

Digital Welfare Gaps and the Social Work Imperative: A Conceptual Framework for Bridging the Digital Divide Among Marginalised Urban Communities in Coimbatore, Tamil Nadu

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ABSTRACT

India's digital governance revolution, anchored in initiatives such as Digital India, Aadhaar-linked direct benefit transfers, and e-Shram, has fundamentally altered the landscape of welfare delivery. In rapidly industrialising cities like Coimbatore, Tamil Nadu, this transformation is particularly visible: the city's textile and garment manufacturing sectors, home to thousands of informal and migrant workers, are increasingly expected to access welfare entitlements, labour protections, and public services through digital platforms for which many remain structurally unprepared. This paper is a conceptual study that critically examines the phenomenon of Digital Welfare Gaps (DWGs), defined as the structural discontinuities between policy-level digital mandates and the lived welfare realisation of marginalised citizens, through the lens of Social Work theory and practice. Drawing on secondary sources including census data, NSO/PLFS labour force surveys, Tamil Nadu government welfare digitisation reports, and published social work scholarship, the paper argues that digital exclusion in urban Coimbatore is not merely a technological deficit but a multidimensional social condition shaped by caste, class, gender, language, and occupational precarity. Theoretically, the study is anchored in Sen's Capability Approach, Social Exclusion Theory, and Structural Social Work (Mullaly & Dupré, 2018), all of which illuminate why market-driven digitisation, without deliberate equity interventions, reproduces and deepens existing social stratification. The paper introduces the Community-Centred Digital Inclusion Framework (CDIF), an original conceptual tool that positions social workers in Coimbatore's urban slums, garment worker hostels, and community service centres as Digital Welfare Navigators operating at micro, mezzo, and macro levels of practice. The paper concludes with context-specific policy recommendations tailored to the Coimbatore Municipal Corporation, Tamil Nadu's welfare administration infrastructure, and the University Grants Commission's social work curriculum mandates. It makes an original theoretical contribution by contextualising global digital divide discourse within a South Indian industrial city, offering a replicable model for similar Tier-2 manufacturing hubs across India.

Keywords: Digital Welfare Gaps, Digital Divide, Social Work, CDIF, Coimbatore, Informal Workers, Digital Inclusion, Tamil Nadu, Structural Social Work, Capability Approach.

Introduction

Coimbatore, known as the "Manchester of South India", is one of Tamil Nadu's most industrially significant cities, hosting over 25,000 textile and garment manufacturing units that together employ an estimated 4.5 lakh workers, a substantial proportion of whom are women migrants from districts such as Tirunelveli, Dindigul, and Virudhunagar (NSO, 2019; Tamil Nadu Textile Policy, 2023). This workforce, residing in densely populated urban slums, worker colonies, and hostel accommodations across areas

such as Peelamedu, Singanallur, Gandhipuram, and Kovaipudur, exists at the intersection of multiple axes of vulnerability: economic precarity, linguistic disadvantage (many are non-Tamil-speaking migrants from other states), low formal education, and digital illiteracy.

The past decade has seen Tamil Nadu's welfare administration undergo aggressive digital reform. Schemes such as the Tamil Nadu Public Distribution System (e-PDS), the Kalaingar Magalir Urimai Thittam (women's financial entitlement scheme), the Chief Minister's Health Insurance Scheme (Makkalai Thedi Maruthuvam), and the e-Shram unorganised worker portal all now require digital registration, Aadhaar authentication, and mobile-linked bank accounts for benefit disbursement. For millions of workers in Coimbatore's informal economy, these requirements are not merely inconvenient; they constitute barriers of exclusion that deny access to rights the Constitution guarantees.

Social Work as a profession and discipline is uniquely positioned to respond to this challenge. Grounded in values of social justice, human dignity, and community empowerment, and operating directly within the communities most affected, social workers in Coimbatore serve as frontline practitioners in NGOs, Community Development Societies (CDS), Urban Local Body welfare programmes, and university field action projects. Yet the digital dimension of welfare deprivation has not been systematically theorised or integrated into social work practice frameworks in this context.

This conceptual paper addresses that gap. It does not present primary empirical data; rather, it draws on published secondary evidence and theoretical synthesis to construct an original conceptual framework, the Community-Centred Digital Inclusion Framework (CDIF), and to articulate the concept of Digital Welfare Gaps as an analytical tool for social work research and practice in Coimbatore and comparable industrial cities across South India.

Coimbatore as a Study Context: Digital Development and Social Fragmentation

- **Industrial Profile and Workforce Composition**

Coimbatore's economy is anchored in textiles, engineering goods, and small-to-medium manufacturing enterprises (SMEs). The Coimbatore Corporation limits (expanded in 2022 to include 38 additional village panchayats) now encompass a population of approximately 35 lakh residents, with the urban agglomeration accounting for over 21 lakh. The city's informal workforce, comprising garment stitchers, power-loom operators, dyeing unit workers, construction labourers, and domestic workers, constitutes an estimated 58–62% of total employment (PLFS, 2021–22 Tamil Nadu State Report).

A significant feature of Coimbatore's labour geography is female migration. Women from southern Tamil Nadu districts constitute the majority of garment sector workers, typically housed in factory-run or private hostels with limited civic infrastructure, restricted mobility, and minimal connection to local welfare administration networks. For this demographic group, digital welfare access is constrained not only by literacy deficits but also by physical and institutional isolation.

- **Digital Infrastructure: Access Without Inclusion**

Tamil Nadu ranks among India's top five states in broadband penetration, and Coimbatore city records relatively high smartphone ownership rates compared to rural Tamil Nadu (TRAI, 2023). Yet ownership does not equate to functional digital inclusion. A review of the Tamil Nadu State Digital Equity Report (2022) and the National Digital Literacy Mission (NDLM) implementation data reveals that in urban low-income wards of Coimbatore, particularly Wards 40–55 covering the densely populated Ganapathy-Saravanampatti and Singanallur-Ramanathapuram corridors, only 34% of adult residents demonstrate the functional digital literacy required to independently complete a welfare scheme registration online.

More critically, Tamil-language digital interfaces remain inconsistently developed across welfare portals. While the Tamil Nadu government has mandated Tamil UI for state-level platforms, Central government welfare portals (e-Shram, PM SVANidhi, PM Garib Kalyan) remain primarily Hindi-English in their navigation architecture, systematically disadvantaging Tamil-speaking users and non-literate applicants who rely on text-based navigation.

- **Welfare Digitisation and Emerging Exclusion Corridors** Three specific welfare digitisation developments in Tamil Nadu are creating what this paper terms Exclusion Corridors in Coimbatore:

First, the Aadhaar-PDS seeding mandate has resulted in exclusions among workers whose biometric data, particularly fingerprints worn by textile machine operators, fail to authenticate reliably. Anecdotal evidence from Coimbatore NGOs working with garment workers documents consistent ration card suspension due to biometric authentication failure (Shanmugam, 2026).

Second, the Kalaigarnar Magalir Urimai Thittam (Rs. 1,000 monthly entitlement for women heads of households) requires Jan Dhan account linkage, Aadhaar seeding, and mobile OTP verification, a three-step digital process that many migrant women workers in Coimbatore hostels cannot complete independently due to non-local mobile numbers, absent Aadhaar updates, and restricted access to personal smartphones.

Third, the e-Shram portal, designed to register India's 38 crore unorganised workers, has faced documented low penetration in Coimbatore's textile sector despite the city's significant informal workforce, with registration rates estimated at below 20% among hostel-resident garment workers (Labour Welfare and Skill Development Department, 2023).

. Review of Literature

• The Evolving Concept of the Digital Divide

The concept of the digital divide has undergone significant theoretical evolution since its initial framing as a binary access gap (NTIA, 1999). Van Deursen and Van Dijk (2019) distinguish between first-level (physical access), second-level (skills and usage), and third-level (tangible outcome) divides, a typology that is particularly relevant to the Coimbatore context, where first-level access is rapidly improving even as second- and third-level gaps persist. Ragnedda (2017) further extends this framework by linking digital inequality to broader social stratification processes, arguing that digital access tends to reproduce and amplify pre-existing class, race, and gender hierarchies.

In the Indian context, Kamath (2024) documents how caste-based social capital mediates digital adoption among Scheduled Caste and Scheduled Tribe populations in peri-urban Tamil Nadu, while Sonne L (2024) demonstrate how gender-based restrictions on device ownership and usage independently create digital exclusion irrespective of household-level access. These studies collectively suggest that technical solutions alone, distributing devices or increasing bandwidth, are insufficient to achieve meaningful digital inclusion.

• Digital Social Work and the Welfare State

Social work scholarship has increasingly engaged with the digitisation of welfare systems. Hämäläinen and Lindh (2026) argue that the profession faces a dual imperative: to adapt its own practice to digital environments while simultaneously advocating against the structural harms that digitised welfare delivery inflicts on vulnerable populations. This tension between professional adaptation and critical advocacy is directly relevant to social workers in Coimbatore, who must navigate both the practical realities of digital welfare delivery and their ethical obligations to ensure access for all clients.

López Peláez and Kirwan (2023) document emerging models of digital social work across Europe and Asia, identifying three dominant practitioner roles: facilitator (supporting digital access and literacy), advocate (challenging exclusionary digital systems), and guardian (protecting data rights and privacy). These roles align closely with the practice framework proposed in this paper, though the specific context of South Indian industrial cities adds important dimensions related to language, caste, migration, and labour rights.

Warschauer (2004) made the foundational argument that digital inclusion requires not merely devices and connectivity but also content, language, literacy, and community, which he termed the "social embeddedness" of technology. This insight is central to the CDIF proposed in this paper: Coimbatore's digital welfare gaps cannot be closed by technology distribution alone but require the social infrastructure that trained social workers are uniquely equipped to provide.

• Social Work in Tamil Nadu: Existing Infrastructure

Tamil Nadu has a reasonably well-developed social work institutional infrastructure. The Coimbatore district alone hosts several University Social Work departments (including those affiliated to Bharathiar University), numerous NGOs with active community development programmes (SNEHA, Pranam Trust, Women's Development Corporation field units), and a network of Urban Community Development Societies (UCDS) operating under the Tamil Nadu Urban Poverty Alleviation Programme (TNUPAP). These institutional actors constitute the practice ecosystem within which the CDIF is

proposed to operate. However, as noted by Fullah (2025) within social work curricula in Tamil Nadu and broader Indian universities, digital literacy and digital rights have not been systematically integrated into professional training, leaving practitioners ill-equipped to address the digital dimensions of welfare deprivation.

Theoretical Framework

- **Sen's Capability Approach**

Amartya Sen's (1999) Capability Approach evaluates social arrangements not by the resources they distribute but by the real freedoms, or capabilities, they enable individuals to exercise. Applied to digital welfare, the Capability Approach reframes the problem: the question is not merely whether Coimbatore's garment workers have smartphones, but whether they have the substantive freedom to use digital platforms to access the welfare entitlements to which they are legally entitled. Digital welfare gaps, in this framework, constitute capability deprivations, structural limitations on workers' freedom to access education, healthcare, financial security, and civic participation through digital channels. Sen's distinction between functionings (actual achievements) and capabilities (real opportunities) is especially useful here: a worker may technically have Aadhaar linkage (functioning) yet lack the capability to use it independently for welfare access due to illiteracy, language barriers, or biometric failure.

- **Social Exclusion Theory**

Social Exclusion Theory (Room, 1995; Bhalla & Lapeyre, 1997; Silver, 2007) conceptualises poverty and marginalisation as multidimensional processes of relational disconnection from social, economic, cultural, and political participation, not merely as income shortfalls. Applied to the digital context, social exclusion theory explains why digital welfare gaps cannot be addressed through income support alone: they require active inclusion in the social relations through which digital participation is mediated. In Coimbatore's industrial wards, digital exclusion compounds existing social exclusions along the lines of caste (predominantly Dalit and OBC migrant workers), gender (female factory workers with restricted autonomy), language (non-Tamil migrants), and labour status (informal workers without formal employer support). Each axis of exclusion amplifies the others, creating what Levitas (2005) terms a "poverty of participation."

- **Structural Social Work**

Bob Mullaly's (2007) Structural Social Work provides the practice-level theoretical anchor for this paper's framework. Structural Social Work argues that social workers must understand and address the macro-level structural conditions, economic systems, state policies, and cultural norms that generate the micro-level problems experienced by clients, rather than treating individual difficulties as personal failures. Applied to digital welfare gaps in Coimbatore, this means that a social worker who merely helps a garment worker register on e-Shram without also challenging the structural inadequacy of Hindi-English portals, biometric authentication systems that disadvantage manual labourers, or hostel-based housing arrangements that deny personal device ownership is practising within an individualist paradigm that Structural Social Work explicitly critiques. The CDIF proposed in this paper operationalises the Structural Social Work imperative by distributing social work activity across micro (individual navigation support), mezzo (community capacity building), and macro (policy advocacy) levels simultaneously.

Original Conceptual Constructs

- **Digital Welfare Gaps (DWG): A Conceptual Definition**

This paper proposes Digital Welfare Gaps (DWGs) as an original conceptual construct for social work scholarship. DWGs are defined as: the structural discontinuities between the digital competency and infrastructure assumed by welfare policy mandates and the actual digital capability and access conditions of marginalised citizens, resulting in the systematic non-realisation of legally guaranteed welfare entitlements.

DWGs differ from the general digital divide concept in three important respects. First, they are specifically anchored in welfare entitlement; the gap is measured not by generic internet usage but by the failure to access specific legal rights. Second, they are structural in origin; DWGs arise from policy design choices (mandatory digital registration, Aadhaar authentication, OTP verification) that implicitly assume universal digital literacy, not merely from individual users' technical limitations. Third, they are socially mediated; the experience of DWGs is systematically differentiated by caste, gender, language, and labour status in ways that reproduce pre-existing inequalities.

Table 1: Typology of Digital Welfare Gaps in the Coimbatore Context

Type of DWG	Description	Affected Population	Example in Coimbatore
Literacy Gap	Inability to navigate welfare portals independently	Migrant women workers, elderly residents	e-Shram self-registration failure
Biometric Gap	Biometric authentication failure due to occupational wear	Textile machine operators	Aadhaar-PDS seeding rejection
Language Gap	Portals inaccessible in Tamil or local languages	Non-Tamil migrants, low-literacy users	PM SVANidhi registration barriers
Device Gap	No personal device ownership or restricted access	Hostel-resident garment workers	Kalaignar scheme OTP verification failure
Institutional Gap	Absence of trained support intermediaries	All marginalised groups	CSCs are understaffed; social workers are untrained

- **Community-Centred Digital Inclusion Framework (CDIF)**

The Community-Centred Digital Inclusion Framework (CDIF) is the second original contribution of this paper. The CDIF is a conceptual practice framework that positions social workers as central actors in bridging digital welfare gaps, operating simultaneously across micro, mezzo, and macro levels of intervention in alignment with Structural Social Work theory. It is "community-centred" in the sense that all activities are grounded in community-identified needs, culturally appropriate communication, and participatory methods, distinguishing it from top-down digital literacy programmes that often fail to address structural barriers.

Table 2: Community-Centred Digital Inclusion Framework (CDIF) - Coimbatore Application

Level	Social Worker Role	CDIF Activity	Coimbatore Partner
Micro	Digital Welfare Navigator	One-on-one welfare portal accompaniment; Aadhaar correction support; document facilitation	UCDS field workers, NGO outreach staff, social work students (field placement)
Mezzo	Community Digital Educator	Peer digital literacy circles in Tamil; hostel-based digital access camps; WhatsApp-based welfare alert networks	Bharathiar University SW Dept.; Pranam Trust; Women's Self-Help Group networks
Macro	Digital Rights Advocate	Policy submissions to Coimbatore Municipal Corporation; representation in District Collector's welfare review meetings; curriculum reform advocacy to UGC	TNSCB; District Welfare Office; NCSWB; Tamil Nadu Social Work Educators' Forum

A defining feature of the CDIF is its insistence on simultaneity: social workers do not first "fix" individual literacy deficits and then move to advocacy, but rather engage at all three levels concurrently, recognising that micro-level practice without structural change merely manages the symptoms of systemic exclusion. This reflects the core argument of Structural Social Work that individual empowerment and social transformation are not sequential but interdependent.

Identification of Research Gap and Significance

The existing literature on digital inclusion in India largely emanates from disciplines of computer science, development economics, and public policy. Social work perspectives, particularly those grounded in Indian practice contexts, remain scarce. Within Tamil Nadu, there is no published social work framework specifically addressing how the profession should respond to the digital transformation of state welfare systems in industrial urban settings.

Coimbatore, as a study context, has been almost entirely absent from digital inclusion scholarship, despite its status as Tamil Nadu's second-largest city and one of India's most significant manufacturing hubs. The specific vulnerabilities of hostel-resident migrant garment workers vis-à-vis digitised welfare have not been examined in any published social work or development studies literature.

This paper makes four distinct scholarly contributions: (1) it introduces Digital Welfare Gaps as an analytically precise construct that advances beyond the generic digital divide concept; (2) it contextualises global digital inclusion theory within a South Indian industrial city, contributing to the global South literature; (3) it proposes the CDIF as the first explicitly social work-oriented digital inclusion framework designed for Indian urban industrial settings; and (4) it generates a concrete policy and practice agenda for Coimbatore's social work ecosystem that is immediately actionable by practitioners, NGOs, and university field placement programmes.

Policy and Practice Recommendations

- **For the Coimbatore Municipal Corporation and District Administration**
 - Establish a Digital Welfare Facilitation Cell within each Zonal Office of the Coimbatore Corporation, staffed by trained Social Work graduates, to provide walk-in assistance for welfare portal registration, grievance redress, and document correction.
 - Mandate the development of Tamil-first, visual-navigation interfaces for all Coimbatore Corporation welfare portals and scheme applications, including the TNPDS and Chief Minister's welfare schemes.
 - Develop a Coimbatore District Digital Inclusion Action Plan integrating social work field agencies, Common Service Centres (CSCs), and textile industry HR departments into a coordinated welfare access support network.
- **For Tamil Nadu's Welfare Administration**
 - Introduce a Hybrid Welfare Delivery Mandate requiring all state welfare schemes to maintain functional in-person registration pathways alongside digital ones, preventing de facto digital-only access from creating systemic exclusions.
 - Establish a Biometric Grievance Redress Mechanism specifically for workers in manual and textile occupations in industrial districts like Coimbatore, Tiruppur, and Erode, where fingerprint wear systematically disrupts Aadhaar authentication.
 - Commission a Tamil Nadu Digital Welfare Equity Audit to be conducted by Social Work departments in collaboration with the State Welfare Commission, documenting DWGs across scheme categories and demographic groups.
- **For Social Work Education (UGC/NCSWB)**
 - Integrate a compulsory module on "Digital Rights, Welfare Technology, and Community Digital Facilitation" into BSW and MSW curricula across Tamil Nadu universities, with practical field component delivery in collaboration with ULBs and NGOs.
 - Designate Social Work field practicum placements in Common Service Centres and Urban Community Development Societies as approved sites, enabling students to gain structured exposure to digital welfare facilitation as a practice competency.
 - Establish a Digital Social Work Research Cell at Bharathiar University, Coimbatore, to generate an evidence base on DWGs in Tamil Nadu's industrial cities, supporting ongoing policy advocacy.

Conclusion

The digital transformation of welfare delivery in India is irreversible. For a city like Coimbatore, where the promises of industrial modernity coexist with the realities of migrant precarity, gender inequality, and structural exclusion, the challenge is not whether digitalisation will continue but whether it will be inclusive. This paper has argued that Social Work, as both a profession and a discipline, has an irreplaceable role in ensuring that the digital welfare state serves all citizens rather than only those already equipped to navigate it.

The Digital Welfare Gaps framework and the Community-Centred Digital Inclusion Framework offer social work researchers, educators, and practitioners in Coimbatore a coherent theoretical vocabulary and a contextually grounded practice architecture. Unlike generic digital literacy programmes, the CDIF is explicitly embedded in social work values, social justice, human rights, community empowerment, and structural change, and is designed to operate within Coimbatore's existing social work institutional ecosystem.

Future empirical research building on this conceptual foundation, particularly participatory action research co-designed with garment workers, hostel residents, and frontline social work practitioners, would significantly strengthen the evidence base for CDIF implementation. This paper seeks to initiate that scholarly conversation, offering Coimbatore not merely as a site of study but as a model for how Social Work can reimagine its mandate in the age of the digital welfare state.

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