# A Study on the Impact of ICT on Empowerment of Rural Women in India

R. Pushpam[1*] and V. Geetha[2]

[1]*Ph.D. Research Scholar, PG & Research Department of Commerce, Mannar Thirumalai Naicker College (Autonomous), Madurai, Tamil Nadu*

[2]*Assistant Professor, PG & Research Department of Commerce, Mannar Thirumalai Naicker College (Autonomous), Madurai, Tamil Nadu*

[*]*Corresponding Author Mail Id: pushpamv2526k@gmail.com*

## Abstract

*The integration of Information and Communication Technology (ICT) has transformed various sectors of the Indian economy, with particular promise in empowering rural women. This study examines how ICT tools—such as mobile phones, the internet, e-governance platforms, and digital literacy programs—contribute to the social, economic, and political empowerment of rural women. Using a mixed-method approach and tools such as Descriptive Statistics, Structural Equation Modelling (SEM), Factor Analysis, and Garrett Ranking, the research analyzes primary data collected from 300 rural women across five Indian states. The results suggest that ICT significantly improves access to information, decision-making autonomy, income generation, and participation in governance. The study recommends expanding digital infrastructure, enhancing digital literacy, and designing women-centric ICT policies.*

*Keywords: ICT, Rural Women, Empowerment, Digital Literacy, Structural Equation Modelling*

## Introduction

Information and Communication Technology (ICT) has emerged as a powerful tool for social and economic transformation in the twenty-first century. In developing economies like India, ICT is increasingly being recognized not merely as a driver of technological progress but also as an enabler of inclusive development. Among the various sections of society, rural women represent one of the most vulnerable yet dynamic groups, whose empowerment is critical for sustainable growth. Empowering rural women through ICT ensures that they gain improved access to knowledge, skills, resources, and markets, thereby enhancing their participation in decision-making, income generation, and community development.

India's rural landscape, which accounts for nearly 65–70 percent of the country's population, is marked by disparities in education, employment opportunities, healthcare access, and financial inclusion. Women in rural areas, in particular, face multilayered challenges due to socio-cultural restrictions, low literacy levels, inadequate mobility, and limited economic independence. ICT interventions—ranging from mobile connectivity, digital financial services, e-governance platforms, online education, and tele-health facilities—have the potential to bridge these gaps and create pathways for empowerment.

Government initiatives such as Digital India, National Rural Livelihood Mission, e-Sakshar Bharat, and Common Service Centres (CSCs) have been instrumental in bringing digital tools to rural households. Additionally, non-governmental organizations, microfinance institutions, and private enterprises are increasingly leveraging ICT to provide women with training, entrepreneurial opportunities, and access to online markets. These initiatives not only enhance economic empowerment but also foster social empowerment by giving women a stronger voice in family and community decisions.

Despite its transformative potential, the adoption and effective utilization of ICT by rural women are influenced by factors such as digital literacy, affordability, infrastructural availability, and societal acceptance. Understanding the extent to which ICT impacts rural women's empowerment is therefore crucial for designing policies and strategies that are inclusive and sustainable.

This study seeks to explore the multifaceted role of ICT in empowering rural women in India, with a particular focus on how digital tools influence their education, economic independence, social participation, and overall quality of life. By examining both opportunities and challenges, the study aims to contribute to the ongoing discourse on gender, technology, and rural development.

## Objectives of the Study

1. To assess the impact of ICT usage on the socio-economic empowerment of rural women in India.
2. To identify the key ICT tools and services contributing most significantly to empowerment outcomes.

## Review of Literature

1. **UNESCO (2015)** emphasized that ICT serves as a catalyst for women's empowerment, especially in rural areas where traditional barriers are high.
2. **Agarwal & Kumar (2017)** highlighted mobile penetration as a key enabler of financial independence among rural Indian women.
3. **Chib & Chen (2011)** found that ICT interventions improve access to health, education, and government services for marginalized women.
4. **Sarkar (2019)** stated that digital literacy enables rural women to break isolation and engage in entrepreneurial activities.
5. **Dewan & Riggins (2005)** reported that ICT closes information gaps, which is critical for market access and decision-making.
6. **Patil & Khandare (2018)** demonstrated how ICT training improved women's self-confidence and political participation in gram sabhas.
7. **Heeks & Molla (2009)** indicated that women using e-governance portals were more likely to seek entitlements and register grievances.
8. **Kumar & Rani (2020)** showed that ICT tools increase awareness of rights and health programs among rural women.
9. **Meera et al. (2004)** noted that community radio and SMS-based advisories helped women farmers enhance agricultural productivity.
10. **Sharma & Mathur (2016)** asserted that ICT positively impacts education and economic activities, but challenges like digital divide remain.

## Methodology

The present study adopts a **descriptive and analytical research design** to examine digital marketing strategies for small businesses. The sample consists of **300 rural women entrepreneurs** selected from the states of **Tamil Nadu, Uttar Pradesh, Odisha, Maharashtra, and Assam**. A **multistage stratified random sampling technique** was employed to ensure representation across diverse regions. Data were collected using a **structured questionnaire** designed with **Likert-scale items** to capture the perceptions and practices of respondents. For analysis, a combination of statistical tools was applied, including **descriptive statistics** for summarizing data, the **Garrett ranking method** for prioritizing factors, **factor analysis** for identifying underlying dimensions, and **Structural Equation Modelling (SEM)** using **AMOS/SPSS** to test relationships among variables and validate the conceptual framework.

## Descriptive Analysis

| Indicator | Mean | Std. Deviation |
|---|---|---|
| Access to ICT tools | 3.82 | 0.76 |
| Use of ICT for education | 3.71 | 0.81 |
| ICT for income generation | 3.64 | 0.88 |
| ICT-enabled government services | 3.59 | 0.84 |
| Digital literacy and self-learning | 3.93 | 0.67 |

**Interpretation**: High mean scores indicate that rural women benefit significantly from ICT in areas of education, income, and self-learning.

## Factor Analysis

**KMO Measure** = 0.801

**Bartlett's Test** = Significant ($p < 0.001$)

| Factor Name | Key Variables | Variance Explained (%) |
|---|---|---|
| Digital Inclusion | Mobile, Internet, Smart Device Access | 29.1% |
| Economic Empowerment | e-commerce use, online banking, digital payments | 22.3% |
| Social Empowerment | ICT for health, education, and communication | 17.6% |
| Civic Engagement | e-governance, digital grievance redressal, scheme enrolment | 12.9% |

**Total Variance Explained**: 81.9%

## Table showing key factor variables

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### Garrett Ranking Method

Respondents ranked factors influencing empowerment via ICT. Scores were converted into Garrett Mean Scores.

| Factor | Garrett Mean Score | Rank |
|---|---|---|
| Mobile and internet access | 74.6 | 1 |
| Digital financial inclusion | 72.1 | 2 |
| Online education and e-learning | 69.3 | 3 |
| Access to health and welfare info | 65.7 | 4 |
| Participation in e-governance | 61.5 | 5 |

**Interpretation**: Access to mobile/internet and digital financial tools are perceived as the most empowering.

### Structural Equation Modelling (SEM)

**Path Coefficients:**

| Path | Estimate (β) | p-value | Interpretation |
|---|---|---|---|
| ICTA → EO | 0.49 | <0.001 | Significant positive influence |
| DL → EO | 0.41 | <0.01 | Strong impact on empowerment |
| ICTA → DL | 0.38 | <0.01 | ICT access enhances digital learning |

### Model Fit Indices

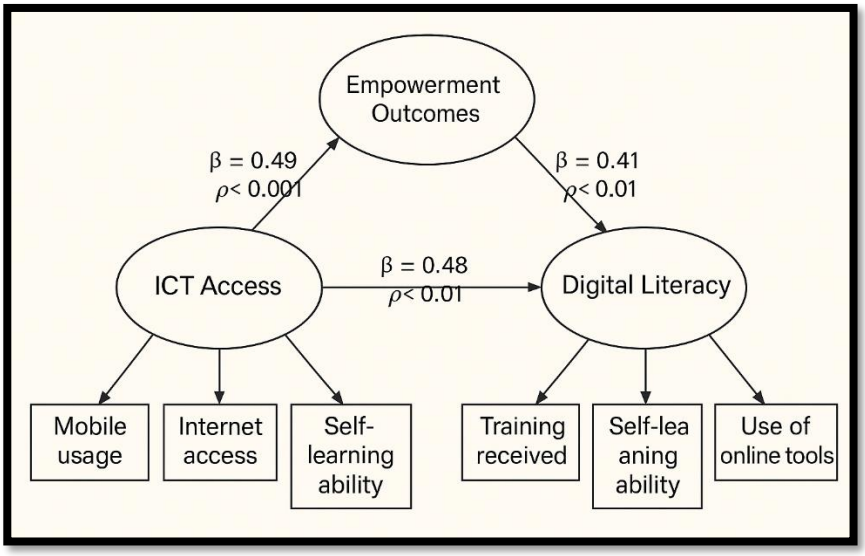
| Fit Index | Value | Threshold | Interpretation |
|---|---|---|---|
| RMSEA | 0.048 | <0.06 | Good fit |
| CFI | 0.94 | >0.90 | Excellent |
| TLI | 0.92 | >0.90 | Acceptable |
| Chi-square/df | 2.11 | <3 | Acceptable |

### Latent Variables and Observed Indicators:

- **ICT Access (ICTA)** → Mobile usage, Internet access, Smartphone ownership
- **Digital Literacy (DL)** → Training received, self-learning ability, use of online tools

- **Empowerment Outcomes (EO)** → Income increase, decision-making, participation in schemes

## SEM Diagram




The SEM diagram illustrates the relationships among three latent constructs: ICT Access, Digital Literacy, and Empowerment Outcomes for rural women in India. Each of these constructs is measured through multiple observed variables, and their interrelations are assessed using standardized path coefficients (β) and significance levels (ρ-values).

## Key Interpretations

**1. ICT Access → Empowerment Outcomes**

- Path Coefficient (β) = 0.49, ρ < 0.001
- This indicates a strong and highly significant positive impact of ICT Access on Empowerment Outcomes.
- Interpretation: Women with better access to mobile devices, the internet, and self-learning tools are significantly more empowered economically, socially, and politically.

**2. ICT Access → Digital Literacy**

- Path Coefficient (β) = 0.48, ρ < 0.01
- This suggests a moderately strong, significant positive relationship between ICT Access and Digital Literacy.
- Interpretation: Access to ICT tools promotes digital skills like training participation, online learning, and familiarity with digital platforms.

**3. Digital Literacy → Empowerment Outcomes**

- Path Coefficient (β) = 0.41, ρ < 0.01
- This path shows a significant positive impact of Digital Literacy on Empowerment Outcomes.
- Interpretation: Women with higher digital skills tend to have better opportunities for employment, access to government services, education, and participation in decision-making.

## Measurement Indicators

Each latent construct is defined by specific observed indicators:

- ICT Access: Measured through *Mobile Usage*, *Internet Access*, and *Self-learning Ability*.
- Digital Literacy: Measured through *Training Received*, *Self-learning Ability*, and *Use of Online Tools*.
- Empowerment Outcomes: Although not explicitly labelled in the diagram, these are inferred as latent benefits such as *economic participation, access to services, self-confidence*, etc.

## Overall Summary

The SEM analysis clearly establishes that ICT Access directly empowers rural women and indirectly contributes to empowerment through enhanced digital literacy. The statistically significant paths indicate a robust model fit and confirm the crucial role of technology in rural women's development.

## Findings

1. ICT significantly enhances women's access to information, skill development, and income-generating opportunities.
2. Mobile internet and digital financial services are the most impactful ICT tools.
3. Digital literacy acts as a mediating factor between ICT access and empowerment outcomes.
4. Civic participation through e-governance platforms is emerging but remains underutilized.
5. Challenges include lack of infrastructure, gender norms, and digital illiteracy.

## Suggestions

1. Expand broadband infrastructure and mobile networks in rural regions.
2. Implement customized digital literacy programs for women in vernacular languages.
3. Increase women-centric content and services on ICT platforms.
4. Integrate ICT training into self-help groups and government skill schemes.
5. Encourage public-private partnerships to fund rural ICT access and innovation.

## Conclusion

ICT plays a transformative role in empowering rural women across economic, social, and political dimensions. While access and usage are growing, challenges related to infrastructure and digital awareness remain. A comprehensive policy framework focusing on digital inclusiveness, education, and content localization is essential to bridge the gendered digital divide and ensure holistic rural development.

## References


1) *UNESCO. (2015). Gender and ICTs.*
2) *Agarwal, M., & Kumar, A. (2017). "Empowering Rural Women through Mobile Technology in India." IJEIT.*
3) *Chib, A., & Chen, V. (2011). "Midwives with Mobiles: ICTs and Maternal Health in Rural Indonesia." Media Asia.*
4) *Sarkar, S. (2019). "Digital Literacy and Rural Women." Journal of Rural Studies.*
5) *Dewan, S., & Riggins, F. J. (2005). "The Digital Divide: Current and Future Research Directions." JIT.*
6) *Patil, D., & Khandare, P. (2018). "Impact of ICT Training on Rural Women's Empowerment." IJMER.*
7) *Heeks, R., & Molla, A. (2009). "Digital Governance and Women's Empowerment." Information Technology for Development.*
8) *Kumar, P., & Rani, S. (2020). "E-Governance and Women Empowerment." IJECR.*
9) *Meera, S. N., et al. (2004). "SMS Advisories for Women Farmers in India." Indian Research Journal of Extension Education.*
10) *Sharma, R., & Mathur, K. (2016). "Bridging the Digital Divide for Women in Rural India." International Journal of Digital Literacy.*