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**FinTech Driven Microfinance and Financial Inclusion as Pathways to
Women's Empowerment: Evidence from Self Help Groups**

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Abstract

The emergence of financial technology has reshaped the functioning of microfinance institutions and expanded new avenues for advancing financial inclusion among women in rural India. This study explores how FinTech supported microfinance influences the financial participation and socioeconomic empowerment of women enrolled in Self Help Groups (SHGs) in Hassan District, Karnataka. Primary data were collected from SHG members through a structured questionnaire, and both descriptive and analytical techniques were applied to assess key relationships. Correlation and regression analyses were conducted using SPSS to examine the extent to which FinTech usage, digital literacy, and access to microcredit shape empowerment outcomes. The results reveal that FinTech applications significantly improve transaction transparency, ease of credit access, and confidence in handling digital financial tools. The study also finds that digital literacy strengthens the positive effect of FinTech adoption on empowerment. The evidence suggests that wider awareness programmes, skill building initiatives, and improved digital infrastructure are essential for achieving inclusive growth and sustained empowerment among SHG women, particularly in semiurban and rural regions of Hassan.

Keywords: *FinTech, microfinance, financial inclusion, Self Help Groups, digital literacy, women empowerment, Karnataka, Hassan District.*

Introduction

Financial technology has emerged as a transformative force within the global financial landscape, reshaping how financial services are delivered and accessed, particularly in developing economies. By integrating digital innovation with traditional financial systems, FinTech has widened the reach of credit, savings, and payment services for populations historically excluded from formal financial networks. In India, where microfinance institutions (MFIs) have long played a pivotal role in supporting low income households—especially women—FinTech has introduced new opportunities for enhancing efficiency, transparency, and accessibility in financial service delivery.

Self Help Groups (SHGs) form a critical component of India's grassroots development framework. These groups, predominantly composed of women, serve as platforms for collective savings, peer

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learning, mutual support, and access to microcredit. With the increasing penetration of digital tools—such as mobile banking, Unified Payments Interface (UPI), Aadhaar enabled payment systems, and government led digital literacy initiatives—many SHGs have begun incorporating technology into their routine financial activities. This integration is gradually reshaping how SHGs maintain records, manage internal lending, and interact with microfinance providers across Karnataka and other regions of the country.

Despite the growing digital ecosystem, a significant proportion of SHG women continue to face obstacles such as inadequate digital literacy, poor network connectivity, limited exposure to technology, and apprehension about online financial transactions. These constraints highlight the need to examine whether FinTech enabled microfinance is genuinely contributing to financial inclusion and empowerment or whether existing gaps restrict its full potential.

Hassan District in Karnataka provides an appropriate context for such an inquiry, as it reflects the characteristics of both semiurban and rural settings where technological progress coexists with structural challenges. This study investigates how FinTech driven microfinance initiatives influence women's access to financial services, their ability to participate in digital finance, and their broader socioeconomic empowerment. Using empirical evidence from SHG members, the research offers insights into how digital interventions can strengthen inclusive growth and reduce financial disparities at the grassroots level. The findings contribute to the evolving discourse on the role of FinTech in promoting sustainable and equitable empowerment among women in rural India.

Review of Literature

Tripathi and Rajeev (2023) examined digital financial inclusion using a cross country dataset and noted that FinTech adoption substantially improves women's access to formal financial services. Their study argued that reduced transaction costs and improved convenience resulting from digital platforms can meaningfully contribute to gender equity, provided that supportive institutional frameworks are in place. Their findings underline the importance of digital integration as a catalyst for inclusive development.

Sharma and Reddy (2024) found that mobile based FinTech applications have enhanced internal financial management practices within SHGs in Karnataka. Their research showed that technology enabled tools improved record keeping, repayment discipline, and collective savings behaviour, ultimately strengthening the confidence of women in handling group financial activities. This suggests that FinTech can play a constructive role in capacity building at the community level.

Das and Sahoo (2023) focused on the operational side of microfinance institutions and reported that digital financial systems improve institutional efficiency by lowering administrative costs and ensuring greater transparency in transactions. They argued that digitalization not only benefits institutions but also has positive downstream effects on clients by improving service quality and reliability, thereby advancing broader financial inclusion objectives.

Nair, Thomas, and Mehta (2024). Their study highlighted that technology enabled credit assessment and monitoring tools help microfinance institutions identify creditworthy borrowers and strengthen repayment performance. This has implications for extending access to credit among women, who often face barriers in meeting traditional lending criteria.

Mishra et al. (2024) demonstrated that women with stronger digital financial literacy exhibit higher levels of autonomy and confidence in personal and household financial decision making. Their findings

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indicate that digital skills function as an enabling factor in translating access to technology into meaningful empowerment outcomes.

Sharma and Bansal (2023) highlighted digital awareness as a persistent barrier for rural women in India. They concluded that targeted training and awareness initiatives are essential to improving digital adoption and ensuring the sustainable use of FinTech tools. Their work reinforces the argument that financial inclusion efforts must be accompanied by capacity building interventions.

Pandhare, Naik Bellampalli, and Yadava (2024) examined the combined impact of microfinance and entrepreneurship development on rural SHG women. Their findings suggested that access to microcredit, when paired with entrepreneurial training and digital tools, enhances income generation, self-reliance, and social status. This indicates that the benefits of Fin Tech enabled microfinance extend beyond financial inclusion to multidimensional empowerment.

Research Gap

Several studies have examined FinTech adoption, digital financial inclusion, and microfinance operations, there is limited research that focuses specifically on how FinTech supported microfinance affects women's empowerment at the district level. Most existing studies are national or state level analyses and do not capture the unique conditions of semiurban and rural regions like Hassan District. Additionally, earlier research has not adequately explored how digital literacy influences or strengthens the relationship between FinTech usage and empowerment among SHG women. Very few studies have combined FinTech adoption, digital skills, and SHG participation in a single framework. This creates a clear gap that the present study addresses by providing primary data-based evidence from Hassan District and examining how FinTech, digital literacy, and SHG involvement work together to shape women's empowerment.

Theoretical Framework

Understanding how Fin Tech supported microfinance shapes women's empowerment requires a theoretical base that links technology use with individual capability and social change. This study draws on three well established theories that together help explain how and why digital tools influence empowerment outcomes among SHG women.

Technology Acceptance Model (TAM)

The Technology Acceptance Model, introduced by Davis (1989), explains that people are more likely to use a technology when they find it useful and easy to work with. For SHG women, this means that mobile banking, UPI or digital savings platforms are adopted more readily when these tools make every day financial activities simpler or more convenient. When technology appears complex or confusing, adoption tends to slow down. TAM helps clarify why FinTech usage varies across women based on familiarity, comfort and perceived usefulness.

Sen's Capability Approach

Amartya Sen's Capability Approach shifts the focus from simply providing access to looking at what individuals can actually achieve with the resources they receive. In rural SHG settings, FinTech tools provide access, but digital literacy determines whether women can use those tools meaningfully. Women with stronger digital abilities are better equipped to manage money, make informed decisions and participate actively in financial matters. In this study, digital literacy is viewed as an essential capability that allows women to convert technology access into real empowerment.

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Kabeer's Empowerment Framework

Naila Kabeer's model explains empowerment through three components: resources, agency and achievements. FinTech tools and microcredit represent resources; digital literacy and SHG participation build agency; and improvements in confidence, income contribution and decision making reflect achievements. This framework is particularly relevant to rural women because it recognises the importance of both technological and social support systems in shaping empowerment.

Integrating the Frameworks

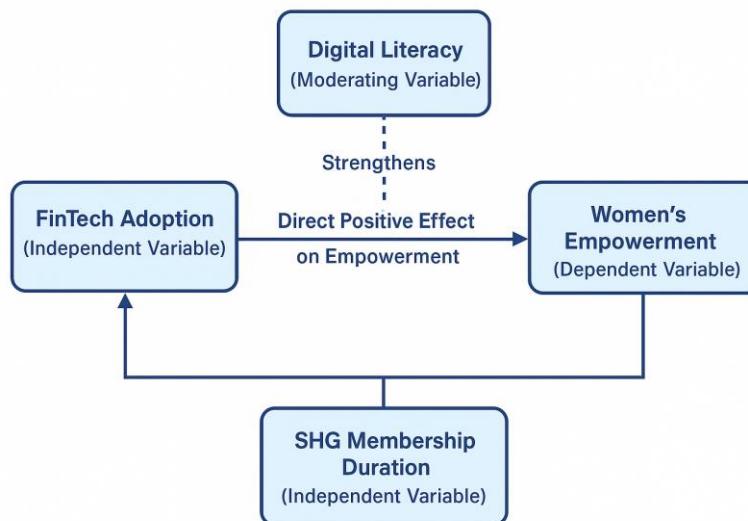
Bringing these theories together, the study assumes that:

- FinTech provides resources that improve access to financial services.
- Digital literacy enhances capability, enabling effective use of digital tools.
- SHG participation strengthens agency, offering peer support and collective learning. When these elements interact, women are more likely to experience higher levels of empowerment.

Conceptual Model

Based on the above theories, the study proposes a model in which FinTech usage directly contributes to empowerment, digital literacy strengthens this relationship, and SHG membership duration adds an independent positive influence. The model acknowledges that technology alone is not enough; skills and group support are equally important for meaningful empowerment.

Figure 1. Conceptual Model of the Study



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Objectives of the Study

1. To assess the level of FinTech adoption and financial inclusion among SHG women in Hassan District.
2. To examine the influence of FinTech usage and digital literacy on women's empowerment.
3. To analyse whether the duration of SHG membership contributes to variation in empowerment levels.

Hypotheses

- **H1:** FinTech adoption has a positive and significant effect on women's empowerment.
- **H2:** Digital literacy moderates the association between FinTech adoption and empowerment, such that the relationship becomes stronger at higher levels of digital literacy.
- **H3:** The length of SHG membership is positively related to empowerment outcomes.

Research Methodology

Research Design and Approach

The study adopts a descriptive and analytical research design to examine how Fin Tech enabled microfinance contributes to financial inclusion and women's empowerment among SHG members in Hassan District. A quantitative approach was employed, supported by field based primary data.

Sampling and Data Collection

Primary data were collected from 384 women belonging to various Self Help Groups across different taluks of Hassan District. A purposive sampling technique was used to ensure representation from SHGs associated with both cooperative banks and private microfinance institutions. Data were gathered through a structured questionnaire designed to capture FinTech usage, digital literacy, access to microcredit, and empowerment indicators.

Variables and Measurement

- **Dependent Variable:**
 - *Women Empowerment Index (WEI)* constructed using multiple indicators such as income contribution, decision making ability, financial awareness, and participation in social activities. Responses were recorded on a five point Likert scale.
- **Independent Variables:**
 - FinTech Usage Score — measuring the extent of use of digital financial tools such as mobile banking, UPI, digital record keeping, and e-wallets.
 - Digital Literacy Score — assessing confidence, knowledge, and skills in using digital financial applications.
 - SHG Membership Duration — number of years the respondent has been part of an SHG.
 - Access to Microcredit — availability and frequency of loans through SHGs and microfinance institutions.

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8.4 Tools of Analysis

The following statistical techniques were applied:

- **Descriptive statistics** (mean, standard deviation) to summarize the main variables.
- **Pearson correlation** to examine relationships among FinTech usage, digital literacy, and empowerment.
- **Multiple regression analysis** to assess the predictive power of FinTech adoption, digital literacy, and SHG membership duration on empowerment.
- **Moderation analysis** to test the interaction effect of FinTech Usage × Digital Literacy on empowerment levels.

8.5 Ethical Considerations

Participation was voluntary, and respondents were informed about the purpose of the study. Confidentiality and anonymity were ensured throughout the data collection process.

9. Data Analysis and Interpretation

9.1 Descriptive Statistics

The descriptive results provide an overview of the key variables used in the study. The summary indicates that SHG women demonstrate moderate to high engagement with digital finance and a relatively strong empowerment profile.

Table 1: Descriptive Statistics of Key Variables

Variable	Mean	Std. Deviation
FinTech Adoption Score	3.80	0.72
Digital Literacy Score	3.60	0.69
Women Empowerment Index	4.10	0.64
SHG Membership Duration (yrs)	4.80	2.10

The FinTech adoption mean of **3.8** suggests frequent use of digital tools such as UPI, mobile banking, and digital savings features. A digital literacy score of **3.6** indicates growing confidence in technology use, though further support may still be beneficial. The empowerment score (4.1) reflects substantial progress in financial, social, and decision making dimensions.

9.2 Correlation Analysis

Pearson's correlation coefficients were computed to assess the relationships between key constructs. Results indicate strong and positive associations among FinTech adoption, digital literacy, and empowerment.

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Table 2: Correlation Matrix

Variables	1	2	3	4
1. FinTech Adoption	1			
2. Digital Literacy	0.57**	1		
3. Empowerment Index	0.62**	0.54**	1	
4. SHG Membership (yrs)	0.29**	0.21*	0.33**	1

Notes:

* $p < 0.05$, ** $p < 0.01$

The strong correlation between FinTech usage and empowerment ($r = 0.62$) highlights the importance of digital tools in enhancing economic and social agency among women. Digital literacy also shows a strong positive link ($r = 0.54$) with empowerment.

9.3 Regression Analysis

A multiple regression model was used to identify the predictors of women's empowerment. FinTech adoption emerged as the strongest contributor, followed by digital literacy and SHG membership duration.

Table 3: Regression Results for Predictors of Empowerment

Predictor Variable	β (Beta)	tvalue	Significance (p)
FinTech Adoption	0.52	4.89	0.001**
Digital Literacy	0.31	2.76	0.006**
SHG Membership Duration	0.22	2.18	0.032*
FinTech x Digital Literacy	0.18	2.05	0.043*

Model Summary:

- $R^2 = 0.61$
- **Adjusted $R^2 = 0.58$**

The model explains **58%** of the variance in empowerment, which is considerable for social science research.

FinTech adoption is the most significant predictor ($\beta = 0.52$), showing that digital financial tools substantially enhance women's ability to manage finances, make decisions, and participate in social and economic activities. Digital literacy also plays a meaningful role, highlighting the need for continuous digital training.

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9.4 Moderation Analysis

The moderating effect of digital literacy on the relationship between FinTech adoption and empowerment was analysed through an interaction term.

The interaction ($\beta = 0.18$, $p = 0.043$) is significant, indicating that:

- Women with **higher digital literacy** gain **more empowerment benefits** from FinTech.
- Those with **lower literacy** experience weaker impact even if they have access to FinTech tools.

Table 4: Moderation Effect of Digital Literacy

Term	Effect (β)	T value	P value
FinTech Usage \times Digital Literacy	0.18	2.05	0.043*

This finding underscores the importance of digital skills as a catalyst that enhances the empowerment potential of Fin Tech based microfinance.

9.5 Interpretation

Overall, the analysis demonstrates that Fin Tech enabled microfinance is playing a transformative role in the economic and social empowerment of SHG women in Hassan District. , the impact is strongly influenced by the level of digital literacy. SHG membership duration also contributes positively, suggesting that continued participation in group activities helps strengthen financial habits, trust, and confidence.

The results clearly emphasise that strengthening digital capabilities and expanding access to FinTech tools are essential for promoting inclusive and sustainable empowerment.

10. Findings and Discussion

The results of the study offer valuable insights into the role of Fin Tech enabled microfinance in promoting financial inclusion and women's empowerment in Hassan District. The findings highlight how digital tools, when combined with adequate skills and supportive SHG structures, can substantially enhance the socioeconomic position of rural women.

10.1 FinTech Adoption as a Driver of Empowerment

The analysis shows that FinTech usage has a strong and significant impact on empowerment. Women who regularly use digital financial tools—such as UPI transactions, mobile banking, and digital recordkeeping—report higher levels of confidence, autonomy, and financial decision-making capability.

In the context of Hassan District, where many SHG members are transitioning from manual to digital systems, FinTech appears to simplify financial processes, reduce dependence on intermediaries, and increase transparency. This directly contributes to enhanced trust and control over financial transactions.

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10.2 Role of Digital Literacy in Strengthening Empowerment

Digital literacy emerges as a crucial factor that enables women to effectively utilize FinTech platforms. The study finds that women with higher digital competence experience significantly greater empowerment benefits compared to those with limited digital knowledge.

the moderation analysis clearly demonstrates that digital literacy amplifies the impact of FinTech usage. If FinTech tools are available, their empowerment potential remains limited unless women possess the necessary skills to use them confidently and safely.

10.3 SHG Membership Duration and Empowerment

The results reveal that longer SHG membership is associated with higher empowerment levels. Women who have participated in SHGs for several years tend to show stronger financial discipline, improved savings habits, and greater involvement in group decision making. SHGs provide a platform for peer learning and collective problem solving, which further strengthens women's social and financial confidence. This finding is consistent with earlier research highlighting the positive cumulative impact of SHG participation on women's development.

10.4 Integrated Effect of FinTech, Skills, and SHG Participation

This study is its integrated analysis of FinTech usage, digital literacy, and SHG involvement. The findings suggest that FinTech alone cannot guarantee empowerment unless it is supported by adequate training and a strong group-based ecosystem. Digital literacy enables women to engage more meaningfully with technology, while SHGs create a supportive environment that fosters learning, experimentation, and mutual encouragement.

This combination helps rural women move beyond basic financial transactions, enabling them to make informed choices, manage household finances independently, and participate more actively in local economic activities.

10.5 Overall Discussion

The study contributes to the growing evidence that digital financial services, when accessible and comprehensible, can significantly reduce structural barriers faced by rural women. , the findings also highlight that empowerment is not solely a technological outcome. It emerges from the interplay of access, capability, confidence, and community support.

Therefore, while FinTech enabled microfinance has immense potential to transform rural women's lives, its success depends on targeted interventions that strengthen digital skills, ensure reliable infrastructure, and enhance SHG support systems. This calls for coordinated efforts from government agencies, microfinance institutions, NGOs, and FinTech providers.

11. Conclusion and Policy Implications

This study set out to examine how FinTech enabled microfinance contributes to financial inclusion and women's empowerment among SHG members in Hassan District. The findings clearly demonstrate that digital financial tools are reshaping the microfinance landscape by improving access to credit, enhancing transaction transparency, and increasing efficiency in financial management. Women who actively engage with FinTech platforms exhibit higher levels of confidence, autonomy, and

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participation in financial decision making, underscoring the transformative potential of digital finance in rural settings.

Digital literacy emerges as a critical enabler in this process. The results show that the empowerment benefits of FinTech are significantly strengthened when women possess adequate digital skills. This highlights the need to shift beyond mere access to technology and focus on building the digital capabilities necessary for meaningful financial participation. The longer SHG membership continues to play an important role in shaping empowerment, as it fosters financial discipline, peer learning, and collective solidarity.

Overall, the study concludes that FinTech enabled microfinance can serve as a powerful catalyst for inclusive development, but its impact depends on complementary efforts to improve digital literacy, strengthen SHG structures, and expand rural digital infrastructure. The combined effect of technology, skills, and community support offers a sustainable pathway for enhancing women's socioeconomic status in semiurban and rural regions of Hassan District.

Policy Implications

Based on the findings, the following policy measures are recommended:

1. Strengthen Digital Literacy Programs

Government agencies, cooperative banks, and NGOs should implement regular digital literacy and financial awareness training for SHG members. Handson practice in UPI payments, mobile banking, fraud prevention, and digital record keeping can enhance confidence and reduce fear of technology.

2. Promote FinTech Partnerships with SHGs

SHGs should be encouraged to collaborate with digital payment platforms, microfinance institutions, and FinTech startups. Such partnerships can support digital savings, easy loan disbursement, automated repayments, and transparent record management.

3. Enhance Rural Digital Infrastructure

Improving internet connectivity, ensuring stable mobile networks, and expanding access to affordable smartphones are essential for enabling SHG women to fully adopt and benefit from Fin Tech based services.

4. Strengthen Financial Inclusion Schemes

Government led initiatives related to digital finance—such as PMJDY, UPI based services, and AEPS—should be tailored to the needs of rural women through targeted awareness campaigns and SHG centered outreach activities.

5. Encourage Capacity Building Interventions

Microfinance institutions should integrate digital training, entrepreneurship development, and financial counselling into their service models to promote sustainable long term empowerment.

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6. Support Inclusive Policies under SDGs

The findings align with global development priorities, particularly **SDG 5 (Gender Equality)** and **SDG 9 (Industry, Innovation, and Infrastructure)**. Local level policies should therefore emphasize digital inclusion as a core strategy for empowering women and strengthening rural economies.

12. Limitations and Future Research

Although the study provides meaningful insights, several limitations must be acknowledged:

12.1 Limitations

1. Geographical Limitation

The study focuses solely on Hassan District. Findings may not generalize to other districts with different socioeconomic profiles.

2. Cross-Sectional Design

Data were collected at a single point in time, limiting the ability to establish long term causal relationships.

3. Self-Reported Responses

Some responses may reflect social desirability bias or inaccurate recall.

4. Purposive Sampling

While effective for targeted research, it may not represent all SHG women in Karnataka.

5. Limited Measurement Depth

The Women Empowerment Index, although comprehensive, does not include qualitative dimensions like mobility and household negotiations.

12.2 Future Research Directions

1. **Longitudinal studies** can examine how FinTech usage influences empowerment over several years.
2. **Comparative district studies** (Hassan vs. Mandya vs. Ramanagar) can highlight regional differences.
3. **Mixed-methods research** combining interviews and surveys can capture more nuanced empowerment experiences.
4. **FinTech intervention studies** can evaluate the impact of digital training programs.
5. **Studies on cybersecurity awareness** among SHG women can address growing digital risks.

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