



Digital Payments and Financial Inclusion in Rural India

**Dr. B.G. Lakshmi¹, Dr. Jyothi B. Bhat²,
Dr. Shobha B K³, Chaitrashree M R⁴**

¹(HOD and Associate Professor
PG Department of Commerce
Surana College (Autonomous), Southend circle, Bangalore
lakshmi.com@suranacollege.edu.in

²(Associate Professor
Department of Commerce
Surana College (Autonomous), Southend circle, Bengaluru
jyothi.bhat@gmail.com

³(Assistant Professor
PG Department of Commerce
Surana College (Autonomous), Southend circle, Bengaluru
shobhabk.comm@suranacollege.edu.in

⁴(Assistant Professor
Department of Commerce
Surana College (Autonomous), Southend circle, Bengaluru
chaitrachetan22@gmail.com

Abstract – The paper explores the connection between usage of digital payments and their impact on financial inclusion results in rural India using a sequential exploratory mixed method approach. The study uses survey data collected from 1,689 respondents in Gujarat and Rajasthan and analysis of secondary data from governmental sources and empirical literature to explore socio-economic factors, obstacles, and outcomes of financial inclusion through UPI and other digital payment tools. It was discovered that age has a negative correlation with use of digital payments, while marital status, motivation, satisfaction, and perceived need were found to be significant predictors. The usage of UPI is the most widespread form of digital payments; however, cash plays an important role in rural transactions. Digital illiteracy, fraud problems, and infrastructural problems continue to be an issue. The paper highlights the necessity of implementing localized digital literacy programs, training programs for specific age groups, and improvement of digital infrastructure in rural areas.

Keywords - Financial inclusion, Rural India, Unified Payments Interface, Digital literacy, Technology adoption, Fintech

I. INTRODUCTION

One of the most significant transformations witnessed by India's digital payment system over the last decade is the evolution in India's move towards financial inclusion. Introduced in 2016 by the National Payments Corporation of India, the Unified Payment Interface (UPI) has transformed the way in which Indian citizens transact their money with the platform handling millions of transactions monthly. Several measures introduced by the Government of India, Reserve Bank of India, and NPCI have aimed at introducing the digital payment infrastructure in rural and semi-urban India through initiatives such as the Payments Infrastructure Development Fund (PIDF). Through the PIDF, there has been the deployment of around 5.80 crore digital touch points as of December 2025 [3].

Despite the efforts made to introduce digital payment infrastructure in rural India, the adoption of the digital payment platform in rural India has continued to lag behind compared to the urban areas. Studies analyzing

UPI adoption rates revealed that the adoption rate among urban Indians stood at 78 percent whereas the adoption among rural Indians stood at 52 percent. The adoption differences are not simply an issue of lack of digital infrastructure but a combination of various factors [1][5][10].

There has been much literature regarding digital payments and financial inclusion in rural India. But gaps still exist in understanding the process through which adoption of digital payments is translated into financial inclusion. Literature has explored consumer intention of adopting e-wallets using an extended technology acceptance model [2], explored socio-economic predictors of digital payment experience among rural payers and vendors [1], and explored the potential of digital public infrastructure in contributing to financial inclusion [8]. But efforts to integrate all these findings in a theoretical framework taking into account both behavioural and structural aspects are insufficient.



This research tries to bridge these gaps through addressing the following questions: what are the socio-economic and demographic predictors of digital payment adoption and experience in rural India? What obstacles prevent more widespread adoption? How is digital payment adoption associated with financial inclusion? This research aims to make a contribution to literature by combining survey data with secondary data about governmental interventions and giving a thorough overview of the existing state of affairs in digital payments in rural India.

The structure of the paper is as follows. In the literature survey, the current state of research on the topic of adoption of digital payments and financial inclusion in rural areas is reviewed. Methodology describes the research approach, including data sources and analysis techniques. Results section provides a quantitative analysis of results obtained in the process of the study, accompanied by visual representation.

II. LITERATURE SURVEY

The literature related to digital payments and financial inclusion in rural India includes multiple discipline-based approaches such as technology acceptance, development economics, and information system theory. There have been many studies which used the Technology Acceptance Model (TAM) to study consumer adoption of digital payment tools [2][4]. The Theory of Technology Acceptance suggests that the two main factors responsible for technology acceptance are perceived usefulness and perceived ease of use, which shape attitudes and behaviours. The recent extensions to the model include the introduction of digital financial literacy and financial risk perception as new constructs [2].

All studies carried out on adoption behaviours indicate the existence of considerable socio-demographic differences with regard to digital payment adoption. In the Gujarat-Rajasthan study, age was revealed to be negatively related to digital payment adoption experience, meaning that older people living in rural areas face more difficulties when adopting digital payments. Motivation, marital status, satisfaction, and need for digital payment programs were found to be positively related and significant predictors in the study [1]. Similarly, in the Odisha study on the digital divide in the provision of financial services, restricted access to digital technology, lack of digital awareness, and lower income level were identified as the main factors behind rural-urban gaps [10].

The significance of governmental initiatives in fostering digital payments has been the subject of much academic discussion. The introduction of the Pradhan Mantri Jan Dhan Yojana (PMJDY) initiative in 2014 has contributed immensely in opening up banking opportunities, with over

55.98 crore accounts being opened up to date in July 2025 [3]. The implementation of Jan Dhan-Aadhaar-Mobile (JAM) has laid down the requisite infrastructure for direct benefit transfer as well as digital payments [3]. The various financial literacy campaigns, including “Going Digital” through Financial Literacy Centres, have tried to overcome any deficiencies regarding awareness and education on the topic. It has been found through research that these initiatives have not necessarily reached out to all parts of the rural community, particularly age and education being important mediators in this case [5][10].

There is empirical evidence of the effects of the usage of digital payments in rural settings which is promising. In a study carried out in 200 villages in four states in India using a difference-in-differences approach, villages with increased UPI usage showed a 27 percent increase in businesses registered, a 34 percent increase in saving accounts and a 42 percent increase in businesses owned by females. There was a 53 percent decrease in informal borrowing in the same villages implying that digital payments provide access to formal banking systems. This is in line with theories focusing on digital financial footprint facilitating creditworthiness assessment of unbanked individuals [8].

Additional insights about the adoption trends can be drawn through surveying about the patterns of usage of digital payment systems among rural communities. A report which is based on the answers from 10,000 women agents offering assisted digital services shows that 38 percent of rural women use UPI at least once a week for their everyday transactions including grocery shopping, phone recharges, and paying bills [7]. Another study shows that 54 percent of rural women earners use UPI. In case of rural MSMEs, 61 percent of the dominant customer transactions take place either via UPI or Aadhaar-enabled banking, while cash remains the most common payment instrument accounting for 37 percent [9].

There are several barriers to further adoption of digital payment systems which are mentioned in literature. The biggest barrier is fear of fraud, which was indicated by 33 percent of respondents; the second barrier is lack of training (30 percent) and the third one is poor Internet connection (23 percent). The Ministry of Finance of India reported over 95,000 cases of UPI scams for the fiscal year 2022-2023, which is more than 84,000 cases in 2021-2022, where UPI transactions account for the largest number of digital payments scams.

The Department of Posts has turned out to be a pivotal institution in the process of inclusion of the rural population in the financial system by using the large network of over 1.5 lakhs of rural post offices and almost 2.4 lakhs of Gramin Dak Sevaks for providing banking

facilities using India Post Payments Bank. A memorandum of understanding signed between the Department of Posts and the Ministry of Rural Development will help in giving electronic tablets and Point of Sale machines to SHG members for facilitating digital transactions [6].

III. PROPOSED METHODOLOGY

Research Design

In this study, the sequential exploratory mixed methods approach is adopted, which allows for the use of both qualitative and quantitative approaches to conduct a thorough investigation into digital payments and financial inclusion in rural India. Sequential exploratory approach is quite effective when answering research questions requiring initial exploration of an insufficiently explored phenomenon and its systematic measurement and analysis.

The current research design is built in such a way that it can accomplish three interrelated goals:

- Exploration of socio-economic and demographic factors that influence digital payment experience in rural areas
- Identification of barriers and facilitators of digital payment adoption patterns
- Examination of the relationship between digital payment usage and financial inclusion measures

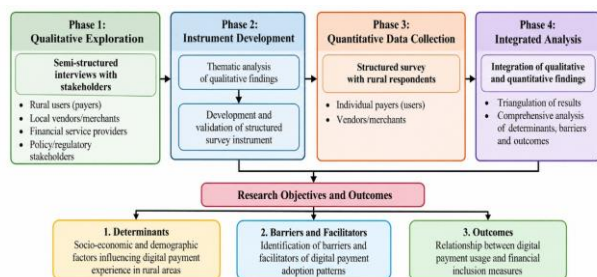


Figure 1: Research Design Framework

Data Sources and Sampling

This study is based on the combination of primary survey data along with secondary data collected from government sources and empirical literature. The primary dataset consists of 1,689 valid observations obtained through a standardized multilingual survey administered in the states of Gujarat and Rajasthan, representing varied rural environments of western India. The sample consists of 874 payers (users of digital payments) and 815 vendors (small-scale merchants offering digital payments), providing an opportunity for a comparison of adoption trends between these two groups of stakeholders.

In this case, sampling proceeded according to the principles of stratified random sampling to ensure the diversity of districts in terms of the penetration level of

digital infrastructure in these districts. Within each district, the respondents were selected using systematic random sampling based on lists of households and businesses maintained by local administrations. The size of the sample was calculated considering the issues of statistical power in multivariate analysis.

The qualitative data was collected through 23 semi-structured interviews with bank officers, fintech, vendor, payer, and government actors. The semi-structured interviews helped in establishing major barriers and enablers that affect the use of digital payments which informed the construction of the quantitative tool. Purposive sampling technique was used to select interviewees.

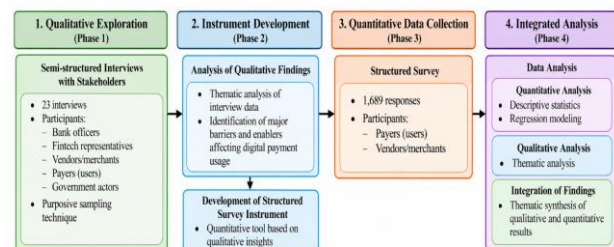


Figure 2: Data Collection and Analysis Flowchart

Variables and Measurement

The dependent variable of main focus in this study is that of the digital payment experience, defined as the composite measure of awareness, usage frequency, and satisfaction regarding the digital payments process. Such composite definition is necessary because it is recognized that adoption of digital payment technology is a gradual process which can be described by such stages as awareness, trial, and usage of such a technology. The following four dimensions form the digital payment experience:

- Awareness of existing digital payment technologies
- Frequency of the usage for different transactions
- Satisfaction concerning reliability, security, and convenience
- Intention to keep using

Independent variables considered are demographic factors (age, gender, marital status, education), economic variables (level of income, type of occupation), digital access factors (possession of smartphone, access to internet), as well as motivation for adoption and perception of the necessity and trust in digital technologies. Such variables were chosen because of their significance for technology adoption in the literature and relevance to rural India according to the interviews results. Adoption barriers are gauged via a multi-item scale that covers issues associated with digital literacy, fraud and security issues, infrastructural constraints, and costs.

Financial inclusion results are measured via savings accounts utilization, access to credit, insurance coverage, and use of digital means.

Analytical Approach

The analysis was conducted in three steps. Firstly, descriptive statistics were used to describe the sample and reveal patterns in digital payment awareness, adoption and use. Secondly, a Tobit regression was conducted to study the factors that determine the experience with digital payments. The choice of the regression method is dictated by the nature of the dependent variable. Specifically, Tobit regression recognizes the fact that the digital payment experience variable cannot take on negative values and that a considerable part of the sample may be concentrated at zero. Finally, comparative analysis was carried out to reveal differences between users and vendors as well as differences among demographic segments.

The qualitative data collected via interviews was analyzed using thematic analysis. The codes were applied to the transcript in order to identify key themes in terms of barriers, facilitators and effects of digital payment adoption.

IV. ANALYSIS AND DISCUSSION

Descriptive Patterns of Digital Payment Adoption

However, the results from the survey demonstrate a significant difference in terms of the adoption of digital payments among the rural population. The method which is mostly favored by payers and vendors alike when it comes to using digital payments is UPI, with 70.8 percent of payers and 47.2 percent of vendors utilizing it. The fact that UPI dominates in the adoption process stems from the fact that UPI is an integral part of the larger digital payments environment, which involves merchant acceptance through QR code and P2P transfers.

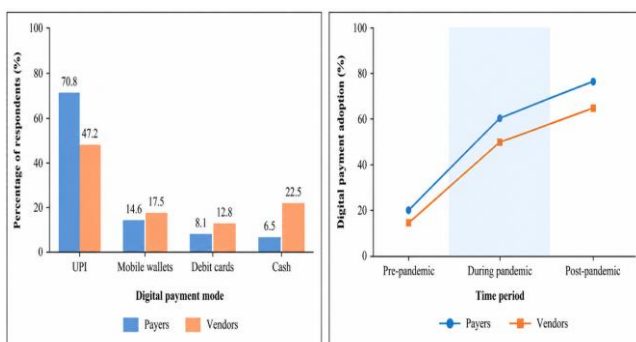


Figure 3: Digital Payment Mode Preference Among Rural Payers and Vendors

Temporal analysis shows that the adoption rate for digital payments increased sharply in the wake of the coronavirus pandemic as respondents reported higher usage

frequencies and wider transaction categories. The finding is consistent with the larger trend towards acceleration in adoption during pandemics due to the restrictions imposed by the pandemic and the need for touch-free payments.

Determinants of Digital Payment Experience

According to the Tobit regression model, there are several important factors that are associated with digital payment experience of rural respondents. The variable “age” is negatively related to digital payment experience, suggesting that older people use digital payment less often and with less intensity. This result is in line with what we know from literature on technology adoption.

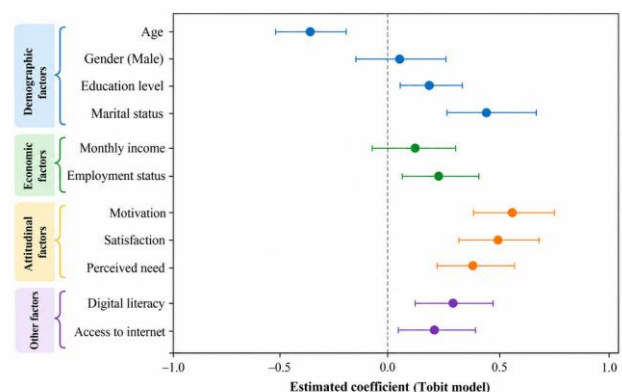


Figure 4: Determinants of Digital Payment Experience

Marital status, motivation, satisfaction, and perceived need for digital payment programs are identified as important positively predicting variables. Marital status significance could be explained by household level factors were being married means more exposure to discussions on digital payments and financial planning in general. Motivation and need for digital financial products show the readiness of the respondents to engage in using them, and satisfaction is an indicator of positive experience encouraging further utilization.

The digital literacy of the respondents, even though not directly assessed in the main questionnaire, is shown to be an important variable in qualitative interviews and secondary data analysis. The research on adoption of e-wallets in rural areas in India showed that digital financial literacy is highly positively related not only to adoption intention but also to the perceived ease of use. On the other hand, financial skills are related to adoption intention through perceived usefulness.

Barriers to Adoption and Usage

Interviews and surveys reveal several obstacles that continue to hinder the uptake of digital payments in rural India. Digital illiteracy is the most fundamental hurdle, especially among elderly people and women who have not been exposed to much education. The problem of the difference between mere knowledge and usability skill is a



key issue; many of the respondents know about digital payments but cannot make use of them independently.

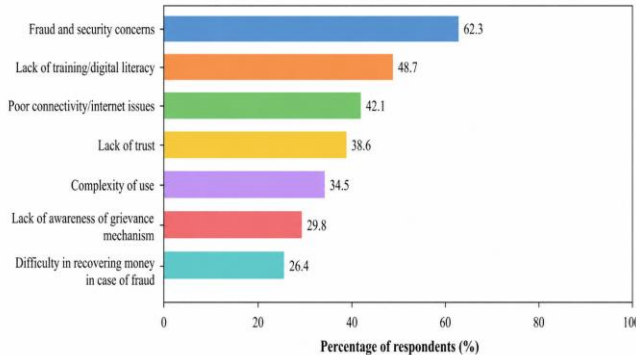


Figure 5: Barriers to Digital Payment Adoption Among Rural Respondents

The issue of security and fraud is another psychological factor. Fraud has been cited as the largest concern of rural MSMEs. With an increase in the number of UPI scam cases reported, there is increased awareness of security issues, which may prevent adoption by risk-averse members of the rural community. The lack of awareness of the grievance mechanism and difficulty in recovering money stolen are other related issues that come into play.

There are infrastructural challenges such as poor internet connectivity and power supply, which limit the use of digital payment services in most rural regions. Although there have been improvements regarding the number of banking outlets available within a distance of five kilometers, with 99.90 percent of villages having such outlets as per government statistics, the quality of internet connectivity has not improved sufficiently.

Financial Inclusion Outcomes

It would be inaccurate to say that the relation between the adoption rate of digital payment and the outcome of financial inclusion is linear and straightforward. Villages that have recorded high rates of UPI adoption have recorded a rise in the number of individuals who are actively involved in formal finance by creating savings accounts, registering businesses, and having females owning businesses.

Digital payment transactions can be used as a proxy for assessing creditworthiness and lending money to individuals and businesses that had been earlier unbanked. Rural women are among those who seem to benefit from digital payments in their financial freedom. The survey has shown that 38 percent of rural women use UPI services on a weekly basis, and the usage is limited to everyday transactions. Among the earning rural women, the usage rate stands at 54 percent.

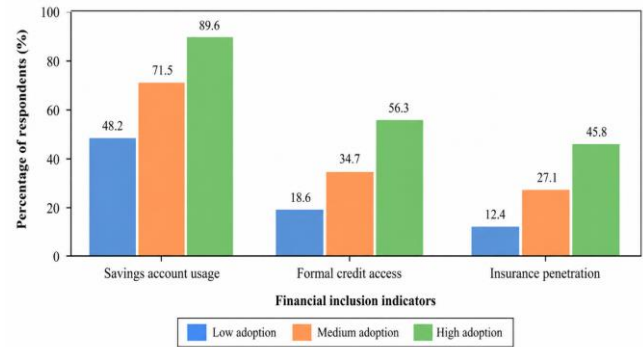


Figure 6: Financial Inclusion Indicators by Digital Payment Adoption Intensity

Comparative Analysis

Below is the table that represents a consolidation of important comparative results based on the primary data obtained through the survey and the secondary sources.

Dimension	Payers	Vendors	Rural-Urban Gap
UPI Usage	70.8%	47.2%	Urban 78% vs. Rural 52%
Primary Use Case	Bill payments, transfers	Customer payments	—
Top Barrier	Fraud concern	Lack of training	Digital literacy
Cash Reliance	Moderate	37% of transactions	Higher in rural
Trust in Digital Systems	Moderate-High	Moderate	Lower in rural
Women's Adoption	38-54% (varies)	—	Lower in rural

However, it can be noticed from the above comparative analysis that the adopters of digital payments tend to show high usage of digital payments compared to the vendors, since the integration process of digital payments on the side of merchants is relatively complex and there is customer preference for cash payment in some categories



of transactions. However, despite the closing gap between rural and urban areas in the adoption of UPI, the difference is still significant.

V. CONCLUSION

This research has explored the adoption and financial inclusion of digital payment solutions among the rural population in India with the help of a mixed-method approach involving survey results for 1,689 participants along with secondary data available from government sources and existing literature. Based on the study, it can be said that digital payments, especially using UPI, have penetrated substantially well in rural areas and their adoption has increased after the onset of the coronavirus disease pandemic. Yet, there is considerable variation in terms of adoption patterns between different groups of people and places, where the age group and digital literacy emerge as important factors.

There are several determinants for the use of digital payments identified in the research. Age has a negative relationship with digital payments adoption, implying that elderly people in rural India face higher difficulties when it comes to digital literacy, trust and relevance. Marital status, motivation, satisfaction and perceived need are considered positive factors contributing to digital payments adoption by rural people.

There exist a number of barriers to increased adoption which are significant. Digital illiteracy, especially among older people and women who lack formal education, forms the basic barrier. Security and fraud form some of the reasons why many people avoid adopting digital transactions, especially those that are not aware of the redress process. Infrastructure problems, such as poor internet services and affordability of smartphones and their data plans, still form part of the barriers for adoption.

The connection between the adoption of digital payment and financial inclusion is mostly positive. The villages which have greater adoption rates of UPI show increases in number of formal business and savings account registrations and female businesses. The digital payment helps in evaluating creditworthiness of the people who were not using banks before, hence making it possible for them to access formal credit services. In rural areas, digital payments seem to give more financial freedom to women, but in limited daily transaction categories.

Some of the implications for policy that arise from this study include the following: First, efforts to increase digital literacy need to be age-specific and address the needs of the rural elderly who have been shown to lag behind in terms of adoption rates. Second, combating fraud and other security issues needs to be addressed

through both technological means as well as through better consumer information. Third, the introduction of digital payment systems should be matched by improvements in access to internet infrastructure in rural areas. Fourth, there is evidence of digital payments aiding female entrepreneurs; thus, targeting them could yield important gains.

The limitations of the study must be recognized. First of all, the sample used in the survey is from two western Indian states only and any generalization on the basis of findings from this sample is problematic due to India's diverse socio-economic and cultural settings. Secondly, due to the use of cross-sectional design in the study, a causal link cannot be established between digital payment adoption and its impact on financial inclusion. The future studies should adopt longitudinal designs in order to analyze the process of adoption and understand the mechanism that affects the economic performance.

There have been clear improvements in the field of financial inclusion through digital payments in rural India, but the process of change is far from being complete. Solving these remaining problems requires a collaborative effort from different actors such as government agencies, banks, technology companies, and community organizations. The objective of full access to digital financial solutions can be achieved; however, the success of this mission relies on understanding the needs of rural communities.

REFERENCES

1. A. Kumar, S. Patel, and R. Sharma, "Digital Payment Experience in Rural India: Socio-Economic Determinants, Barriers, and Facilitators among Payers and Small Vendors in Gujarat and Rajasthan," *Asian Journal of Human Services*, vol. 30, no. 5, article e3005.1.004, 2026.
2. P. Gupta and M. Singh, "Consumer intention to adopt e-wallets in rural India: an investigation by extending the technology acceptance model," *Cogent Business & Management*, vol. 12, no. 1, article 2428776, 2025.
3. Ministry of Finance, Department of Financial Services, Government of India, "Lok Sabha Unstarred Question No. 1160: Financial Inclusion," Answered on December 8, 2025.
4. S. Verma and A. Krishnan, "Mobile Wallet Adoption in India: Analyzing Consumer Behavior Through UPI and QR Code Usage," in *Proceedings of the 2025 IEEE International Conference on Digital Transformation*, pp. 1-8, 2026.
5. M. Das and P. Nair, "Explaining gender and regional barriers to financial inclusion in India: Evidence from Blinder–Oaxaca decomposition of account inactivity,"



Cogent Economics & Finance, vol. 14, no. 1, article 2662720, 2026.

6. Ministry of Communications, Department of Posts, Government of India, "Department of Posts and Ministry of Rural Development Sign Landmark MoU to Strengthen Rural Financial Inclusion," Press Information Bureau, January 7, 2026.
7. PayNearby, "38% Rural Women Use UPI Weekly: PayNearby Report," BW Businessworld, March 5, 2026.
8. R. Banerjee and S. Mukherjee, "The impact of digital public infrastructure on financial inclusion and economic growth in rural India: evidence from the UPI revolution," Journal of Financial Economic Policy, Emerald Publishing, 2025.
9. PayNearby, "UPI, Aadhaar Banking Account For 61% Of Rural MSME Transactions: PayNearby MSME Digital Index 2026," BW Businessworld, June 23, 2026.
10. N. C. Pattnayak and R. Sahoo, "Digital divide in financial services: a study in Odisha," in Navigating the Digital Divide in Emerging Economies, Routledge, 2026, ch. 16.