# Role of Fintech in Agricultural Lending and Rural Credit

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**ABSTRACT**

This research paper explores the pivotal role of financial technology (Fintech) in transforming agricultural lending and improving access to credit in rural India. Traditional rural banking faces persistent challenges such as documentation hurdles, high transaction costs, and limited outreach. Fintech offers innovative solutions by integrating technologies like mobile banking, e-KYC, AI-driven credit scoring, and satellite data analytics. This study combines insights from primary observations during an internship at the State Bank of India (SBI), supported by secondary data from RBI, NABARD, and NPCI. The paper assesses current practices, highlights successful use cases, and proposes recommendations for scaling fintech-enabled rural finance.

## INTRODUCTION

Agricultural credit plays a crucial role in ensuring the sustainability and development of India's rural economy. However, access to timely and affordable credit remains a major challenge, especially for small and marginal farmers who often lack proper documentation or credit history. Traditional lending methods are slow, manual, and often limited by the reach of physical bank branches, which makes it difficult to meet the growing financial needs of the agricultural sector.

Over the past decade, financial technology (Fintech) has emerged as a transformative force in the financial services sector. Leveraging innovations such as mobile banking, Aadhaar-enabled e-KYC, AI-based credit scoring, and real-time data analytics, fintech has introduced efficient and inclusive solutions for rural lending. Institutions like the State Bank of India (SBI) are increasingly adopting fintech platforms to streamline agricultural loan disbursement and enhance financial inclusion in underserved regions.

This paper aims to analyse the role of fintech in improving agricultural lending mechanisms, identify implementation challenges, and suggest practical policy recommendations. The research is informed by field observations from an internship at SBI, supplemented by secondary data from national financial and policy institutions.

### SCOPE OF THE PROJECT

The scope of this study encompasses the examination of how fintech is transforming agricultural lending practices and enhancing access to rural credit in India. Specifically, the project covers:

- The operational integration of fintech tools by public sector banks, particularly SBI.
- The impact of fintech innovations like e-KYC, digital credit scoring, and mobile banking apps on credit accessibility and efficiency.
- The role of government schemes and policy frameworks that support fintech-led agri finance.
- Challenges such as digital literacy, regulatory compliance, and infrastructure gaps affecting fintech adoption.

- Recommendations for improving the scalability and inclusiveness of fintech in the rural banking ecosystem.

**OBJECTIVES OF THE STUDY**

- To Understand the Structure and Functioning of ABU
- To Study the Role of ABU in Agri Lending.
- To Analyse the Implementation of Government Schemes.
- To Examine the Credit Appraisal and Risk Management Process.
- To Explore the Use of Fintech and Digital Tools in Agri Financing.
- To Identify the Challenges Faced by ABU in Rural Credit Delivery.


## LITERATURE REVIEW

The literature on financial technology and rural credit delivery highlights a growing recognition of fintech's transformative potential in agriculture. The Reserve Bank of India's (2021) report by the Working Group on Digital Lending underscores the need for transparency, customer protection, and standardization in digital credit practices. It also emphasizes the importance of fintech partnerships for improving credit flow to underserved segments.

**NABARD's Annual Reports (2022–23)** provide critical insights into the limitations of conventional rural lending models and the emerging role of technology in expanding outreach. The reports advocate for closer integration between banks and fintechs, particularly in the context of schemes like the Kisan Credit Card (KCC) and the Agriculture Infrastructure Fund (AIF).

**NITI Aayog (2021)** notes that fintech can play a pivotal role in increasing financial inclusion among smallholder farmers by using alternative data for credit assessment, reducing operational inefficiencies, and digitizing government benefit transfers. The World Bank (2022) adds a global perspective, showing how digital financial services are improving resilience and productivity in developing economies.

**Consulting reports by McKinsey & Company, PwC, and FICCI** provide detailed case studies and market data. For instance, PwC India (2023) documents how startups like Samunnati and Jai Kisan are using AI, satellite data, and APIs to disburse agri-loans quickly and securely. FICCI (2021) outlines strategic recommendations for scaling fintech solutions across rural India, emphasizing regulatory support and digital infrastructure.

Together, these sources establish a solid foundation for understanding the drivers, benefits, and constraints of fintech in rural credit, setting the stage for a contextualized case study of SBI's agri-fintech practices.


## INTRODUCTION TO RESEARCH METHODOLOGY

This study employs a qualitative research design, supplemented by observational and secondary data analysis. The methodology is structured as follows:

**Sample Design**

A purposive sampling method was used to select participants and branches with relevant exposure to fintech-enabled lending processes

**Sample Size**

The sample includes:

- 1 regional business office
- 2 agricultural branches

- 5 bank officers (for informal discussions and observations)

**Sampling Technique**

Non-probability sampling (purposive) was used due to the field-based and qualitative nature of the internship study.

**Research Design**

An exploratory and descriptive design was used to assess the application and impact of fintech tools in agricultural lending at a regional level, with a focus on public sector banking practices.

**Area of Research**

The research was conducted at the State Bank of India's Regional Business Office-5 in Rudrapur, Uttarakhand, covering agri-branches that deal with KCC, AIF, and other rural credit schemes.

**SOURCES OF DATA**

This research utilizes both primary and secondary sources of data to provide a comprehensive understanding of the "Role of Fintech in Agricultural Lending and Rural Credit.

- **Primary Data:** Extracted from firsthand observation of SBI's agri-lending workflow, including the use of digital platforms like YONO Krishi, e-KYC implementation at the branch level, geo-tagging processes for farm verification, and interactions with bank staff handling KCC and PMFBY loan applications.

- **Secondary Data:** Drawn from the following sources:

o **RBI Reports** (e.g., Working Group on Digital Lending – for regulatory landscape)

o **NABARD Annual Reports** (e.g., credit disbursement patterns, rural banking performance)

o **SBI Annual Reports** (e.g., YONO user growth, agri-loan data)

o **NPCI UPI Transaction Reports** (e.g., digital transaction volumes by geography)

o **Policy Documents** from NITI Aayog and Ministry of Agriculture

o **Industry Reports** from PwC, McKinsey, and FICCI (e.g., fintech adoption in agri-tech)

**DATA COLLECTION**

- **Direct Observation:** Detailed observations were made during day-to-day functioning at SBI's agricultural branches to understand how fintech is integrated into processes like loan applications, disbursals, and KYC verification.

- **Informal Interviews:** Conversations with bank staff including agricultural credit officers, relationship managers, and IT support staff provided insights into practical challenges and perceptions about fintech adoption.

- **Document Review:** Review of internal circulars, policy implementation notes, YONO Krishi usage logs, and KCC loan processing documentation helped understand procedural frameworks.

- **Secondary Research:** Involved collecting and analysing public reports, transaction statistics, and research studies to contextualize SBI's practices within the broader rural fintech ecosystem.

This multi-method approach to data collection strengthened the reliability and depth of the research.

**TOOLS FOR DATA ANALYSIS**

- Comparative tables for traditional vs. fintech models
- Visual aids including bar graphs and pie charts to present digital adoption and credit share data
- Thematic analysis of observational findings

**SCOPE OF PROJECT**

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- The impact of fintech innovations like e-KYC, digital credit scoring, and mobile banking apps on credit accessibility and efficiency.
- The role of government schemes and policy frameworks that support fintech-led agri finance.
- Challenges such as digital literacy, regulatory compliance, and infrastructure gaps affecting fintech adoption.
- Recommendations for improving the scalability and inclusiveness of fintech in the rural banking ecosystem. This comprehensive scope enables a focused analysis of both institutional practices and grassroots-level outcomes, providing actionable insights for future policy and innovation.

**The Role of Fintech in Agricultural Lending**

**Key Innovations**

- **Digital KYC:** Aadhaar-enabled onboarding streamlines borrower verification.
- **Mobile Apps:** Platforms like YONO Krishi offer loan applications, market updates, and subsidy tracking.
- **AI-Based Credit Scoring:** Uses alternative data like crop history, satellite imagery, and weather to assess risk.
- **Remote Monitoring:** GPS and IoT devices enable digital field inspections.

**SBI's Agri-Fintech Integration** SBI has incorporated fintech tools such as:

- YONO Krishi for paperless KCC applications.
- Geo-tagging of farms for loan verification.
- Real-time dashboards for loan tracking.

**Table 1: Traditional vs Fintech Lending Comparison**

| Feature | Traditional Lending | Fintech Lending |
|---|---|---|
| Loan Processing Time | 10–15 days | 1–3 days |
| KYC Method | Paper-based | Aadhaar/e-KYC |
| Risk Assessment | Manual | AI/Data-Driven |
| Monitoring | Field visits | GPS-enabled/Digital |

| Access | Branch-only | App-based/Remote |
|---|---|---|
| | | |

**FINDINGS:**

The findings of this study demonstrate the evolving impact of fintech in the rural credit landscape, particularly in terms of accessibility, efficiency, and adoption challenges:

- **Increased Digital Penetration and UPI Growth** According to NPCI, digital payments via UPI surged from 5.3 billion in FY 2018–19 to 131 billion in FY 2023–24. A significant portion of this growth was driven by government schemes, increased smartphone usage, and targeted fintech outreach in rural areas. Field-level discussions revealed that UPI adoption among small traders and input dealers has created a ripple effect, encouraging farmers to adopt digital methods.



Growth of UPI Transactions in India (2018–2023)
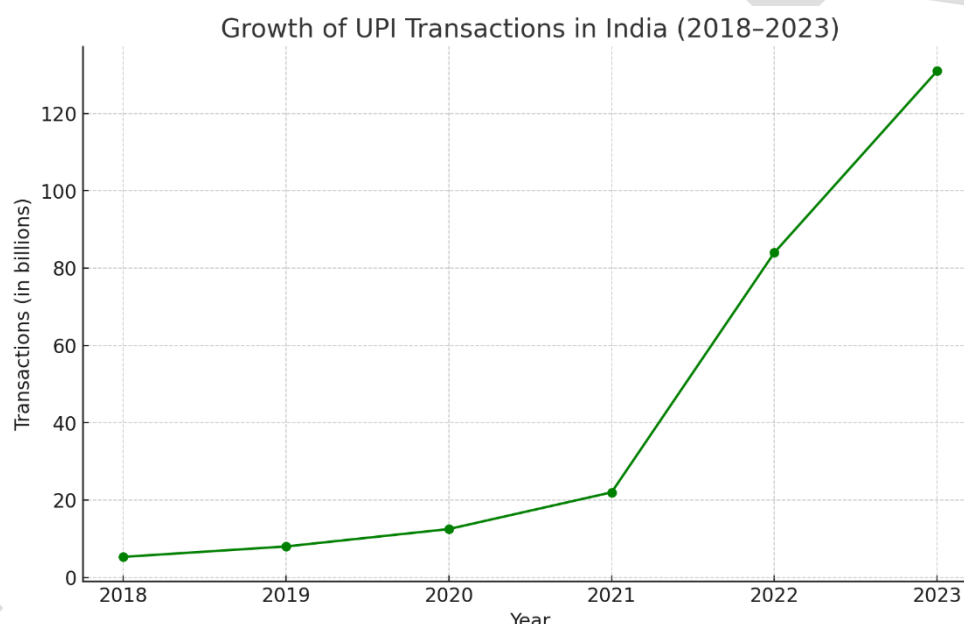
This chart illustrates the rapid increase in UPI-based digital transactions in India. The steep growth from 5.3 billion in 2018 to over 131 billion in 2023 highlights the country's accelerated adoption of digital payment

- **Enhanced Efficiency in Loan Processing** Bank officials at SBI branches reported that fintech tools—especially YONO Krishi and e-KYC—reduced loan turnaround time from 10–15 days to 1–3 days. The e-KYC mechanism eliminated the need for physical verification and documentation, especially benefiting first-time borrowers. Geo-tagging of agricultural land helped prevent fraud and ensured quicker appraisal of crop loans.

- **Inclusion of First-Time Borrowers** AI-driven credit scoring has enabled banks to assess creditworthiness using alternate data like rainfall records, cropping cycles, and digital transaction history. Officers noted that this has allowed inclusion of farmers with no prior formal borrowing history, thus deepening financial inclusion.

- **Limitations in Infrastructure and Capacity** Despite progress, gaps persist. Many rural customers lack access to stable internet, smartphones, or the digital literacy to use fintech tools effectively. Several branch officers

indicated that older customers were still hesitant to trust app-based platforms. Furthermore, some staff lacked training in fully utilizing the available fintech systems, leading to under-utilization of their potential.

- **Institutional Support and Adoption Trends** Government push through DBT (Direct Benefit Transfer), PM-KISAN, and digitized subsidies have acted as major catalysts for digital adoption. SBI's back-end integration with platforms like UIDAI, land record databases, and satellite-based crop monitoring has streamlined loan disbursement and improved transparency.

- **Evolving Role of Fintechs and NBFCs** the credit distribution chart reveals that fintechs now constitute 15% of agri-credit provision, often focused on small-ticket, fast-disbursal loans. NBFCs, while slightly ahead, rely heavily on fintech partnerships for rural reach. This trend indicates the potential for collaborative models in the future.

## RECOMMENDATIONS

Based on the findings and observations, the following policy recommendations are proposed to enhance the effectiveness and outreach of fintech in agricultural lending and rural credit:

- **Expand Digital Infrastructure in Rural Areas** Invest in reliable internet connectivity and power supply to ensure smooth functioning of digital platforms. Government and private players should collaborate to extend broadband coverage to remote and underserved areas.

- **Promote Digital and Financial Literacy** Launch targeted literacy programs for farmers and rural entrepreneurs to improve familiarity with fintech tools, mobile banking, and digital transactions. These programs should be delivered in local languages using on-ground support and community-based facilitators.

- **Encourage Public-Private Partnerships (PPPs)** Facilitate partnerships between banks, fintech firms, agri-tech startups, and NBFCs to leverage combined strengths in outreach, technology, and risk management. PPP models can accelerate innovation while ensuring regulatory compliance and service reliability.

- **Streamline Regulatory Approvals and Compliance** Simplify regulatory frameworks for fintech firms engaged in agri-lending, especially around KYC norms, loan documentation, and data-sharing policies. A single-window clearance mechanism could ease onboarding and improve efficiency.

- **Incentivize Fintech Integration in Government Schemes** Offer incentives to banks and fintechs that align their platforms with government welfare schemes such as PMFBY, KCC, and PM-KISAN. Integration would ensure faster subsidy disbursement and better tracking of loan utilization.

- **Build Capacity Among Banking Staff** Provide regular training and upskilling opportunities for rural bank staff to operate and troubleshoot fintech platforms. Familiarity among front-line officers will improve adoption and service delivery.

- **Develop Custom Fintech Products for Rural Needs** Encourage the development of fintech products that cater specifically to seasonal incomes, small-ticket loans, informal credit history, and crop cycles. Customized loan offerings and flexible repayment models can increase borrower satisfaction and credit uptake.

- **Improve Data Interoperability and Credit Scoring Models** Promote data-sharing between banks, fintechs, and government databases to enhance credit scoring accuracy. Use of geospatial data, crop analytics, and weather data should be standardized for wider use in rural credit assessment.

**FUTURE SCOPE**

The integration of financial technology (Fintech) in agriculture lending and rural credit has opened up new avenues for transforming the rural economy. My learning during the internship at SBI has not only provided exposure to the current practices but also revealed significant future scope in multiple dimensions:

**1. Enhanced Financial Inclusion**

Fintech innovations can bridge the rural credit gap by offering:

- Digital onboarding and KYC, enabling faster and paperless access to credit.

- Mobile banking and UPI-based transactions, improving accessibility for farmers in remote areas.

- Use of vernacular apps and user-friendly interfaces to ensure wider adoption.

**2. Data-Driven Credit Assessment**

- Leveraging AI and data analytics for creditworthiness evaluation using alternative data (e.g., farm yields, weather data, transaction history).

- Satellite imaging and IoT tools to monitor crop health and reduce information asymmetry for lenders.

- Customized credit products based on real-time risk **assessment**.

**3. Expansion of Agri-Fintech Ecosystem**

- Opportunities for fintech startups to collaborate with banks and NBFCs to offer tailored agri-credit solutions.

- Blockchain-based supply chain finance models to ensure transparent and timely payments to farmers.

- Growth in embedded finance within agri-input or agri-tech platforms (e.g., credit linked to seed/fertilizer purchases).

**4. Improving Credit Delivery and Monitoring**

- Use of mobile apps and digital dashboards for monitoring credit usage, repayment behaviour, and crop outcomes.

- Digital loan disbursement and collection improving efficiency and reducing operational costs for banks.

- Integration of crop insurance and credit systems to manage agri-risk better.

**5. Career and Research Opportunities**

- Scope for working in fintech firms, agri-tech startups, rural banking divisions, and policy institutions.

- Potential for contributing to policy design for rural financial inclusion, especially with organizations like NABARD, RBI, or NITI Aayog.

- Academic research on impact of fintech on credit penetration, farmer income, and rural development.

**6. Supporting Government Schemes Digitally**

- Fintech can help in efficient implementation of schemes like:

o **Kisan Credit Card (KCC)/KSR (Kisan Samriddhi Rinn)**

o **Pradhan Mantri Fasal Bima Yojana (PMFBY)**

o **Agriculture Infrastructure Fund (AIF)**

- Automation and integration of government benefits with digital credit platforms can ensure faster delivery and reduced leakage.

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