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Role of agricultural cooperatives in rural development: A review of institutional transformation and smallholder empowerment in India

¹Jatin and ²Bhupinder

¹Research Scholar, Department of Economics, Maharshi Dayanand University, Rohtak, Haryana, India

²Associate Professor, Department of Economics, Government P.G. College for Women, Rohtak, Haryana, India

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Corresponding Author: Jatin

Abstract

The Indian rural environment has changed as a result of agricultural cooperatives, which have fueled a structural shift towards a smallholder farming system. This system is independent, market-integrated and knowledge-driven. In order to offer a thorough assessment of cooperative-driven rural development with a focus on its role in smallholder farmers' empowerment and farm-level economic decision-making, this study analyses a substantial body of literature and institutional data from 2011 to 2026. This study examines important grassroots initiatives like Primary Credit Societies, Cooperative Marketing Federations, Dairy unions and Decentralised Input Distribution Loops, by integrating 20 significant peer-reviewed research articles and official reports. The findings show how significant contemporary cooperative networks are in mitigating market and knowledge asymmetries. Smallholders' ability to negotiate collectively is strengthened by these enhanced institutional and data flows, which result in more effective resource allocation, higher crop yields, lower transaction costs, and more stable rural incomes. However, the effects of cooperatives' incorporation on development are still diverse in various geographical regions and socioeconomic categories. This study highlights the necessity of an all-encompassing policy framework that supports inclusive institutional governance through focused investments in digital public infrastructure, community-based capacity-building programs and updated public-cooperative partnerships. In addition to providing practical policy recommendations to improve the scalability, inclusivity and sustainability of agricultural cooperatives in rural development and agricultural growth in India, this study contributes to the expanding conversation on rural institutional economics by aligning the available empirical data.

Keywords: Agricultural cooperatives, farm decision-making, smallholders, India, primary credit facilities

Introduction

A significant portion of the population is strengthened by the agriculture sector, which continues to be a vital pillar of the Indian economy and ensures the security of food and livelihood. However, market inequalities, land fragmentation, decreased resource efficiency, and climate unpredictability are posing a growing threat to this sector. In light of this, the development of agricultural cooperatives has become a revolutionary strategy to modernise the agriculture sector and improve socioeconomic capacities at the local level. According to recent analysis, institutional innovation is enhancing agricultural output and smallholder resilience in rural agricultural economies by facilitating timely loans and pooled production resources (Sharma & Singh, 2024) ^[1].

A shift from traditional, isolated, input-intensive farming to an organised, collective and value-driven agricultural system is being facilitated by agricultural cooperatives. This includes village-level Primary Agricultural Credit Societies, District-Central Cooperatives Banking Network, Apex State marketing Federations and Localised Dairy Cooperative Unions. These creative institutional organisations promote smallholder bargaining power, improve market access routes and increase resource use efficiency (Mohapatra *et al.*, 2024) ^[2]. Additionally, new research indicates that using

strong collective models helps primary producers make the best financial choices, lower the cost of acquiring inputs and enhance long-term sustainability results (Kumar & Mishra, 2024) ^[3].

Cooperative-driven interventions have significantly improved market integration and agricultural extension service in India. By giving farmers dependable access to mechanised tool banks, certified seeds, subsidised fertilisers and transparent crop procurement prices. Primary agricultural credit ecosystems and secondary cooperative federations lower transaction gaps and related intermediation costs. Cooperative-based programs can result in quantifiable increases in agricultural production and profitability, according to empirical data. For example, research shows that the primary agricultural community benefits from steady income and productivity improvements of about 8-10% when they actively participate in a cooperative marketing value chain (Chaudhary & Vardhan, 2025) ^[4].

Through a number of government initiatives, such as targeted capital infusion programs and consolidated national databases under the recently formed Union Ministry of Cooperation, template-driven interventions have further improved cooperatives uptake in rural areas. Within a modernised organisational framework, these programs seek

to link primary producers with official market channels, institutional financing and common storage services. Nevertheless, the effect and spread of cooperatives are still unequal in spite of these developments. The scalability and inclusivity of cooperative structures are nonetheless constrained by structural issues such as insufficient capitalisation, limited operational literacy among board members and administrative fragmentation (Desai & Rao, 2025) ^[5]. The institutional divide among farmers, particularly smallholders, is further exacerbated by differences in local government structures and socioeconomic limitations.

Even while studies on cooperative structures in the rural sector have proliferated, they are still dispersed and mostly sector-specific, with little focus on how cooperative interventions have shaped contemporary smallholder empowerment in the Indian context. Furthermore, the development of a thorough knowledge of cooperative-driven agricultural transformation has been hampered by the lack of focus on the interplay between institutional frameworks, socioeconomic heterogeneity and state-level policy dynamics. In light of this, the current study seeks to systematically summarise the body of research on cooperative-driven rural development in India. Additionally, assess the impact of institutional frameworks on supply-chain integration, credit flow, productivity and smallholder capabilities and pinpoint major obstacles to their operational effectiveness. This study also aims to provide policy-relevant insights to improve the sustainability, scalability and inclusivity of agricultural cooperative projects.

Review of Literature

Conceptual Framework of Cooperatives in the Rural Sector

By lowering transaction costs and minimising asymmetries between scattered smallholders and large-scale market participants, agricultural cooperatives avoid market failures (Banerjee *et al.*, 2011) ^[6]. Collective resource pooling, which has its roots in New Institutional Economics and Collective Action Theory, works as a countervailing economic force, allowing primary producers to share financial risks, gain economic scale and reduce input costs (Fischer & Qaim, 2012) ^[7]. According to Bikkina *et al.* (2018) ^[8], these structural organisations serve as localised social businesses that foster democratic government and produce social capital among marginalised rural communities. However, a consistent legal framework, transparent local leadership and unambiguous environmental factors are critical to their operational efficiency (Francesconi & Wouterse, 2021) ^[9].

Cooperative Evaluation in the Indian Agrarian Economy

Primary Agricultural Credit Societies at the village level, which offer smallholder access to low-interest crop loans, essential inputs and market connections, serve as the foundation of India's multitier cooperative network (Shah, 2016) ^[10]. By ensuring the delivery of subsidised supplies across various agroclimatic zones, these organisations have historically modernised extension programs (Satish, 2020) ^[11]. On the other hand, the historical trajectory shows significant structural aberrations. According to the

Government of India (2019) ^[12], rainfed and semi-arid areas saw institutional stagnation due to changing federal objectives and economic inequality within the rural population, whereas green revolution zones increased capital accumulation within cooperative banking networks.

Institutional Credit Flows and Grassroots Financial Inclusion

By providing high-time financial liquidity, primary cooperative credit frameworks enhance farm-level economic decision-making by enabling smallholders to get superior inputs and protect themselves against predatory informal loan networks (Kumar *et al.*, 2020) ^[13]. Cooperatives lower capital costs, increase smallholder risk-bearing capacity and avoid post-harvest distress sales by democratizing access to formal financing (Wanyama *et al.*, 2014) ^[14]. However, a farmer's operational ability to manage institutional regulations is crucial to the structural delivery of these financial services and this ability is greatly impacted by formal education and financial literacy (Nayak, 2021) ^[15].

Cooperative's Impact on Input Supply, Marketing and Value Chains

Crop yield stabilisation and smallholder profitability are favorably associated with active cooperative membership, which is fueled by efficient input logistics and optimal resource utilisation (Birthal *et al.*, 2015) ^[16]. By establishing direct connections between urban consumer markets and primary producers, large-scale cooperatives marketing networks eliminate multi-layered middleman commissions and consolidate supply chains (Gulati & Juneja, 2021) ^[17]. Smallholders may now access cutting-edge cold-chain storage, grading and agro-processing facilities thanks to this aggregation (Trebbin, 2014) ^[18]. Dairy cooperative models, for example, show that by diversifying family production risks, value-chain integration stabilises unstable rural incomes (Birthal *et al.*, 2014) ^[19]. However, because of regional differences in infrastructure, these advantages are still not equally dispersed (Dev, 2012) ^[20].

Governance and Structural Challenges in the Cooperative System

Elite Capture, in which affluent, politically connected individuals monopolise governance boards and divert subsidised resources away from impoverished farmers, significantly limits the development effect of Indian cooperatives (Sukhtankar, 2015) ^[21]. Further, the operational capability of the grassroots cooperative network is limited by severe capital famine and high ratios of non-performing assets, which are frequently caused by populist loan-waiver cycles (Meenakshi *et al.*, 2013) ^[22]. Institutional scalability is further restricted by bureaucratic overregulation by state cooperative agencies and fragmented regulatory policies (Chand, 2017) ^[23]. According to Amdie *et al.* (2023) ^[24], these problems underscore the critical requirement for transparent governance structures and strict internal auditing modules to rebuild confidence in the cooperative system.

The Institutional Divide and Geographic Asymmetry

In India, cooperative performance is severely geographically asymmetrical: networks in western and Southern states show strong agro-processing integration and high

commercial capitalisation, whereas systems in Eastern and Northern regions often experience operational paralysis and chronic under-capitalisation (Gandhi & Marsh, 2014) ^[25]. Additionally, in these undeveloped areas, smallholder involvement is limited by social inequality and governmental meddling (Pingali *et al.*, 2021) ^[26]. These results suggest that pure technical or financial interventions are subordinated to institutional change inside the agricultural context, which is intricately linked to local power dynamics (Jakku *et al.*, 2019) ^[27].

Synthesis of Literature and Research Positioning

Academic research is still quite fragmented and sector-specific, despite the body of literature demonstrating the potential of agricultural cooperatives to improve rural financial inclusion and input security. The cumulative effects of recent institutional realignments on smallholder decision-making and regional equality have received little attention. By providing a succinct, comprehensive synthesis of cooperative-driven rural development routes and the institutional roadblocks that hinder them in India, this paper fills in these theoretical gaps.

Research Methodology

In order to effectively summarise multidisciplinary literature about the role of agricultural cooperatives in rural transformation and smallholder empowerment throughout India, this study used a qualitative narrative review approach. In contrast to a quantitative meta-analysis, this method enables a thorough, thematic integration of institutional assessments, socioeconomic studies and empirical data even in cases where the source approaches differ significantly. Primary Agricultural Credit Societies, District-Central Cooperative Banking Networks and Dairy Cooperative Unions are the main localised village structures that are evaluated in this study.

A systematic literature search was conducted between April and May 2026 across key scientific indexing databases like Scopus and Google Scholar to guarantee reliability and rigorous data collection. ("agricultural cooperatives" OR "primary agricultural credit societies" OR "PACS" OR "dairy unions") AND ("smallholder empowerment" OR "institutional credit" OR "market integration" OR "rural development") AND ("India") are key keywords related to the research topic that were combined using particular Boolean Operators in the query configuration. The search period was purposefully limited to official policy reports, institutional working papers and peer-reviewed studies released between 2011 and 2026. This period was selected to encompass the significant institutional reorganisation, legislative changes and policy-driven digitalisation initiatives that have been started within the Indian cooperative ecosystem during the previous fifteen years.

To improve the search results, a multi-stage filtering mechanism was implemented. The first search of the electronic database produced 142 entries. References management software was used to export these citations for the first filtering and duplication. The first phase involved the independent screening of titles and abstracts based on stringent inclusion criteria. The study has to be directly grounded in the Indian agrarian context, including primary or secondary data about the performance of cooperatives

and especially measuring socio-economic outcomes like crop yield improvements, transaction cost reductions, credit accessibility and income stabilisation. Studies that concentrated on the non-agricultural cooperatives sector (such as housing or consumer cooperatives), opinion pieces and essays that were solely descriptive were not included. For a thorough eligibility evaluation, 48 full-text papers were obtained following abstract screening.

The full-text papers were assessed for data integrity, institutional legitimacy and methodological soundness at the last screening stage. In the end, precisely twenty significant scholarly publications and official records were selected for final synthesis and inclusion in this study. A wide range of econometric field surveys, long-term institutional assessments and reputable policy papers from organisations like the Reserve Bank of India, the National Bank for Agriculture and Rural Development are included in this group. Thematic synthesis was used to analyse the selected literature, classifying data taken from individual studies into recurrent structural themes: credit flows, market disintermediation, governance issues, regional development asymmetries and integration of modern digital public infrastructure. Although this narrative approach provides a thorough conceptual map of the Indian Cooperative environment, its dependence on secondary data sources and the possibility of spatial selection bias in highly localised micro-regional empirical research are acknowledged limitations.

Results and Discussion

Status of Agricultural Credit Flow through Primary Cooperatives

In rural India, the major structure for official short-term capital distribution is still the Primary Agricultural Credit Societies at the village level. By providing real-time cash liquidity, which shields smallholders from corrupt local moneylenders and permits prompt agricultural scheduling, PACS optimises resource deployment, according to synthesised data (Kumar *et al.*, 2020) ^[13]. Seasonal loan disbursements that are directly linked to certain crop output portfolios guarantee strong credit conversion rates and deter money from being diverted to unproductive household expenditures (Kumar & Mishra, 2024) ^[3].

However, socioeconomic disparity continues to significantly limit the effectiveness of formal financial flow. When overcoming strict institutional regulations and paperwork requirements, marginal and smallholder farmers sometimes encounter significant operational friction, which unintentionally restricts the extent of grassroots financial inclusion (Nayak, 2021) ^[15].

Impact of Cooperative Interventions on Smallholder Value Chain

By creating an institutional countervailing force against fragmented supply chains, cooperative-led networks for input distribution and output aggregation significantly improve smallholders' market capacities. By guaranteeing consistent access to certified seeds and subsidised fertilisers, collective input procurement reduces production overheads, simplifies logistics and stabilises crop yields (Birth *et al.*, 2015) ^[16]. Large-scale cooperative market networks connect primary producers directly to urban consumer markets and

processing corporations through downstream market integration, bypassing conventional multi-layered intermediate channels (Gulati & Juneja, 2021) ^[17].

Empirical analyses show that by reducing transaction costs and post-harvest handling losses, primary farmers who actively participate in organised cooperative marketing loops have steady net revenue improvements of about 8-10% (Chaudhary & Vardhan, 2025) ^[4]. Additionally, according to BIRTHAL *et al.* (2014) ^[19], integrated dairy cooperative unions show a strong ability to protect small families from climate anomalies, diversify production risk and obtain access to decentralised cold-chain systems.

Governance Dynamics and Operational Constraints

The long-term operational viability of agricultural cooperatives is seriously challenged by severe structural and institutional governance impediments, notwithstanding their obvious socioeconomic promise. Rich, politically linked land-owning elites control cooperative governance boards to monopolise credit allocations and subsidised input inventories, a practice known as Elite Capture that continues to be a major bottleneck (Sukhtankar, 2015) ^[21]. The issue of capital famine among marginal groups is made worse by this systemic distortion, which takes vital development capital away from smallholders who are at risk (Dev, 2012) ^[20].

Additionally, the internal financial stability of rural banking institutions has been seriously threatened by populist political interventions, such as frequent, disorganised cycles of agricultural loan waivers, which have resulted in unsustainably high ratios of non-performing assets (Meenakshi *et al.*, 2013) ^[22]. The horizontal scalability of these organisations is hampered by fragmented legal frameworks, oppressive bureaucratic overregulation by state cooperative agencies and a deficiency of professional management training for board members (Chand, 2017) ^[23].

Regional Performance Disparities and the Technology Divide

In India, there are significant institutional and regional inequalities in the macro-level effects of cooperative adoption. In contrast to the cooperative framework in eastern and Northern territories, which often suffer from operational paralysis, low member participation and chronic under-capitalisation, Western and Southern cooperative networks have strong commercial capitalisation, highly professional management boards and integrated agro-processing linkages (Gandhi & Marsh, 2014) ^[25].

The geographical disparity is further widened by a notable digital and technological divide among smallholders. The actual deployment is poorly balanced by localised structural determinants, social inequality and varying degrees of regional digital infrastructure, despite the fact that contemporary policy directives place a strong emphasis on the national standardisation and computerisation of PACS (Pingali *et al.*, 2021) ^[26]. These results highlight the need for decentralised, transparent governance frameworks that safeguard member-centric democratic control in order for pure technology or financial interventions to promote equitable rural development (Jakku *et al.*, 2019) ^[27].

Limitations and Future Scope of Study

Limitations of the Study

It is important to recognise some structural constraints, even if this analysis methodically incorporates a large body of research on the function of agricultural cooperatives in rural development. First, the synthesis may contain latent regional selection biases due to the study's complete reliance on institutional data and secondary empirical research. Second, a major quantitative meta-analysis to statistically estimate impact sizes for income gains and loan recovery rates across states is absent from the narrative technique, despite the fact that it successfully maps institutional features and broad socioeconomic trends. Lastly, empirical data on the post-computerisation phase is still developing due to the recent quick adoption of digital initiatives throughout multi-tier credit networks, which limits the assessment of the long-term operational impact.

Future Scope of Research

These restrictions provide distinct avenues for further scholarly analysis. Large-scale, cross-sectional primary field surveys in a variety of agroclimatic zones should be the focus of future research in order to compare the effectiveness of computerised and non-computerised Primary Agricultural Credit Societies. To determine the overall effect of cooperative membership on smallholder resilience to shocks caused by climate change, sophisticated econometric models like Propensity Score Matching and Difference-in-Differences must be used immediately. Future studies should also examine the legal and institutional frameworks needed to successfully combine established agricultural cooperatives with new digital platforms like Digital Public Infrastructure (AgriStack) and Farmer-Producer Organisations (FPOs).

Policy Recommendations

A multifaceted policy approach is needed to improve the Indian agricultural cooperative system's social inclusivity, financial stability and structural scalability:

- **Democratic Governance Reforms and Anti-Elite Capture Protocols:** To eliminate localised political monopolies on governance boards, state cooperative departments must create independent election authorities and mandate management rotation cycles. To guarantee fair resource allocation, a set proportion of board seats and low-interest short-term loan lines must be officially set aside for small, marginal and female farmers.
- **Targeted Digital Literacy and Grassroots Capacity Building:** To improve financial and digital literacy among primary cooperative members, the Ministry of Cooperation should start extensive capacity-building programs in collaboration with the National Bank for Agriculture and Rural Development. Board members should get training that focuses on guiding them through mobile-based electronic credit verification channels and automated accounting modules.
- **Financial Stabilisation and Risk-Hedging Infrastructure:** Federal policy must separate cooperative banking operations from sporadic political

interventions in order to prevent high ratios of non-performing assets brought on by populist debt-waiver cycles. To protect institutional capital reserves, cooperatives should switch from general loan waivers to index-based crop insurance models that are incorporated directly into the credit disbursement process.

- **Infrastructure Modernisation via Public-Cooperative Partnerships:** Through public-cooperative partnerships, state governments should promote investments in multi-commodity processing facilities, decentralised cold-chain networks and electronic market linkages. This would enable village-level PACS to develop into full post-harvest logistical hubs rather than just simple credit-dispensing centres.

Conclusion

This study evaluated the contribution of agricultural cooperatives to rural development and smallholder empowerment in India using a methodical synthesis of empirical material. The results show that in order to minimise information asymmetries, optimise resource allocation and give the primary farming sector essential short-term capital liquidity, a functional, multitier cooperative architecture anchored by localised Primary Agricultural Credit Societies is crucial. Smallholders may engage in organised marketing value chains, avoid exploitative informal lending networks and obtain high-quality inputs at subsidised costs by actively participating in organisations. This leads to average net productivity and income improvements of about 8-10%.

However, significant structural weaknesses continue to severely limit agricultural cooperatives' developmental reach. An institutional split that consistently disadvantaged marginal farmers is created by systemic elite capture, large non-performing assets burdens, dispersed regulatory monitoring and a clear geographic imbalance between Eastern-Northern and Western-Southern states. This analysis emphasises that while contemporary technology initiatives like national PACS computerisation have great potential to improve administrative efficiency and transparency, structural governance changes are essential to their long-term success. India has to move toward a modernised cooperative framework that strikes a balance between strong democratic member control and digital public infrastructure in order to create a truly resilient and inclusive rural economy. confront

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