. P., Kumar, S., Amuthaselvi, G., Porkodi, G., Suganya, K., & Malathiet, G. (2025). Evolution and growth of Farmer Producer Organizations (FPOs) in agriculture. *International Journal of Agriculture Extension Social Development, 8*(1), 442–452. https://doi.org/10.33545/26180723.2025.v8.i1g.1566

Arahant, A., et al. (2025). Farmer producer organization: An ecosystem for building socio-economic resilience of farmers in India. *Current Agriculture Research Journal*. https://doi.org/10.12944/CARJ.13.1.26

Arpith, T. A., & Ishwara, P. (2023). Primary agricultural cooperative societies (PACS) and sustainable development goals (SDGs): A study in Karnataka, India. *EPRA International Journal of Economics, Business and Management Studies, 10*(12), 131–138. https://doi.org/10.36713/epra15206

Ashtankar, O. M. (2015). Importance of cooperative movement for Indian agriculture sector. *International Journal of Applied Research, 1*(11), 557–561.

Asif Khan, M., Abbasi, E. H., & Nisha, K. M. (2012). Indian agribusiness and globalisation: Prospects and challenges. *International Journal of Management Research and Development, 2*(1), 70–83.

Banerjee, A. & Banerjee, R. (2021). Farming cooperatives in India: Problems and prospects. *Supremo Amicus, 24*, 481–490.

Bansal, S., Budhedeo, S., & Thakkar, G. (2012). Reforms in rural credit cooperatives in India. *IOSR Journal of Business and Management, 4*(3), 41–45. ISSN: 2278-487X.

Baviskar B. S. (2007). Cooperatives in Maharashtra: Challenges ahead. *Economic and Political Weekly, 42*(42), 4217–4221.

Bhat, S., & Momaya, K. S. (2020). Innovation capabilities, market characteristics and export performance of EMNEs from India. *European Business Review, 32*(5), 801–822.

Bikkina, N., Turaga, R. M. R., & Bhamoriya, V. (2018). Farmer producer organizations as farmer collectives: A case study from India. *Development Policy Review Journal, 36*(6), 669–687. https://doi.org/10.1111/dpr.12274

Birchall, J., & Ketilson, L. H. (2009). Resilience of the cooperative business model in times of crisis. International Labour Organization. https://www.ilo.org/publications/resilience-cooperative-business-model-times-crisis. Accessed on 20 Feb 2025

Birthal, P. S., Srivastava, S. K., Saxena, R., et al. (2025). Indian Agriculture to 2047: Reshaping Policies for Sustainable Development. Policy Paper 50. ICAR-National Institute of Agricultural Economics and Policy Research, New Delhi.

Bose G. & Nagarajan P. (2018). A study on the working performance of primary agricultural co-operative societies in India. *International Journal of Creative Research Thoughts, 6*(2), 41–47.

Capoor Committee. (2000). *Report of the Capoor Committee on revitalization of cooperative credit structure*. Reserve Bank of India.

Carvalho, A. (2012). The cooperative development and strategy. *International Journal of Accounting and Financial Reporting, 2*(1), 191. https://doi.org/10.5296/ijafr.v2i1.1563

Cervantes, J., et al. (2023). Sustainability of agricultural cooperatives: A comprehensive analysis. https://doi.org/10.13140/RG.2.2.25037.82405

Chandre Gowda, M. J., Dixit, S., & Megha, H. L. (2018). Women's participation in Karnataka's FPOs. *Economic and Political Weekly, 53*(45), 20–23.

Chawla, S. S. (2022). A study of the evolution of cooperative societies in India and its effect on the socio-economic development of members. *Social Work Bulletin, 3*(1), 45–58.

Cook, M. L. & Burress, M. J. (2009). A cooperative life cycle framework. University of Missouri, Department of Agricultural Economics. https://www.researchgate.net/publication/228545021_A_Cooperative_Life_Cycle_Framework.

Cook, M. L. (2018). A life cycle explanation of cooperative longevity. *Sustainability, 10*(5), 1586. https://doi.org/10.3390/su10051586

Dhananjaiah H. T. (2015). A historical study of co-operative movement in India. *International Journal of Innovative Research in Technology, 1*(9), 204–208.

Dharmaraj, S. (2024). Multipurpose PACS (MPACS): Strengthening rural economies to realize the vision of Viksit Bharat. The Cooperator, NCUI November Edition. https://vamnicom.gov.in/uploads/1b3adbe3eb1cdb5ff849bb07eeca04fa.pdf. Accessed on 25 Jan 2025.

FAO. (2021). *The State of Food and Agriculture 2021. Making agrifood systems more resilient to shocks and stresses*. FAO.

Food and Agriculture Organization of the United Nations, International Fund for Agricultural Development, United Nations Children's Fund, World Food Programme, & World Health Organization. (2019). *The state of food security and nutrition in the world 2019: Safeguarding against economic slowdowns and downturns*. FAO.

Ghosh, P. K., Dutta, J., & Mitra, A. (2023). Economic impact of primary agricultural cooperative societies (PACS): Findings from Nadia District of West Bengal. *Economic Affairs, 68*(01), 435–444.

Goswami, D., & Jindal, M. (2021). Awareness of farmers about the primary agriculture credit societies (with special reference to Uttar Pradesh and Uttarakhand). *International Journal of Engineering and Management Research, 11*(4), 1–7.

Government of India. (2009). *Report of the high-powered committee on cooperatives*. Ministry of Agriculture and Cooperation.

Gruere, G., Nagarajan, L., & King, E. D. I. O. (2009). The role of collective action in the marketing of underutilized plant species: Lessons from a case study on minor millets in South India. *Food Policy, 34*(1), 39–45. https://doi.org/10.1016/j.foodpol.2008.10.006

Gyau, A., Takoutsing, B., Degrande, A., & Franzel, S. (2012). Producers' motivation for collective action for kola production and marketing in Cameroon. *Journal of Agriculture and Rural Development in the Tropics and Subtropics, 113*(1), 43–50.

Institute of Rural Management Anand (IRMA). (2020). *Cooperatives and rural development: Challenges and pathways*. https://livelihoods.net.in/wp-content/uploads/2020/05/Cooperatives-and-Rural-Development-IRMA.pdf. Accessed on 25 Apr 2025.

International Labour Organization (ILO), and International Cooperative Alliance (ICA). (2014). *Cooperatives and the sustainable development goals—a contribution to the post-2015 development debate*. https://www.ilo.org/wcmsp5/groups/public/---ed_emp/documents/publication/wcms_240640.pdf. Accessed on 25 May 2025.

IPCC. (2022). Climate change 2022: Impacts, adaptation and vulnerability. *Sixth Assessment Report.*

Karmakar, K. G. (2013). NABARD's self-help: Letter. *Economic and Political Weekly, 48*(22), 4–5.

Kavithambika, S., Shravanthi, A. R., Palanichamy, N. V., & Deshmukh, S. (2024). Agri-business, a journey from farm to market: Trends and challenges. In S. S. Meena, A. Sharma, & A. Mathur (Eds.), Agri Business: A Managerial Perspective (pp. 1–7). Scientific Publishers.

Kropp, W., Suran B. S. (2002). Linking banks and (financial) self help groups in India—an assessment. Seminar on SHG-bank Linkage Programme at New Delhi, NABARD, November 25–26, 2002, Available at SSRN: https://ssrn.com/abstract=1170845. Accessed on 28 Dec 2024

Kruijssen, F., Keizer, M., & Giuliani, A. (2009). Collective action for small-scale producers of agricultural biodiversity products. *Food Policy, 34*(1), 46–52. https://doi.org/10.1016/j.foodpol.2008.10.008

Kumar R., Kumar S., et al. (2022). FPOs in India: Creating enabling ecosystem for their sustainability (p. 22). ICAR-National Academy of Agricultural Research Management. https://naarm.org.in/wp-content/uploads/2022/04/FPO-Policy-Paper.pdf. Accessed on 20 July 2025.

Kumara, H. & Bhat, S. (2022). A Industry analysis on cooperative banking sector in India. *International Journal of Creative Research Thoughts, 10*(10), 761–776.

Kumawat, P., & Bansal, V. (2018). A study on problems faced by SHG members in carryout the SHG activities. *International Journal of Current Microbiology and Applied Sciences, 7*(1), 420–423. https://doi.org/10.20546/ijcmas.2018.701.048

Madugu, V. (2025). Cooperatives and inclusive growth in India: Challenges and opportunities. *International Journal of Creative Research Thoughts, 13*(3), 227–232.

Mehta Committee: Government of India. (1937). Report of the Cooperative Planning Committee (Chair: D. R. Mehta). New Delhi: Government of India.

Ministry of Cooperation (MoC). (2022). *The cooperative movement in India—a brief history*. https://www.cooperation.gov.in/sites/default/files/2022-12/History_of_cooperatives_Movement.pdf. Accessed on 12 Jan 2025

Ministry of Cooperation (MoC). (2024a). *National cooperative database*. https://cooperatives.gov.in/en. Accessed on 10 Jan 2024

Ministry of Cooperation (2024b). *Major initiatives of Ministry of Cooperation (6th July 2021–10th October 2023)*. Ministry of Cooperation. https://www.cooperation.gov.in/sites/default/files/2023-10/Major%2054%20initiatives%20in%20English_0.pdf. Accessed on 12 Jan 2025

Ministry of Cooperation (MoC). (2023). *Model Bye-laws for PACS*. Government of India.

Momaya, K. S. (2020). Return from COVID-19: Thinking differently about export competitiveness and sustainability. *Competitiveness Review, 30*(5), 455–460.

Momaya, K. S. (2022). *Flexibility, innovation, and sustainable business: Emerging perspectives and practices*. Springer.

Mridha Committee: Government of India. (1965). Report of the Committee on Cooperative Training (Chair: A. R. Mridha). New Delhi: Ministry of Community Development and Cooperation.

NABARD. (2023–24). Ch 2—cooperatives tackling challenges, building opportunities. *Annual Report 2023–24*. https://www.nabard.org/pdf/2024/cooperatives-tackling-challenges-building-opportunities.pdf. Accessed on 18 Feb 2025.

NAFSCOB. (2023). Need of credit in cooperative sector, constraints and ways ahead. https://nafscob.org/master/whasnew/images/image15192023-01-09-14-29-37.pdf. Accessed on 30 Nov 2024.

Narrod, C., Roy, D., Okello, J., Avendano, B., Rich, K., & Thorat, A. (2009). Public–private partnerships and collective action in high value fruit and vegetable supply chains. *Food Policy, 34*(1), 8–15. https://doi.org/10.1016/j.foodpol.2008.10.005

National Commission on Agriculture. (1976). Report of the National Commission on Agriculture, Part XI: Cooperative Credit. New Delhi: Ministry of Agriculture and Irrigation, Government of India.

Patil, S., & Kokate, K. (2017). Identifying factors governing attitude of rural women towards self-help groups using principal component analysis. *Journal of Rural Studies, 55*, 157–167. https://doi.org/10.1016/j.jrurstud.2017.08.003

Patil, S., Mehta, M., Pancholi, G., et al. (2025). Unveiling the dynamics of farmer producer organizations in India: A systematic review of status, challenges, and future directions. *Humanities and Social Sciences Communications, 12*, 758. https://doi.org/10.1057/s41599-025-05063-9

Prabash Bakshi Committee: NABARD. (2012). Report of the Expert Committee on the Short-Term Cooperative Credit Structure (Chair: Prakash Bakshi). Mumbai: National Bank for Agriculture and Rural Development.

Prasad, S. C. (2019). Farming as an enterprise—Ten years of FPO movement in India. In *State of India's Livelihoods Report 2019* (pp. 45–60). https://www.indiaspend.com/wp-content/uploads/2020/10/Ten-Years-of-FPO-Movemet-in-India.pdf. Accessed on 5 April 2025

Prasad, C. S., Kanitkar, A., & Dutta, D. (Eds.). (2023). *Farming futures: Reimagining producer organisations in India*. Routledge.

Ramappa, K. B., & Yashashwini, M. A. (2018). Evolution of farmer producer organizations: Challenges and opportunities. *Research Journal of Agricultural Sciences, 9*(4), 709–715.

Ramesh, J. (2007). Self-help groups revolution: What next? *Economic and Political Weekly, 42*(36), 3621–3624.

Rao V. M. (2007). A self-help group model for farmer insurance. *Economic and Political Weekly, 42*(10), 820–822.

Rao, M. V. (2017). Role of cooperatives in rural financial inclusion. *International Journal of Agricultural Management and Development.*

Reserve Bank of India. (1954). *Report of the All-India Rural Credit Survey Committee*. Reserve Bank of India.

Sahoo, A., et al. (2020). Critical review on cooperative societies in agricultural development in India. *Current Journal of Applied Science and Technology (CJAST)., 39*(22), 114–121. https://doi.org/10.9734/CJAST/2020/v39i2230850. article no. CJAST.59935 ISSN: 2457-1024.

Sapovadia V. (2012). Cooperatives in India: The humanization of our world. *Munich Personal RePEc Archive.* MPRA Paper No. 55317. https://mpra.ub.uni-muenchen.de/55317/. Accessed on 26 Jan 2025

Senapati, S., & Bhatia, A. (2018). A study on the contributions of PACS towards inclusive growth of the rural economy. *Theoretical Economics Letters, 8*, 2818–2829. https://doi.org/10.4236/tel.2018.813177

Shah, T. (1995). Liberalisation and Indian agriculture: New relevance of farmer co-operatives. *Indian Journal of Agricultural Economics, 50*(3), 488–509.

Shah, T. (2016). Farmer producer companies fermenting new wine for new bottles. *Economic and Political Weekly, 51*(8), 15–20.

Shah, D. (2020). Success and failure of cooperative marketing societies in India: A state-wise analysis. Available at SSRN: https://ssrn.com/abstract=3582618 or https://doi.org/10.2139/ssrn.3582618

Shivmaggi, H. B. (1996). Future strategy for development of co-operatives. *Economic and Political Weekly, 31*(20), 1187–1188.

Singh, S. (2008). Producer companies as new generation cooperatives. *Economic and Political Weekly, 43*(20), 22-24.

Singh, S., & Singh, T. (2013). Producer Companies in India: A study of organization and performance, publication No 246, Centre for Management in Agriculture, Indian Institute Management, Ahmedabad. https://web.iima.ac.in/users/webrequest/files/cmareports/14Producer_Company_Final.pdf. Accessed on 2 April 2025

Singh, S. (2016). Problems and prospects of the cooperative movement in India under the globalization regime. *International Journal of Indian Psychology, 3*(4), 59. https://doi.org/10.25215/0304.073

Singh, S. (2021). Institutional innovations in India: An assessment of producer companies as new-generation co-operative companies. *Journal of Asian Development Research*. https://doi.org/10.1177/2633190X211033510

Singh, S. (2023). (Farmer) producer companies in India as new generation cooperatives: Case studies of performance and impact from West Bengal, India. *Annals of Public and Cooperative Economics, 94*(3), 1007–1029. https://doi.org/10.1111/apce.12436

Singh, S., Ruivenkamp, G., & Jongerden, J. P. (2011). A state of the art of self-help groups in India. *Journal of Human Ecology, 36*(2), 91–102. https://doi.org/10.1080/09709274.2011.11906422

Sinha, D., & Chattopadhyay, A. (2024). Self-help groups and its future directions: Evidence from West Bengal. *Journal of Rural Development, 42*(4), 348–364. https://doi.org/10.25175/jrd/2023/v42/i4/172990

Sinha, P., & Navin, N. (2021). Performance of self-help groups in India. *Economic and Political Weekly, LVI*(5), 36–43.

Smart, M., & Ernest, D. (2017). The role of cooperatives in sustaining the livelihoods of rural communities: The case of rural cooperatives in Shurugwi District, Zimbabwe. *Jàmbá Journal of Disaster Risk Studies*. https://doi.org/10.4102/jamba.v9i1.341

Tripathy, K. K., & Wadkar, S. K. (2021). Social enterprises: An instrument for sustainable development. Agriculture Extension in South Asia (AESA) Blog 157 - August 2021, pp 1–8. https://www.aesanetwork.org/wp-content/uploads/2021/08/AESABLOG-157.pdf

Tripathy, K. K., et al. (2020). Catalyzing development through collectives: Status and issues of cooperatives, SHGs and farmer producers organizations in India. *VAMNICOM Working Paper Number 3, 2*(1), 1–42. ISSN: 0302-7767.

Umamaheswari, K. & Manivel, S. (2021). Progress of primary agricultural cooperative societies in India and Tamil Nadu: An analysis. *Journal of Emerging Technologies and Innovative Research, 8*(11), 85–96.

UNCTAD. (2022). *Harnessing value chains for sustainable development*. UNCTAD.

United Nations, Department of Economic and Social Affairs (UN DESA), Population Division. (2017). *World population prospects: The 2017 revision, key findings and advance tables* (Working Paper No. ESA/P/WP/248). https://desapublications.un.org/publications/world-population-prospects-2017-revision. Accessed on 20 March 2025

Vaidyanathan, A. (2013). Future of cooperatives in India: Perspectives. *Economic and Political Weekly, 48*(18), 30–34

Vaidyanathan Committee: Government of India. (2005). Report of the Task Force on Revival of Rural Cooperative Credit Institutions (STCCS) (Chair: A. Vaidyanathan). New Delhi: Ministry of Finance, Government of India & NABARD.

Verma, S. K. (2004). Cooperative centenary in India, *New Sector Magazine,* 61, 1–2. http://www.caledonia.org.uk/papers/Indian%20Coops.pdf

Vijaya, C. (2025). Cooperatives: Socio-economic and cultural identity of Indian ethos. *International Journal for Multidisciplinary Research (IJFMR), 7*(1). E-ISSN: 2582-2160 https://www.ijfmr.com/papers/2025/1/36741.pdf. Accessed on 28 Dec 2025.

Vijayan, B., et al. (2022). Primary agricultural credit societies to change the Indian agricultural economy trajectory. *Ecofarming, 03*(01), 54–57.

von Braun, J., Afsana, K., Fresco, L. O., Hassan, M. H. A., & Torero, M. (2023). Food system concepts and definitions for science and political action. In J. von Braun, K. Afsana, L. O. Fresco, & M. H. A. Hassan (Eds.), *Science and innovations for food systems transformation*. Springer. https://doi.org/10.1007/978-3-031-15703-5_2

Vyas Committee: Government of India. (2004). Task Force on Revival of Cooperative Credit Institutions (Interim Report) (Chair: M. S. Vyas). New Delhi: Ministry of Finance.

Wadkar, S. K., & Dubey, V. K. (2024). Cooperative federalism: Types and status. In Wadkar & Dubey, *Training module on community mobilisation and registration of cooperatives*. pp 80–95. NIPA Publisher, New Delhi. [ISBN: 978-93-5887-919-3].

Wadkar, S. K. (2018). Farmers producers organisation: Present status, challenges and way forward. *Cooperative Perspective Journal (Special Issue), 53*(1), 51–79.

Wadkar, S. K., et al. (2024). Market diversification strategies for enhancing competitiveness of Indian marketing cooperatives: Lessons from Gujarat State Cooperative Marketing Federation Ltd. (GUJCOMASOL). *International Journal of Global Business and Competitiveness*. https://doi.org/10.1007/s42943-024-00108-3

Farmer's Welfare. (2025). Power to the people: The boom and transformation of cooperatives in India. *Press Information Bureau (PIB)*. 25 JUL 2025 9:12AM. https://www.pib.gov.in/FeaturesDeatils.aspx?id=154936&NoteId=154936&ModuleId=2. Accessed on 26 July 2025

Yadav, G. (2018). A study on the impact of cooperatives on economical development. *International Journal of Research - Granthaalayah*. https://doi.org/10.29121/granthaalayah.v6.i5.2018.1444

Yashoda, (2017). Role of Primary Agricultural Co-Operative Society (PACS) in agricultural development in India. *Global Journal of Management and Business Research, 17*(3) **(Version I. Online ISSN: 2249-4588)**.

Sagar Wadkar is a social enterprise management trainer, cooperative law expert, and cooperative policy analyst with over twelve years of experience in research, training, and advisory services for cooperatives in India. He has worked with premier institutions including NCUI, Delhi; VAMNICOM, Pune; TISS, Mumbai, and ICAR-IARI, Delhi and currently serves as an independent consultant supporting legal and institutional reforms in the cooperative sector. Wadkar has led national studies on cooperative law, authored the book "FAQ on Cooperatives: Decoding the Cooperative Law", and developed training modules to promote legal literacy and enterprise development in cooperatives and FPOs. His expertise spans cooperative legislation, social entrepreneurship, livelihood systems, and institutional strengthening. He holds a Bachelor's degree in Agriculture from Dr. PDKV Akola, a Master's in Agricultural Extension from G.B.P.U.&T., Pantnagar, and a Ph.D. from ICAR-NDRI, Karnal.

K. K. Tripathy is an officer of the Indian Economic Service, Government of India. He earned his Ph.D. in Micro-Finance Management from the IIT, Delhi. Currently, he is serving as Joint Secretary in the Economic Advisory Council to the Prime Minister, Government of India, New Delhi. Earlier, Tripathy served as Economic Adviser in the Ministry of Health and Family Welfare, Government of India, and as Officer on Special Duty (OSD) in the office of the Home and Cooperation Minister, where he played a key role in designing and implementing innovative cooperative development policies and programmes for more than two years. He has over 26 years of experience in key positions across the Ministries of Education, Agriculture & Farmers Welfare, Rural Development, Fertilizers, and Food Processing Industries, as well as the Planning Commission, UNDP, and VAMNICOM, Pune. Tripathy has published extensively on self-employment, microfinance, and cooperative and rural development issues.

Vaishali Goswami is a dedicated researcher having Post Graduate Degree in Environmental Science. She worked for three years as a Research Assistant at National Cooperative Union of India, New Delhi. She has involved in various studies assigned by the Ministry of Cooperation and development of training modules for cooperative education. Her expertise in cooperative development and cooperative law, combined with her environmental science background, allows her to approach research with a unique interdisciplinary perspective. Her dedication for producing impactful research is driven by a desire to promote sustainable practices and positive social change within the cooperative movement.

Naveen K. Singh is a Program Officer (Research) at International Cooperative Alliance-Asia and Pacific. He also serves as Secretary of the ICA-AP Research and Credit & Banking Committees. Naveen has extensive experience in cooperative development, having worked as a Research Officer at the National Cooperative Union of India, where he developed training modules, facilitated programs, and managed stakeholder engagement. He also worked with the Bihar Rural Livelihoods Promotion Society (BRLPS) on the World Bank-funded Bihar Transformative Development Project. Naveen holds a PGDM in Agribusiness and Management from Vaikunth Mehta National Institute of Cooperative Management, Pune, and a BTech in Mechanical Engineering from Dr. APJ Abdul Kalam Technical University, Lucknow.