Revisiting the Digital Divide: Mobile Technology and the Economic Empowerment of Rural Women in Sindhupalchowk, Nepal

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Abstract

This paper examines the complex relationship between digital divides and economic empowerment among rural women in Sindhupalchowk, Nepal. Using a mixed-methods approach, the study integrates survey data, in-depth interviews, and ethnographic observations with twenty-five rural women to explore how mobile phone usage mediates women's access to information, financial services, and market participation. Findings demonstrate that while mobile phones have increased women's communication autonomy, access to financial transactions, and engagement in income-generating activities, deep-rooted structural inequalities, patriarchal norms, digital illiteracy, and infrastructural limitations, continue to restrict full empowerment. Drawing on Kabeer's (2005) resources-agency-achievements framework and Sen's (1999) capability approach, this paper argues that empowerment must be understood as a socially embedded process rather than a technological outcome. The study concludes with policy recommendations emphasizing gender-sensitive digital inclusion strategies, literacy programs, and community-based empowerment initiatives to advance equitable participation in Nepal's digital transformation.

Keywords

Digital divide, Gender inequality, Economic empowerment, Mobile technology, Rural women.

7

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1. Introduction

Across the developing world, digital technologies are reshaping the contours of social and economic life. Yet, access to these technologies remains profoundly unequal, reinforcing pre-existing hierarchies of class, gender, and geography. In Nepal, mobile phone ownership stands at 81% among men but only 65% among women (Nepal Telecommunication Authority, 2024). These disparities illuminate how the promise of digital inclusion is mediated by persistent patriarchal structures and resource inequalities.

Sindhupalchowk District, located northeast of Kathmandu, provides an especially relevant setting for exploring this issue. The district, predominantly rural and economically marginalized, records a poverty rate of approximately 25.2% (Nepal Central Bureau of Statistics, 2023). For women, access to resources, education, and technology remains particularly constrained. However, the expansion of mobile connectivity has opened new possibilities for communication, entrepreneurship, and financial participation.

This research tries to find out the answers of following two interrelated questions:

1. How does mobile phone usage affect the economic empowerment of rural women in Sindhupalchowk?
2. What social and structural barriers constrain women's ability to use mobile technology for economic advancement?

The study contributes to sociological debates on gender and technology by situating digital inequality within broader social relations of power. It challenges the techno-deterministic view that access to devices automatically leads to empowerment, arguing instead that meaningful inclusion depends on agency, social capital, and supportive institutional structures.

2.   Literature Review

2·1   Theoretical Perspectives

The concept of the 'digital divide' has evolved from a simple binary of access to a multidimensional framework encompassing disparities in motivation, material access, digital skills, and usage outcomes (Van Dijk, 2006). Within this schema, women's exclusion often reflects intersecting inequalities of gender, class, and geography.

Sen's (1999) Capability Approach provides a foundational lens for understanding empowerment as the expansion of substantive freedoms. In the context of digital access, mobile phones become "conversion factors" that may enhance individuals' capabilities, such as communication, mobility, and decision-making, depending on their social environment.

Kabeer's (2005) resources-agency-achievements framework further refines this perspective. Empowerment is not simply the acquisition of resources but the process by which individuals convert those resources into agency and achievements. In patriarchal contexts like rural Nepal, women's agency is mediated by family norms and social expectations.

Social Capital Theory (Putnam, 2000) adds another dimension, emphasizing how social networks influence access to information and opportunities. For rural women, mobile phones serve both as bridges to new social networks and as reinforcers of existing hierarchies when mediated through male-controlled communication channels.

Together, these frameworks provide an integrated theoretical base to analyze how digital technologies can both enable and constrain women's empowerment within specific socio-cultural structures.

2·2   Global and Regional Contexts

Globally, 52% of women remain offline compared with 42% of men (International Telecommunication Union [ITU], 2023). In low- and middle-income countries, the gender gap in mobile internet use stands at 23% (GSMA, 2023). These divides are shaped by intersecting barriers: affordability, digital literacy, safety concerns, and restrictive gender norms.

In South Asia, women's mobile ownership is closely tied to household income and male approval (Hafkin & Huyer, 2007). Studies in India and Bangladesh reveal that cultural perceptions of women's

morality and honour often determine whether they can possess or freely use mobile phones (Agarwal, 2018). Consequently, even where devices are available, usage patterns remain highly gendered.

In Nepal, despite near-universal mobile coverage, digital inclusion remains uneven. The Nepal Telecommunication Authority (2024) reports that women in rural areas are significantly less likely to own smartphones or use mobile banking services than men. Structural barriers, including limited literacy, poverty, and socio-cultural control, perpetuate digital marginalization.

2·3   Mobile Technology and Women's Empowerment

Empirical research highlights both the transformative and constrained potential of mobile technology. In Kenya, M-Pesa mobile banking has facilitated financial inclusion and increased women's bargaining power within households (Morawczynski, 2017). Similar outcomes are observed in India, where mobile microfinance initiatives support female entrepreneurship (Kumar & Kumar, 2017).

In Nepal, mobile-based interventions have enhanced agricultural productivity and facilitated market participation (Shrestha & Karki, 2021). Yet, gender norms continue to limit women's independent control over digital tools. Studies show that women frequently rely on male intermediaries to operate mobile devices or interpret digital information (Adhikari *et al*., 2022).

These findings suggest that technology can serve as both an instrument of empowerment and a medium through which existing inequalities are reproduced. Recent South Asian scholarship further highlights how digital access intersects with local cultural understandings of gender. In many rural regions of Nepal, women's social reputation is closely tied to modesty, immobility, and limited interaction beyond kin networks. Mobile phones, by enabling communication beyond immediate kinship circles, are often framed as potentially "disruptive" to established gender norms. Community leaders and elder family members sometimes express concerns that "mobile phones lead women astray", linking digital access with fears of romantic autonomy, social independence, or resistance to domestic expectations. Similar narratives have been documented in Uttar Pradesh in India (Agarwal, 2018) and rural Bangladesh (Hafkin & Huyer, 2007), suggesting a regional pattern in which technology becomes symbolically associated with women's moral character and social respectability.

At the same time, feminist technology studies emphasize that digital tools can also serve as subtle means of renegotiating autonomy and self-expression. For younger rural women in particular, mobile phones do not only function as economic instruments but as spaces to articulate identity, maintain emotional relationships, and seek peer support. This dual role of technology, both contested and enabling, creates a dynamic field in which empowerment unfolds not as a direct outcome of access, but as a negotiated, incremental, and socially situated process.

2·4 Research Gaps

Despite a growing body of literature, significant gaps remain. Few studies have systematically examined how rural Nepali women navigate digital access within the constraints of patriarchy, poverty, and low literacy. Moreover, there is limited integration of qualitative perspectives capturing women's lived experiences of empowerment through technology. This study seeks to fill that gap by employing a mixed-methods design to analyze both measurable outcomes and interpretive meanings of mobile phone use.

2·5 Application of Theoretical Framework to Rural Nepal

The theoretical frameworks discussed above are deeply relevant to the social realities of rural Nepal. In Sindhupalchowk, mobile phones can be understood as resources within Kabeer's (2005) model, offering women new channels of communication, information access, and participation in small-scale commerce. However, whether these resources translate into agency depends strongly on household decision-making structures and gender norms. For example, even when women possess mobile phones, their autonomy to use mobile banking or social media is often conditioned upon the approval of husbands, in-laws, or community expectations regarding appropriate female behaviour.

Similarly, Sen's (1999) Capabilities Approach is reflected in how mobile phones expand potential freedoms, such as the freedom to make economic choices, negotiate prices, or seek external assistance. Yet, these freedoms are not uniformly realized. Limited literacy, fear of social judgment, and concerns about moral reputation restrict women's capacity to convert technological resources into meaningful capabilities. Thus, empowerment remains contingent upon wider social support and recognition.

The role of social capital is also particularly crucial. Mobile phones create new horizontal networks among rural women, for instance, cooperative chat groups, mutual aid information sharing, or informal business advertising through Facebook and TikTok marketplaces. However, vertical inequalities persist: access to these networks still favors women who are younger, literate, or socially outgoing. Therefore, the transformative potential of mobile technology must be understood not as universally accessible, but as mediated by layered social hierarchies in rural Nepal.
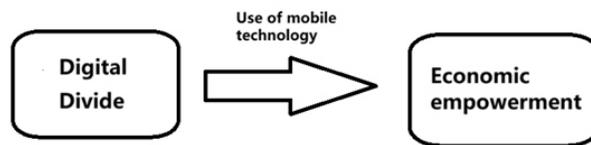
Fig.-1: Digital divide and its Economic empowerment

3.   Methodology

3·1   Research Design and Rationale

A mixed-methods approach was employed to triangulate quantitative and qualitative data. Quantitative surveys captured demographic and behavioral patterns, while qualitative interviews and ethnographic observations revealed subjective experiences, constraints, and adaptive strategies. This design enabled a holistic understanding of empowerment as both a material and relational process.

3·2   Study Site and Sampling

The research was conducted in Sindhupalchowk District, characterized by dispersed rural settlements and limited infrastructure. Twenty-five women were selected using purposive sampling to ensure diversity in age, education, occupation, and marital status. The majority were subsistence farmers or engaged in small-scale trade. Moreover, the decision to include twenty-five participants is justified based on the principle of qualitative saturation, wherein additional interviews yield diminishing new conceptual insights. The sample reflects diversity in age, economic roles, and education, allowing the study to capture multiple forms of digital engagement. While not statistically representative, the sample is analytically robust for revealing patterns of empowerment and constraint within the broader cultural context of rural Nepal.

3·3 Data Collection

Data collection took place over three months in 2023. Four primary methods were used:

1. Structured surveys to quantify ownership, usage frequency, and purposes.

2. Semi-structured interviews to explore experiences of empowerment and constraints.

3. Participant observation in households and local cooperatives to observe real-life usage.

4. Key informant interviews with local leaders, NGO staff, and telecommunication agents to contextualize institutional influences.

The semi-structured interview guide focused on five thematic domains: (1) the circumstances under which participants first accessed mobile phones, (2) the role of family members in enabling or restricting phone use, (3) emotional and psychological experiences associated with digital communication, (4) specific practices of using mobile phones for economic transactions, and (5) perceived changes in social status or household bargaining power. Participant observation included daily household routines, cooperative meetings, and weekly market exchanges, allowing the researcher to observe real-time interactions involving mobile phone negotiation, instruction, and supervision. These combined methods provided not only descriptive data but also insight into the contextual meaning of empowerment.

3·4 Data Analysis

Quantitative data were analyzed descriptively using frequency distributions and cross-tabulations. Qualitative transcripts were coded thematically using grounded theory principles. Three major themes emerged: (1) economic opportunity through mobile use, (2) barriers to digital inclusion, and (3) transformation of gendered roles.

3·5 Ethical Considerations

Informed consent was obtained verbally and in writing. Pseudonyms protected participants' identities. Cultural sensitivity was maintained throughout, especially regarding gender norms and privacy in technology use.

4. Findings

Table-1: Survey Responses on Women's Empowerment and Mobile Phone Usage   (n = 25)

Survey Item	Yes/Agree (n)	No/Disagree (n)
Q1: Women's empowerment is necessary	15	10
Q2: Empowerment leads to social change	21	4
Q3: Economic empowerment is distinct from social empowerment	16	9
Q4: Education is essential for empowerment	20	5
Q5: NGOs play a role in empowerment	18	7
Q6: Men dominate household decision- making	19	6
Q7: Women have access to family income	8	17
Q8: Socio-cultural norms influence empowerment	14	11
Q9: Patriarchal society limits women's opportunities	16	9
Q10: Economic empowerment is overstated by media	6	19
Q11: Women use mobile phones regularly	23	2
Q12: Mobile phones provide practical benefits	21	4
Q13: Mobile phones support development	19	6
Q14: Women experience digital suppression or restrictions	18	7
Q15: Mobile phone impact is mostly positive	20	5
Q16: Private sector telecom performs better than government	7	18
Q17: Satisfaction with government digital efforts	8	17

Source: Field survey, Sindhupalchowk, 2023.

4·1 Ownership and Usage Patterns

Among the 25 participants, 17 owned a mobile phone, eight of which were smartphones. Ownership correlated with education and age; younger and literate women were more likely to own and operate smartphones. Most used phones for calls and messaging, while a smaller subset engaged in mobile banking, market coordination, and social media-based selling.

4·2 Economic Engagement

Mobile banking adoption was reported by 60% of participants, primarily using eSewa and IME Pay. These tools enabled women to receive remittances, pay bills, and save money without male intermediaries. For instance, one participant stated,"Now I can save money myself and decide how to use it".

For example, a 34-year-old participant who sells homemade pickles began using Facebook Messenger and local women's cooperative chat groups to advertise her products. Initially, her husband questioned the necessity of "talking to outsiders", but after observing the increase in household income, he began assisting with delivery logistics. The participant emphasized that mobile communication did not merely expand her customer base; it also enabled her to renegotiate her role in household decision-making.

Another participant, aged 27, uses eSewa to receive remittances from her husband working abroad. Previously, her mother-in-law controlled remittance withdrawals, but mobile banking allowed her to manage savings directly. She described this shift as *"the first time I felt I could decide something important by myself"*.

Women also utilized mobile phones to obtain agricultural information through SMS updates and community groups. Co-operative-led chat groups facilitated collective marketing, improving price negotiation. Six women used social media platforms to advertise homemade products, generating modest but meaningful income.

4·3 Barriers to Digital Empowerment

Despite these gains, multiple obstacles persisted:

- Patriarchal restrictions limited women's ownership and usage freedom; several participants required husbands' permission to buy or use smartphones.
- Digital illiteracy prevented full use of advanced features.
- Economic constraints, high data costs and unreliable power supply, restricted consistent access.
- Social stigma associated with women's smartphone use perpetuated surveillance and moral judgment.

Beyond infrastructural limitations, social judgment emerged as one of the most significant barriers. Several participants described being criticized by neighbors or relatives for "using the phone too much", which was interpreted as neglecting household duties or

violating expectations of female modesty. Phone use in public spaces, such as marketplaces or tea houses with Wi-Fi access, was particularly stigmatized. One participant reported: *"If a woman is seen using her phone outside, people will say she is talking to some other man"*. The fear of reputational damage leads many women to restrict phone usage to private spaces, limiting potential for entrepreneurship and cooperative networking.

Notably, married women faced more surveillance than unmarried girls, who were often encouraged to use phones for educational purposes. This paradox suggests that digital restriction is not solely about gender but also linked to marital identity and household honor. The phone becomes a symbolic site where women's expected social roles are reinforced.

4·4   Shifts in Gendered Power Relations

Incremental empowerment was evident. Women reported increased autonomy in communication, participation in financial decisions, and greater confidence in negotiating with traders. Younger women, in particular, exhibited more assertive digital behavior and aspirations for self-employment. However, empowerment remained conditional, dependent on male tolerance, infrastructural availability, and social context.In several cases, women described gaining bargaining power through demonstrating economic contribution. For example, a participant involved in TikTok-based informal product advertising stated that when she began generating enough income to pay for children's clothing and school materials, household discussions shifted. Her husband, initially opposed to her use of social media, began asking for her help in digital payments. This shift reflects not only economic negotiation but an emerging recognition of women's competence. Such incremental changes suggest that empowerment is relational: women's digital participation alters household power not through confrontation but through accumulated evidence of practical value.

4·5   Negotiating Power within Household Decision-making

Empowerment in Sindhupalchowk is not a sudden outcome but a gradual process negotiated within household relationships. The decision to purchase a smartphone is often influenced by husbands or sons, reinforcing initial dependency. However, as women increasingly demonstrate economic contribution through mobile-enabled activities, such as managing remittances or generating small business income, their bargaining power in household decisions

shifts. This shift is often subtle rather than confrontational; women described using persuasion, demonstrated responsibility, and shared benefit framing to negotiate digital autonomy. The household thus becomes a critical arena where digital empowerment is both enabled and contested.

4·6   In-depth Interview Narratives

To deepen the understanding of how mobile phone usage shapes women's everyday economic and social practices, extended interview-based life histories were collected in the study area. These narratives highlight the intersections between migration, gendered labour shifts, and the use of digital tools for coordination and livelihood management.

Interview 1—Ratna Thapa (52), Sindhupalchok, October 9: Ratna Thapa has been responsible for managing agricultural production since her husband migrated to Haldwani, India, to work as a seasonal miner. According to government estimates, approximately 2.2 million Nepalese men currently work abroad, leaving women to assume agricultural and financial responsibilities at home. *"Since my husband works in India now, I am responsible for harvesting all our crops", Ratna explained.*

Although physical separation increases her workload, mobile phones have become essential for maintaining emotional connection and coordinating household management. *"Even though most of our conversations are phone-based, when he comes home with tons of goods and merchandise, seeing my kids rejoice is priceless".*

Mobile phones also assist Ratna in managing land-rental agreements. Over the past six months, she has cultivated only part of her land and leased approximately 1,700 square meters to poorer, low-caste farmers. Regular communication through mobile phones allows her to monitor cultivation progress and receive monthly rental payments. *"My daily livelihood with my children runs because of this small technology",* she stated, emphasizing that mobile communication has become central to both family continuity and local agricultural cooperation.

This interview reflects broader rural labour transitions. As men migrate, women increasingly assume land management roles, and mobile phones become instrumental in enabling coordination and financial decision-making within rural households.

Interview 2—Subrita (28), Sindhupalchok, October 20: Another participant, Subrita, organizes a small-scale meal production

and delivery network known locally as tiffin. *"Mobile phone has helped me a lot, not just with me-I have 20 women working under me"*, she explained. Her group prepares lunch boxes for agricultural workers who lack time or resources to cook while working in the fields. All orders, scheduling, and deliveries are coordinated through mobile phones, allowing flexible and reliable organization across dispersed settlements.

She emphasized that independent phone ownership among the women involved is essential. Each member uses mobile communication to receive orders, plan daily responsibilities, and coordinate transportation of food. This structure has created a network of mutual support and shared economic responsibility rooted in everyday digital communication.

A similar model appears in a sewing business run by a 67-year-old widow who employs 15 women living across different mountain slopes. Due to difficult terrain and long walking distances, face-to-face meetings are infrequent. Mobile phones allow coordination of orders, production timelines, and distribution logistics. *"After the death of my husband, it was very hard to live. There were no sources of income"*, she explained. *"My daughter gave me the idea of using mobile phones, and slowly the other women understood that phones are not just to contact family but to see different possibilities"*.

Both cases demonstrate how mobile phones function as organizational infrastructure for women-led micro-enterprises. These networks expand income opportunities, build collective skills, and reduce isolation among women in geographically dispersed communities.
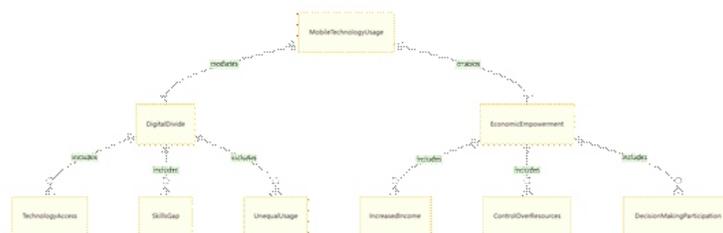

Fig.-2: Conceptual Framework

5. Discussion

Comparative evidence from South Asia further contextualizes these findings. In India, women's phone usage is frequently policed as

a matter of family honor, with community surveillance mechanisms reinforcing male guardianship. In Bangladesh, mobile technology has been widely incorporated into microfinance systems, enabling women to form digital lending groups and informal market networks. Compared to these contexts, rural Nepal represents a transitional stage: mobile access is relatively widespread, but women's autonomous usage still depends on household negotiation and community acceptance. Thus, empowerment is shaped less by the device itself and more by the socio-cultural landscape in which the device is embedded. This study's findings reveal that mobile phones act as both catalysts and constraints within the process of women's empowerment.

From Kabeer's perspective, access to mobile phones constitutes a new form of resource, but the translation into agency depends on women's capacity to make decisions and control their own usage. In Sindhupalchowk, this agency was partial: women used mobile phones to perform economic functions, yet often within the boundaries of male supervision.

Applying Sen's (1999) capability lens, mobile phones enhanced certain freedoms, communication, information access, and financial participation, but these freedoms remained limited by illiteracy and social norms. Technology alone did not create empowerment; rather, it expanded potential capabilities contingent upon structural supports.

The findings also align with social capital theory. Mobile connectivity strengthened horizontal ties among women, facilitating mutual aid, information exchange, and solidarity networks, but vertical inequalities persisted. Access to digital networks remained mediated by class and education.

In sum, digital inclusion in rural Nepal embodies a paradoxical dynamic: it fosters micro-level empowerment while coexisting with macro-level structural subordination.

6. Conclusion

The study concludes that mobile phones play a pivotal but incomplete role in empowering rural Nepali women. They have improved communication autonomy, enabled financial participation, and facilitated entrepreneurial initiatives. However, the digital divide remains deeply gendered, reflecting the interplay between poverty, patriarchy, and technology. Unlike prior studies that treat technology as a neutral instrument, this study shows that empowerment is negotiated through household power relations and social reputation, not simply through device ownership.

6·1 Key Insights

- Empowerment is relational: Ownership alone does not equal power; agency is socially negotiated.
- Digital literacy is essential: Without skills, access translates into dependence.
- Structural reforms are required: Infrastructure, education, and social attitudes must evolve simultaneously.

6·2 Policy Recommendations

- Develop gender-sensitive ICT programs focusing on rural literacy and financial inclusion.
- Subsidize mobile data and expand rural network coverage.
- Integrate women's digital cooperatives within agricultural and microfinance systems.
- Foster public-NGO partnerships for localized digital training initiatives.

In addition to national-scale digital inclusion efforts, community-based training programs play a crucial role. Evidence from local cooperatives in Sindhupalchowk suggests that women learn digital skills most effectively in supportive peer-group environments rather than formal instructional settings. Establishing "Women's Digital Circles" in ward-level cooperatives, where women collectively practice using mobile banking, online marketplaces, and government service apps, would help normalize female digital participation and reduce stigma.

Furthermore, literacy and empowerment initiatives should involve men and elders rather than targeting only women. Patriarchal resistance is more likely to soften when husbands and mothers-in-law understand the household-level benefits of women's digital engagement. Programs that frame women's mobile use as a contribution to family welfare, rather than individual autonomy, have greater community acceptance. Therefore, digital empowerment strategies should focus on reshaping social attitudes alongside skill-building.

6.3 Future Research

Further longitudinal research is needed to trace how sustained digital engagement influences household power relations and intergenerational mobility. Comparative studies across districts could deepen understanding of regional variation in digital gender dynamics.

Ultimately, empowerment in the digital age must be understood not as an outcome of technology, but as an evolving social process, negotiated between access, agency, and structure.

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