

Evaluating the Effectiveness of Digital Inclusion Strategies in Bridging the Urban–Rural Development Gap

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Abstract

Digital inclusion has become one of the major forces of equitable development in the 21st century. However, in spite of the progress of connectivity and technology in the world, there are stark inequalities between urban and rural populations. This paper is a conceptual analysis of the effectiveness of digital inclusion strategies in reducing the urban-rural development gap from a global perspective. Using recent literature and international measures to assess the intersection of access, affordability, and capability to determine the outcomes of digital inclusion, this study explores empirical research findings in China, India and sub-Saharan Africa that have found that successful inclusion goes beyond infrastructure delivery to include digital literacy, local relevance and institutional coordination. However, this paper argues that while digital inclusion has shifted from the rhetoric of connectivity to the actuality of empowerment, the effects have been unequal because of the disjointed policies and contextual blindness. Finally, this paper recommends a multidimensional model that is based on inclusion, participation, and adaptability to inform future interventions, as sustainable digital inclusion is possible only when physical barriers to digital inclusion are addressed.

Keywords: *Digital Inclusion; Urban–Rural Development; ICT for Development (ICT4D); Digital Literacy; Inclusive Innovation; Global Development; Sustainable Digital Transformation.*

I. INTRODUCTION

The digital transformation has changed the world development environment, and it is transforming the way individuals live, study, work, interact and access services, the digital divide, however, especially between urban and rural areas, continues to reflect and worsen existing socioeconomic inequalities. Nevertheless, even though urban residents have better connectivity, higher digital literacy, and more institutional backing, rural communities tend to be left behind in the digital economy due to infrastructural shortages, affordability, and digital illiteracy (World Bank, 2024; ITU, 2023).

Becker et al. (2012) posit that digital inclusion is not just a matter of technological access, but also the equitable participation of every citizen in the digital era, such as the availability of cheap and high-quality internet, digital skills development, and meaningful use of technology in education, health, finance, and governance. This is in line with the recommendation of the United Nations (2022) in its Digital Inclusion (2022-2025) strategy, as the core of the realisation of the Sustainable Development Goals (SDGs) and especially SDG 9 (Industry, Innovation and

Infrastructure), SDG 10 (Reduced Inequalities), and SDG 11 (Sustainable Cities and Communities).

However, there is still a gap in urban-rural development. While cities evolve as digital hubs, rural communities tend to be left behind in loops of exclusion. Hence, this paper discusses the effectiveness of existing digital inclusion policies to reduce this gap around the world, by exploring comparative experiences of China, India and Africa to evaluate not only infrastructural, but also the social and policy aspects of inclusion, and the progress.

II. THEORETICAL AND CONCEPTUAL FRAMEWORK

The term digital inclusion has evolved over the years, and extended beyond the argument of “digital access” to more, extensive concepts that include literacy, participation, and empowerment. This digital divide theory describes the differences between the access and use of ICTs by various groups of people (Van). Dijk, (2006). However, recent frameworks, like the Fang et al. (2024) Development-Gap-Integration (DGI) model,

demonstrate that digitalization is a progression of the first bias towards integration, which implies that inclusion is both a process and an outcome.

Furthermore, digital inclusion, from the Capability Approach standpoint, (Bahr et al., 2024; Robeyns, 2017), enhances the freedom of people to attain desirable functioning, e.g. education, work, etc. and social participation, through ICTs. Conceptually, this paper considers digital inclusion as a multidimensional construct that has three interrelated elements:

➤ *Access and Infrastructure:*

This means the physical accessibility and affordability of digital technologies helping individuals and communities to access the digital ecosystem.

➤ *Capability and Literacy:*

This involves the knowledge, skills and the competencies to effectively and meaningfully use digital tools.

➤ *Meaningful Use and Integration:*

This entails the incorporation of digital technologies in the daily lives, in livelihoods, governance, education, and community development, to create real social and economic gains.

This three-part framework is the conceptual basis of the digital inclusion strategies in the world and the effectiveness of such strategies in reducing the long-standing development gaps between urban and rural regions.

III. GLOBAL OVERVIEW OF DIGITAL INCLUSION STRATEGIES

➤ *International Policy Interventions*

Globally, numerous initiatives have sought to promote digital inclusion as a pathway to sustainable development, such as the United Nations Development Programme (UNDP) for Digital Strategy through 2022–2025, which focuses on inclusive digital ecosystems in a bid to “leave no one behind.” Also, the World Bank’s Digital Economy for Africa Initiative (DE4A) which aims to extend broadband connectivity and digital public services to underserved populations. Similarly, the International Telecommunication Union (ITU) promotes the Connect 2030 Agenda, emphasizing universal connectivity and digital skills.

More so, In Europe, the Digital Compass 2030 aims to ensure that every citizen enjoys gigabit connectivity and digital literacy. In addition, the policies of rural revitalization in China, according to Fang et al. (2024), integrate digitalization into regional planning, which shows a digital divide into digital inclusion through the incorporation of urban and rural communities. In Africa, one of the e-governance and broadband projects that have begun to develop, such as Smart Africa. Despite the existing challenges, infrastructure and inclusion programs are available (World Economic Forum, 2019).

➤ *Sectoral and Regional Initiatives*

ICT-based interventions such as Krishi Vigyan Kendras in India (Upadhyaya et al., 2019) show how digital centres in the area can provide farmers with power by accessing information in time and promoting digital literacy. Agwu (2020) emphasises in the financial field that digital financial services have increased access to credit and savings, but still do not cover a large portion of rural residents because of the lack of trust and literacy. The trend is similar throughout the regions: although strategies have become more accessible, the inclusion is still biased, and more structural interventions are needed.

However, digital inclusion strategies can be evaluated based on three dimensions which include access to infrastructure, digital literacy, and integration into society.

• *Access and Infrastructure:*

The growth of broadband has greatly enhanced connectivity across the globe, with 54% of the global population being online in 2019 to more than 67% in 2024 (ITU, 2024). However, the difference is still very high: rural users constitute less than a third of all internet users. According to Fang et al. (2024), in China, the level of digitalisation in urban and rural areas both improved between 2000 and 2020, but the performance gap indicated the existence of unequal performance of provinces, especially inland. On the same note, Upadhyaya et al. (2019) noted that physical infrastructure is not enough to ensure inclusion unless it is supported by community-based access points, including telecentres and kiosks.

• *Capability and Digital Literacy:*

The key inclusion determinant is digital literacy. The rural communities tend to be poorly equipped in terms of skills to use digital tools. Upadhyaya et al. (2019) highlighted the importance of training farmers and extension workers as the key to the continued use. The Smart Villages initiative demonstrates that in sub-Saharan Africa, local digital literacy centres have the potential to fill the participation divide when culturally sensitive content and language are employed.

• *Creative Use and Integration:*

Creative and meaningful use is the process of integrating digital tools into daily life and local economies. Agwu (2020) reveals that digital financial services have increased access, but there is a lack of trust and low literacy levels that prevent the rural poor from adopting them. On the same note, Fang et al. (2024) demonstrate that elevated rates of digital development may be coupled with the existence of gaps, which means that the inclusion process will need to incorporate social, economic, and institutional levels.

In conclusion, the evidence on a global scale indicates that digital inclusion strategies have enhanced access but have been partial in full socioeconomic integration because of contextual and weak governance and uneven capacity.

IV. CRITICAL DISCUSSION

In spite of the positive developments, the digital inclusion policies tend to work in disjointed policy systems. Most nations do not regard inclusion as a social objective, but as a technical one, centred on the rollout of broadband. Upadhyaya et al. (2019) observed that generalised models do not work; region-specific policies that consider literacy levels, local economies, and cultural aspects are more effective.

The integrative strategy by China, as outlined by Fang et al. (2024), claims that the coordinated policies between infrastructure and education, and governance, provide superior inclusion results. Conversely, most African and South Asian programs are still project-based and donor-funded and as a result, there are gaps in sustainability. Furthermore, digital inclusion has shown new disparities of usage and results in a second-order digital divide, in which rural users have access but little capacity to translate their access into material gains (Van Dijk, 2006).

More so, gendered and generational aspects of digital inclusion are much underexplored. The digital divide is skewed against women and older adults because of social constructs and reduced literacy (WEF, 2019). Intersectional approaches are thus required to address these structural inequities in order to make effective strategies.

V. FUTURE DIRECTIONS AND POLICY IMPLICATIONS

Looking ahead, digital inclusion should not be narrowed to the idea of access but expanded to a larger concept of empowerment, equity, and sustainability. The second stage of digital inclusion is the one that demands the change of infrastructure-based policies to integrative frameworks that can relate technology and human development. Inclusion is not only a matter of connecting people, according to Fang et al. (2024)'s Development-Gap-Integration (DGI) model, but it is more of integrating digitalisation into social, economic, and governance systems. In this way, the future strategies must be aimed at the development of multidimensional models of inclusion that would pay attention to technological progress and social ability.

One of the priorities is local capacity building. The only way that digital inclusion will be successful is when people and communities have the ability and confidence to use technology in a meaningful way. This entails intensifying digital literacy initiatives, especially for the marginalised population, like women, the youth, and rural entrepreneurs. Locally instigated training programs, locally based telecentres, and grassroots digital hubs have been shown to reduce participation disparities once organised in local languages and cultural settings (Upadhyaya et al., 2019). The future inclusion policies should therefore focus on building human capacity.

Another approach is to overcome the issue of affordability and accessibility that still exists in low and middle-income nations. Even though connectivity has significantly improved, the cost is a major obstacle to many rural users (ITU, 2023). This problem can be addressed by governments and international organisations by providing subsidised broadband services, tax incentives on telecom growth, and cheap devices programs, like in the case of the Digital Village program in India. Partnerships between the public and the private are also necessary in the expansion of the last-mile infrastructure, so that the inclusion efforts do not remain dependent on the donors.

Finally, the monitoring, evaluation, and coherence of policies are the key to the future of digital inclusion. Most nations do not have effective systems to monitor the results of digital inclusion other than the connectivity rates. It would be possible to set up digital inclusion indices at national and regional levels to determine not only access but also the role of digitalisation in education, income, and civic engagement. Besides this, coherent alignment of policy in sectors, education, telecommunication and finance is imperative to maintain progress. Finally, the successful digital inclusion policies should be contextual, equity-based, and sensitive to dynamic technological and social realities.

VI. CONCLUSION

Equitable global development is centred on digital inclusion. The evidence shows that access to technology has spread, but the advantages are not spread equally in urban and rural areas. The inclusion strategies need to be context-sensitive, participatory and adaptive that extend beyond infrastructure to deal with social or institutional divides. The process of transforming the divide into inclusion, as Fang et al. (2024) depict, can be achieved, yet with the help of conscious integration of development policies, community involvement, and development of digital capabilities. Connecting the unconnected is not simply the problem, but making the connection count towards empowerment, productivity, and resilience. Hence, the urban-rural digital divide is a technological and ethical necessity that is at the centre of realising inclusive and sustainable growth for everyone.

Furthermore, the quest for digital inclusion is a reformulation of the global development ethics in the digital era. The right to digital participation is a principal pillar of social justice and citizenship as societies progressively become dependent on data and connectivity. The realisation of this vision will require a concerted effort of the world to coordinate the policy of the people, individual innovation and community involvement towards shared objectives. The future of digital development will not be determined by technological sophistication but by the ability of countries to make sure that all people, irrespective of their geographical location, gender, or social status, can enjoy the benefits of the digital revolution in a meaningful way.

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