

Financial Risk Management and Sustainable Planning for Farmers and Agripreneurs in India

Dr. Shivraj Uddhavrao Kanase

Research Scholar, Agriculture Business Management, Frankford International University

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Abstract

India's agricultural sector, contributing 18.2% to the national GDP and providing livelihood support to 42.3% of the population, faces multifaceted financial risks including price volatility, climate variability, credit inaccessibility, and inadequate insurance penetration. This paper investigates the financial risk management mechanisms and sustainable planning strategies available to Indian farmers and agripreneurs, with specific focus on crop insurance under PMFBY, institutional credit flow through NABARD and commercial banks, and the role of agripreneurial diversification in income stabilization. The objectives encompass evaluating the effectiveness of existing financial risk mitigation instruments and assessing sustainable planning frameworks for agripreneurial growth. A descriptive-analytical methodology was adopted utilizing secondary data from government reports, RBI bulletins, NABARD annual reports, and PMFBY dashboards for the period 2019–2025. The hypothesis posits that integrated financial risk management positively correlates with sustainable agricultural planning outcomes. Results reveal that PMFBY enrollment increased by 32% between 2022–23 and 2024–25, while agricultural ground-level credit disbursement reached ₹25.1 lakh crore in FY2024, surpassing targets by 25%. The discussion confirms that multi-layered risk management combining insurance, credit access, and agripreneurial diversification significantly enhances farm-level financial resilience. The paper concludes that policy convergence between financial inclusion and sustainable agricultural practices is essential for long-term agrarian prosperity.

Keywords: Financial Risk Management, Sustainable Agriculture, Agripreneurship, Crop Insurance (PMFBY), Agricultural Credit India

1. Introduction

Indian agriculture stands at a critical juncture where the imperatives of food security, rural livelihood sustenance, and climate adaptation converge with the urgent need for financial resilience. The Economic Survey 2024–25 confirms that the agriculture and allied sector averaged 5% annual growth from FY2017 to FY2023, yet agricultural income growth remains uneven across regions and farm-size categories (Government of India, 2025). The sector employs nearly half of India's workforce, but persistent challenges including fragmented landholdings, rainfall dependence, market price volatility, and limited access to formal credit continue to expose farmers and agripreneurs to severe financial risks (Chand & Singh, 2023). The Situation Assessment Survey (77th Round, NSSO 2021) revealed that a substantial proportion of agricultural households remain dependent on non-institutional credit sources, highlighting the structural gaps in formal financial inclusion despite decades of policy interventions. Financial risk in agriculture encompasses production

risk arising from weather uncertainties, price or market risk linked to commodity price fluctuations, credit risk stemming from debt obligations, and institutional risk associated with policy changes (Kumar et al., 2020). For Indian farmers, these risks are compounded by the dominance of smallholder farming, where 86.1% of operational holdings are classified as small and marginal, making risk absorption capacity extremely limited (Agricultural Census, 2015–16; Birthal et al., 2022). The Pradhan Mantri Fasal Bima Yojana (PMFBY), launched in 2016, represents India's most comprehensive effort at crop-level risk transfer, with cumulative enrollment of 78.4 crore farmer applications and claims disbursement exceeding ₹1.83 lakh crore through 2024–25 (PIB, 2025). Simultaneously, institutional agricultural credit has expanded substantially, with ground-level credit reaching ₹25.1 lakh crore in FY2024, overachieving the ₹20 lakh crore target by 25% (NABARD, 2024).

Agripreneurship has emerged as a transformative pathway for sustainable economic development in

rural India, integrating entrepreneurial innovation with agricultural value chains (Arumugam & Manida, 2023). The AgriSure initiative by NABARD, the Agriclincs and Agribusiness Centres (ACABC) Scheme, and the formation of over 8,195 Farmer Producer Organizations (FPOs) under the 10,000 FPO scheme reflect the institutional momentum toward agripreneurial development (Bairwa et al., 2015; Kademani et al., 2020). However, financial barriers, particularly the absence of priority lending for agri-startups and delayed seed funding, remain significant constraints (Nain et al., 2019). This paper therefore examines the intersection of financial risk management instruments and sustainable planning frameworks, analyzing how their convergence can strengthen the economic resilience of Indian farmers and agripreneurs. The study draws on verified secondary data from government sources and aims to contribute evidence-based insights for policy refinement.

2. Literature Review

The literature on agricultural financial risk management in India has evolved substantially over the past two decades, reflecting the sector's growing complexity and the intensification of climate-related vulnerabilities. Cole et al. (2017) demonstrated through a randomized controlled trial with Indian farmers that rainfall insurance provision induces farmers to invest more in higher-return but rainfall-sensitive cash crops, suggesting that financial risk transfer instruments can catalyze productive behavioral changes. Birthal et al. (2022) conducted a comparative assessment of crop insurance vis-à-vis irrigation benefits in Indian agriculture, concluding that while both instruments reduce income variability, crop insurance provides a more immediate safety net for smallholders facing climate shocks. Their findings align with the broader evidence that premium-subsidized insurance schemes substantially enhance risk-bearing capacity among resource-constrained farmers (Madaki et al., 2023). The institutional credit dimension has been extensively analyzed by Kumar et al. (2010), who examined the performance and determinants of institutional credit to the agriculture sector in India, identifying farm size, education, and proximity to banking institutions as significant determinants of credit access. Gulati and Juneja (2019) traced the evolution of India's agricultural credit system, highlighting that despite the progressive institutionalization of farm credit through the Kisan Credit Card scheme and NABARD's refinance operations, regional disparities and the short-term credit bias persist. The KCC scheme, with 7.75 crore operational cards as of March 2024 and enhanced loan limits raised to ₹5 lakh under Budget 2025–26,

remains the cornerstone of affordable farm credit at an effective 4% interest rate (EY India, 2025). However, credit growth to agriculture moderated to 10.4% year-on-year as of March 2025, down from 20% in the preceding year, indicating potential saturation in short-term lending without corresponding growth in long-term investment credit (RBI, 2025).

Research on agripreneurship has gained momentum, with Uplaonkar and Biradar (2015) establishing the foundational role of agricultural entrepreneurs in driving rural economic development through innovation and value addition. Nain et al. (2019) identified the theoretical foundations of agripreneurship development processes, emphasizing that effective leadership, strategic planning, and credit facility access are critical success factors. The MDPI study by Singh et al. (2023) on first-generation agripreneurs in Haryana confirmed that effective leadership ranked highest among success factors with a Cronbach's alpha of 0.812, followed by strategic planning and business opportunity scanning. More recently, a Frontiers study on sustainable agri-entrepreneurship development revealed that financial barriers, including absence of priority lending and delayed seed funding, are the highest-priority challenges requiring targeted policy interventions (Frontiers, 2024). The Climate Policy Initiative's January 2025 report on sustainable finance flows to India's agriculture sector quantified annual flows averaging INR 22,393 billion (USD 301 billion) for FY 2020–22, establishing a baseline for tracking the adequacy of financial resource allocation toward sustainable agricultural transformation (CPI, 2025). This body of literature collectively underscores that integrated approaches combining risk transfer, credit access, and entrepreneurial capacity building are essential for achieving resilient and sustainable agricultural growth in India.

3. Objectives

1. To evaluate the effectiveness of financial risk management instruments, particularly crop insurance (PMFBY) and institutional agricultural credit, in mitigating financial vulnerabilities of farmers and agripreneurs in India during 2019–2025.
2. To assess the role of sustainable agricultural planning and agripreneurial diversification strategies in enhancing long-term income stability and economic resilience for the Indian farming community.

4. Methodology

This study adopts a descriptive-analytical research design to investigate financial risk management and sustainable planning for Indian farmers and

agripreneurs. The research is based entirely on secondary data, systematically collected from authenticated government publications, institutional reports, and peer-reviewed academic literature. The primary data sources include the PMFBY National Crop Insurance Portal dashboard statistics (2016–2025), NABARD Annual Reports (2022–23 and 2023–24), Reserve Bank of India's Handbook of Statistics on the Indian Economy (2024–25), the Economic Survey of India (2023–24 and 2024–25), Ministry of Agriculture and Farmers' Welfare press releases through the Press Information Bureau, and the Climate Policy Initiative's Sustainable Agriculture Finance Report (January 2025). Academic literature was sourced exclusively from Google Scholar, Scopus-indexed journals, and recognized publications including Food Policy, Agricultural Economics

Research Review, and Sustainability (MDPI). The sample encompasses national-level aggregate data on crop insurance enrollment, claims settlement, agricultural credit disbursement, KCC coverage, FPO formation, and agripreneurial scheme performance across India for the period 2019–2025. Data analysis tools include trend analysis, percentage growth computation, and comparative tabular analysis. Six structured data tables have been constructed to present verified statistical findings on PMFBY performance, agricultural credit targets versus achievements, KCC penetration, sustainable agriculture scheme allocation, agripreneurial growth indicators, and financial risk exposure patterns. All data points have been cross-verified against original government portals and official publications to ensure accuracy and reliability.

5. Results

Table 1: Year-wise Performance of PMFBY in India (2019–20 to 2024–25)

Year	Farmer Applications Enrolled (Crore)	Claims Paid (₹ Crore)	Non-Loanee Farmers (%)
2019–20	2.81	18,519	30
2020–21	2.95	20,264	33
2021–22	2.38	18,756	35
2022–23	3.17	22,890	38
2023–24	4.02	25,460	42
2024–25	4.19	27,350*	48

Source: PIB (2025); PMFBY Dashboard; * Provisional estimates

Table 1 demonstrates a significant upward trajectory in PMFBY enrollment, with farmer applications increasing from 2.81 crore in 2019–20 to 4.19 crore in 2024–25, representing a 49% cumulative growth. Notably, the proportion of non-loanee farmers, who voluntarily enroll without being linked to institutional loans, rose from 30% to 48%, indicating growing

voluntary awareness and trust in the scheme. The total claims disbursement since inception has exceeded ₹1.83 lakh crore, with farmers receiving approximately ₹500 for every ₹100 paid as their premium share, confirming the scheme's substantial risk-transfer effectiveness (PIB, 2025).

Table 2: Agricultural Ground Level Credit—Targets vs. Achievements in India (2019–20 to 2024–25)

Year	Target (₹ Lakh Crore)	Achievement (₹ Lakh Crore)	Achievement (%)
2019–20	13.50	13.92	103.1
2020–21	15.00	15.22	101.5
2021–22	16.50	18.60	112.7
2022–23	18.50	21.55	116.5
2023–24	20.00	25.10	125.5
2024–25	22.00	-- (Ongoing)	--

Source: NABARD Annual Reports (2023–24); Economic Survey 2024–25

Table 2 reveals consistent overachievement of agricultural credit targets since 2019–20. The most remarkable performance was in FY2023–24, where actual disbursement of ₹25.1 lakh crore exceeded the ₹20 lakh crore target by 25.5%. This trend reflects the combined expansion of short-term crop loans, KCC-

linked lending, and growing participation of commercial banks, RRBs, and cooperative banks in agricultural financing. However, long-term investment credit for infrastructure such as irrigation, storage, and mechanization continues to lag behind short-term crop lending (NABARD, 2024).

Table 3: Kisan Credit Card (KCC) Penetration in India (2020–21 to 2024–25)

Year	Operational KCCs (Crore)	KCC Loan Limit (₹ Lakh)	Effective Interest Rate (%)
2020–21	6.90	3.00	4.0
2021–22	7.20	3.00	4.0
2022–23	7.45	3.00	4.0
2023–24	7.75	3.00	4.0
2024–25	8.10*	5.00	4.0

Source: PIB (2025); Ministry of Agriculture; * Estimated based on MISS KCC campaign data

Table 3 illustrates the steady expansion of KCC penetration from 6.90 crore in 2020–21 to an estimated 8.10 crore operational cards in 2024–25. The Union Budget 2025–26 significantly raised the KCC loan limit from ₹3 lakh to ₹5 lakh, enhancing farmers' borrowing capacity for investment in technology,

quality seeds, and sustainable inputs. The maintained effective interest rate of 4% through the interest subvention scheme ensures the affordability of formal credit, with 5.9 crore farmers mapped under the Mission for Saturation of KCC (MISS KCC) through the Kisan Rin Portal (EY India, 2025).

Table 4: Sustainable Agriculture Scheme Allocations and Coverage in India (2023–2025)

Scheme/Initiative	Budget Allocation (₹ Crore)	Coverage/Target
PMFBY (FY 2025–26)	12,242	4.19 crore farmers
PM-KISAN (Annual)	60,000	11+ crore beneficiaries
NMNF (Natural Farming)	2,481	Chemical-free farming promotion
PDMC (Micro Irrigation)	4,000+ cumulative	95.58 lakh hectares (FY16–25)
FPO Formation Scheme	6,860	8,195 FPOs registered (by Feb 2024)
PM Dhan-Dhaanya Yojana	3,200	Comprehensive farmer support

Source: Union Budget 2025–26; PIB; Ministry of Agriculture

Table 4 presents the financial commitment of the Government of India toward sustainable agriculture planning. The allocation of ₹12,242 crore for PMFBY in FY2025–26 and ₹60,000 crore for PM-KISAN direct income transfers reflects a dual strategy of risk mitigation and income stabilization. The National Mission on Natural Farming (NMNF), approved in

November 2024 with ₹2,481 crore outlay, promotes chemical-free farming to enhance soil health and climate resilience. The Per Drop More Crop initiative has covered 95.58 lakh hectares under micro-irrigation since FY2016, representing 104.67% improvement over the pre-scheme period (Economic Survey, 2024–25).

Table 5: Agripreneurship Growth Indicators in India (2020–2025)

Indicator	2020	2022	2024
FPOs Registered under 10,000 FPO Scheme	2,200	5,600	8,195
Equity Grants Released to FPOs (₹ Crore)	35.0	98.5	157.4
ACABC Agripreneurs Trained (Cumulative)	72,000+	78,000+	85,000+
Agri-Startups Funded by NABARD AgriSure	--	Pilot	Active
Agri-Food Exports (USD Billion)	35.16	43.30	46.44

Source: Ministry of Agriculture; NABARD; APEDA; Economic Survey 2024–25

Table 5 tracks the progressive growth in agripreneurial indicators, with FPO registrations nearly quadrupling from 2,200 in 2020 to 8,195 by February 2024, accompanied by equity grants of ₹157.4 crore. The ACABC scheme has cumulatively trained over 85,000 agripreneurs across India. Agri-food exports reached

USD 46.44 billion in FY2024, with processed food exports rising from 14.9% of total agri-food exports in FY2018 to 23.4% in FY2024, demonstrating the value-addition capability of the growing agripreneurial ecosystem (Economic Survey, 2024–25).

Table 6: Financial Risk Exposure of Indian Agricultural Households (NSSO 77th Round and Recent Data)

Risk Parameter	Small/Marginal Farmers	Medium Farmers	Large Farmers
Households with Outstanding Loans (%)	50.2	47.8	42.5
Institutional Credit Access (%)	69.6	76.3	85.4
Non-Institutional Dependence (%)	30.4	23.7	14.6

Crop Insurance Coverage (%)	28.5	38.6	45.2
Average Monthly Income (₹)	8,337	13,661	22,443

Source: NSSO 77th Round (2019); *Agricultural Statistics at a Glance 2022*; PIB

Table 6 exposes the structural inequalities in financial risk exposure across farm-size categories. Small and marginal farmers exhibit the highest loan indebtedness (50.2%), lowest institutional credit access (69.6%), and greatest reliance on non-institutional sources (30.4%). Their crop insurance coverage at 28.5% is substantially lower than large farmers' 45.2%, indicating that the most financially vulnerable segment remains insufficiently protected. The average monthly income gap between small (₹8,337) and large farmers (₹22,443) underscores the urgency of targeted financial inclusion and risk management interventions for smallholders (NSSO, 2021).

6. Discussion

The findings of this study present a comprehensive picture of the evolving financial risk management landscape for Indian farmers and agripreneurs, revealing both significant progress and persistent structural gaps that demand targeted policy action. Aligned with the first objective of evaluating financial risk mitigation instruments, the data confirms that PMFBY has emerged as a transformative institution in agricultural risk transfer. The 32% increase in enrollment from 3.17 crore in 2022–23 to 4.19 crore in 2024–25 (Table 1) reflects the effectiveness of operational reforms including voluntary participation, technology-driven claim processing through YES-TECH and DigiClaim modules, and the introduction of automatic 12% penalty on delayed claim payments from Kharif 2024 (PIB, 2025). This finding corroborates the observations of Birthal et al. (2022) that subsidized crop insurance provides immediate risk buffering for smallholders, though the data in Table 6 reveals that only 28.5% of small and marginal farmers have crop insurance coverage, suggesting that the scheme's reach among the most vulnerable remains insufficient despite aggregate enrollment growth.

The agricultural credit analysis (Tables 2 and 3) demonstrates that institutional credit delivery has consistently exceeded targets, with the landmark achievement of ₹25.1 lakh crore in FY2024 representing a 25.5% overshoot. This quantitative expansion aligns with Gulati and Juneja's (2019) assessment of progressive institutionalization, yet the qualitative dimension raises concerns. The moderation of credit growth to 10.4% in March 2025, down from 20% in the previous year, combined with the continued dominance of short-term crop loans over long-term investment credit, indicates a structural imbalance that constrains farmers' capacity to invest in climate-resilient infrastructure, storage facilities, and

mechanization (NABARD, 2024; RBI, 2025). The KCC limit enhancement to ₹5 lakh under Budget 2025–26 is a welcome step, but its impact will depend on reducing processing delays and extending coverage to tenant farmers and sharecroppers who remain marginally included. Addressing the second objective on sustainable planning and agripreneurial diversification, the data in Tables 4 and 5 demonstrates substantial institutional momentum. The NMNF allocation of ₹2,481 crore for chemical-free farming, the micro-irrigation coverage of 95.58 lakh hectares under PDMC, and the registration of 8,195 FPOs collectively reflect a multi-dimensional sustainability framework (Economic Survey, 2024–25). The agripreneurial growth indicators are particularly encouraging, with agri-food exports reaching USD 46.44 billion in FY2024 and the share of processed food exports rising to 23.4%. This trend validates Arumugam and Manida's (2023) thesis that agripreneurship fosters economic viability and innovation adoption among younger agricultural stakeholders. However, the evidence from Frontiers (2024) on persistent financial barriers, particularly delayed seed funding and absence of priority lending for agri-startups, indicates that the enabling environment for agripreneurial growth requires further strengthening through dedicated financial products and post-incubation support mechanisms.

The income disparity data in Table 6 between small farmers (₹8,337/month) and large farmers (₹22,443/month), combined with the higher non-institutional credit dependence of smallholders (30.4%), confirms that financial risk management benefits are disproportionately accruing to larger, better-connected farm households. This structural inequity can be addressed through the convergence of schemes like PM-KISAN direct income transfers, enhanced KCC access with simplified documentation, and targeted agripreneurial training through ACABC for women and marginal farmers. The CPI (2025) report's finding that sustainable agriculture finance averaged INR 22,393 billion annually during FY 2020–22 provides a macroeconomic benchmark, but ensuring these financial flows reach the last mile requires digital infrastructure integration, transparent monitoring through portals like the Kisan Rin Portal, and state-level commitment to timely premium subsidy deposit through the mandatory ESCROW mechanism introduced from Kharif 2025.

7. Conclusion

This study establishes that India's financial risk management architecture for farmers and agripreneurs has expanded substantially through PMFBY, institutional credit channels, and agripreneurial development schemes during 2019–2025. PMFBY's cumulative coverage of 78.4 crore farmer applications and ₹1.83 lakh crore in claims disbursement, combined with agricultural credit achievements exceeding ₹25 lakh crore annually, reflect strong policy commitment. However, the persistent gaps in smallholder insurance coverage, over-reliance on short-term credit, income disparities across farm categories, and financial barriers to agripreneurial growth necessitate a convergent policy approach. The integration of digital platforms, enhanced long-term investment credit, targeted financial inclusion for women and marginal farmers, and robust post-incubation support for agripreneurs are essential for achieving sustainable and equitable agrarian prosperity in India.

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