

# Assessing the Role of FinTech Companies in Advancing Sustainable Development Goals (SDGs) in India: A Comprehensive Evaluation

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## Abstract

This study evaluates the role of FinTech companies in advancing Sustainable Development Goals (SDGs) in India, focusing on digital financial innovations and their socio-economic and environmental impacts. FinTech adoption in India has surged, with digital payment penetration increasing from 20% in FY17 to 60% in FY24, contributing to enhanced financial inclusion, credit accessibility, and sustainable investments.

Despite these advancements, challenges such as digital illiteracy, regulatory ambiguity, and uneven financial access persist. This research aims to examine the collective impact of FinTech solutions on SDGs, including their effects on financial inclusion, green investments, employment generation, and environmental sustainability.

The study employs a quantitative approach using multiple regression analysis, chi-square tests, and confirmatory factor analysis (CFA). The research is grounded in theoretical frameworks such as Diffusion of Innovation, Financial Inclusion, Sustainability, Institutional, and Stakeholder Theories. Data is sourced from RBI, NPCI, and global financial institutions spanning FY17–FY24.

Findings reveal that FinTech innovations significantly improve financial inclusion and green financing while reducing poverty and carbon emissions. Future research should focus on longitudinal studies to further explore regulatory impacts and technological advancements, ensuring a resilient, inclusive, and sustainable financial ecosystem in India.

# Introduction

The financial sector has undergone a significant transformation with the rise of Financial Technology (FinTech), which has revolutionized banking, lending, payments, and investment services worldwide. FinTech solutions have enhanced accessibility, efficiency, and affordability in financial services, particularly in emerging economies like India. The integration of digital payments, AI-driven credit scoring, blockchain-based transactions, and mobile banking has opened financial services to previously unbanked populations, aligning



with the Sustainable Development Goals (SDGs) outlined by the United Nations. Previous research highlights FinTech's role in financial inclusion and economic development. Barberis and Buckley (2016) explored FinTech's impact post the 2008 financial crisis, noting its ability to disrupt traditional banking. Philippon (2016) emphasized cost reduction and efficiency in financial markets due to digital finance. More recent studies, such as Sandhu and Kuntluru (2023), confirm that FinTech-driven financial inclusion has grown, though digital illiteracy and cybersecurity threats persist. Malhotra (2023) examined India's shift towards cashless transactions and found that digital payments are reducing transaction costs and increasing transparency, yet challenges remain in regulatory oversight and technological adoption. Given FinTech's critical role in economic and environmental sustainability, this study provides a comprehensive assessment of its impact on SDGs in India, evaluating both opportunities and challenges.

While FinTech has significantly improved financial accessibility in India, its broader impact on achieving SDGs remains underexplored. Existing studies have examined individual aspects such as digital payments, AI credit scoring, and green investments but lack an integrated evaluation of how FinTech collectively contributes to financial inclusion, environmental sustainability, and socio-economic development. Additionally, rural-urban financial accessibility gaps, regulatory constraints, and digital illiteracy hinder inclusive growth. The study aims to address these gaps by analysing how FinTech solutions impact SDGs in India, focusing on financial inclusion, green financing, regulatory impact, employment generation, and environmental sustainability.

Early studies on financial technology, such as Philippon (2016), emphasized its efficiency in reducing transaction costs and improving accessibility. Gomber and Siering (2017) categorized FinTech into digital payments, online lending, and asset management, highlighting the need for regulatory frameworks to ensure sustainable growth. Chen and Yang (2019) examined FinTech's influence on financial efficiency, noting that AI-driven credit scoring improved access to capital for SMEs.

Recent research has focused on FinTech's role in sustainable development. Ali and Ghildiyal (2023) analysed digital financial inclusion in India, finding that mobile banking penetration significantly improved financial access among rural populations. Sandhu and Kuntluru (2023) assessed FinTech's role in expanding financial inclusion but identified regulatory barriers and cybersecurity concerns. Narula and Gupta (2024) explored how FinTech facilitates green financing through blockchain-based ESG investments and digital lending for renewable energy projects. The current study builds upon these findings by integrating multiple dimensions of FinTech's influence on SDGs, providing a holistic perspective on its economic, social, and environmental impact in India. The primary objective of this study is to assess how FinTech innovations contribute to sustainable development in India.



## The specific objectives include:

- 1. Evaluating the impact of digital financial services on financial inclusion.
- 2. Analysing the role of FinTech in facilitating green investments.
- 3. Examining the effect of AI-driven credit scoring on credit accessibility.
- 4. Assessing the influence of regulatory policies on FinTech adoption.

5. Investigating the socio-economic benefits of FinTech in employment generation and environmental sustainability.

## **Major Hypotheses:**

- 1. **H1:** Digital payment penetration significantly enhances financial inclusion.
- 2. **H2:** ESG transactions significantly impact green bond issuance.
- 3. **H3:** AI-based credit scoring significantly increases loan approvals for individuals and MSMEs.
- 4. **H4:** Regulatory support significantly influences FinTech adoption and innovation.
- 5. **H5:** Digital banking adoption significantly reduces carbon footprint and promotes sustainability.

# **Research Methodology**

The primary aim of this study is to assess the role of FinTech in advancing Sustainable Development Goals (SDGs) in India, focusing on financial inclusion, green investments, regulatory impacts, employment generation, and environmental sustainability. The research follows a quantitative approach, using secondary data analysis to examine the causal relationship between FinTech innovations and sustainable development outcomes. A descriptive and analytical research design is employed, combining multiple regression analysis, chi-square tests, and confirmatory factor analysis (CFA) to validate the hypotheses. The study is based on theoretical frameworks such as Diffusion of Innovation Theory, Financial Inclusion Theory, Sustainability Framework, Institutional Theory, and Stakeholder Theory to interpret FinTech's impact systematically.

The target population consists of financial transactions, investment data, regulatory policies, and digital finance adoption trends in India from FY17 to FY24. Data is sourced from Reserve Bank of India (RBI), National Payments Corporation of India (NPCI), World Bank, Digital India reports, and financial market studies by PwC, KPMG, and McKinsey.

For sample size determination, the study uses purposive sampling, selecting key variables such as digital payment penetration, ESG investments, AI-based credit scoring, regulatory indices, and employment generation. Given that the dataset spans 8 fiscal years (FY17–FY24), with multiple financial indicators collected annually, a panel dataset structure is used. The total number of observations includes over 100 financial indicators across different years and sectors, ensuring sufficient statistical power for regression analysis.



A pilot study was conducted to validate the secondary data reliability. The results confirmed data consistency across multiple sources.

The study employs the FinTech-SDG Model, integrating key indicators affecting financial inclusion, green finance, regulatory compliance, and socio-economic outcomes. The research framework is depicted below:

## FinTech-SDG Model:

## Independent Variables (IVs):

Digital Payment Penetration (%)

ESG Transaction Volumes (USD Million)

AI-Based Credit Scoring Adoption (%)

Mobile Banking Usage (%)

Regulatory Support Index (1–100)

#### **Dependent Variables (DVs):**

Financial Inclusion Index

Green Bond Issuance (USD Million)

Loan Approval Rates for Individuals & MSMEs

Employment Generation in FinTech Sector

Reduction in Carbon Footprint (%)

**Statistical Techniques:** 

Multiple Regression Analysis (To measure impact strength)

Chi-Square Tests (To test categorical relationships)

Confirmatory Factor Analysis (CFA) (To validate factor loading and relationships)

The study ensures internal consistency by computing **Cronbach's Alpha**, which resulted in **0.89**, indicating a high level of reliability in data measurements.

#### Limitations:

1. **Dependence on Secondary Data:** The study relies on published data, limiting direct control over its accuracy.

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2. **Regulatory Changes:** The study does not account for sudden policy shifts that may impact FinTech growth.

3. Technological Evolution: Emerging financial technologies such as CBDCs (Central Bank Digital Currencies) and blockchain advancements may introduce new variables beyond the study's scope.

4. **Generalizability:** The findings are India-specific and may not be fully applicable to other emerging economies with different financial regulations.

This research provides valuable insights into FinTech's impact on SDGs, with future studies recommended to incorporate **longitudinal mixed-method approaches** for deeper analysis.

# **Data Analysis**

This section provides a consolidated overview of the statistical findings related to FinTech's impact on Sustainable Development Goals (SDGs) in India from FY17 to FY24. The analysis spans nine critical domains-ranging from digital payments and financial inclusion to carbon footprint reduction—and employs regression and hypothesis testing techniques.

## Table 1

below summarizes the key results, including significance values, adjusted R<sup>2</sup>, F-statistics, and the number of observations for each domain.

Table Name	Significance Value (p)	Adjusted R <sup>2</sup>	<b>F-Statistic</b>	Observations (n)
Digital Payments & Financial Inclusion	< 0.05	0.9959	167.4	8
FinTech & Green Investments	< 0.05	0.9152	54.2	8
AI-Based Credit Scoring (Individuals)	< 0.05	0.8658	32.8	8
AI-Based Credit Scoring (SME)	< 0.05	0.8723	29.5	8
Mobile Banking & Rural Financial Accessibility	< 0.05	_	18.7	8
Regulatory Impact on FinTech Growth	< 0.05	0.8241	28.6	8
Digital Remittances & Poverty Alleviation	< 0.05	0.8978	62.4	8

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FinTech & Employment Generation	< 0.05	0.9994	753.2	8
Digital Banking & Carbon Footprint Reduction	< 0.05	0.9958	232.1	8

(Source: RBI, NPCI, Digital India, World Bank, Economic Times, Climate Bonds, PwC-KPMG, McKinsey, TRAI-IAMAI, DPIIT, NASSCOM, Deloitte-PwC compiled data (FY17–FY24)).

Chi-square test was originally conducted for Mobile Banking & Rural Financial Accessibility, but an equivalent F-statistic is listed here for tabular uniformity.

## 1. Digital Payments & Financial Inclusion

A strong correlation between the penetration of digital payments and financial inclusion shows up in the data with an adjusted R<sup>2</sup> of 0.9959. Digital payment usage increased from 20% to 60% during the eight-year period (FY17–FY24) and the Financial Inclusion Index showed a consistent uptrend. The elevated F-statistic (167.4) and p < 0.05 indicates that the boom in digital transactions is significantly and heavily correlated with the enhancement of access to banking services, especially for those who have long been without. The results highlight the critical importance of digital infrastructure and policy to enable the closing of financial gaps.

## 2. FinTech & Green Investments

Likewise, the adjusted relationship is relatively strong for green financing that is measured by ESG transaction volumes and green bond issuance (adjusted  $R^2 = 0.9152$ , F = 54.2, p < 0.05). The increasing prevalence of ESG-driven transactions aligns with an increase in green bonds issuance, demonstrating that FinTech platforms enable the routing of capital towards sustainable projects. This domain showcases FinTech's larger supervisory role in making financial markets congruent with environmental objectives, which aids in achieving India's clean energy and sustainability ambitions.

## 3. AI-Based Credit Scoring (Individuals and SME)

One area where AI is revolutionizing the landscape is in credit assessments to supplement loan approvals. The adjusted R<sup>2</sup> for individual borrowers is 0.8658 (F-statistic = 32.8, p < 0.05); For SMEs, adjusted R<sup>2</sup> is 0.8723 with F-statistic 29.5 (p< 0.05). AI-based scoring adoption rates soared from FY17 to FY24. These statistics show that AI counteracts human biases, accelerates processing times, and enhances overall credit accessibility, enabling inclusive growth in both the consumer and SME segments.

## 4. Mobile Banking & Rural Financial Accessibility

The role of mobile banking in accessing rural populations was assessed using a chi-square test, but an equivalent F-statistic (18.7) is reported for consistency. p-value <0.05 taking into account that the minimum limit for most



statistical testing is between 0.03-0.05, the results confirmed the linkage of mobile banking usage, as well as greater rural account ownership. Mobile banking penetration jumped from 18% in FY17 to 53% in FY24, reflecting the UIP expansion of rural financial services. This highlights the need for accessible mobile platforms and tailored digital literacy initiatives to empower rural populations.

## 5. Regulatory Impact on FinTech Growth

The adjustment model merits consideration, with the regulatory environment as the key variable (adjusted  $R^2 = 0.8241$  (F = 28.6, p < 0.05)). Proactive government policies and balanced compliance requirements emerge as main drivers of innovation and industry growth, the findings suggest. Reduce compliance costs with TCF, supported by guidance, fosters a legal environment that enables FinTech firms integrate new services, while ensuring both consumer protection and systemic solidity.

## 6. Digital Remittances & Poverty Alleviation

Digital remittance platforms display strong inverse association with poverty status (adjusted  $R^2 = 0.8978$ , F = 62.4, p < 0.05). The study found that in the period remittance costs fell, transaction volumes increased — suggesting that cheap, fast digital transfers play a role in stabilizing household income, especially in rural areas. This domain demonstrates how cost-effective financial technologies can directly lead to positive socio-economic change by lowering transaction costs and enhancing household liquidity.

## 7. FinTech & Employment Generation

The adjusted R<sup>2</sup>, that describes the variance explained by employment generation was 0.9994. 753.2 of the Fstatistic indicated an excellent overall fit. The data confirm a considerable rise in job prospects, corresponding to the widening of FinTech solutions and investor flow. The wealth of work opportunities and FinTech facilitating diverse programs have fuelled job creation, in addition to highlighting the FinTech industry as a significant growth contributor and innovation magnet for global investors.

## 8. Digital Banking & Carbon Footprint Reduction

Finally, the adoption of digital banking is associated with a massive reduction in paper use (adjusted  $R^2 = 0.9958$ , F = 232.1, p < 0.05). In FY24, digital banking penetration was at 65%, resulting in lesser dependency on bank branches and physical paper formats. The upshot is that FinTech has great potential to support environmental sustainability through reduced paper use and lower carbon emissions.

## Implications

In sum, the table and subsequent analyses provide compelling evidence that FinTech innovations meaningfully drive SDG advance in India. The variable coefficients attest to the diversity of the value proposition digital financial services bring, from financial inclusion to environmental sustainability, with high adjusted R<sup>2</sup> and



statistically significant p-values. The rising trends of adoption rates alongside measurable socio-economic benefits highlight the transformational potential of FinTech. The regulators, in turn, can take a leaf from these findings and devise regulations and infrastructural investments that enable corporate stakeholders to further innovate for market needs that remain unfulfilled. Future studies can utilize longitudinal design or between and with-in country comparisons, which will help understand the long-term effects of FinTech on sustainable development.

## Discussion

This study examined the role of FinTech in advancing Sustainable Development Goals (SDGs) in India by analysing its impact on financial inclusion, green investments, regulatory influence, employment generation, and environmental sustainability. The findings confirm that FinTech has significantly contributed to financial inclusion, with digital payment penetration and mobile banking adoption positively impacting formal financial access, particularly among unbanked populations. Additionally, AI-based credit scoring has improved loan approvals for individuals and MSMEs, supporting economic growth through increased access to credit.

A major concern identified in the problem statement was the lack of an integrated evaluation of FinTech's impact across economic, social, and environmental dimensions. The study addresses this by demonstrating that FinTech-driven ESG transactions positively influence green bond issuance, highlighting its role in sustainable finance. Moreover, supportive regulatory frameworks significantly enhance FinTech adoption and innovation, reinforcing the need for consistent policy measures. The study also confirms that digital banking adoption reduces carbon footprint through decreased paper usage and enhanced digital transactions. These findings collectively validate that FinTech innovations are not only reshaping financial services but also driving sustainable development in India, bridging the urban–rural divide and fostering economic resilience.

#### 2. Relevance and Implications for Stakeholders

## **Government and Policymakers**

The findings provide valuable insights for policymakers in designing regulatory frameworks that balance innovation with security and inclusivity. Since regulatory support significantly influences FinTech adoption, the government must ensure clear and consistent policies to encourage FinTech growth while addressing cybersecurity threats and financial fraud risks. Additionally, subsidies or incentives for digital financial services could enhance financial inclusion, particularly in rural areas. The study suggests that FinTech-driven ESG investments should be encouraged through tax benefits or policy incentives to promote sustainable finance and green investments.



#### **Corporate Sector and Financial Institutions**

For banks and financial institutions, the study highlights the importance of AI-based credit scoring in reducing loan default risks and enhancing credit access for MSMEs. Financial service providers should invest in advanced data analytics, AI, and machine learning models to improve credit assessments and lending efficiency. Additionally, digital remittance platforms have shown a significant impact on poverty reduction, suggesting that corporates in the FinTech sector should expand mobile banking **services** to underserved communities.

#### **FinTech Startups and Investors**

For FinTech startups, the study identifies key growth opportunities in mobile banking, AI-driven credit assessments, and digital payment expansion. Investors can use these insights to focus on high-impact areas, particularly green finance solutions, blockchain-based ESG investments, and financial accessibility for lower-income groups. As digital banking and paperless transactions contribute to carbon footprint reduction, sustainability-focused FinTech firms have a strong market opportunity in developing green financial products.

#### **Researchers and Academicians**

The study provides a theoretical foundation linking FinTech adoption to financial inclusion, regulatory influence, and sustainability outcomes. Future research can expand on these findings through longitudinal studies to track the evolution of FinTech's impact over time. Researchers can also explore comparative studies between India and other emerging economies to identify best practices and policy recommendations for global FinTech development.

#### **General Public and Financial Consumers**

The study's findings emphasize that FinTech enhances financial accessibility and economic **empowerment**, particularly for individuals and small businesses. However, challenges such as digital illiteracy, cybersecurity threats, and uneven financial adoption in rural areas remain. Public awareness campaigns and digital literacy programs are crucial in ensuring that more people can safely and effectively utilize FinTech services.

## Conclusion

This study comprehensively assessed the role of FinTech in advancing Sustainable Development Goals (SDGs) in India, focusing on financial inclusion, green investments, credit accessibility, regulatory influence, and environmental sustainability. The findings confirm that penetration significantly enhances financial inclusion, particularly among unbanked populations. AI-based credit scoring improves loan approval rates for both individuals and MSMEs z, reducing credit access barriers. The study also establishes that FinTech-driven ESG transactions play a crucial role in mobilizing capital for green investments, reinforcing its contribution to sustainable finance.

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The study successfully addresses the lack of an integrated evaluation of FinTech's impact on SDGs by demonstrating its multi-dimensional influence on economic, social, and environmental outcomes. It highlights that regulatory support significantly influences FinTech adoption, emphasizing the need for clear and adaptive policies. Additionally, digital banking adoption effectively reduces carbon footprint, proving FinTech's role in promoting environmental sustainability.

By providing empirical evidence on FinTech's holistic impact, this study helps bridge the research gap and offers actionable insights for policymakers, financial institutions, and FinTech innovators. Moving forward, a sustained focus on digital literacy, regulatory clarity, and technological innovation will be essential in maximizing FinTech's potential to drive inclusive and sustainable economic growth in India.

# Scope for further research

Future research can explore the long-term impact of FinTech innovations using longitudinal studies to assess their evolving role in financial inclusion, green finance, and regulatory adaptation. Comparative studies between India and other emerging economies can provide deeper insights into best practices and policy frameworks. Additionally, the role of Central Bank Digital Currencies (CBDCs) in enhancing digital transactions and FinTech's impact on rural financial accessibility require further investigation. Future studies should also address cybersecurity risks, digital literacy challenges, and regulatory complexities, ensuring a more resilient, inclusive, and sustainable FinTech ecosystem in India and beyond.

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