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Original Article

Assessing the impact of fintech innovation on financial inclusion in rural Pune

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Summary *Digital transformation has emerged as one of the most important forces reshaping the financial sector in India. The rapid expansion of mobile banking , Unified Payments Interface (UPI), Aadhaar - enabled services , QR - code payments , digital banking platforms , electronic funds transfer and technology - enabled credit have created new opportunities for reaching the rural and semi - rural population with formal financial services . This paper examines the role of fintech innovation in strengthening financial inclusion in rural Pune , with a special focus on cooperative banking institutions and Pune District Central Cooperative Bank (PDCC Bank) . The study is set against the backdrop of a broader transformation of rural finance , where there is a growing need for convenient , affordable and secure financial services for agriculture , small businesses , self-help groups (SHGs), micro - industries and households . The economic environment of Pune district is unique, as it is a confluence of rapidly developing urban centres and a large rural economy based on agriculture , allied activities , cooperatives , small businesses and rural entrepreneurship . PDCC Bank, established in 1917 as a central financing institution for cooperative and rural finance, has gradually incorporated core banking systems, mobile banking , IMPS, NEFT, RTGS, RuPay cards, QR-based services and other digital facilities . The bank operates across the entire Pune district and considers agricultural and cooperative finance as a major part of its institutional role. The study adopts a descriptive and analytical research design based on secondary data obtained primarily from Reserve Bank of India, PDCC Bank and other institutional sources . The analysis examines indicators such as deposits, loans and advances , working capital , net profit , CASA deposits , branch and ATM infrastructure and participation of savings groups . PDCC Bank's registered deposits increased from ₹ 12,966.22 crore in 2023-24 to ₹ 14,766.84 crore in 2024-25 and ₹ 17,189.13 crore in 2025-26 . Loans and advances increased from ₹ 10,785.99 crore to ₹ 12,059.03 crore and ₹ 13,578.61 crore during the same period . At the national level, as per the RBI report , digital payments accounted for 90.9 % of the total retail payment value in 2023-24 , while UPI accounted for 79.6 % of the retail payment volume . RBI's Financial Inclusion Index also increased to 64.2 in March 2024 , representing a growth of 6.8% over the previous year . These developments provide an important backdrop for understanding rural financial transformation. The paper concludes that FinTech can significantly improve financial inclusion by reducing transaction costs , increasing convenience , improving payment speed , supporting small-value transactions, and connecting rural consumers to formal and tertiary institutions. However , digital literacy , cybersecurity , connectivity , trust , affordability, and the ability of cooperatives to continuously update technology are key challenges . Therefore , sustainable rural financial inclusion requires not only technology, but also financial literacy , institutional governance , consumer protection, and human support .*

Keywords: *Fintech, Digital Transformation , Financial Inclusion , Rural Finance , Pune Rural , Cooperative Banking , Digital Payments , UPI , PDCC Bank , Financial Literacy , Sustainable Development .*

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Introduction

The availability of affordable, convenient and appropriate financial services to individuals and businesses, and their effective use. Financial inclusion is particularly important in rural India , where households often rely on agriculture, wage employment , small businesses , self-help groups and informal economic activities .

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Access to savings , credit , insurance , payments and other financial services can improve household resilience , business activity and economic participation .

Digital technology has significantly accelerated the transformation of rural finance. Traditionally , rural customers relied heavily on physical bank branches , cash transactions , passbooks and face-to-face interactions . While branch banking is still important , digital technology has provided alternative ways through which customers can transfer money , check balances , make payments and access financial services . Mobile banking , UPI , RuPay card , QR code , IMPS , NEFT , RTGS , Aadhaar - enabled systems and digital customer registration are becoming components of India's financial infrastructure.

The Reserve Bank of India has clearly linked digitization to financial inclusion. Its 2024 report on India's Payment Revolution states that digitization has transformed payment delivery and increased the reach of financial services. The RBI's ' Broadening and Deepening of Digital Payment Ecosystem ' programme aims to provide at least one digital payment method to eligible individuals in identified districts .

Rural Pune provides an interesting backdrop for studying this transformation. Pune district encompasses both a developed urban economy and a vast rural area . Agriculture , dairying , sugar - related enterprises , cooperatives , self-help groups , rural industries and small businesses are important components of the rural economy. As a result , the financial needs of rural households are diverse , including agricultural loans , savings , remittances , government payments , insurance , business financing and everyday digital payments .

The Pune District Central Cooperative Bank is particularly important for this study. PDCC Bank was established on 4 September 1917 as a central financing institution , with a focus on cooperative and rural finance . The bank's current digital infrastructure includes a core banking system, mobile banking and a number of electronic payment services . The bank also provides agricultural and non - agricultural finance through its cooperative network .

PDCC Bank's transformation demonstrates how traditional cooperative banking can coexist with fintech-enabled services . Its mobile banking platform provides account information , statements , NEFT and IMPS facilities , while its service infrastructure includes RuPay card and QR - based payment services .

The importance of digital transformation becomes even more evident when viewed in the context of the scale of the payments revolution in India. The RBI has reported that UPI accounted for 79.6% of the total retail payment volume during 2023-24 , making it the preferred method of retail payments . The total digital payment volume also recorded a significant increase during 2023-24 .

However, technology alone does not guarantee financial inclusion . Rural consumers may face challenges such as digital literacy , smartphone ownership , internet connectivity , cybersecurity , language , trust, and fear of financial fraud. Older consumers and those with limited formal education may continue to prefer branch - based services . Therefore , the key issue is not just whether digital technology is available to rural consumers , but whether they can use it confidently , safely, and regularly.

To understand the direction of change and identify opportunities and challenges for sustainable rural economic development, we examine the relationship between fintech innovation and financial inclusion in rural Pune using institutional and economic indicators .

Study Objectives

The objectives of this study are as follows:

1. Examining the role of fintech innovation in the transformation of rural finance in rural Pune.
2. To study the contribution of digital banking services to financial inclusion.
3. Examining the digital transformation of cooperative banking in the context of PDCC Bank .
4. To analyze selected financial indicators of PDCC Bank from 2023-24 to 2025-26 .
5. Identifying the key opportunities created by digital payments and mobile banking for rural consumers.
6. Identifying barriers to effective digital financial inclusion in rural areas.
7. To suggest measures to strengthen a sustainable and inclusive digital financial system in rural Pune.

Research methods

This study adopts a descriptive and analytical research method .

1 Nature of the study

This study is primarily based on secondary data. It examines digital financial transformation based on institutional information , financial indicators, and published policy information .

2 Field of study

The geographical context of this study is Pune Rural/ Pune District , with the specific institutional context of Pune District Central Cooperative Bank . PDCC Bank operates throughout Pune District and has historically played a significant role in agricultural and cooperative finance .

3 Sources of information

Secondary information was collected from:

- Reserve Bank of India Annual Reports and Publications
- PDCC Bank Annual Report and Official Website
- Government and institutional publications
- Published research literature
- Reports related to digital payments and financial inclusion

4 Analysis period

The key institutional financial analysis covers the period 2023-24 to 2025-26 , while selected national digital - payment indicators are discussed for the latest period for which comparative RBI data is available .

5 Analytical Techniques

This study used:

- Percentage analysis
- Year-wise comparison
- Growth analysis
- Descriptive interpretation
- Comparative analysis
- Trend analysis

This study does not claim that changes in PDCC Bank's financial indicators are solely due to the adoption of fintech. Such causal inferences would require preliminary survey data and econometric testing.

Fintech and financial inclusion in rural Pune

Fintech, in its broadest sense, refers to the use of technology in financial services. In rural areas , fintech can reduce dependence on physical banking infrastructure

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and enable customers to access services through mobile phones, payment applications , QR codes, and digital banking channels .

Key Fintech-based services related to rural Pune include :

Fintech services	Potential rural benefits
UPI	Instant low- value digital payments
QR payment	Accepting payment from a merchant
Mobile banking	Remote access to banking services
IMPS	Instant Fund Transfer
NEFT/ RTGS	Electronic account- to - account transfer
RuPay Card	Digital card -based payment
AEPS	Banking facilities through Aadhaar- enabled channels
Digital lending	Fast loan assessment and disbursement
E- KYC	Fast customer onboarding
Account Aggregator Ecosystem	Consent-based financial data sharing

The RBI has highlighted fintech as a key component of the evolving financial inclusion architecture and has continued its efforts to expand digital payments infrastructure.

For farmers, digital finance can facilitate payments for farm inputs , receipt of government benefits, loan - related transactions, and transfers between family members . For rural entrepreneurs , digital payments can increase customer convenience and reduce cash handling . For self-help groups , digital banking can improve transparency and the speed of transactions .

Descriptive data analysis

Table 1: Selected Financial Indicators of PDCC Bank

₹ crore

Indicator	2023-24	2024-25	2025-26
Own funds	2, 847 . 99	3 , 457. 28	3, 839 . 64
Deposits	12, 966 . 22	14, 766 . 84	17 , 189. 13
Loans and advances	10, 785 . 99	12 , 059. 03	13, 578 . 61
Investment	7, 867 . 22	9, 054 . 72	१०,२२८.०८
खेळते भांडवल	२०,६१४.५२	२३,९२६.३३	२७,०९७.३४
निव्वळ संपत्ती	२,६५८.१०	२,९८९.९८	३,४०८.८४
निव्वळ नफा	७२.७३	75. 75	78. 78
CASA deposits	6 , 172. 31	7 , 019. 03	7, 442 . 33

Source: PDCC Bank official financial information .

The table shows a clear growth in the financial position of PDCC Bank. Deposits increased from ₹12,966.22 crore in 2023-24 to ₹ 17,189.13 crore in 2025-26 . This represents a growth of approximately 32.6% over a period of three years .

Loans and advances increased from ₹10,785.99 crore to ₹ 13,578.61 crore , representing an increase of approximately 25.9 % . Working capital increased from ₹ 20,614.52 crore to ₹ 27,097.34 crore , or an increase of approximately 31.5 % .

It should not be taken as a direct measure of fintech adoption. However , it reflects the growing financial reach of the organization at a time when digital banking infrastructure was being strengthened .

Table 2: Digital and physical banking infrastructure

Indicator	Reported position
PDCC Branch	290+ branches are registered on the profile .
Expansion counter	4
ATM	135
Staff	1, 009
Core Banking System	Implemented
Mobile banking	Available
IMPS	Available
NEFT/ RTGS	Available
RuPay Card Services	Available
QR- based service	Available

* Source : PDCC Bank official website / profile ; Branch numbers for specific services may appear slightly different on current website pages .*

A combination of physical and digital infrastructure is key to rural financial inclusion. Rather than completely replacing branches , digital banking can complement the branch network . This hybrid model is particularly useful in rural areas , where customers may require human assistance for complex services , while they prefer digital channels for day-to-day transactions

Development of digital payments in India and its rural significance

of India's digital transformation is clearly visible at the national level. According to a report by the RBI , 90.9 % of the total value of retail payments in 2023-24 were digital , compared to just 1.3 % in 2005-06 . UPI alone

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accounted for 79.6% of the total volume of retail payments during 2023-24 .

This change will have significant implications for rural Pune. Farmers can receive or transfer money without visiting a branch ; rural shopkeepers can accept QR payments; self-help groups can keep more transparent records of digital transactions ; and small entrepreneurs can pay suppliers electronically .

However, the availability of digital services should not automatically be taken to mean effective inclusion . True inclusion depends on usage , affordability , reliability , digital literacy and consumer protection .

Self - Help Groups and Inclusive Rural Finance

Self-help groups are an important mechanism for financial inclusion, especially among rural women . As per the PDCC Bank report , 43,461 self-help groups were associated with the bank as on March 2024 , out of which 40,780 were women's self-help groups . The bank also recorded a loan of Rs 190.74 crore sanctioned to self-help groups during the reporting period and a recovery rate of 94.67 % .

This demonstrates the potential of cooperative banking institutions to connect traditionally marginalized groups to formal finance.

Digital technology can strengthen SHG financing through the following:

- Digital collection of savings
- Electronic Loan Disbursement
- Digital repayment records
- Mobile Transaction Notification
- Account- based transparency
- Digital Bookkeeping
- QR- based group payment
- Financial Literacy Program

Therefore, women-led self-help groups can become an important channel for spreading digital financial literacy in rural communities.

Key Benefits of Fintech for Rural Financial Inclusion

1 Improved accessibility

Mobile banking and digital payments allow customers to carry out daily transactions without having to visit a bank branch.

2 Reduced transaction costs

Electronic payments can reduce travel, waiting time, and cash handling costs.

3 Fast transactions

IMPS and other electronic payment systems enable fast exchange of funds . PDCC Bank provides IMPS , a 24 ×7 electronic transfer facility.

4 More transparency

can improve monitoring of financial transactions of households, businesses, and savings groups.

5 Assistance for rural businesses

QR payments and digital banking can help rural traders participate in the broader digital economy.

6 Improved credit distribution

Digital records and technology-based credit systems could eventually help financial institutions evaluate borrowers more efficiently.

7 Women's Economic Empowerment

Mobile- based financial services can give women greater control and clarity over their own accounts and financial transactions .

Challenges ahead for digital financial inclusion

Despite significant opportunities, many obstacles remain .

Digital literacy

Consumers may have bank accounts and smartphones, but they may not know how to use digital financial services safely .

Cybersecurity and fraud digital fraud, phishing , fake links , OTP fraud, and impersonation can deter rural consumers from using digital media .

Connectivity

The quality of internet and mobile networks in rural areas can affect the reliability of digital transactions.

Language barriers

Financial applications and digital notifications should be available in local languages.

Faith

Some customers, especially for large-value transactions , trust a physical bank more than a digital platform.

Elderly and less educated customers

Customers who find technology difficult to use may be unknowingly excluded from digital transformation .

Organizational capacity

Require consistent investment in cybersecurity, software , employee training , data protection, and customer support .RBI's Financial Inclusion Policy recognizes that along with technological infrastructure, financial literacy , consumer protection and digital accessibility should also be developed .

Limitations of the study

This study has the following limitations:

1. This is mainly based on secondary information.
2. Publicly available data does not provide consistent annual information on UPI or mobile - banking usage by individual rural consumers, especially in rural Pune.
3. PDCC Bank operates throughout Pune district, so the financial data it publishes should not be assumed to be data from rural villages only .
4. does not conduct a primary survey of farmers, self-help groups , rural traders, or bank customers .
5. The growth observed in deposits and loans cannot be attributed solely to the adoption of fintech.
6. Adoption of digital payments can vary greatly depending on age, education , income , occupation , connectivity, and location .
7. The causal relationship between fintech adoption and financial inclusion has not been statistically tested.

Therefore, future research should collect primary data from rural households, farmers , self-help groups , traders, and cooperative bank customers and apply statistical techniques such as correlation , regression , factor analysis, or structural - covariance modeling.

Instructions

The following measures can further strengthen digital financial inclusion in rural Pune:

1. Organize digital financial literacy programs at the village level.
2. Provide digital banking education in Marathi language.
3. Train SHG members as digital financial literacy ambassadors.
4. Strengthen cybersecurity awareness and fraud prevention campaigns.
5. Increase acceptance of QR-payments among rural merchants.
6. Improve network and digital infrastructure in villages where services are not available .

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7. Provide supportive digital banking facilities for senior customers.
8. Provide ongoing training to cooperative bank employees in fintech and cyber security.
9. Develop an easy-to-use mobile-banking interface for first-time users.
10. Strengthen the grievance redressal mechanism for failed or fraudulent digital transactions.
11. Use digital transaction history responsibly to improve access to appropriate loans.
12. Promote partnerships between cooperative banks, fintech companies, and government agencies.

Conclusion

Digital transformation is fundamentally changing the way rural financial services are delivered in India. Pune Rural is an important area to study this transformation , as it is home to a confluence of agricultural activities , cooperatives , self-help groups , rural industries, and growing digital connectivity.

Evidence shows that FinTech has enormous potential to deepen financial inclusion . Digital payments , mobile banking , electronic funds transfers , QR codes and technology - enabled financial services can reduce transaction costs, improve accessibility, and make financial transactions faster and more transparent . The experience of PDCC Bank demonstrates that traditional cooperative financial institutions can leverage modern digital infrastructure while maintaining their historic role in agricultural and rural finance .

in PDCC Bank's deposits , loans , working capital and other financial indicators during the period 2023-24 to 2025-26 is a reflection of the institution's expanding financial base . At the same time , the adoption of core banking , mobile banking and electronic payment services indicates the transition from traditional branch- centric banking to a hybrid digital banking model .At the national level, the rapid growth of digital payments , particularly UPI , provides a supportive technological ecosystem . The RBI's financial inclusion index reaching 64.2 in March 2024 is another indication of India's progress in its overall financial inclusion process .

Yet, sustainable financial inclusion requires more than just technology . Rural consumers must have the knowledge , confidence, and skills to use digital services safely. Therefore , financial literacy , cybersecurity , consumer protection , reliable connectivity, and human support are essential components of digital transformation .a “ digital is more human ” model . Cooperative banks can use fintech to make services faster and easier , while maintaining physical branches and community connections for customers who need help . Stronger partnerships between cooperative banks , government agencies , fintech companies , self-help groups and rural entrepreneurs can create a more inclusive digital financial ecosystem.

In short, FinTech innovation has the potential to transform rural financial inclusion in Pune by connecting traditional cooperative finance with a modern, accessible and technology - enabled financial system . The ultimate success of this transformation will not only depend on the number of digital transactions, but also on whether digital finance improves the financial security , participation and sustainable development of rural households and enterprises .

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of thesis paper.

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