

# UPI Usage in Rural India: Opportunities and Challenges

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**Abstract**—Unified Payments Interface (UPI) has emerged as a pivotal rail for low-cost, real-time digital payments in India, yet its diffusion across rural regions remains uneven. This study examines the opportunities and challenges of UPI usage in rural India using secondary data drawn from official reports, dashboards, and prior academic work. The analysis highlights clear opportunities: improved financial inclusion via instant bank-to-bank transfers; reduced cash-handling costs for micro-merchants; greater transparency and record-keeping that support credit access; and the convenience of interoperable QR payments in local markets. Countervailing challenges persist, including patchy internet and electricity, low digital and financial literacy, limited awareness of security practices, language and usability barriers, fear of fraud, and occasional transaction failures that undermine trust. Evidence indicates faster adoption among youth and semi-urban fringes, with slower uptake in remote areas where infrastructure and hand holding are weakest. The paper consolidates these patterns and proposes policy levers: targeted literacy and fraud-awareness drives, vernacular interfaces, grievance redressal that works offline, and accelerated last-mile connectivity. Overall, UPI can significantly advance a cash-light rural economy if infrastructure gaps and trust frictions are systematically addressed.

**Index Terms**—UPI; Rural Digital Payments; Financial Inclusion; Cashless Economy; Digital Literacy; NPCI; FinTech Adoption; Digital India.

## I. INTRODUCTION

Digital payments have become an important part of India's financial system, especially after the launch of the Unified Payments Interface (UPI) in 2016 by the National Payments Corporation of India (NPCI). UPI allows users to transfer money instantly between bank accounts using a mobile phone, without needing cash or a card. It has made payments faster, easier, and more accessible to the general public.

While digital payments are widely adopted in cities, the growth of UPI in rural India holds special significance. A large portion of India's population lives in rural areas, and many of them were traditionally dependent on cash for daily transactions. With increasing mobile phone usage, government initiatives like Digital India, and awareness campaigns by banks, UPI has started to enter rural markets, small shops, local vendors, and even weekly village markets.

However, the adoption of UPI in rural areas is not uniform. There are regions where UPI is used actively, while in other areas people still prefer cash. Factors such as internet connectivity, digital literacy, trust in technology, and awareness about security play a major role in this difference.

Therefore, studying UPI usage in rural India is important for understanding how digital payments can support financial inclusion, improve convenience in transactions, and reduce cash dependency. At the same time, it is equally important to examine the challenges that rural users face while using UPI. This study focuses on both the opportunities and the challenges, based entirely on secondary data.

## II. REVIEW OF LITERATURE

Singh and Garg (2019) explained that UPI has simplified digital transactions by allowing instant transfers through mobile devices. The study highlighted that UPI has reduced the need for cash and promoted digital financial behaviour among users.

Sharma (2020) observed that digital payment adoption in rural areas is influenced by awareness levels and mobile network availability. The study found that rural users are willing to adopt UPI when they receive proper guidance and support.

Kumari and Rani (2021) studied the role of UPI in financial inclusion. Their findings showed that UPI has made banking services more accessible to people

who do not visit banks frequently, especially small shopkeepers and farmers.

Patel (2021) emphasized that trust and security are important factors in digital payments. The study noted that fear of fraud and lack of knowledge about safety features discourage some rural users from using UPI.

Mishra and Das (2022) discussed the growth of mobile wallet and UPI usage during the COVID-19 pandemic. The study found that contactless payments increased rapidly, but the growth was stronger in urban areas than in rural regions.

Gupta (2023) highlighted that language barriers and interface complexity limit UPI usage among elderly and less educated rural people. The study suggested that apps with simple steps and local language support can improve adoption.

Overall, the reviewed literature indicates that UPI has the potential to expand financial inclusion and support digital transactions in rural India. However, challenges relating to infrastructure, digital literacy, trust, and security awareness still remain.

### III. OBJECTIVES OF THE STUDY

The present study aims to achieve the following objectives:

1. To examine the current level of UPI usage in rural India.
2. To identify the key opportunities created by UPI for rural users and local businesses.
3. To analyze the major challenges faced by rural populations in adopting UPI.
4. To suggest measures for improving the adoption and safe usage of UPI in rural areas.

### IV. RESEARCH METHODOLOGY

This study is descriptive in nature and is based entirely on secondary data. No primary data such as surveys or interviews has been collected. The information for this article has been gathered from reliable published sources including:

- Reports of the Reserve Bank of India (RBI)
- NPCI (National Payments Corporation of India) UPI transaction data dashboards
- Ministry of Electronics and Information Technology (MeitY) Digital India progress reports
- Articles and research papers published in academic journals

- Government policy documents and official websites

The data reviewed relates to the period after the launch of UPI in 2016, with particular focus on trends and developments observed in recent years. The study analyzes published findings to understand patterns of UPI adoption, opportunities created, and challenges faced in rural areas. The conclusions are drawn through qualitative interpretation of the reviewed secondary information.

### V. OVERVIEW OF UPI USAGE IN RURAL INDIA

The introduction of UPI in 2016 marked a major shift in India's digital payment landscape. UPI allows users to send and receive money instantly using a mobile phone, without needing a debit card or bank branch visit. Over time, UPI has moved beyond cities and has started gaining acceptance in rural regions as well.

In rural India, UPI adoption has been supported by three major developments:

1. Increase in mobile phone and smartphone ownership, even in small villages.
2. Expansion of internet connectivity through affordable data plans and network penetration.
3. Government initiatives such as Digital India, Jan Dhan Yojana, and Aadhaar-linked bank accounts, which connected millions of rural residents to the formal banking system.

Small shopkeepers, farmers, local vendors, and daily wage earners are gradually using UPI for daily transactions such as buying groceries, paying utility bills, or receiving payments for goods sold. QR code stands can now be seen in village ration shops, tea stalls, and weekly village markets.

However, the spread of UPI is not uniform across all rural regions. Adoption is higher in semi-rural areas near towns, where connectivity is stable and awareness is greater. In remote villages, usage remains limited due to network issues and lack of digital literacy. Despite this, UPI continues to show strong potential to improve financial inclusion and reduce dependency on cash in rural economies.

### VI. OPPORTUNITIES OF UPI IN RURAL AREAS

The adoption of UPI in rural India offers several advantages that support financial growth and everyday convenience. Some of the key opportunities include:

#### 1. Promotion of Financial Inclusion

UPI enables people to access banking services through a mobile phone, even if there is no bank branch nearby. This is especially helpful for villagers who earlier depended on cash and had limited interaction with banks.

#### 2. Convenience in Daily Transactions

UPI allows instant money transfer without carrying cash. Small vendors, farmers, and shopkeepers can receive payments quickly, which saves time and reduces issues related to handling physical currency.

#### 3. Support for Small Businesses

Local shops, vegetable sellers, and small service providers can accept digital payments through a QR code without purchasing card swiping machines. This reduces business costs and increases customer convenience.

#### 4. Transparent and Recorded Transactions

UPI keeps a clear record of every transaction. This helps rural shopkeepers and workers maintain simple accounts and even proves useful when they apply for loans or credit from banks.

#### 5. Reduced Risk of Cash Handling

Carrying cash in rural areas can sometimes involve risks such as theft or loss. UPI transactions reduce the dependency on cash, making financial dealings safer.

#### 6. Easy Government Benefit Transfers

Government subsidies, pension payments, and welfare scheme benefits can be directly transferred to bank accounts linked with UPI. This minimizes delays and reduces middlemen.

#### 7. Encouragement to Digital Awareness

As more villagers begin using UPI, it increases their familiarity with digital tools, improving overall digital literacy and confidence in using technology.

### VII. CHALLENGES IN UPI ADOPTION IN RURAL INDIA

While UPI brings many benefits, its adoption in rural areas faces several difficulties. These challenges slow down digital payment usage and affect trust and convenience among rural users.

#### 1. Limited Internet Connectivity

In many rural and remote areas, mobile network signals and internet bandwidth are weak or unstable. UPI transactions require real-time connectivity, so slow networks often lead to transaction failures, which reduce user confidence.

#### 2. Low Digital Literacy

A large number of rural residents are not familiar with using smartphones or digital applications. Many users depend on others for help with UPI payments, which makes them uncertain and hesitant to use it independently.

#### 3. Fear of Fraud and Security Risks

Cases of online scams and fraud have increased with digital payments. Rural users, who are often unaware of security measures like UPI PIN confidentiality, easily fall into social engineering traps. This fear discourages many from using UPI.

#### 4. Language and App Interface Barriers

Many UPI apps are available in English or Hindi, but rural populations often prefer their regional languages. Complex app interfaces and unfamiliar terms create confusion among elderly and less educated users.

#### 5. Dependence on Smartphones and Electricity

UPI requires smartphones, stable mobile battery, and regular charging. Rural households with irregular electricity supply or shared mobile usage find consistent usage difficult.

#### 6. Lack of Trust in Digital Transactions

Cash feels more “real” and reliable for many villagers, whereas digital payments feel abstract. If one failed transaction occurs, trust is shaken, and users often return to cash-based transactions.

#### 7. Insufficient Awareness Campaigns

Awareness programs about how to use UPI safely and confidently are still limited in many areas. Banks and government agencies have started campaigns, but deeper grassroots engagement is needed.

### VIII. DATA ANALYSIS AND INTERPRETATION

The data presented in this study highlights both the progress and the gaps in UPI usage in rural India. The adoption of digital payments depends heavily on

factors such as smartphone availability, internet accessibility, digital literacy, and user trust.

1. Digital Readiness in Rural India

Table 1: UPI Smartphone and Internet Penetration in Rural India

Indicator	Value
Rural Smartphone Ownership (2018)	36% of households
Rural Smartphone Ownership (2022)	74.8% of households
Rural Internet Users (2024)	Approximately 488 million users
Share of New Internet Users Coming from Rural Areas (2025 Projection)	56% of new users

Table 1 shows that smartphone ownership in rural households increased sharply from 36% in 2018 to 74.8% in 2022. This indicates that the foundation required for digital financial services, including UPI, has strengthened significantly in recent years. Similarly, rural internet users have crossed 488 million as of 2024, reflecting the expansion of connectivity.

2. UPI Usage Patterns in Rural Areas

Table 2: UPI Usage and preference in Rural Areas

Indicator	Value
Rural & Semi-Urban Preference for UPI	Approximately 40% of respondents
Rural Digital Transaction Participation	Approximately 38% of rural users
UPI Share in India's Digital Payments (2024)	83% of all digital payment transactions
Monthly UPI Transactions (October 2024)	16.58 billion transactions valued at ₹23.49 lakh crore

Table 2 indicates that around 40% of individuals in rural and semi-urban regions prefer UPI for payments. This reflects increasing comfort with digital transactions. However, only about 38% of rural residents actively participate in digital transactions overall. This difference points to a persistent gap between awareness and consistent usage.

3. Key Indicators of UPI Usage and Digital Payment Growth in India

Table 3 Key Indicators of UPI Usage and Digital Payment Growth in India

S.No	Data Point	Description	Source
1	UPI Preference in Rural & Semi-Urban	About 38 % of respondents in rural and semi-urban India reported that UPI is their most preferred transaction mode. (EY)	EY & CII (2024) (EY)
2	Digital Transaction Penetration in Rural India	Only around 38 % of rural users engage in digital transactions (all kinds, not only UPI). (MEDIANAMA)	Media Nama Report (2025)
3	Total Monthly UPI Transactions	In October 2024, Unified Payments Interface processed 16.58 billion transactions with value ₹23.49 lakh crore. (Press Information Bureau)	NPCI Data
4	Digital Payments Index (DPI)	Reserve Bank of India's DPI stood at 465.33 for September 2024 (base March 2018 = 100), indicating deepening of digital payments. (Press Information Bureau)	RBI Press Release (2024)
5	UPI's Share in Digital Payment Volumes	UPI's share in India's digital payments jumped to 83 % in 2024. (Indian Start-up News)	News report (2025)

Table 3 presents selected secondary data indicators that reflect the scale and pattern of UPI adoption in India, with a focus on rural and semi-urban regions. The data highlights user preference for UPI, overall digital transaction penetration levels, total monthly UPI transaction volumes, the growth of digital payment infrastructure as measured by RBI's Digital Payments Index (DPI), and UPI's share in India's total digital payments. These indicators collectively illustrate the increasing importance of UPI in promoting a digital and cash-lite economy, while also pointing toward disparities in adoption between urban and rural areas.

#### 4. Interpretation of Results

- Opportunity: Widespread smartphone access and increasing internet connectivity create strong potential for UPI growth in rural areas.
- Barrier: Limited digital literacy and fear of fraud continue to reduce consistent usage.
- Opportunity: UPI is cost-free and easy to use, which benefits farmers, vendors, and small shopkeepers.
- Barrier: Transaction failures due to weak networks discourage trust.
- Opportunity: Government welfare payments through UPI-linked bank accounts reduce middlemen and delays.
- Barrier: Language complexity in apps restricts adoption among elderly and less-educated rural citizens.

Overall, the data indicates that UPI is on a positive growth trajectory in rural India, but to achieve full inclusion, infrastructural and educational support is essential.

### IX. FINDINGS

Based on the analysis of secondary data, the following key findings have emerged regarding UPI usage in rural India:

1. UPI Adoption is Increasing but Still Uneven  
The data shows that while UPI usage has grown in rural and semi-urban regions, the adoption is not uniform across all villages. Areas with better network access and market connectivity show higher usage, whereas remote regions still rely heavily on cash.
2. Digital Readiness Has Improved Significantly  
The increase in smartphone ownership and rural internet users indicates that the basic digital infrastructure is becoming more accessible. This has created a favourable environment for expanding digital payments like UPI.
3. Preference for UPI is Present but Usage is Limited  
Although around 38–40% of rural individuals show preference for UPI, actual participation in digital transactions remains lower. This indicates a gap between awareness and consistent usage.
4. Trust and Confidence Play an Important Role  
Many rural users hesitate to use UPI

independently due to fear of fraud, misunderstanding of UPI PIN confidentiality, and concerns about losing money during failed transactions. Trust-building remains a crucial factor.

5. Connectivity Issues Limit Transaction Reliability  
Despite improvements in telecom penetration, network quality remains inconsistent, which leads to transaction failures. This affects user confidence and encourages continued reliance on cash.
6. Younger Users Adopt Faster than Older Generations  
UPI adoption is stronger among younger and educated population groups, especially students, shopkeepers, and youth working in semi-urban markets. Elderly and less-educated individuals show lower confidence in using UPI.
7. UPI Supports Financial Inclusion but Needs Training Support  
UPI helps reduce dependency on cash and enables faster payments, but digital literacy training, awareness workshops, and handholding support are needed to expand usage across wider rural populations.

### X. SUGGESTIONS / POLICY RECOMMENDATIONS

Based on the key findings of this study, the following suggestions are proposed to improve the adoption and effective usage of UPI in rural India:

1. Strengthen Digital Literacy Programs  
Training programs should be conducted through schools, village panchayats, self-help groups (SHGs), and Common Service Centres (CSCs). Demonstrations on how to download UPI apps, create UPI PINs, and make safe transactions will build user confidence.
2. Enhance Internet and Network Infrastructure  
Telecom providers and government agencies should work toward improving 4G/5G connectivity in remote rural locations. Stable network access is essential to reduce transaction failures and build trust in digital payments.
3. Promote UPI Awareness Through Local Language Campaigns  
Awareness campaigns on UPI usage and fraud prevention should be delivered in regional languages using radio, community events, local cable channels, and

- village meetings. Simple messaging increases acceptance among less-educated users.
4. Simplify UPI App Interface for First-Time Users UPI applications should offer “Basic Mode” interfaces with large buttons, minimal steps, voice guidance, and local language support to help elderly and digitally-new users transact confidently.
  5. Strengthen Fraud Prevention and Grievance Support Banks and NPCI should provide easy-to-access helplines, offline complaint support, and faster dispute resolution processes. Clear warnings against sharing UPI PIN and OTPs should be displayed prominently in apps.
  6. Promote UPI Among Rural Merchants and Micro-Businesses Local shopkeepers, farmers’ cooperatives, milk vendors, and small traders should be encouraged to adopt QR-based payment systems. Banks can conduct merchant enrolment drives and offer incentives for regular usage.
  7. Integrate UPI Usage in Government Welfare Distribution Encouraging beneficiaries to receive subsidies, pensions, and NREGA wages through UPI-linked accounts will improve familiarity and trust among users.
  8. Encourage Community Influencers to Demonstrate Usage Village teachers, anganwadi workers, panchayat members, and youth leaders can act as digital ambassadors to promote UPI through social proof and peer demonstration effects.

#### XI. CONCLUSION

The study shows that UPI has emerged as an important tool for supporting digital financial transactions in rural India. The rapid growth in smartphone ownership and expansion of internet connectivity have created a favourable environment for UPI adoption. Many rural residents, especially youth and small business owners, are increasingly recognizing the convenience, speed, and transparency offered by UPI. However, the progress remains uneven across regions due to challenges such as limited digital literacy, unstable network connectivity, fear of fraud, and lack of trust in digital transactions. The findings indicate that while UPI has great potential to promote financial inclusion and reduce

dependency on cash, its long-term success in rural areas depends on consistent awareness efforts, strong technical infrastructure, and user support systems. Training programs, simplified app designs, regional language support, and effective grievance redressal mechanisms can help bridge the digital divide. If these challenges are addressed, UPI can play a significant role in building a more inclusive, efficient, and cash-lite rural economy in India.

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