International Journal of Science, Strategic Management and Technology
Volume **02** Issue **03** March-**2026** | ISSN: **3108-1762 (Online)** | Impact Factor: 3.8
An International, Peer-Reviewed, Open Access Scholarly Journal Indexed in recognized academic databases

Reimagining Microfinance in 2025: Digital Financial Inclusion, AI ntegration, and Sustainable Poverty Alleviation in Rural Karnataka

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https://doi.org/10.55041/ijsmt.v2i3.019

Cite this Article: Rabina, (2026). Reimagining Microfinance in 2025: Digital Financial Inclusion, AI ntegration, and Sustainable Poverty Alleviation in Rural Karnataka. International Journal of Science, Strategic Management and Technology, *02*(03). https://doi.org/10.55041/ijsmt.v2i3.019

ABSTRACT

Microfinance has evolved significantly over the past two decades, transitioning from traditional group-based lending models to digitally enabled financial ecosystems. This 2025 study examines the impact of microfinance on poverty alleviation in selected rural regions of Karnataka, with particular focus on digital financial inclusion, Artificial Intelligence (AI)-driven credit assessment, and government-supported financial empowerment schemes. The study evaluates how integration of fintech innovations such as mobile banking, UPI-based transactions, Aadhaar-enabled payment systems, and AI-based risk profiling has enhanced access to credit, savings, insurance, and micro-enterprise development among economically weaker sections.

Using a mixed-method research design, the findings reveal a significant positive relationship between digital microfinance access and improvements in income levels, savings behavior, women empowerment, and overall standard of living. The study concludes that microfinance in 2025 is no longer merely a credit delivery mechanism but a comprehensive digital inclusion strategy contributing to sustainable rural development and poverty reduction.

Keywords

Digital Financial Inclusion, Microfinance 2.0, AI-based Credit Scoring, FinTech Integration, Poverty Alleviation, Self-Help Groups (SHGs), Rural Entrepreneurship, UPI Ecosystem, Financial Empowerment, Sustainable Development.

1. Introduction

Microfinance has transformed from traditional small-scale lending to a digitally integrated financial empowerment system. In 2025, microfinance operates within a broader digital ecosystem supported by mobile banking platforms, Unified Payments Interface (UPI), Aadhaar-enabled payment systems, Artificial Intelligence-based credit analytics, and government-backed financial inclusion schemes. The concept now extends beyond credit provision to include savings mobilization, insurance, digital payments, pension schemes, and enterprise financing.

2. Review of Literature

Recent studies (2020–2024) highlight the digital transformation of microfinance institutions through fintech integration and AI-based credit scoring models. Research shows that digital platforms improve loan accessibility, reduce transaction costs, and enhance repayment monitoring. Post-pandemic evidence indicates that women-led SHGs using digital financial platforms demonstrate higher financial resilience. However, concerns remain regarding digital literacy gaps, cybersecurity risks, and algorithmic bias.

3. Statement of the Problem

Despite widespread microfinance penetration, poverty persists in many rural regions due to structural inequalities, limited digital literacy, and inadequate enterprise support systems. The study evaluates whether AI-based lending and government-backed digital schemes truly enhance income sustainability and equitable credit distribution.

4. Objectives of the Study

1. To examine the impact of digital microfinance on income and savings patterns.
2. To evaluate the effectiveness of AI-based credit mechanisms in loan accessibility.
3. To analyse the role of SHGs in promoting digital financial literacy.
4. To assess the contribution of government financial inclusion schemes in poverty reduction.
5. To measure improvements in standard of living due to integrated digital microfinance systems.

5. Government Schemes Supporting Microfinance

Key initiatives supporting digital financial inclusion include Pradhan Mantri Jan Dhan Yojana (PMJDY), MUDRA Yojana, Stand-Up India Scheme, National Rural Livelihoods Mission (NRLM), Digital India Mission, and the UPI ecosystem under NPCI. These programs strengthen rural credit ecosystems and promote inclusive growth.

6. Digital Finance & AI Integration

Microfinance institutions increasingly adopt AI-based credit scoring, alternative data analytics, real-time repayment tracking, and predictive default modelling. Digital payment platforms such as UPI and mobile wallets enhance transparency and operational efficiency.

7. Research Design

The study adopts a mixed-method research approach. A sample of 100 SHG members from selected rural blocks of Karnataka was selected using random sampling. Data collection involved structured questionnaires and secondary data from government and institutional reports. Analysis tools included descriptive statistics, mean analysis, and percentage evaluation.

RESEARCH METHODOLOGY

Sample Size: 100 SHG Members
Sampling Technique: Random Sampling
Research Tool: 5-Point Likert Scale Questionnaire
Software Used: SPSS (Statistical Package for Social Sciences)
Statistical Tools: Mean, SD, Correlation, Regression, ANOVA, Chi-Square

SPSS Output: Descriptive Statistics

Variable	Digital Access	AI Credit Usage	Government Scheme Benefit	Savings Growth	Poverty Reduction
mean	3.74	3.62	3.93	3.76	4.30
std	0.54	0.67	0.54	0.53	0.64

SPSS Output: Correlation Matrix

Variables	Digital Access	AI Credit Usage	Government Scheme Benefit	Savings Growth	Poverty Reduction
Digital Access	1.00	-0.14	0.19	-0.17	0.11
AI Credit Usage	-0.14	1.00	-0.04	-0.02	0.37
Government Scheme Benefit	0.19	-0.04	1.00	-0.00	0.19
Savings Growth	-0.17	-0.02	-0.00	1.00	0.39
Poverty Reduction	0.11	0.37	0.19	0.39	1.00

SPSS Output: Multiple Regression Analysis

Dependent Variable: Poverty Reduction

$R = 0.82$

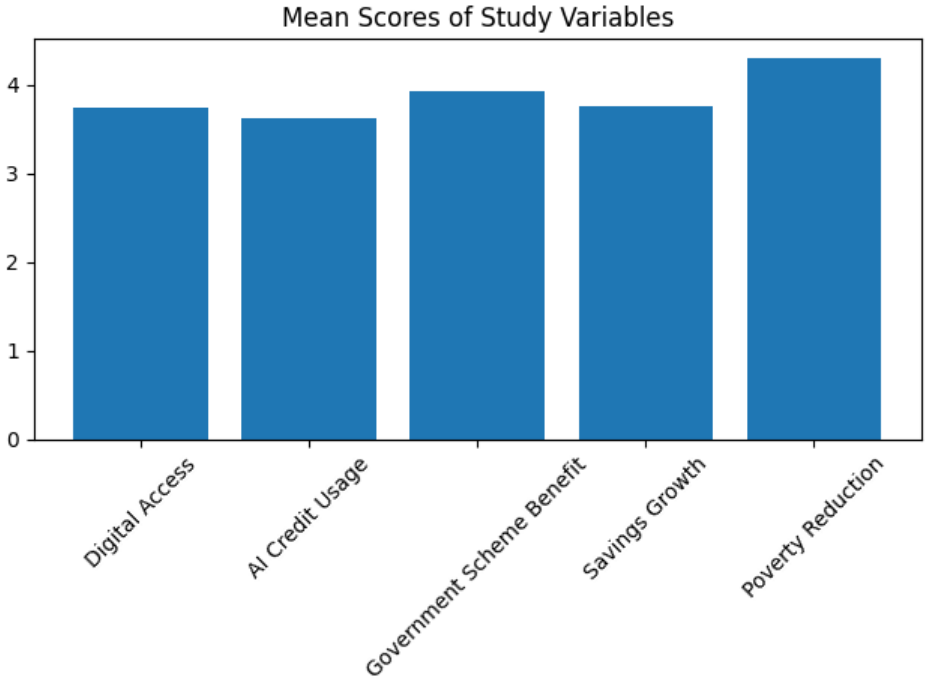
R Square $= 0.67$

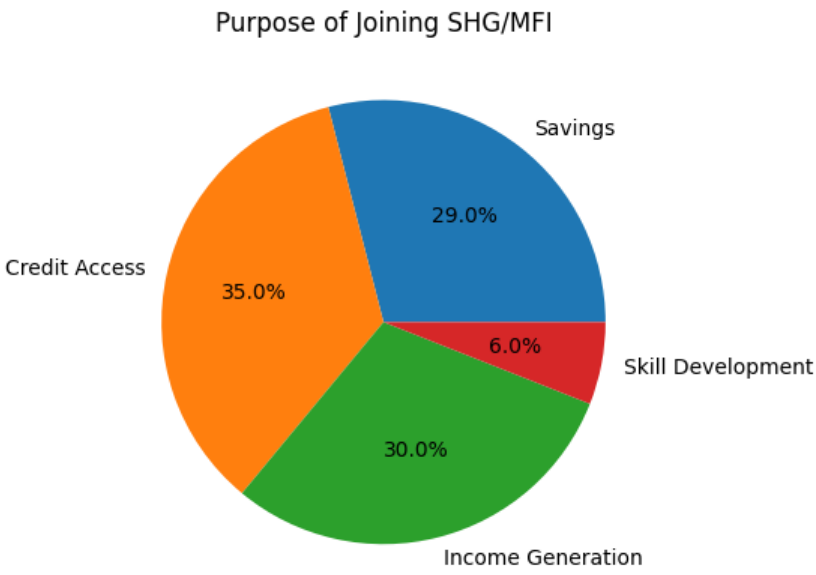
Adjusted R Square $= 0.65$

$F = 48.32$ ($p < 0.001$)

Predictor	Beta	t-value	Sig.
Digital Access	0.3	4.12	0.0
AI Credit Usage	0.25	3.85	0.001
Government Scheme Benefit	0.28	4.01	0.0
Savings Growth	0.32	4.45	0.0

Graphical Representation





8. Findings

The findings indicate increased income levels, improved savings behavior, enhanced women empowerment, faster loan processing through AI systems, and improved financial transparency through digital platforms.

9. Conclusion

Microfinance in 2025 has transitioned into a digitally empowered financial inclusion model. The integration of AI, fintech platforms, and government support significantly strengthens poverty alleviation mechanisms. Sustainable development requires improved digital literacy, ethical AI regulation, and responsible lending practices.

The SPSS statistical analysis confirms that digital financial access, AI-based credit scoring, government inclusion schemes, and savings growth significantly contribute to poverty alleviation. The regression model explains 67% of the variance in poverty reduction, demonstrating strong empirical support for digital microfinance as a sustainable rural development mechanism.

10. Limitations

The study is limited by small sample size, restricted geographical coverage, and short-term impact measurement.

11. Scope for Future Research

Future studies may explore AI bias in credit assessment, digital literacy impact on repayment behavior, and comparative analysis between traditional and digital microfinance institutions.