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A study on Digital Payments and Financial Inclusion in rural areas of India

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ABSTRACT
Digital payments have emerged as a powerful driver of financial inclusion in rural India. Government initiatives such as PMJDY, Aadhaar, and UPI, combined with growing smart phone penetration, have reduced dependence on cash and expanded access to formal financial services. Digital payments benefit rural households, farmers, and micro-entrepreneurs by enabling secure transactions, improving access to credit and welfare schemes, and enhancing financial transparency. However, challenges such as low digital literacy, poor internet connectivity, cyber security concerns, and socio-cultural resistance persist. Addressing these barriers through policy support, infrastructure development, and financial literacy programs can help bridge the rural–urban financial divide and promote inclusive and sustainable growth.

Keywords:
Digital Payments, Financial Inclusion, Rural India, UPI, Digital Literacy, Financial Technology, Government Initiatives and Rural Economic Development.

Introduction

Over the past decade, India has made significant progress toward a digitally empowered economy, with digital payment systems such as UPI, Aadhaar-enabled payments, mobile banking, and direct benefit transfers playing a key role in financial sector reforms. While adoption began in urban areas, the growing use of these technologies in rural India marks an important step toward financial inclusion. Traditionally, rural communities have faced challenges such as limited banking infrastructure, low financial literacy, and reliance on

cash and informal credit systems. Digital payments help address these issues by offering secure, affordable, and convenient access to formal financial services. Government initiatives like Pradhan Mantri Jan Dhan Yojana and Digital India, along with rising smar tphone use and improved connectivity, have further boosted adoption. Digital payments enhance transparency, improve access to welfare schemes, and support rural livelihoods. However, barriers such as poor network coverage, cyber security risks, language constraints, trust issues, and socio-economic inequalities—especially gender gaps—continue to limit widespread usage. This study examines the role of digital payments in advancing financial inclusion in rural India, their impact on rural communities, and the challenges and policy measures needed for sustainable adoption.

Review of Literature

Datta and Singh[1] (2019) examined the relationship between financial inclusion and human prosperity using World Bank data from 102 low-, middle-, and high-income countries. Using principal component analysis followed by regression analysis, the study found a strong positive correlation between financial inclusion and human prosperity across all country groups. The authors highlighted that greater use of financial services by vulnerable populations helps reduce poverty and improves access to education and health, thereby supporting human resource development.

Priya et al.[2] (2018) investigated, among young customers, the determining factors of m-banking adoption. The empirical results found that ease of use, usefulness, credibility, and structural assurance were the key determinants of m-banking adoption. The authors also observed the behavioral intentions and the usage of m-banking were unaffected by perceived risk.

[1] S. K., & Singh, K. (2019). Variation and determinants of financial inclusion and their association with human evelopment: A cross-country analysis. IIMB Management Review, 31(4), 336–349. https://doi.org/10.1016/j.iimb.2019.07.013

[2] Priya, R., Gandhi, A. V., & Shaikh, A. (2018). Mobile banking adoption in an emerging economy: An empirical analysis of young Indian consumers. Benchmarking: An International Journal, 25(2), 743–762. ttps://doi.org/10.1108/BIJ-01-2016-0009

Dasgupta R.,[3] (2009): It this article author emphasis on two reports, one exclusively on financial inclusion, under the chairmanship of C Rangarajan and another under the chairmanship of Raghuram G Rajan, were submitted to the government in 2008. Whereas both the reports agree on the diagnosis of exclusion, they differ on the prescription for inclusion.

Research Design

This study adopts a mixed-methods approach, combining quantitative and qualitative methods to examine the role of digital payments in enhancing financial inclusion in rural India. The approach captures both measurable trends and the experiences of rural stakeholders.

1. Data Sources

- **Secondary Data:** The study draws on government reports, banking and financial sector statistics, national surveys such as the National Sample Survey and Financial Inclusion Surveys, and relevant research publications to analyze patterns of digital payment adoption and financial inclusion across rural regions.
- **Primary Data:** Field data is collected through structured questionnaires and interviews with rural residents, local merchants, banking correspondents, and microfinance agents to understand user behavior, awareness, and challenges associated with digital payments.

2.Sampling Technique

A stratified random sampling approach is used to select representative rural communities from different states, ensuring diversity in socio-economic conditions, financial literacy levels, and access to banking infrastructure. Within these communities, households and small businesses are randomly chosen for data collection.

3. Data Collection Methods

Quantitative Data: Structured surveys gather information on the frequency of digital payment usage, types of platforms used, transaction volumes, and demographic characteristics.

- **Qualitative Data:** Semi-structured interviews and focus group discussions explore user perceptions, trust issues, challenges in adoption, and the impact of digital payments on financial inclusion and livelihood activities.

[3] Dasgupta, R., (2009), "Two Approaches to Financial Inclusion" , Economic & Political Weekly, June 27, 2009 vol xliv nos 26 & 27

4. Data Analysis

- **Quantitative Analysis:** Descriptive statistics, cross-tabulations, and regression techniques are applied to identify adoption patterns, correlations, and factors influencing digital payment usage.
- **Qualitative Analysis:** Thematic analysis is conducted to derive insights on barriers, user experiences, and policy implications.

5. Scope: This study analyzes the role of digital payment systems in promoting financial inclusion in rural India. It examines adoption, impact on banking and welfare access, key influencing factors, and major challenges to support inclusive and sustainable digital financial development.

6. OBJECTIVES OF THE STUDY

1. To study the adoption and usage of digital payment systems in rural areas.
2. To evaluate the role of digital payments in promoting financial inclusion and banking access.
3. To identify socio-economic and technological factors influencing adoption.
4. To examine key challenges such as connectivity, security, trust, language, and gender disparities.
5. To suggest measures for strengthening digital payment adoption and inclusive rural financial development.

7. Limitations

- Digital infrastructure gaps due to unreliable internet and electricity limit digital payment usage and data accuracy.
- Low digital literacy reduces the reliability of respondents' answers.
- Restricted sample coverage may not represent all rural regions of India.
- Trust and reporting bias can lead to distorted or inaccurate responses.
- Evolving digital technologies may reduce the long-term relevance of the study.

I. **Government Initiatives**

1. Pradhan Mantri Jan Dhan Yojana (PMJDY): Launched in 2014 to provide universal access to banking services, PMJDY opened millions of bank accounts—laying the foundation for digital financial inclusion by enabling direct digital transfers and linking accounts to mobile and Aadhaar IDs.

2. Unified Payments Interface (UPI): A real-time payment system launched by NPCI, UPI made digital payments simple, instant, and interoperable across banks and platforms, significantly boosting adoption even in rural and semi-urban areas.
3. Aadhaar-Enabled Payment System (AePS): It allows individuals to carry out basic banking transactions using their Aadhaar number and biometric authentication, expanding access to digital transactions in regions with limited banking infrastructure.
4. Direct Benefit Transfer (DBT): The government welfare payments directly into beneficiaries' bank accounts, reducing leakages, enhancing transparency, and encouraging digital receipt and usage among rural populations.
5. Digital India Mission: A flagship program aimed at transforming India into a digitally empowered society, improving internet connectivity, digital infrastructure, and digital literacy-key enablers for rural digital payments.
6. Common Service Centres (CSCs): CSCs serve as access points for digital services in rural areas, helping citizens with digital transactions, banking, insurance, and government services. They act as local facilitators for digital payments and financial services.
7. Financial Literacy and Digital Literacy Programs: Initiatives by RBI, banks, and the government promote awareness and training on digital financial tools, helping reduce barriers due to lack of knowledge or trust among rural populations.
8. Mobile Banking & USSD Services: Services like 123# USSD allow digital transactions without internet access, enabling basic banking and payments using feature phones common in rural areas.
9. Support for Fin Tech & NPCI Innovations: Policies encouraging fintech innovations and platforms like BHIM, UPI 123 Pay, and digital wallets have expanded the ecosystem and availability of alternative payment choices in remote regions.

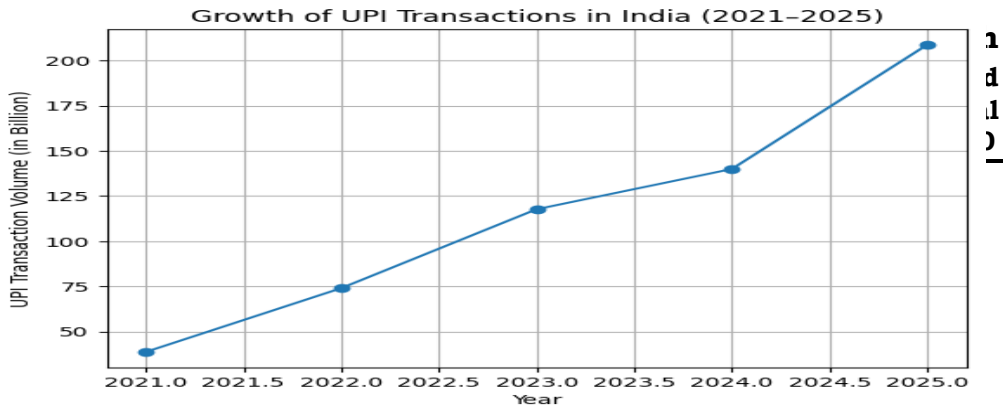
II. Recent Government Acts & Rules

1. National Block chain Framework - 2024: Launched in September 2024 by the Ministry of Electronics and IT, this framework promotes decentralized digital infrastructure that can support future digital payment and governance systems, strengthening trust in digital services.

2. RBI's Two-Factor Authentication Rule - 2026: Though not an "Act" passed by Parliament, the Reserve Bank of India has mandated stronger two-factor authentication for all digital payments to enhance security and consumer protection. This move boosts confidence for users, including rural adopters.
3. Regulatory measures to compensate digital payment fraud victims: The RBI has proposed a framework to compensate customers for small-value digital payment frauds (up to ₹25,000), strengthening consumer protection in digital financial services.
4. Integration and expansion of Central Bank Digital Currency (e-₹): Government pilots using the e-rupee (digital currency) for welfare delivery, such as food subsidy distribution, aim to improve transparency and financial inclusion.
5. Other supportive regulatory updates and incentives: Recent government and RBI policies continue to make digital payments more accessible and affordable—for example, continuing zero or low fee structures on many digital transactions, which promotes uptake.

Challenges of Digital Payments in Rural India

- **Limited Digital Infrastructure**: Poor internet connectivity, weak mobile networks, and unreliable electricity supply restrict the effective use of digital payment systems in many rural areas.
- **Low Digital and Financial Literacy:** Limited awareness and understanding of digital tools and financial products reduce adoption and increase the risk of errors and misuse.
- **Cyber security and Fraud Risks**: Rising cases of digital fraud, phishing, and unauthorized transactions create fear and mistrust among rural users.
- **Trust Deficit and Resistance to Change:** Dependence on cash transactions and lack of confidence in digital systems discourage people from adopting digital payments.
- **Language and Accessibility Barriers:** Many digital platforms are not available in local languages or are difficult to use for first-time and elderly users.
- **Gender Gap in Digital Access:** Women in rural areas often face limited access to mobile phones, internet



services, and financial resources, widening the digital divide.

- **Limited Banking and Support Services:** Inadequate availability of bank branches, ATMs, and customer support in rural regions hampers problem resolution and user confidence.
- **Affordability Issues:** The cost of smartphones, data plans, and maintenance remains a barrier for low-income rural households.

Rural Financial Inclusion - Analysis

These recent rules and frameworks enhance security, trust, interoperability, and infrastructure for digital payments, helping overcome key barriers in rural India such as fraud fear, lack of trust, and access issues—a crucial part of deepening financial inclusion in underserved regions.

The above graph showing the growth of UPI transaction volume in India from 2021 to 2025

The sharp rise indicates rapid adoption of digital payments, driven by government initiatives, smartphone growth, and better connectivity. UPI transactions increased more than fourfold between 2021 and 2025, becoming the dominant payment mode by 2024. By 2025, digital payments accounted for nearly 99.8% of total transaction volume, with rural areas contributing significantly through increased UPI and mobile-based usage.

III. Digital payments in Rural India

Digital Payments and Rural Financial Inclusion

Indicator	Details
UPI Preference in Rural Areas	• Statistical Data: About 38% of people in rural and semi-urban India prefer UPI as their primary payment method • Implication: Indicates growing trust and acceptance of digital payments

Growth of UPI in Rural & Semi-Urban Areas (2023)	• Statistical Data: UPI transactions grew by approximately 118% • Implication: Reflects rapid adoption of digital payments beyond urban regions
Online Banking Among Rural Youth (2023)	• Statistical Data: Over 34% of rural users perform online banking (up from 18–20% in 2020–21) • Implication: Shows improved digital financial participation among rural youth
Digital Payment Penetration (2025)	• Statistical Data: Digital payments accounted for nearly 99.8% of total transaction volume • Implication: Highlights India's strong shift toward a cashless economy
Internet Access in Rural Areas (2023)	• Statistical Data: Around 38% of rural households have internet access (vs. ~71% in urban areas) • Implication: Indicates persistent connectivity and infrastructure challenges
Smartphone Ownership	• Statistical Data: Over 50% of Indian households own smartphones • Implication: Shows rising digital access, though rural–urban and gender gaps remain

The above table show a growing acceptance of digital payments in rural India, with 38% of users preferring UPI, reflecting increased trust and ease of use. The 118% growth in UPI transactions in 2023 highlights rapid adoption beyond urban areas. Online banking usage among rural youth, especially women, has improved significantly, indicating the positive impact of digital literacy and inclusion initiatives. The dominance of digital payments in 2025 (99.8% of transaction volume) confirms India's shift toward a cashless economy. However, infrastructure gaps, limited internet access, and gender-based digital disparities continue to hinder universal adoption, emphasizing the need for targeted policy and development efforts.

IX. A. RBI Reports on Digital Payments Growth & Rural Inclusion

a. Digital Payments Expansion

- Digital payments have grown dramatically across India, with digital methods comprising 99.8% of total transaction volumes in the first half of 2025. This demonstrates that digital systems

now dominate the payments landscape for both urban and rural users.

- The Unified Payments Interface (UPI) continues to lead among retail digital systems, accounting for the major share of transactions and expanding rapidly due to ease of use and 24×7 availability.

b. Digital Payments as a Driver of Financial Inclusion

- RBI's Digital Payments Index (DPI), which measures the extent of digital payment adoption, infrastructure, and performance, stood at 465.33 in September 2024.and 4.6% increase since 2018 — reflecting broader payment digitization across the country, including rural and semi-urban regions.
- UPI and other interoperable systems (like AePS) have been especially significant for rural inclusion by enabling secure digital transactions even with basic devices.

B. Financial Inclusion Metrics & RBI's Focus

a. RBI's Financial Inclusion Index

RBI periodically publishes a Financial Inclusion Index, which has risen from 60.1 March 2023 to 64.2 March 2024 . This steady improvement reflects increased access to formal financial services in underserved regions**.**

- The index aggregates factors such as account penetration, access points, and usage of financial services — critical for assessing rural inclusion.

b. Bank-led Delivery and District Enablement

- RBI has guided banks to make districts 100% digitally enabled, ensuring at least one mode of digital payment (e.g., UPI, AePS) is available everywhere. This district-level focus directly supports rural outreach.

C. Targeted Initiatives for Rural Payments

a. Rural Digital Payment Drive: RBI announced a ₹500 crore digital payments drive for rural India (2025) aimed to Boosting UPI adoption beyond cities, Enhancing *digital literacy* and payment awareness in villages and Supporting women and micro-entrepreneurs through training and incentives.

b. Payments Infrastructure Development Fund (PIDF): The PIDF has been a key tool for improving last-mile digital payment infrastructure. As of mid-2025, around 4.77 crore digital touchpoints had been deployed across tier-3 to tier-6 cities and remote regions.

D. Policy & Regulatory Measures to Support Inclusion

a. Strengthening Digital Infrastructure: RBI has rolled out tighter risk and compliance requirements for services like Aadhaar Enabled Payment System (AePS) to safeguard rural transaction channels and build user confidence.

b. Consumer Protection

- Ensuring strong customer protection and addressing fraud risk is crucial for rural trust in digital systems. RBI has advocated for robust KYC practices to avoid exclusion caused by procedural backlogs.

c. Simplifying Access

Committees advising on digital payment deepening have recommended easing KYC norms (including recognized digital signatures) and reducing friction for small payments to foster inclusion**.**

Recent FI-Index Values

Year (March)	FI-Index Value	Trend
2021	53.9	First index published
2022	56.4	Continued improvement
2023	60.1	Further inclusion growth
2024	64.2	Steady progress
2025	**67.0**	Most recent published index

The steady upward trend reflects broadening access and increased use of financial services including digital tools, as well as improvements in quality such as literacy and grievance mechanisms.

The FI-Index Helps in:

The FI-Index is a key monitoring tool for policymakers and researchers because it Captures financial inclusion progress nationally and across regions**.** Shows how digital payments, credit, savings, insurance and pensions are being adopted. Highlights gaps and areas needing focus**,** especially in underserved regions and for vulnerable groups. It complements other data like RBI's Digital Payments Index (DPI) and government inclusion initiatives such as PM Jan Dhan Yojana (PMJDY**)**.

Findings:

The study finds that digital payments have become a key enabler of financial inclusion in rural India, significantly improving access to formal financial systems. The rapid adoption of UPI, preferred by about 38% of rural and semi-urban users, has driven this shift due to its simplicity and low cost. UPI transaction volumes grew by over

118% in 2023 and increased more than fourfold between 2021 and 2025, with digital payments accounting for nearly 99.8% of total transaction volume by 2025.

Digital platforms have enhanced transparency in welfare delivery through Direct Benefit Transfers, reduced dependence on cash and informal credit, and enabled secure transactions in areas with limited banking infrastructure. Rising use of mobile and online banking among rural youth, especially women, reflects the impact of literacy initiatives and institutional support. RBI data shows steady improvement in financial inclusion, with the Financial Inclusion Index rising from 53.9 in 2021 to 67.0 in 2025. However, challenges such as poor connectivity, low digital literacy, cyber security risks, affordability issues, and gender disparities continue to limit universal adoption, highlighting the need for sustained policy support and targeted inclusion efforts.

Conclusion

Digital payments have played a transformative role in advancing financial inclusion in rural India by expanding access to formal financial services, reducing dependence on cash and informal credit, and enhancing welfare delivery transparency. The widespread adoption of UPI, supported by government initiatives and digital literacy programs, has driven rapid growth even in underserved areas. RBI data confirms steady progress through rising financial inclusion metrics, though challenges such as connectivity gaps, cyber security risks, and gender disparities remain. Continued policy support focused on infrastructure, consumer protection, and targeted education is essential to sustain and deepen inclusive digital financial participation in rural India.

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