

Last Mile Financial Service Delivery through Micro ATMs: Evidence from the Burdwan District Central Cooperative Bank, West Bengal

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ABSTRACT

Banking service delivery has changed and the new technologies like microATM and AePS have given the impetus to scale it to masses. This study highlights the socio-economic impact due to implementation of microATM bundled with Aadhar Enabled Payment System (AePS) taking the case study of The Burdwan Central Co-operative Bank Ltd. (TBCCB) which ushered financial inclusion in the rural areas by providing doorstep mobile banking facilities for villagers. Secondary data sources were used from the bank to study the impacts TBCCB brought in through their digital transformation initiative expansion in the rural areas. There was increase of 15% account holders, issue of approx. 12% new Debit cards/ Kisan Credit Cards (KCCs) and increase of around 19% money volume handled in their operational areas. This is not only incremental increase but also shows the trust and confidence of the customers in mode of service delivery of the bank. Other banks can become the part of digital transformation initiative in rural settings and increase their business by deploying microATMs.

1. INTRODUCTION

Effective service delivery and outreach of financial products and services are at the core of the policies and guidelines of government, regulatory bodies and financial institutions. As per the latest estimates, nearly two-thirds of India's population lives in rural India. World Bank estimates that India's rural population was about 65% in 2024. Reserve Bank of India (RBI) report, 2025 shows that there are about 1.64 lakh bank branches and approx. 2.11 lakh ATMs and it also depicts that the outreach to the rural areas is still far behind what it is seen in the urban areas. The average distance of one bank branch to another bank branch is approx. 4.2 kms which has come down from 43.5 km in 1951 (Garg & Gupta, 2023).

Accessibility to the banking services in terms of brick and mortar branches has its own merits and demerits. Counting the merits, it's a licensed branch of a bank having approval of licensing authority i.e. RBI. There is the fix place and fix timing of business

catering to the need of the residents in the periphery of the branch. Demerits include high operation cost for running a branch which includes the rent, electricity, security and staff (Mishra & Padhan, 2025). From the customer point of view, there is fix schedule of the bank for operations and beyond the scheduled time, no services are accessible. For a farmer, daily wage labourer, an artisan, a women living in the villages, accessibility of the services comes with cost for them (Garg & Gupta, 2023; Lal, 2018). Either they have to do away with the daily wage or keep aside all urgent works of the day and visit the branch. Banks are designed to serve the customers and when customer has to pay the extra price to avail service, it becomes pain point on the one part (Garg & Gupta, 2023). Keeping many factors in view, as part of the deepening the financial inclusion, there exists the short-term cooperative credit structure in our country which is organised as a three-tier rural credit delivery system, with State Cooperative Banks (StCBs) at the apex level, District Central Cooperative Banks (DCCBs) at the district level and Primary Agricultural Credit Societies (PACS) at the village level. Rural branches are linked with the objective of augmenting ground level credit in the rural areas, poverty reduction and propelling the growth in farm sectors and off-farm sectors (Panda et al., 2023). As per the Annual Report, 2024-25 of National Bank for Agriculture and Rural Development (NABARD), there are total 34 State Cooperative Banks (StCBs), 351 DCCBs and around 1.06 lakh PACS.

Since the DCCBs are locally present formal banking outlets, they have better outreach to the last mile through their banking products and services concentrating on the rural customers (Lal, 2018). In this chapter, to understand better the last mile service delivery of the banking products and services, case of The Burdwan Central Co-operative Bank Ltd. (TBDCCB) has been taken. It was established on the 26th January 1917 and is one of the oldest DCCBs in India and at present the largest Central Cooperative Bank in the Eastern region. TBDCCB has the two districts viz. Purba (East) Bardhaman and Paschim (West) Bardhaman as the geographical areas with the license from RBI to operate their branches and render the banking products and services to the rural masses.

Last mile service delivery is being ensured by the banks through the physical, digital public infrastructure and technology enabled solutions (Muat et al., 2025; Pal et al., 2026). In the recent years, there are Business Correspondents (BCs) who are generally certified by Indian Institute of Banking and Finance (IIBF), Common Service Centres (CSCs), Bank Mitras, Bank Sakhis, Mobile banking, digital payment platforms and Micro ATMs (RBI Report, 2006) forming the part of physical and digital mode of service delivery. In recent years, the conventional brick and mortar structure has been strengthened through Bank Mitras, PACS-based service points, RuPay/debit cards, Aadhaar-enabled Payment System (AePS), mobile banking, digital payment platforms and microATMs. NPCI describes AePS as a bank-led model that enables interoperable transactions such as cash withdrawal, cash deposit, fund transfer, balance enquiry and mini statement through Aadhaar authentication at AePS touchpoints.

microATM is a handheld, portable device that enables basic banking services in remote locations. It is agent-assisted service delivery model that brings banking to the customer through BC/BF/CSC/PACS-type touchpoints and Aadhaar-based biometric authentication. RBI came with the regulation in 2006 for the allowing banks to use third-party non-bank agents such as Non-Governmental Organisations (NGOs), Self-Help Groups (SHGs), and Microfinance Institutions (MFIs), Civil Society Organisations (CSOs) as intermediaries to extend services at the doorsteps of customers. microATMs have revolutionised service delivery by decentralising the banking access. Access to financial products and services through non-banking agents has improved consumption, resilience, saving and occupational choices (Ghosh, 2017). In India, implementation of the microATM is bank-led and services are rendered by BC points, branches, PACS, /Milk and other non-credit cooperative societies.

This chapter assesses the impact of microATM deployment, their usage and impacts on service delivery and financial inclusion taking the case of The Burdwan Central Co-operative Bank Ltd. (TBDCCB) in Southern Bengal.

2. TECHNOLOGY ADOPTION IN INDIA

2.1 Ecosystem Enablers

India's digital finance architecture is supported by the multiple enablers such as RBI with regulatory powers, policies, circulars, guidelines and frameworks like financial inclusion policy, National Strategy for Financial Inclusion (RBI, 2006). Digital identity has become possible with Aadhaar framework where the biometric data is stored and utilised for identification of the residents of India (Ghosh, 2017; Mir *et al.*, 2020). This digital identity has helped in integrating the credentials with robust payment infrastructures which has been augmented by the NPCI through its developed digital solutions such as Aadhaar Enabled Payment System (AePS), RuPay debit cards and the Unified Payments Interface (UPI) (Ghosh, 2017; RBI, 2025). microATM relies on the AePS solutions developed by the NPCI which enables seamless and low cost digital transactions across the country. Banks have adopted the service delivery model based on the regulatory guidelines using BCs, Business Facilitators (BFs), PACS, non-credit cooperative societies etc. These infrastructure and delivery networks converge under major public policy missions such as the Pradhan Mantri Jan Dhan Yojana (PMJDY), Digital India program and Direct Benefit Transfers (DBT), PMJJBY, PMSBY, and the Atal Pension Yojana. This has led broader public participation in accessing products and services offered by the formal financial systems (Ghosh, 2017). NABARD has extended grants-based support to Cooperative Banks (StCBs & DCCBs), Regional Rural Banks (RRBs), and Scheduled Commercial Banks (SCB) (including Scheduled Small Finance Banks and Payment Banks) for augmenting financial inclusion infrastructure, technology and literacy. These grants are disbursed out of Financial Inclusion Fund (FIF). Under the Banking Technology adoption schemes, there is the grants support of ₹22,500 per microATM (both Special Focus Districts (SFDs) and non-SFD for rural cooperative banks (NABARD, 2023).

2.2 History of Micro ATM in India, Licensing, Operationalisation

After the introduction of BC model by the RBI in 2006 where RBI allowed third party agents to offer banking financial services in underserved and unbanked areas, the era for use of low cost devices began (RBI, 2006). In fact, this was also a policy push towards rural financial inclusion serving the underserved. These third party agents needed the low-cost, interoperable, portable and user-friendly technology which can ease the burden of high operating cost and bring the trust in service delivery mechanism within banking system. Accepting this challenge, the Institute for Development and Research in Banking Technology (IDRBT) drafted the foundational hardware and software standards for Micro ATMs in March 2010. It was designed for accessing the services such as deposit, withdrawal, fund transfer and balance enquiry with the features of online and offline solutions. Offline solutions offered processing of the transactions locally in POS devices and smartcards and load to Core Banking Solutions (CBS) later on. It had the objective of bringing down the cost, ensure maximum compatibility with the already available banking systems, secure and transparent transactions and usher uniform customer experiences (IDRBT, 2010). microATM infrastructure supported both intra-bank (ON-US) and inter-bank (OFF-US) transactions seamlessly. In 2011, National Payments Corporation of India (NPCI) launched the Aadhaar Enabled Payment System (AePS) which enhanced the capabilities of microATMs to be used by biometric authentication via Aadhaar. Portable Point-of-Sale (PoS) devices with GPRS connectivity transformed the local shops and merchant points into last mile banking hubs. Pradhan Mantri Jan Dhan Yojana (PMJDY) was launched for deepening financial inclusion and deployment of the microATM through debit cards, Rupay cards, Kisan Credit Cards (KCC) and using AePS allowed local villagers cash withdrawals, deposits and balance inquiries (CGAP, 2019; World Bank, 2020).

The broad differences between the traditional ATM and microATM as given in table below:

Table 1: Difference between Traditional ATM and microATM

Basis	Traditional ATM	Micro ATM
Nature	Fixed machine installed at a physical location	Portable/POS-like device operated by BC/ agent
Operation	Customer self-service	Agent-assisted/customer-assisted
Authentication	Card and PIN mainly	Aadhaar biometric and/or card-based depending on mode
Infrastructure cost	Higher installation and maintenance cost	Lower-cost rural delivery channel
Location	Branch/offsite ATM points	CSC, BC point, PACS, Milk Centres, Non-credit societies, village touchpoints
Suitability	Urban/semi-urban high footfall locations	Rural/remote/low-density areas
Role in FI	Access point for cash withdrawal and enquiry	Doorstep/near-doorstep financial inclusion channel with flexibility of time and space

3. MICROATM- SOLUTION TO FINANCIAL INCLUSION

As per the World Bank, there are both supply side and demand side barriers. microATM has been able to bridge the gap between barriers of these two sides. Supply-side barriers are comprised of high branch operating cost, staff limitation and low volume rural transaction density whereas Demand-side barriers cover the travel cost, wage loss, low digital literacy and lack of confidence by the rural customers (World Bank, Garg & Gupta, 2023; Ghosh, 2017). The microATM adoption is not an isolated event but it has become possible due to the overall strengthening of the ecosystem and growth in the technologies and capacities. Customers have perceived the usefulness and ease in using this technology where they can withdraw; they can deposit the money near their home and get the confirmation through SMS on their mobile for the successful transactions. Agent based model has increased the trust and reduced the hesitation among the customers to access the services (RBI, 2006; Ghosh, 2017). In terms of the cost, it is very cost effective from the customers' point of view as there is no need to visit to the brick and mortar branch for any need. The prominent factor in usage is the flexibility of space and timing in accessing the services. Agent based service delivery is accessible from the early morning to late night which helps the rural masses especially farmers, women and artisan to access the services based on their convenience (Garg & Gupta, 2023).

4. IMPACT ON CUSTOMERS – SERVICE DELIVERY – DATA FROM THE DCCB, TWO DISTRICTS PURBA (EAST) BARDHAMAN AND PASCHIM (WEST) BARDHAMAN

This study uses institutional secondary data sourced from the records of the TBDCCB based on two parameters. First parameters focused on collecting data to know the expansion of services in terms of the issue of the debit cards/KCC, opening of the bank accounts, and money volume handled before and after deployment of the microATMs. Second part covered the data on the number of the microATMs deployed in the geographical boundaries of Purba and Paschim Bardhaman (operational areas of TBDCCB) during the past five years from 2022 to 2026. The data was analysed by using excel sheet.

4.1 Expansion of Service Access

As part of the expanding the business, TBDCCB opened two new branches in each of the districts. In both the districts, there was increase of around 15% in the number of account holders, increase of approx. 12% in issue of Debit cards/KCCs and increase of around 19% money volume handled after deployment of the microATMs. This is evident from the data given in Fig. 1. The increase is not incremental but it shows the trust and confidence of the customers in the service delivery of the bank. Customers have found the value with the deployment of microATMs.

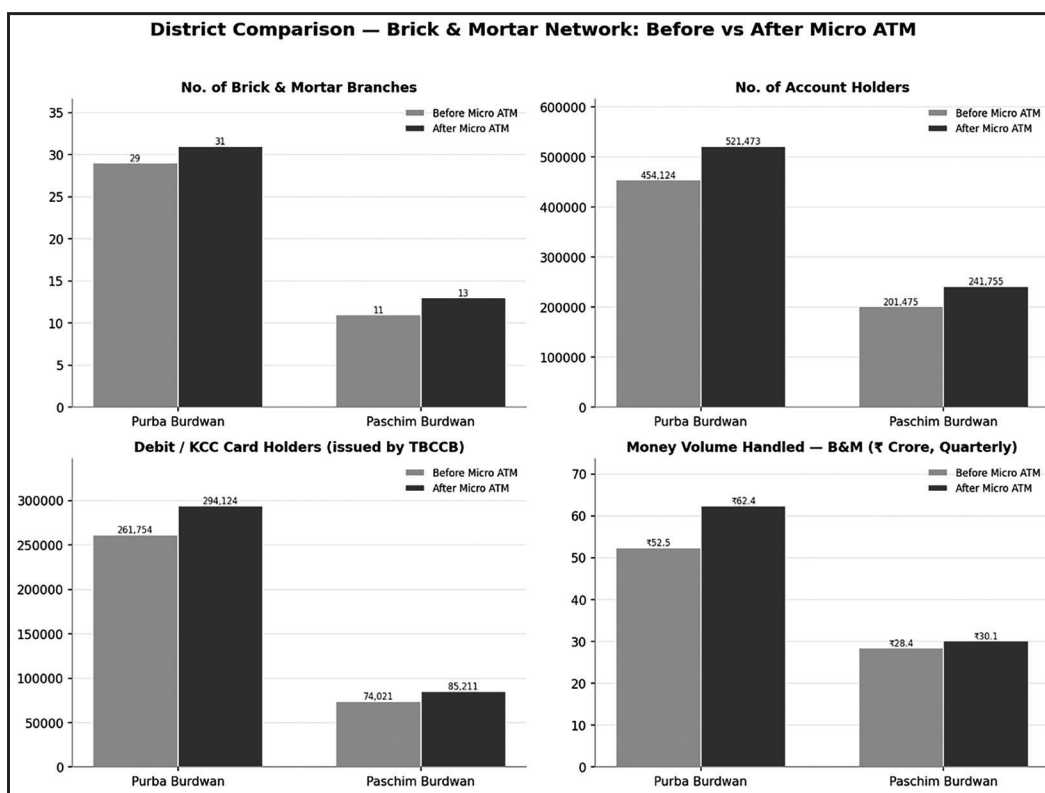


Fig. 1: Number of Brick & Mortar Branches

Data Source: Secondary Data Sourced from the Bardhaman Dist. Central Cooperative Bank.

4.2 Deployment of microATM and Usage

microATM deployment period has been taken from financial year 2022 to 2026. There were total 448 micro ATM deployed in Purba Bardhaman in 2022 which increased to 699 in 2026 whereas 35 microATMs were deployed in Paschim Bardhaman in 2022 and 104 in 2026. There has been tremendous increase in number of transactions in both the districts. In Purba Bardhaman, total 9335 transactions were reported in 2022 which rose upto 35103 in 2026 which is around four times. Same is the case with the Paschim Bardhaman district where 2811 transactions were recorded in 2022 and went upto 10221 in 2026. In terms of money volume handing, there is approximately three times increase in both the districts from 2022 to 2026 (see Fig. 2 to 4).

Data trends of the past five years show that customers have accepted the microATM as an inevitable part of their life and their trust has been built over the months of use of the technology as well as trust on the service provider. Rural customers have taken benefit of the flexibility in terms of time and space provided by the digital mode of transactions.

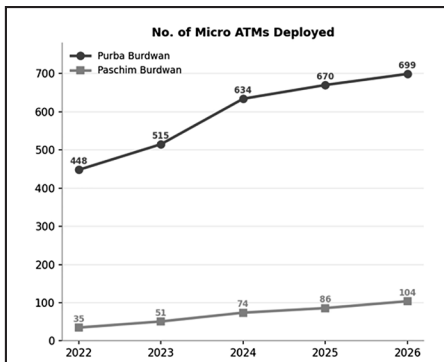


Fig. 2: Deployment of microATM

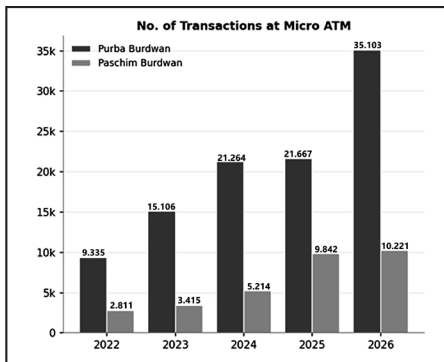


Fig. 3: No. of Transactions at microATM

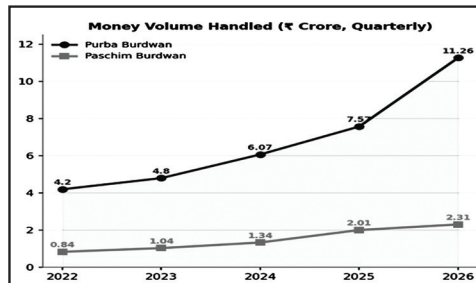


Fig. 4: Money Volume handled at microATM

Data Source: Secondary Data Sourced from the Bardhaman Dist. Central Cooperative Bank.

4.3 District Comparison

Purba Bardhaman appears to have a higher customer and transaction base than Paschim Bardhaman. Paschim Bardhaman should be presented as a district with scope for deeper penetration. Fundamental reason behind the difference lies in the larger geographic area, total population, number of branches in Purba Bardhaman than Paschim Bardhaman and thus there are variations in number of microATMs deployed by the TBDCCB (see Fig. 5).

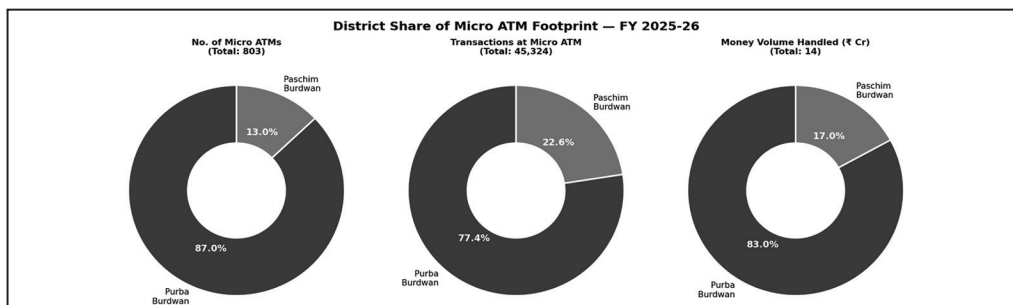


Fig. 5: District-wise Comparison of Deployment and Usage

Data Source: Secondary data sourced from the Bardhaman Dist. Central Cooperative Bank

5. IMPACT ON ECOSYSTEM PLAYERS

Micro ATM has emerged as an important tool for improving the accessibility of banking services in rural areas, going beyond the basic function of account opening. For elderly pensioners, farmers, artisans, members of self-help groups, small traders and beneficiaries of DBT - the main difficulty has been accessing their funds in a convenient and secure manner (Garg & Gupta, 2023).

The agent-based model also plays an important role in building trust, as customers feel more comfortable dealing with a known intermediary. Over the time, regular usage through such channels helps in keeping bank accounts active. Thus, micro ATM has improved access to banking services and supported its continued use in everyday rural life.

From the empirical data, it is visible that microATM has contributed towards increasing the access of financial services through bringing formal banking touchpoints at the doorstep of rural customers. It has also improved usage by providing hassle-free experiences of withdrawals, deposits, balance enquiry, mini statements and transfers. It has the strongest contribution on these two factors of access and usage. These two factors are important because the Financial Inclusion Index (FI Index) which gets published by RBI on yearly basis has three sub-indices of Access, Usage and Quality. As per the FI Index of 2021, the index score was at 53.9 and the highest score of 73.3 was achieved by the Access sub-index out of three sub-indices. The latest FI Index as on March 2025 stood at 67.0 compared to 64.2 in March 2024.

Deployment of microATM contributes towards the objective of ESG (Environmental, Social and Governance) frameworks where the environmental factors stress upon fewer customer trips to distant branches may reduce travel-related burden, the social factor brings in inclusivity to the rural, elderly, differentially abled and low-income and digitally hesitant customers and governance includes the traceable, authenticated and interoperable transactions through formal banking channels.

6. CONCLUSION

microATM has been a game changer in terms of service delivery at the doorstep of rural customers. It has bridged the gap of both demand-side and supply-side barriers. It has built the trust of the rural villagers who are more vulnerable to losing money in the present age of digital payment ecosystem. Integration of bank accounts with the Aadhaar has strengthened that trust because without biometric authentication transactions at the microATM will not be successful. For the farmers and artisans, it has saved their daily wages and precious time by accessing services as per the time and space flexibility. These factors have shown positive relation with the empirical data analysed from the Burdwan District Central Co-operative Bank. Results have shown that the rural customers have become the backbone of operations of the TBDCCB as the total money volume has touched around Rs.11.26 crores in 2026 in Purba Bardhaman and Rs. 2.31 crores in Paschim Bardhaman. It is the testimony of the customer showing loyalty towards the TBDCCB. The grants based support from the FIF has become instrumental in terms of reducing the equipment cost of for the banks and deepening the financial inclusion in the rural areas. Technology adoption, trust and usability will bring in financial inclusion and help banks serve underserved.

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APPENDIX**Table 1: Data from FY 2022-23 to FY 2025-26 on No. of microATM, Transactions Done and Money Volume Handled**

Year	District-Purba (East) Bardhaman			District - Paschim (West) Bardhaman		
	No. of micro ATM	Number of Transactions at Micro ATM level	Money volume handled (mATM)-Quarterly	No. of micro ATM	Number of Transactions at Micro ATM level	Money volume handled (mATM)-Quarterly
2026	699	35103	11.26 Crore	104	10221	2.31 Crore
2025	670	21667	7.57 Crore	86	9842	2.01 Crore
2024	634	21264	6.07 Crore	74	5214	1.34 Crore
2023	515	15106	4.8 Crore	51	3415	1.04 Crore
2022	448	9335	4.2 Crore	35	2811	0.84 Crore

Table 2: Data on the Branches, KCC/Debit Cards Issued and Money Volume

	District-Purba (East) Bardhaman			District-Paschim (West) Bardhaman		
	Before Micro ATM	After Micro ATM	Difference (expected increase)	Before Micro ATM	After Micro ATM	Difference (Expected increase)
No. of Brick & Mortar Branches	29	31	2	11	13	2
No. of accounts holders in Brick & Mortar	454124	521473	67349	201475	241755	40280
Debit /KCC Credit card holders issued by TBCCB	261754	294124	32370	74021	85211	11190
Money volume handled (Brick& mortar) - Quarterly	524521387	623894125	99372738	284132147	300894120	16761973

Data Source: Secondary Data Sourced from the Burdwan Dist. Central Cooperative Bank