

Role of Digital Finance in Empowering Rural Women: A Study in Warangal District

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ABSTRACT

Digital finance has the potential to move rural women from passive account ownership to active financial participation, yet access alone does not guarantee autonomy, confidence or safety. This study examines the role of digital finance in empowering rural women in Warangal District, Telangana. The study period is 2026 and the analysis is based on primary survey data collected from 150 rural women through a structured bilingual questionnaire. A descriptive research design was adopted, and the collective frequency data were analysed using frequencies, percentages and five-point weighted mean scores. The findings show strong foundations for digital inclusion: 89.3 per cent of respondents hold and independently operate a bank account, 62.7 per cent use a smartphone, and 65.3 per cent report reliable network availability. Knowledge is comparatively strong in checking balances and transaction details (mean 4.08) and protecting PINs, passwords and OTPs (mean 4.00). Digital finance most clearly reduces dependence on others for banking (mean 4.03) and improves household expense management (mean 3.77). However, training is limited to 38.7 per cent, awareness of grievance channels is weak (mean 2.87), satisfaction remains modest (mean 2.49), and fear of fraud and limited local support continue to constrain usage. The study concludes that digital finance can support rural women's economic agency only when digital access is combined with practical Telugu-language training, cyber-safety awareness, dependable connectivity and accessible grievance redressal. These measures are relevant to inclusive growth and the Viksit Bharat–2047 agenda.

Keywords: Digital finance, rural women, financial inclusion, women empowerment, UPI, cyber safety, Warangal District.

INTRODUCTION

Digital finance refers to the delivery and use of payments, deposits, credit, insurance, pensions and related financial services through mobile phones, digital platforms, cards, biometric channels and other technology-enabled mechanisms. In India, the combination of bank-account expansion, Aadhaar-enabled identification, mobile connectivity, Direct Benefit Transfer, business correspondents and the Unified Payments Interface has created an unprecedented infrastructure for low-cost financial participation. The scale of this transformation is visible in official statistics: UPI processed more than 23.65 billion transactions in July 2026, while the Pradhan Mantri Jan-Dhan Yojana reported over 59 crore beneficiaries in August 2026 (NPCI, 2026; Department of Financial Services, 2026).

For rural women, however, financial inclusion is more than the possession of a bank account. Meaningful inclusion requires the capability to use an account independently, understand charges and risks, receive benefits safely, make household financial decisions, build savings, access formal financial products and obtain timely help when a transaction fails. Digital systems can reduce travel time and transaction costs, protect privacy, provide direct control over government transfers and connect women to markets. At the same time, lack of a personal phone, weak connectivity, low digital literacy, language barriers, fear of fraud and dependence on family members or agents can convert formal access into only nominal inclusion.

The Reserve Bank of India conceptualises financial inclusion through the interrelated dimensions of access, usage and quality. This framework is especially appropriate for analysing rural women because the quality of use—including financial literacy, consumer protection, confidence and equality—determines whether digital access produces empowerment. The National Strategy for Financial Inclusion 2025–30 also emphasises digital infrastructure, responsible innovation, financial education, consumer protection and last-mile delivery. In this context, district-level evidence is important because national averages may conceal local differences in networks, institutions, social norms and support systems.

Warangal District has a substantial rural population and a strong presence of agriculture, wage work, self-help groups and small livelihood activities. Rural women increasingly encounter digital finance through bank accounts, UPI, ATM cards, Direct Benefit Transfers, loan repayments and household payments. This study therefore investigates whether such exposure has translated into knowledge, control over money, participation in decisions and economic independence, and identifies the barriers that must be addressed for inclusive and equitable growth.

REVIEW OF LITERATURE

Demirgüç-Kunt et al. (2022), using the Global Findex database, showed that digital payments and account ownership expanded rapidly across developing economies, while gender, income and digital-access gaps remained important. The Global Findex 2025 further integrates financial inclusion with mobile connectivity and digital safety, underscoring that access to a phone and the ability to use it safely are central to effective digital finance (World Bank, 2025).

Ghosh and Vinod (2017), using Indian microdata, found that women's financial inclusion is constrained by socio-economic characteristics, employment, education and household conditions. Their work indicates that gender-sensitive financial policy must address both supply-side access and demand-side capabilities. Klapper and Singer (2017) similarly argued that digital payments can advance women's economic participation by increasing account use, privacy and control, particularly when wages and government benefits are paid directly into accounts.

Suri and Jack (2016) provided influential causal evidence from Kenya that mobile money improved long-run household resilience and lifted many households, especially female-headed households, out of extreme poverty. Although institutional conditions differ from India, the study demonstrates the potential of digital finance to strengthen risk management, occupational choice and women's economic position. Ozili (2018) noted that digital finance can improve inclusion and efficiency but may also create risks of exclusion, data misuse and unequal access when digital capability or infrastructure is weak.

Indian policy literature highlights the same transition from access to quality. The RBI's Financial Inclusion Index assigns substantial weight to usage and quality, including financial literacy and consumer protection, rather than treating account numbers as the sole indicator of inclusion (RBI, 2021). The National Strategy for Financial Inclusion 2025–30 calls for a coordinated ecosystem involving banks, business correspondents, local institutions, digital infrastructure and grievance systems (RBI, 2026). The present study contributes local evidence by simultaneously measuring access, usage, knowledge, empowerment outcomes, barriers and satisfaction among rural women in Warangal District.

Research Gap

Existing national and international studies establish the broad relationship between digital finance and inclusion, but they do not fully reveal how rural women at the district level experience independence, confidence, household decision-making, safety and grievance redressal. Aggregate transaction growth can coexist with assisted usage and persistent vulnerability. There is therefore a need for a local, women-centred assessment that distinguishes access from actual capability and empowerment. This study addresses that gap through a structured survey covering the full pathway from access and usage to outcomes and barriers.

Objectives of the Study

- To examine rural women's access to bank accounts, mobile phones, connectivity and digital financial services.
- To assess the frequency and pattern of digital financial-service usage.
- To measure digital financial knowledge, confidence and cyber-safety awareness.
- To evaluate the contribution of digital finance to financial control, household decision-making, savings and economic independence.
- To identify the principal barriers, risks and support requirements affecting rural women.
- To offer policy suggestions aligned with inclusive growth and Viksit Bharat–2047.

Research Questions

- What is the level of access to and use of digital finance among rural women in Warangal District?
- To what extent do rural women possess the knowledge and confidence required for independent and safe digital transactions?
- How does digital finance influence control over money, household decision-making and economic independence?
- Which barriers and support measures are most important for safer and more useful digital finance?

RESEARCH METHODOLOGY

Research design: The study follows a descriptive and empirical survey design. It measures the existing status of digital-finance access, behaviour, capability, empowerment outcomes and constraints without manipulating any variable.

Study area, period and sample: The geographical scope is rural areas of Warangal District, Telangana. The study relates to 2026. A sample of 150 rural women was covered through a convenience-cum-purposive approach, with attention to different age, education, occupation and income groups. The sample is suitable for an exploratory district-level conference study, but it should not be treated as a probability estimate for every rural woman in the district.

Instrument and data: Primary data were collected through a 41-item bilingual (English–Telugu) questionnaire. Sections covered respondent profile, access, usage, knowledge and confidence, financial and economic empowerment, barriers and overall assessment. Questions 16–37 used a five-point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree); Question 38 used a parallel five-point satisfaction scale. Question 41 was open-ended. Only collective frequency data, not respondent-level records, were used in this paper, thereby protecting respondent privacy.

Analytical tools: Frequencies and percentages were used for categorical questions. Weighted means were calculated for five-point items as $\Sigma(\text{frequency} \times \text{scale value})/150$. A mean above 3.00 indicates an overall positive/agree tendency, while a value below 3.00 indicates a negative or weak tendency. For Questions 10, 12 and 39, although the questionnaire permitted multiple responses, the supplied collective sheet totals to 150 and therefore represents each respondent's principal or coded priority response. The training-source frequencies in Question 15 relate only to the 58 respondents who reported receiving training. No correlations, regressions or respondent-level significance tests were attempted because the data were supplied only in aggregate form. The open-ended Question 41 was treated qualitatively and was not assigned a numerical total.

Data Analysis and Interpretation

Table 1: Leading Respondent Characteristics (N = 150)

Variable	Largest category	Frequency	Percent
Age group	40–49 years	40	26.7
Education	Graduate	41	27.3
Marital status	Married	78	52.0
Occupation	Salaried	35	23.3
Personal income	₹5,001–10,000	75	50.0
SHG membership	Yes	113	75.3

Table 1 indicates a socially and economically diverse sample. The largest age group is 40–49 years, but respondents are distributed across all six age categories. More than half are married, half report a monthly personal income of ₹5,001–10,000, and three-fourths are members of SHGs. The strong SHG presence is important because SHGs can act as trusted channels for financial learning, peer support, credit linkage and grievance guidance. The education profile is also mixed: 23.3 per cent have no formal education, while 41.3 per cent possess a graduate or higher qualification, implying that a single training format may not suit all respondents.

Table 2: Access and Usage Indicators (N = 150)

Indicator	Leading response	Frequency	Percent
Own-name bank account	Independent operation	134	89.3
Personally used phone	Smartphone	94	62.7
Village connectivity	Always reliable	98	65.3
Principal accessible service	ATM/debit card	86	57.3
Transaction frequency	Daily	54	36.0
Principal transaction use	Send/receive money	58	38.7
Transaction performer	Self	71	47.3
Preferred receipt mode	Bank/UPI transfer	84	56.0
Digital-finance training	Yes	58	38.7

The access indicators are encouraging. Nearly nine in ten women independently operate an account, almost two-thirds use smartphones, and almost two-thirds report consistently reliable connectivity. Nevertheless, independent performance of transactions (47.3 per cent) is substantially lower than independent account operation (89.3 per cent). This gap suggests that formal ownership has advanced faster than practical digital autonomy. ATM/debit cards remain the most commonly coded accessible service, while sending or receiving money is the leading use. Only 38.7 per cent have received digital-finance or cyber-safety training. Among the 58 trained respondents, SHGs are the largest training source (21), followed by banks (18), family/others (9), NGOs (6) and government programmes (4).

Table 3: Digital Financial Knowledge and Confidence

Statement	Mean	Agree + Strongly Agree (%)
16. Use UPI/mobile banking without assistance	3.93	67.3
17. Check transaction details and balance digitally	4.08	74.7
18. Understand charges, interest and repayment terms	3.41	54.0
19. Know that PIN/password/OTP must not be shared	4.00	70.7
20. Identify suspicious links, calls or requests	3.41	50.0
21. Know where to complain after failure/fraud	2.87	36.7

The average knowledge-and-confidence score is 3.62 out of 5. Respondents are strongest in checking balances and transaction details and in understanding that secret credentials must not be shared. Independent UPI/mobile-banking ability also receives a high mean. The weakest item is knowledge of complaint channels (2.87), with only 36.7 per cent agreeing or strongly agreeing. This is a critical consumer-protection gap: users who can initiate a payment but cannot navigate dispute resolution remain vulnerable. Understanding charges and recognising suspicious requests are only moderate, showing the need for scenario-based education rather than general awareness alone.

Table 4: Financial and Economic Empowerment

Statement	Mean	Agree + Strongly Agree (%)
22. Greater control over own money	3.27	46.0
23. Participation in household financial decisions	3.31	48.7
24. Helps save more regularly	3.11	40.7
25. Quicker/safer receipt of government benefits	2.41	25.3
26. Reduces dependence on others for banking	4.03	72.0
27. Improves management of household expenses	3.77	62.7
28. Supports income-generating/business activity	3.42	52.7
29. Improves access to credit/insurance/pension	3.29	48.7
30. Increases confidence with financial institutions	3.35	49.3
31. Improves economic independence overall	3.59	56.0

The composite empowerment mean is 3.35, indicating a moderately positive contribution. The clearest benefit is reduced dependence on others for banking (4.03), followed by improved household-expense management (3.77) and overall economic independence (3.59). These results support the view that convenience and control are the first empowerment gains from digital finance. More structural outcomes—regular savings, formal credit, insurance, pension access and participation in household financial decisions—show only moderate progress. The unexpectedly low score for quicker and safer receipt of government benefits (2.41) may reflect limited use, cash-out dependence, service interruptions or dissatisfaction with the delivery experience; the aggregate data do not permit a causal explanation, so this issue warrants focused follow-up research.

Table 5: Barriers and Risks

Barrier statement	Mean	Agree + Strongly Agree (%)
32. Poor network connectivity	3.25	47.3
33. Lack of digital skills	2.93	38.7
34. Fear of fraud or losing money	3.09	40.7
35. Language/application-interface difficulty	3.35	51.3
36. Lack of personal smartphone/internet	2.79	30.7
37. Limited local support for failed transactions	3.57	57.3

The average barrier score is 3.16. Limited local support for failed transactions is the most strongly experienced barrier, followed by language or interface difficulty and poor connectivity. Fear of fraud is also material. Lack of a personal smartphone is comparatively less severe at the aggregate level, consistent with the relatively high smartphone-ownership rate, but it remains important for the minority who share a phone or have no phone. The results show that the policy challenge is shifting from opening accounts to creating a trusted support environment around digital usage.

Table 6: Overall Assessment and Support Priorities

Measure	Response	Frequency	Percent
Overall satisfaction	Very dissatisfied	47	31.3
Overall satisfaction	Satisfied/very satisfied combined	37	24.7
Most-needed support	Telugu-language apps/guidance	97	64.7
Second coded support	Better network	27	18.0
Third coded support	Affordable smartphone/data	26	17.3
Recommend to other rural women	Yes	101	67.3
Recommend to other rural women	Maybe	37	24.7
Recommend to other rural women	No	12	8.0

Overall satisfaction has a mean of 2.49, and only 24.7 per cent are satisfied or very satisfied. Yet 67.3 per cent would recommend digital financial services to other rural women. This apparent contrast suggests that respondents recognise the usefulness and future value of digital finance even while current service quality and support remain inadequate. Telugu-language applications or guidance is the dominant coded support priority, selected by 64.7 per cent. Better networks and affordable smartphones/data are the other recorded priorities. Question 41 invited one descriptive suggestion; because only collective quantitative data were supplied, no numerical result was assigned to it. Its role is best addressed through thematic categories in future data collection, such as local training, Telugu interfaces, fraud prevention, connectivity and nearby grievance assistance.

Major Findings

- Bank-account inclusion is high: 89.3 per cent independently operate an account, indicating a strong base for digital empowerment.

- Smartphone use and connectivity are relatively favourable, but only 47.3 per cent usually perform digital transactions themselves.
- Daily or weekly digital use accounts for 64.0 per cent of respondents, showing that digital finance is already part of regular financial behaviour for many women.
- Only 38.7 per cent have received training; SHGs and banks are the most important existing training channels.
- Respondents demonstrate good ability to check balances and protect confidential credentials, but grievance-channel awareness is weak.
- Digital finance is most effective in reducing dependence on others and improving household-expense management.
- The broader empowerment effect is positive but moderate; gains in savings, formal-product access and household decision-making are not yet universal.
- Limited local transaction support, Telugu-language/interface difficulties, connectivity and fear of fraud are the principal barriers.
- Low satisfaction coexists with a high willingness to recommend digital finance, indicating strong perceived potential but shortcomings in the present user experience.

Suggestions and Policy Implications

1. **Village-level practical training:** Banks, SHGs, colleges, panchayats and business correspondents should conduct hands-on sessions using demonstration accounts. Training should cover UPI registration, QR verification, balance checking, transaction-history review, safe loan-app behaviour and complaint filing.
2. **Telugu-first design and guidance:** Banks and payment providers should offer complete Telugu interfaces, voice prompts and pictorial instructions. Key warnings, charges and consent messages should be written in plain Telugu rather than technical language.
3. **Cyber-safety as a recurring programme:** One-time awareness is insufficient. Short repeated modules should use realistic examples of screen-sharing fraud, fake customer-care numbers, suspicious links, collect requests, remote-access apps and OTP/PIN theft.
4. **Accessible grievance redressal:** Every village or cluster should have a clearly identified help point through a trained Bank Mitra, SHG resource person or help desk. Printed cards should display the bank complaint channel, the National Cyber Crime helpline 1930 and the complaint portal.
5. **Assisted-to-independent transition:** Service providers should not merely complete transactions on behalf of women. Each assisted transaction should be used to teach the user one repeatable step, gradually increasing confidence and autonomy.
6. **Connectivity and affordability:** Improved rural network quality, low-cost data access and affordable smartphones are required to prevent a new form of digital exclusion. Offline or low-bandwidth payment solutions should be promoted where appropriate.
7. **Link digital use to livelihoods:** Training should connect payments with savings, bookkeeping, SHG enterprises, market receipts, insurance, pensions and responsible formal credit so that digital finance produces income and resilience rather than convenience alone.

8. **Measure quality, not only enrolment:** District monitoring should include independent usage, failed-transaction resolution time, fraud awareness, active savings and women's participation in financial decisions, alongside account-ownership figures.

CONCLUSION

The study confirms that digital finance has become an important instrument of rural women's financial participation in Warangal District. High levels of independent bank-account operation, smartphone use and regular transactions provide a strong foundation. Women report meaningful gains in independence from intermediaries, management of household expenses and overall economic confidence. These are significant elements of empowerment because they increase immediacy, privacy and agency in everyday financial life.

At the same time, the findings caution against equating digital access with complete empowerment. Training coverage is low, grievance awareness is inadequate, satisfaction is modest, and language, connectivity, fraud fears and limited local support continue to shape experience. The next phase of inclusion must therefore be qualitative: safe use, understandable interfaces, reliable assistance, effective complaints and links to savings, insurance, credit and livelihoods. If banks, SHGs, government institutions, educational institutions and technology providers work together on these priorities, digital finance can make a stronger contribution to inclusive, equitable and balanced economic growth and to the vision of Viksit Bharat–2047.

Limitations and Scope for Further Research

The study is confined to 150 rural women in Warangal District and uses a non-probability sample, limiting statistical generalisation. The analysis is based on aggregated frequencies; consequently, relationships between education, income, SHG membership, digital knowledge and empowerment cannot be tested at the respondent level. The multiple-response questions were available only as principal coded choices, and the descriptive suggestions were not supplied as text. Future research should retain anonymised respondent-level data, use stratified random sampling across mandals, validate multi-item scales, conduct reliability analysis and examine causal pathways through regression or structural-equation models. Focus-group discussions could also explain the low satisfaction and government-benefit ratings found in this survey.

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