



The Problems and Prospects of FinTech in the Achievement of SDGs: An Indian Scenario

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Abstract. In the year 2025 almost, a decade is over for the implementation of the Sustainable Development Goals (SDGs), those were stated by the United Nations Member States in the year 2015. The SDGs is considered as a framework for highlighting critical worldwide challenges and focusing the inter-dependence between economic, social, and environmental issues of development. India is dominating in defining and implementing the SDG agenda in order to achieve those goals by year 2030. The Sustainable Development Goals – National Indicator Framework Progress Report, 2025, is considered as a crucial tool for evaluating national progress based on all the 17 Sustainable Development Goals. This report not only gives an overview of current status of these national indicators but also point out the data gaps with comparison to the global status. Out of these goals, the Sustainable Development Growth Goal no. 8 (Decent Work and Economic Growth) indicates the promotion of inclusive and sustainable economic growth. As per the United Nations global indicator for this SDG 8.10.1 is mainly focusing on number of commercial bank branches and ATM penetration. When it comes to the India's current status of SDG 8.10.1, National Indicator Framework Progress Report 2025 shows the partial achievement as compared to Global Indicator Framework for 8.10.1. It indicates that the traditional banking system is not sufficiently providing access to financial services in India.[1] But at the same time FinTechs in India have initiated in developing the Digital Public Infrastructure to acquire the new customers and providing them financial services with a low cost as compared to traditional banking system. The recent report by EY and Digital Lenders Association of India (DLAI) entitled 'The role of FinTech in building Viksit Bharat' has highlighted that the India's FinTech market is expected to grow by 30% to reach 180-200 billion US\$ by the year 2029 and FinTechs can play crucial role in achieving SDG by providing easy access to financial services and empowering the underserved segments of society. Ongoing collaborations between the Indian government, other stakeholders and FinTechs can help in creating a more inclusive and sustainable financial services and thus contributing to India's transformation into a developed nation through significant Sustainable Development Growth.[2]

Keywords: Sustainable Development Growth, FinTech, Financial Inclusion, ATM penetration

1. Introduction-SDG: Understanding Target for Economic Growth

The “Sustainable Development Goals - National Indicator Framework Progress Report, 2025” provides the current chronological data of India’s SDG indicators. Published in the year 2025 i.e. a decade after the acceptance of the SDGs at global level in 2015, the report indicates India’s serious efforts over these past ten years. This report is considered as an important tool for checking India’s progress in all 17 Sustainable Development Goals. In order to promote inclusive and sustainable economic growth, SDG 8 (Decent Work and Economic Growth) is focusing on promoting ongoing economic progress through higher end productivity and innovation in technology. There are 12 targets under Goal no. 8 to ensure serious efforts for economic growth of the societies. But at national level, total 26 indicators have been rectified to measure and monitor the progress of the SDG 8 through the data collected and presented for 25 indicators in this report.

The main goal of the SDG 8 is to strengthen the ability of local financial institutions for expanding access to banking, insurance and other financial services to all. As per SDG 8.10.1 it will be calculated with the data based on (a) Number of banking outlets per 1,00,000 population and (b) Automated Teller Machines (ATMs) per 1,00,000 population. As per the data provided by Reserve Bank of India and office of the Registrar General & Census Commissioner, Ministry of Home Affairs, India, the following table indicates the commercial bank branches and ATM penetration in India.[1]

Table 1: Number of Banking Outlets and ATMs per 1,00,000 population

Year	Banking Outlets	ATMs
2015-2016	59.9	16.5
2016-2017	60.5	17.1
2017-2018	60.9	16.9
2018-2019	85.4	16.7
2019-2020	98.8	17.5
2020-2021	130.3	17.6
2021-2022	267.5	18.1
2022-2023	158.8	18.7
2023-2024	144.3	18.5

Source: Ministry of Statistics and Programme Implementation

The above data (table 1) serves as the basis for the evidence-based evaluation of the SDGs while formulating the effective policies. Identifying the complexity and critical-

ity of all the SDGs, the Government of India has come up with a comprehensive framework for monitoring and evaluating the progress of SDGs by aligning its national indicators with those set up at global level.

SDG 8 Metadata: National Indicator 8.10.1	
Goal	8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Target	8.10: Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all
Indicator	8.10.1 : (a) Number of banking outlets 1,00,000 population (b) Automated Teller Machines (ATMs) per 1,00,000 population
Data Source Ministry	Reserve Bank of India
Department/Division	-
Description of Indicator	The indicator denotes number of banking outlets (functioning Branches of Commercial Banks and ATMs) per 1,00,000 population as on 31st March of the reference financial year.
Computation	(a) Numerator: Number of Banking outlets in reference year Denominator: Mid-year population of reference year Multiplier: 1,00,000 (b) Numerator: Number of ATM in reference year Denominator: Mid-year population of reference year Multiplier: 1,00,000
Unit of measurement	Per 1,00,000 population
Periodicity	Annual
Level of Disaggregation	State/UT
Type of Disaggregation	-
Mapping with Global Indicator	Partial match with GIF 8.10.1
References	https://dbie.rbi.org.in

Fig. 1. Mapping of National Indicator 8.10.1 with Global Indicator

National Indicator Framework Progress Report, 2025 shows that the India’s National Indicator 8.10.1 partial matches with its relevant Global Indicator Framework. It indicates that the traditional banking system is lacking in providing access to financial services in India. There exists a huge opportunity to cater to the banking and finance needs of the unbanked and underbanked segment of society through innovative but easy to use techniques.[1]

2 LITERATURE REVIEW

2.1 Cybersecurity making Sustainable Development possible

It was increasingly identified by the recent research that the sustainable development and digital transformation has been made feasible due the cyber security. It was found that the vigorous cyber security measures enhance the institutional governance, improve digitalization and facilitates sustainable healthcare systems (Abbas, H. S. M. et al. 2022). It was also discussed that by protecting the digital infrastructure, ensuring business continuity, and accelerating the trust in digital ecosystems the cyber security adds directly to the sustainability (Sulich, A. et al. 2021). It was also emphasized in the

further study that the cyber security is vital for the attainment of SDGs particularly SDG 9 (Industry, Innovation, and Infrastructure) and SDG 16 (Peace, Justice, and Strong Institutions).

2.2 Cybersecurity and Digital Infrastructure for SDGs

The modern sustainable development activities are relying on the digital infrastructure forms. The study revealed that for the achievement of multiple SDGs intelligent connectivity and secure digital infrastructure are crucial (Fowdur, T. P. et al. 2022). In the developing economies a strong positive relationship was observed between digital infrastructure development and socioeconomic progress (Zaballos, A. G. et al. 2019).

The linking of the rising technologies like blockchain and distributed ledger technologies is also in focus. The sustainable education, organizational viability and the lucidity in supply chain management is always supported by the secure digital platforms (Chivu, R. G. et al. 2022 and Etemadi, N. et al. 2021)

2.3. Artificial Intelligence and Machine Learning in Cybersecurity

The cybersecurity is been dominated by the emerging tools like Artificial Intelligence (AI) and Machine Learning (ML). The growing professional cyber threats are being addressed by Ai-drive cyber security solutions (Bresniker, K. et al. 2019)

Current studies show that the irregularity detection, forecasting the future threats, automated incident response capabilities are increasingly enhanced by the AI and ML (Adewusi, A. O. et al., Ajala, O. A. and Okoli, U. I. 2024)

It was revealed that intelligent security systems improve organizational resilience and facilitates sustainable digital transformation (Salih, A. et al. and Mijwil, M.2021)

2.4. Cybersecurity Governance and Regulatory Frameworks

The key determinant of cyber security efficiency was identified as the Governance. A dynamic and adaptive cyber security governance model was proposed that was capable of responding to the changing threats (Melaku, H. M. 2022). Likewise, a comprehensive framework for cybersecurity strategies in developing countries was also developed (Donalds, C. M. et al. 2022)

The growing importance of privacy legislation and regulatory enforcement in safeguarding digital rights was also highlighted (Reis, O. et al. 2024). To ensure the organizational accountability the stress was given on emphasize the need for compliance-driven cybersecurity mechanisms (Oguejiofor, B. B. et al. 2023)

2. 5. Cybersecurity in Education and Human Capital Development

The trust and effectiveness in e- learning environment is been positively influenced by the cybersecurity initiatives (A. S. et al. 2023). Similarly education accessibility, skills shortages, and gender disparities were identified as vital threats affecting cybersecurity workforce development (Puchkov, O. and Botha-Badenhorst, D 2023)

These findings match with SDG 4 (Quality Education) and SDG 5 (Gender Equality), suggesting that comprehensive cybersecurity education adds to larger sustainability goals.

2. 6. Cybersecurity Challenges in Emerging Technologies

The recent cyber security challenges are emerging due to the latest technologies like blockchain, smart cities, IoT, and e-commerce etc. The vulnerabilities in blockchain implementations despite their security advantages were also been realized (Mahmood, S.2022). The use of blockchain to mitigate cybersecurity risks in e-commerce was also demonstrated (Zawaideh, F. H. 2023). It was revealed in the research that for ensuring the sustainable urban development digital connectivity needs robust cyber security frameworks (Vaslavskaya, I. and Ekmen, O.2023)

2. 7. Cybersecurity and Critical Infrastructure Protection

The protection of critical infrastructure has become a major concern for sustainable development. Galinec, D. emphasizes the need for national-level cybersecurity strategies to protect essential services. Likewise, Adewusi, A. O. et al. (2024) highlight AI-based security solutions for protecting national infrastructure against evolving cyber threats. Research by Turk, Ž. et al. (2022) further demonstrates that sector-specific cybersecurity frameworks are necessary to secure increasingly digitalized infrastructure systems. It was identified from the previous studies that, majority research was done treating cybersecurity, digital transformation, AI-based threat detection, or sustainable development separately. Limited studies focused inclusively explaining explaining how cybersecurity contributes to the achievement of specific Sustainable Development Goals (particularly SDG 9, SDG 11, and SDG 16). Furthermore, empirical evidence measuring the impact of cybersecurity governance, AI-enabled security systems, and digital infrastructure resilience on sustainable development outcomes remains limited, especially in developing economies.

Hence, the present research, is focused on bridging this gap by examining the relationship between cybersecurity practices and SDG achievement, while proposing an integrated framework that links cybersecurity capabilities, digital resilience, governance mechanisms, and sustainable development outcomes.

3. Financial Inclusion through FinTech

As current National Indicator 8.10.1 regarding promoting inclusive and sustainable economic growth relies on robust traditional banking system and ATM outlets, FinTech

entities, particularly UPI bring agility, innovation, efficiency, affordability, enhanced customer experiences and expanded access to unbanked and underbanked customers for inclusive financial environment in India. With a simple, easy to access, and affordable payment solution, UPI has provided millions of unbanked and underbanked individuals in the society to mark their presence in this formal financial system and helping towards achieving the sustainable development growth. UPI's simple technology have enabled individuals to use digital payments immaterial of their socio-economic backgrounds for getting the benefits of digital financial services more easily than traditional financial services through bank and ATM outlets.

Research has identified that the amount of cash withdrawn through debit cards at ATMs has declined due to usage of UPI. Based on monthly time series data analysis for the period of April 2016 to April 2023, it has been calculated that if UPI transactions increase by Rs. 1 it causes decline of 18 paise in debit card transactions. As far as frequency of visits are concerned a person visiting to ATM on an average 16 times a year earlier is doing the same for 8 times.[5]

According to data from the Reserve Bank of India (RBI), ATM numbers decreased from 219,000 in September 2023 to 215,000 in September 2024, with a significant decline in off-site ATMs from 97,072 in September 2022 to 87,638 by September 2024. [5]

On the other hand, Fintech entities are playing a crucial role in achieving the Indian government's vision of a USD 5 trillion economy rather much beyond this. As of 2024, it is estimated to be around USD 110 billion, and by 2029, it is projected to reach around USD 420 billion at a CAGR of 31 percentage. [2]

In order to identify the significance of the same trend up to the year 2025, ARDL model is applied and the results are shown in the Fig. 2 below.

ARDL Model: Dependent Variable: Debit Card Transactions (Value in Rs Crore)			
Time Period: Jan 2021 to May 2025			
Variable	Coefficient	Std Error	P Value
Adjustment factor	-0.3320	0.1028	0.000*
UPI Transactions (Value in Rs Crore)	-0.1428	0.0199	0.000*
Source: SBI Research * Significant at 1%			

Fig. 2. ARDL Model: Debit Card Transactions

The ARDL model estimates how changes in UPI transactions (independent variable) affect the Debit card transactions (dependent variable) over time, considering the past values of both the variables. The result based on lower p-value (<0.01) at significance

level at 1% shows that there is a significant impact of UPI transactions on Debit card transactions.[5]

The benefits of digital shift in payment system are visible in India. These benefits highlight an upward trend with adoption of new technologies by Government, corporates and citizens to perform their financial transactions. Based on the results of ARDL model, policy makers should redefine parameters for Sustainable Development Goal (SDG) goal no. 8 regarding financial inclusion. It is necessary to shift the focus from physical outlets of ATM per 100000 population to technical innovation. Fintech services as the adoption rate of Fintech in India is 87 percent, which is well above the global average of 64 percent as depicted in the following figure. [2]

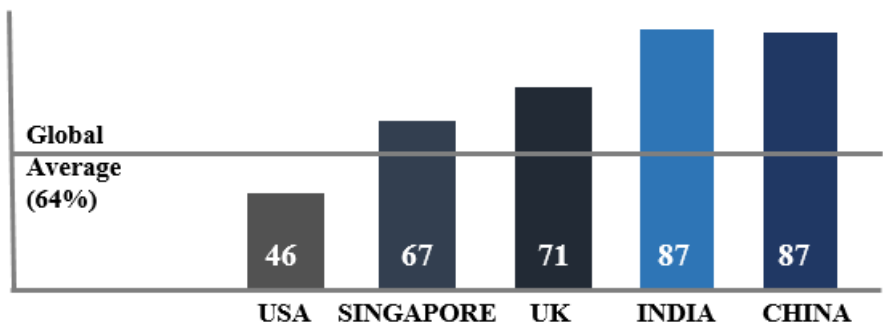


Fig.3 Fintech Adoption Rate, JM Financial, EY Analytics

Continued smartphone adoption and merchant acceptance are major forces for keeping the FinTech segment on a high-growth track with value-added services. The Indian FinTech ecosystem is expected to flourish due to favorable policies, development and existence of technological innovations. India is leading from the front in the digital payment revolution that is showing a significant impact not only on the South Asian region, but across the world as well. Global investors are showing keen interest in the Indian digital payment system for the past few years and expecting to attract them in investing in the coming years. Currently, there are more than 2,174 FinTechs in India, of which more than 1,500 has been established in the last four years.[6]

4. FinTech Challenges in India

Though FinTechs have already shown their significance in the achievement of the sustainable development growth, they are also facing some challenges like cyber security threats due to poor technical literacy and improper digital infrastructure especially in the rural and remote areas in India. Despite of innovation and technological progress, there is a need of policy for consumer protection and data protection by FinTech services against for cyber security threats. While FinTechs are strengthening the financial inclusion, the growth in sophisticated fraud cases is causing a threat to this progress.

Therefore, the challenge is to maximize the benefits of fintech while minimizing potential risks for the financial system.

The Unified Payment Interface (UPI) has improved the way people make payments in India. With its easy-to-use and secure platform, UPI has gained extreme popularity and has become a most powerful mode of payment for all the stakeholders across the country. However, there are examples when UPI transactions fail, causing inconvenience to the users. There are variety of reasons as shown below, ranging from technical problems to human errors.

- Rate of transaction failure due to insufficiency or exceedance
- Rate of transaction failure due to incorrect input data
- Rate of transaction failure due to bad internet connection
- Rate of successful UPI transactions
- Insufficient balance rate
- Exceeding rate of daily limit on no. of transactions
- Maintenance rate of account balance and daily limits
- Rate of internet speed
- Incorrect rate of UPI Pin
- Incorrect rate of receiver details
- Correct input data rate
- Bad weather rate like heavy rainfall
- Distance between device and tower
- Network overload rate

Table 2: Common UPI Error Codes

Error Code	Meaning	Quick Fix
U16	Exceeded transaction limit	Wait for the limit reset or contact the bank
U30	Debit failed – insufficient funds	Add funds and retry
U69	Risk threshold breached	Contact your bank
Z9	Bank server unavailable	Retry after 30 minutes
YB	Beneficiary bank unavailable	Try again later
M0	UPI system error	Retry or change app

Source: <https://www.mobikwik.com/blog/upi-payment-declined/>

If UPI payments keep getting declined despite fixing the usual issues, the problem might be UPI app itself and it requires a faster, more reliable payment infrastructure. Public sector players such as Union Bank of India and Bank of Baroda, with fewer resources, have a lower failure rate than SBI, NPCI data shows

TD rates	Jan 2025	Feb 2025	March 2025
SBI	0.84	0.34	0.9
HDFC	0.08	0.06	0.02
Bank of Baroda	0.28	0.06	0.03
Union Bank	0.68	0.22	0.06
Punjab National Bank	0.13	0.14	0.33
Kotak Mahindra	0.06	0.19	0.02
Canara Bank	0.37	0.44	0.13
Axis Bank	0.02	0.02	0.03
ICICI Bank	0.06	0.06	0.13
Bank of India	0.37	0.83	0.58
■ Public Sector Banks ■ Private sector Banks			

Fig.4 Transaction Decline rates in percentage

While most large private sector banks continue to have a low technical decline (TD) of below 0.1 percent, SBI's touched 0.9 percent in March, NPCI data shows. SBI's TD rate was 0.84 percent in January and 0.34 percent in February. The government-owned SBI is the country's largest bank and also leads the UPI transaction pack by a wide margin. A technical decline (TD), the industry speak for a transaction not getting through, happens when the server of a bank or that of NPCI is unresponsive or for some technological reason the payment doesn't get through.

Though technical failure rate for UPI transactions has dropped significantly to around 0.7% to 0.8%, this issue in UPI transactions is questioning the digital infrastructure of banking systems, which are not adequately configured to handle these growing cases. That's why the RBI, along with the NPCI, is urging banks to reduce the number of technical failures and come with real-time redressal system for sorting out customer complaints.[7]

Hence it is always a challenge to keep a balance between policy objectives such as promotion of innovation on one hand while mitigating risks on the other. Achieving this balance is very crucial for allowing innovation that can provide benefits to the society without compromising the security of financial system. To achieve this, the FinTech sector should focus on customer centric services with the performance and security governance. [3]

5. Conclusion

FinTechs are playing a crucial role in India's mission of Viksit Bharat which is working towards bridging the gap between financial literacy and inclusive access to financial services. With its highest contribution in real-time payments, India's FinTech sector is promoting financial inclusion, with easy-to-use digital payment solutions. Though challenges like regulatory issues and data security threats do exist, opportunities for FinTechs in their expansion in urban and rural areas is huge. The market is expected to grow significantly by 2029 as digital lending growth showing dominance of FinTechs through their revenue. As fintech services continue to innovate and expand exponentially, it will take the financial industry towards more digitalization and bring improved efficiency, affordability, inclusivity and sustainability, and has the potential to revise the National indicator 8.10.1 regarding inclusive and sustainable economic growth through FinTech services rather than traditional banking services.[2]

Developing suitable financial products is the key to cater specific needs of the financially deprived section and for this there are two broad areas that require attention in the Indian context. The first is regarding improving the accessibility of financial platforms using FinTech and the second is about analyzing potential risks that may arise out of FinTech adoption.[3]

Financial and digital literacy needs to be improved in order to create the consumers awareness regarding digital platforms and services launched by the Government of India. FinTechs can play a crucial role in promoting awareness through financial literacy programs to underserved segments and areas. By converting challenges into opportunities through innovation and transformation, India can definitely utilize its FinTech potential to achieve sustainable development goals particularly SDG 8 to promote inclusive and sustainable economic growth.[4]

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