



Assessment of Digital Awareness and Challenges in Accessing Digital Services in Rural Communities

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Despite expanding mobile network coverage and smartphone penetration under India's Digital India programme, rural communities continue to face significant barriers in independently accessing digital public services. This study assesses digital awareness levels and identifies structural, technical, socio-cultural, economic, and psychological challenges in Hirmi village (Simga block, Balodabazar-Bhatapara district, Chhattisgarh). Using stratified random sampling, primary data were collected from 150 respondents (aged 18–70) through a structured Hindi questionnaire, supplemented by focus group discussions and key informant interviews. Results show a substantial gap between awareness and functional use: 74% were aware of the e-PDS portal but only 26% used it independently; similar disparities existed for PM-KISAN (61% awareness vs 15% independent use) and Bhuiyan land records (52% vs 11%). Only 44% had exclusive smartphone ownership, 48% could independently manage apps, and just 32% demonstrated basic OTP/PIN security competence. Major barriers included network instability (64.67%), language/interface issues (52%), limited device access especially for women (58.67%), affordability constraints, and fear of cyber fraud (68%). Targeted NSS digital literacy interventions produced measurable improvements (e.g., +37.33% in independent OTP validation). The findings underscore that infrastructure expansion alone is insufficient. Functional digital literacy, gender-equitable device access, simplified interfaces, and sustained community-level training are essential for meaningful rural digital inclusion.

Keywords: Digital awareness, rural digital divide, e-governance, functional digital literacy, Common Service Centres, Chhattisgarh, National Service Scheme

Introduction

The National Service Scheme (NSS), launched in 1969 on Mahatma Gandhi's birth centenary, integrates higher education with community service under the motto "Not Me But You." Its objectives include developing students' civic responsibility, applying academic knowledge to local problems, and mobilizing community participation. India's shift from paper-based rural administration to digital platforms (National e-Governance Plan, Digital India, JAM trinity, e-PDS, PM-KISAN, Bhuiyan, UPI, AePS) aims to reduce intermediaries, leakage, and transaction costs. However, last-mile functional access remains uneven. Many rural citizens are "technically connected" yet dependent on Common Service Centres (CSCs) or private intermediaries for even basic transactions, exposing them to fees, privacy risks, and exploitation.

Study Area and Context

Hirmi (Simga block, Balodabazar-Bhatapara district, central plains of Chhattisgarh) have approximately 5,139 residents in 1,072 households. The local economy combines smallholder farming/daily wage labour with employment linked to nearby cement plants. 4G coverage exists from multiple operators, and two CSCs operate in the village. Fixed broadband is largely limited to institutions. Seasonal power outages and network congestion are common. Device sharing within households is widespread, with primary control often resting with male members.

Objectives

1. Measure baseline digital awareness and operational competence across demographic groups.
2. Identify and categorize structural, technical, and environmental challenges to online service access.
3. Examine socio-cultural, economic, and gender-based barriers to device ownership and usage.
4. Evaluate the role of local public access points (CSCs).
5. Develop an action-oriented framework for future NSS digital literacy interventions.

Methodology

Sampling and Respondents

Stratified random sampling was applied across household income sources, landholding, and neighbourhood clusters. Inclusion criteria: age 18–70 years, permanent residents (>12 months), and a gender quota ensuring $\geq 45\%$ women. Final sample: $n = 150$ (male 54.67%, female 45.33%).

Data Collection

- Structured questionnaire (Hindi) covering socio-demographics, hardware access, service adoption frequency, and perceived barriers/security literacy.
- Three Focus Group Discussions (including women SHG and marginal farmers).
- Key Informant Interviews with CSC Village Level Entrepreneurs, Sarpanch, and teachers.
- Secondary sources: Census, TRAI, MeitY, and state digital portals.

Analysis

Descriptive statistics, Chi-square tests of independence, and multiple linear regression. Variables were operationalized into measurable indicators (device autonomy, transactional literacy, e-governance frequency, security literacy score). Ethical protocols included informed verbal consent and anonymity.

Results

Demographic Profile (n=150)

- Age: 18–35 (38.67%), 36–55 (41.33%), >55 (20%).
- Education: Non-literate (16%), primary (24%), secondary/higher secondary (42.67%), graduate/diploma (17.33%).
- Occupation: Marginal farming (34.67%), daily wage/agrarian labour (29.33%), industrial (21.33%), retail/services (14.67%).
- Smartphone custody: Exclusive ownership (44%), shared domestic (38.67%), none (17.33%).

Exclusive ownership was concentrated among younger males and industrial workers; women, elderly, and daily-wage households showed higher rates of shared or zero access.

Digital Awareness vs Functional Use

Basic voice functions were manageable for 82.67% of respondents, but independent app download/configuration was possible for only 48%.

Portal awareness versus independent use:

- e-PDS: 74% aware, 26% independent.
- PM-KISAN: 61% aware, 15% independent.

- Bhuiyan land records: 52% aware, 11% independent.
- Security literacy was low: only 32% correctly understood OTP purpose/secure PIN practices; 58.67% reported sharing PINs; 71.33% could not identify common scam indicators.

Service Access Frequency

UPI payments showed the highest everyday adoption (28% daily, 22.67% monthly). e-PDS biometric verification was used monthly by 81.33% (driven by ration linkage). Land records and Agmarknet were mostly seasonal or unused. Telemedicine remained largely unutilized (77.33% never used).

Table 6.2: Service Access Frequency and Independent Adoption Rates (n=150)

Service Classification Category	Daily Access Count	Monthly Access Count	Seasonal / Rare Access	Zero Documented Use
Instant UPI Mobile Payments	42 (28.00%)	34 (22.67%)	18 (12.00%)	56 (37.33%)
e-PDS Biometric Verification	0 (0.00%)	122 (81.33%)	14 (9.33%)	14 (9.33%)
Land Registry (Bhuiyan)	0 (0.00%)	8 (5.33%)	78 (52.00%)	64 (42.67%)
Agri Informatics (Agmarknet)	4 (2.67%)	12 (8.00%)	36 (24.00%)	98 (65.33%)
Online Health / Telemedicine	0 (0.00%)	6 (4.00%)	28 (18.67%)	116 (77.33%)

Key Barriers

- Infrastructural: Network fluctuations/slowdowns (64.67%); power outages disrupting towers and CSC terminals.
- Capability: Language/interface barriers (52%); complex English terms even in Hindi modes.
- Access: Limited independent phone access for women and elderly (58.67% shared-device constraint).
- Economic: Data plan treated as non-essential by 41.33% of low-income households; kiosk convenience fees (₹20–50).
- Psychological: Fear of cyber fraud or irreversible errors (68%).

Impact of NSS Interventions

Pre-/post-campaign comparison showed clear gains: independent OTP validation rose from 32% to 69.33% (+37.33%); independent app management from 48% to 65.33% (+17.33%).

Table 6.3: Post-Intervention Shift in User Competency and Safety Habits (n=150)

Measured Competency Dimension	Pre-Campaign Baseline Count	Post-Campaign Observed Count	Absolute Percentage Shift
Independent OTP Validation	48 (32.00%)	104 (69.33%)	+37.33%
Independent App Installation	72 (48.00%)	98 (65.33%)	+17.33%
Verification of Phishing Links	43 (28.67%)	86 (57.33%)	+28.66%
Direct E-Gov Portal Access	24 (16.00%)	52 (34.67%)	+18.67%

Discussion

The results confirm a multi-dimensional digital divide extending beyond physical access (van Dijk, 2006; Warschauer, 2003). High awareness of mandatory services (e-PDS) does not translate into independent capability. Gendered device control, language barriers, network unreliability, and fear of fraud sustain dependence on intermediaries—precisely the vulnerability Digital India seeks to eliminate.

CSCs play a vital bridging role but face capacity and connectivity constraints. Economic seasonality (lean agricultural months) further interrupts continuous connectivity. NSS-style localized, practical training produced measurable short-term gains, suggesting that community-embedded, continuous support is more effective than one-off national campaigns for sustained functional literacy.

Conclusions and Recommendations

Rural digital inclusion requires simultaneous attention to infrastructure reliability, interface design (true vernacular simplicity), gender-equitable device access, cybersecurity education, and sustained last-mile facilitation.

Practical recommendations for policy and future NSS cohorts:

- Village-level digital literacy modules focused on OTP safety, UPI, and key portals, delivered through women's groups and youth volunteers.
- Strengthening CSC capacity and monitoring of service fees.
- Simplified, fully Hindi (or local-language) interfaces with voice guidance.
- Community digital assistance desks during peak agricultural/welfare seasons.
- Integration of digital safety into regular NSS activities.

This study provides a diagnostic baseline for Hirmi and similar transitional villages. Scaling participatory, NSS-linked interventions can convert passive awareness into functional agency and reduce vulnerability to digital exclusion and fraud.



Fig. Interacting with local people

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