



Barriers to digital participation in developing countries: Identifying technological, social, and cultural obstacles to community involvement

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GSC Advanced Research and Reviews, 2025, 23(02), 061-071

Publication history: Received on 29 March 2025; revised on 11 May 2025; accepted on 14 May 2025

Article DOI: <https://doi.org/10.30574/gscarr.2025.23.2.0130>

Abstract

Digital technologies hold significant promise for fostering inclusive development in low- and middle-income countries, yet many communities remain excluded due to persistent barriers to digital participation. This study investigates the technological, social, and cultural obstacles that prevent equitable access and engagement with digital tools. Key technological barriers include inadequate internet infrastructure, high costs of connectivity and devices, and unreliable electricity, which collectively hinder digital inclusion in rural and underserved areas. Social inequalities such as gender disparities, low income, advanced age, and disability further exacerbate exclusion, while cultural factors—including mistrust in digital systems, language barriers, and limited digital literacy—discourage meaningful engagement. Drawing on a review of relevant literature and case studies, the study finds that these barriers are often interlinked, creating a cycle of digital marginalization. Even where access is available, low usage rates are attributed to the lack of locally relevant content and support structures. The findings highlight that addressing digital exclusion requires more than infrastructure investment; it demands inclusive design, culturally appropriate digital education, and active collaboration among governments, civil society, and private actors. Ultimately, this research emphasizes that closing the digital divide is critical not only for individual empowerment but also for the broader goals of sustainable and equitable development.

Keywords: Digital inclusion; Digital divide; Countries; Barriers to participation

1. Introduction

The rapid advancement of digital technologies has fundamentally reshaped the ways in which individuals communicate, access information, and engage in civic and economic life. This technological transformation holds significant promise for addressing critical developmental challenges in the Global South, particularly in the areas of education, healthcare, governance, and economic inclusion (Hilbert, 2016). As digital platforms proliferate and connectivity improves, there is an opportunity to enhance access to services and increase participation in democratic processes across developing countries (World Bank, 2020). However, despite the evident potential of digital technologies, large segments of the population in these regions remain excluded from the digital sphere due to a confluence of technological, social, and cultural barriers that persist in impeding their participation (Jensen, 2019).

The term "digital divide" refers to the disparity between individuals and communities who have access to modern information and communication technologies (ICTs) and those who do not. This divide is particularly pronounced in developing countries, where limited infrastructure, unaffordable internet access, inadequate digital literacy, and entrenched social inequalities often serve to exclude large portions of the population from the benefits that digital participation can offer (Gurumurthy, Vasudevan, & Chami, 2018). According to the International Telecommunication Union (ITU), (2021), approximately half of the global population remains

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offline, with the majority of these individuals residing in low- and middle-income countries. This digital exclusion not only restricts individuals' ability to engage with the digital economy but also exacerbates existing socio-economic disparities, thereby hindering efforts toward inclusive development.

At the core of the technological barriers to digital participation are the infrastructural limitations that characterize many developing countries. In these regions, unreliable or insufficient internet connectivity remains a significant impediment, particularly in rural and remote areas where the lack of adequate infrastructure hinders individuals' access to digital platforms and services (World Bank, 2020). These technological gaps are further compounded by the high costs associated with both internet services and the devices necessary for digital engagement. The Alliance for Affordable Internet reports that mobile data costs remain prohibitively expensive in many low- and middle-income countries, placing digital participation out of reach for a substantial portion of the population (Alliance for Affordable Internet (A4AI), 2020). Without affordable internet access and digital devices, the potential for digital technologies to foster inclusion is limited, leaving many vulnerable groups further marginalized in an increasingly digital world.

In addition to technological challenges, digital literacy is a critical factor that influences the extent to which individuals can engage with digital technologies. A significant proportion of the population in developing countries lacks the necessary skills to navigate digital platforms effectively, which restricts their ability to benefit from online services such as education, healthcare, and e-government (UNESCO, 2021). This digital literacy gap is particularly pronounced among marginalized groups, including women, older adults, and persons with disabilities, who face additional barriers in acquiring digital skills (UNDP, 2020). As a result, even when individuals have access to the internet, their ability to utilize it effectively remains constrained, limiting their opportunities to participate in the digital economy and society.

While technological limitations are a key factor in digital exclusion, social factors also play an instrumental role in shaping individuals' ability to engage with digital technologies. One of the most significant social barriers is gender inequality, which manifests in various forms, including unequal access to digital devices, mobile services, and digital training opportunities (GSMA, 2021). In many developing countries, women are systematically disadvantaged in terms of both access to technology and the skills required to use it effectively. For instance, women in low-income regions are, on average, 16% less likely to use mobile internet than men, with the gap being even wider in rural areas (GSMA, 2021). This gendered digital divide not only limits women's ability to access critical services such as healthcare, education, and financial services, but also curtails their participation in online civic and political activities, further entrenching gender-based inequalities in society.

Social inequalities based on income, education, and geographic location also contribute to the digital divide. Poverty is a significant determinant of digital exclusion, as individuals in low-income communities are less likely to afford the devices and internet services required for digital participation. Similarly, lower levels of education and illiteracy in marginalized communities hinder the development of digital skills, reducing individuals' capacity to use digital platforms effectively (UNDP, 2020). In rural areas, where educational opportunities are often limited, the lack of both digital infrastructure and digital literacy further exacerbates the divide, preventing rural populations from accessing services and information that are increasingly available online (Srinivasan, Diehm, & Fife, 2017). Moreover, marginalized groups, including ethnic minorities and indigenous communities, may experience additional barriers to digital participation, as digital platforms may not cater to their specific needs or reflect their cultural contexts.

Cultural factors also significantly shape how individuals in developing countries engage with digital technologies. Cultural norms, values, and traditions can either facilitate or hinder digital participation, depending on how well digital platforms align with local practices and belief systems. In many cases, digital platforms are perceived as foreign or incompatible with traditional practices, leading to resistance to their adoption (Rathore, 2020). Additionally, in societies where traditional decision-making structures are hierarchical, the introduction of digital platforms may disrupt existing power dynamics, leading to reluctance in adopting new technologies (Srinivasan, Diehm, & Fife, 2017). Concerns related to privacy, security, and data protection also act as deterrents for digital participation, particularly in contexts where trust in government or private-sector entities is low (Srinivasan, Diehm, & Fife, 2017). These cultural and trust issues must be addressed in the design of digital platforms to ensure that they are perceived as legitimate and trustworthy by local communities.

Given the complex and interconnected nature of these technological, social, and cultural barriers, addressing digital exclusion in developing countries requires a multifaceted approach. It is insufficient to focus solely on improving infrastructure or providing access to digital devices. Efforts must also include initiatives to enhance digital literacy, promote gender equality, and ensure that digital content and services are inclusive and culturally relevant. Moreover, addressing the barriers to digital participation requires collaborative efforts across multiple stakeholders, including governments, non-governmental organizations, the private sector, and local communities. Only through such

comprehensive, integrated approaches can digital technologies fulfill their potential to drive inclusive development in the Global South.

2. Technological Barriers to Digital Participation in Developing Countries

Digital participation in developing countries faces significant technological barriers that limit access to information and communication technologies (ICTs), hindering the potential for inclusive social, economic, and political participation. These barriers manifest primarily through infrastructure limitations, affordability and accessibility challenges, and deficits in digital literacy. This section examines these three critical barriers, exploring their impacts on digital inclusion in developing countries, and emphasizing the need for targeted interventions to overcome them.

2.1. Infrastructure Limitations

One of the most prominent technological barriers to digital participation in developing countries is the insufficient infrastructure that hampers access to digital technologies. In rural and remote areas, the lack of reliable and widespread broadband connectivity, coupled with inconsistent electricity supply, significantly limits the ability of individuals to participate in the digital ecosystem. As noted by the International Telecommunication Union (ITU), (2021), about 3.7 billion people globally remain offline, with the majority residing in rural regions of low-income countries. The absence of stable internet connections restricts individuals' access to digital services such as e-healthcare, online education, and e-government platforms, thereby exacerbating the digital divide.

In many developing countries, the internet infrastructure is underdeveloped, with urban areas receiving the lion's share of connectivity improvements. Rural areas often experience lower internet speeds, unreliable connections, and in some cases, no connectivity at all (GSMA, 2023). The quality of infrastructure is further exacerbated by geographical factors, such as the remoteness of rural regions or the difficulty in providing internet access across mountainous or isolated landscapes (Hussain, Malik, & Ahmad, 2019). The absence of high-speed internet in rural regions means that many individuals cannot access essential online services, participate in the digital economy, or engage in online civic activities such as voting or public consultations.

Moreover, electricity supply remains a critical challenge in many developing countries. According to the World Bank (2020), approximately 770 million people still lack access to electricity globally, the majority of whom are in Sub-Saharan Africa and rural Asia. Without a consistent electricity supply, devices such as smartphones, computers, or televisions cannot be reliably charged, and digital platforms cannot function effectively. Consequently, the inability to access digital tools due to unreliable infrastructure becomes a major barrier to digital participation, particularly for marginalized communities that rely on these tools for education, economic opportunities, and healthcare services (Menyah & Nketiah, 2018).

2.2. Affordability and Accessibility

Cost-related issues represent another significant barrier to digital participation in developing countries. Affordability remains a primary constraint for individuals seeking access to digital technologies, including internet services and the devices necessary to use these services. The Alliance for Affordable Internet (2022) reports that in many low-income countries, the cost of 1GB of mobile data exceeds 5% of the average monthly income. This cost is disproportionately high compared to the global average, where mobile data costs account for a much smaller fraction of income. As a result, many individuals in developing countries cannot afford the necessary digital devices or data plans to access online services. The affordability issue is particularly acute among lower-income households, where the majority of the population may prioritize other basic necessities such as food, healthcare, or education over internet access.

Moreover, while mobile phones have become a common tool for accessing the internet in many developing countries, their affordability is still a barrier. Despite the proliferation of smartphones, many individuals cannot afford the upfront costs of purchasing mobile devices or paying for ongoing data usage (Aker & Mbiti, 2010). This issue is especially pertinent in rural and marginalized communities where income disparities are more pronounced, and there is limited access to financing options such as credit. Additionally, the disparity in affordability between rural and urban areas further exacerbates the digital divide, with urban residents generally having better access to affordable devices and mobile plans (Kende, Rose, & Yates, 2017).

In the absence of affordable connectivity options, individuals are often unable to participate in the digital economy, which is increasingly essential for accessing information on job opportunities, online banking services, or government services. Moreover, for students, the lack of affordable access to digital tools and the internet limits their ability to engage in online learning, undermining educational opportunities. In this context, affordability and accessibility are

critical barriers that need to be addressed to ensure that digital technologies can truly promote inclusion and equity in developing countries.

2.3. Digital Literacy Deficits

A crucial barrier that impedes meaningful digital participation in developing countries is the lack of digital literacy among large segments of the population. Digital literacy refers to the ability to use digital tools effectively to access, evaluate, and create information. In many developing countries, a significant portion of the population lacks the necessary skills to navigate the internet, operate digital devices, or engage with e-government platforms (UNESCO, 2021). This gap in digital literacy means that individuals may struggle to make use of digital technologies even when they have access to the internet and devices.

The digital literacy gap is particularly pronounced among certain demographic groups, such as women, older adults, rural populations, and low-income communities (UNDP, 2020). Women, for instance, are often excluded from digital training programs, and the societal norms in many developing countries can limit their access to education and technology (GSMA, 2023). Similarly, older adults may not have had the opportunity to learn digital skills during their schooling years, leading to difficulties in adapting to modern technologies. In rural areas, where education and training resources are already scarce, the lack of digital literacy programs further exacerbates the challenge.

Digital literacy is not limited to the ability to operate digital devices but also encompasses understanding how to protect one's personal data, navigate online services safely, and critically evaluate digital information. In the absence of these skills, individuals are more susceptible to misinformation, cybercrime, and online exploitation (Van Deursen & Van Dijk, 2014). Without digital literacy, people cannot fully engage with the increasing array of digital services, such as online banking, healthcare, e-government services, or even job opportunities that are now conducted through digital platforms. As a result, they are unable to access the social, economic, and political benefits of digital participation, further deepening social inequalities in developing countries.

Moreover, the lack of digital literacy among the general population impedes the effective use of emerging technologies, such as mobile health apps or online education platforms, which are increasingly being integrated into development strategies. Digital literacy is essential not only for the individual's ability to use these tools but also for their ability to participate in broader societal conversations about technology and digital policy. If individuals are not equipped with the skills to critically engage with technology, they remain passive consumers rather than active participants in the digital ecosystem (Helsper, 2020). Therefore, addressing the digital literacy gap is essential for ensuring that all individuals, regardless of their socio-economic status or geographic location, can actively participate in the digital society.

3. Social Barriers to Digital Participation in Developing Countries

In addition to the technological barriers that limit access to digital participation in developing countries, social factors play a critical role in shaping who can engage with digital technologies. These social barriers, including gender disparities, educational inequality, and income and economic inequality, create profound divisions in digital access and participation. Addressing these social barriers is essential for fostering inclusive digital societies, as they prevent large segments of the population from benefiting from the transformative potential of digital technologies.

3.1. Gender Disparities

Gender disparities in digital access and participation represent one of the most significant social barriers in developing countries. Traditional gender norms, cultural expectations, and unequal access to resources contribute to the systemic disadvantages women and girls face in relation to digital technologies. According to the GSMA Mobile Gender Gap Report (2022), women in low- and middle-income countries are 16% less likely to use mobile internet than men. This digital gender gap persists across various regions, exacerbating existing inequalities and hindering women's ability to participate fully in the digital economy, education, and civic life.

Several factors contribute to the gender gap in digital participation. In many developing countries, societal norms assign women primary roles in domestic work, often limiting their time and freedom to engage with digital technologies. Cultural attitudes and expectations regarding women's mobility further restrict their ability to access digital platforms, particularly in rural and conservative regions where the digital divide is often most pronounced (Aker & Mbiti, 2010). Furthermore, women may face gender-based violence and harassment both offline and online, which can deter their digital engagement and limit their ability to safely navigate the internet (UN Women, 2020).

Lower levels of literacy among women also exacerbate the gender gap in digital participation. In many developing countries, women have lower literacy rates than men, and this disparity extends to digital literacy (Chigona & Chigona, 2015). Without the necessary skills, women are less able to access online education, participate in e-commerce, or engage in e-government platforms. Moreover, women in low-income households often lack access to digital devices and internet services, which are prioritized by male family members who are more likely to be employed or economically active (Aker & Mbiti, 2010). This digital exclusion further entrenches gender inequalities and limits women's opportunities for empowerment, education, and economic advancement.

3.2. Educational Inequality

Educational inequality is another significant social barrier that limits individuals' ability to engage with digital technologies. In many developing countries, poor education systems and low literacy levels, particularly in rural areas, hinder people from acquiring the digital skills necessary to navigate online platforms. The lack of quality education exacerbates the challenges faced by marginalized groups, such as ethnic minorities, linguistic minorities, and people with disabilities, in accessing and utilizing digital tools effectively.

The digital literacy gap is particularly pronounced in rural areas, where educational infrastructure is often underdeveloped, and access to trained teachers and educational resources is limited. In these areas, individuals are less likely to be familiar with the internet and digital technologies, making it difficult for them to participate in online education or access digital services such as telemedicine and e-government programs (Gleason & Hemphill, 2020). Moreover, rural populations often face additional challenges such as language barriers, with digital content primarily available in dominant national languages, thereby excluding those who speak indigenous or local languages (UNESCO, 2021).

Among marginalized ethnic or linguistic groups, educational inequality in digital literacy is compounded by systemic exclusion from mainstream educational opportunities. In many developing countries, indigenous communities or minority groups are denied equitable access to education, and the resulting lack of skills limits their ability to engage with digital technologies (Crawford & Evans). The digital divide between urban and rural populations is particularly stark for these groups, as they are often the last to benefit from digital infrastructure improvements, further limiting their access to information and services that are increasingly offered through digital platforms (Blommaert & Verschueren, 2015).

Educational inequality also intersects with gender disparities, as women and girls in many developing countries have less access to education, particularly in rural and impoverished areas (Chigona & Chigona, 2015). This lack of educational opportunity restricts their access to digital literacy training, preventing them from acquiring the skills needed to fully participate in the digital world. Therefore, addressing educational inequality and ensuring that marginalized groups have access to quality education and digital literacy programs is critical to promoting equitable digital participation.

3.3. Income and Economic Inequality

Income and economic inequality represent significant barriers to digital participation, particularly in low-income communities. For many individuals in developing countries, basic needs such as food, healthcare, and housing take precedence over digital access, and the cost of digital services and devices is often prohibitive. In such contexts, internet subscriptions and mobile data plans are considered luxury items, and many people are unable to afford the necessary technology to access digital platforms (Aker & Mbiti, 2010).

According to the Alliance for Affordable Internet (A4AI, 2022), the cost of mobile data in many low-income countries is disproportionately high, relative to the average income. For example, in some countries, 1GB of mobile data costs more than 10% of a person's monthly income. This affordability gap is particularly acute for individuals in rural areas or informal urban settlements, where income levels are typically lower and access to affordable digital infrastructure is limited. In these settings, individuals may prioritize basic survival needs over digital connectivity, which further entrenches existing social and economic inequalities (Kende, Rose, & Yates, 2017).

Additionally, the inability to afford digital devices or internet connectivity means that people are excluded from participating in the digital economy, where job opportunities, online businesses, and financial services are increasingly available. The economic divide between those who can afford digital access and those who cannot further perpetuates poverty and limits opportunities for social mobility. For example, low-income individuals who are unable to access online education may struggle to acquire the skills necessary to improve their employability or increase their income, thus exacerbating existing inequalities (Aker & Mbiti, 2010).

The COVID-19 pandemic has further exposed the economic barriers to digital participation, as many individuals were unable to transition to remote work or online learning due to a lack of internet access or devices. The economic impact of the pandemic has made it even more challenging for individuals in developing countries to afford the technology required for digital participation, particularly among vulnerable populations such as the unemployed, informal sector workers, and those living in poverty (World Bank, 2020).

4. Cultural Barriers

Digital participation in developing countries is not solely impeded by technological or economic constraints; cultural factors also exert a profound influence on the capacity and willingness of individuals and communities to engage with digital technologies. These barriers are often entrenched in historical, linguistic, and socio-normative systems that shape people's interactions with new forms of communication, information dissemination, and governance. This section explores three significant cultural barriers: language and content relevance, trust and privacy concerns, and the influence of social norms and traditional practices.

4.1. Language and Content Relevance

Language constitutes a fundamental axis of digital inclusion. A considerable proportion of online content is produced in dominant global languages, particularly English, which limits access for non-English-speaking populations. In many developing countries, especially those with high linguistic diversity, the lack of localized content and interfaces significantly hinders digital participation. For instance, Sub-Saharan Africa is home to over 2,000 languages, yet digital platforms rarely accommodate this diversity, often excluding speakers of minority languages from engaging in digital spaces (UNESCO, 2021). Similarly, many national government portals and e-services are offered in official or colonial languages (e.g., French, Portuguese) rather than indigenous or widely spoken vernaculars, thereby marginalizing rural or less formally educated users.

Beyond language, cultural relevance also plays a critical role. Digital content that fails to reflect local contexts, norms, or experiences may be perceived as foreign, irrelevant, or even inappropriate. For example, educational materials developed in Western contexts may not address the lived realities of students in rural Southeast Asia or East Africa, reducing their perceived usefulness or credibility. Moreover, the dominance of Western-centric narratives on the internet can reinforce digital hegemony, whereby knowledge production and discourse are shaped by external actors rather than local voices (Mohanty, 2020).

Efforts to overcome this barrier require localized content creation, community engagement in digital development, and investment in machine translation technologies and natural language processing (NLP) for underrepresented languages. Digital participation can only be equitable when content is linguistically and culturally accessible.

4.2. Trust and Privacy Concerns

Trust is a critical precondition for meaningful digital engagement. In many developing countries, historical legacies of political repression, surveillance, and limited data protection frameworks have fostered widespread skepticism toward digital technologies and online platforms. Citizens may perceive online engagement—especially on political, financial, or personal issues—as risky or potentially exposing them to surveillance, manipulation, or cyber threats (Donovan & Martin, 2022). In authoritarian or semi-authoritarian contexts, these fears are particularly acute, as governments may monitor digital communications or use online platforms to target dissenters.

Even in democracies, the absence of robust data privacy legislation and weak enforcement mechanisms can erode public trust. For example, in some regions of Latin America and South Asia, incidents of unauthorized data collection, identity theft, or state misuse of personal information have contributed to a digital environment where users are hesitant to fully engage (World Bank, 2020). Such concerns are compounded by low digital literacy, where users may not fully understand how their data is collected, stored, or shared.

Trust deficits are further exacerbated by misinformation and disinformation, which erode confidence in online content and services. When individuals cannot distinguish between credible and misleading information, or when they are repeatedly exposed to harmful online interactions, they may disengage altogether. Addressing these concerns requires not only legal and regulatory reform but also sustained investment in public digital education, digital rights advocacy, and community-based awareness initiatives.

4.3. Social Norms and Traditional Practices

Social norms—defined as shared expectations about appropriate behavior—can significantly influence patterns of digital participation. In many societies, particularly in South Asia, the Middle East, and parts of Africa, cultural expectations surrounding gender roles, age hierarchies, and community authority can restrict who is permitted to use digital devices, when, and for what purposes (GSMA, 2022). For instance, women and girls may be discouraged or even prohibited from using mobile phones or the internet due to perceptions that digital engagement threatens moral values or social cohesion. Similarly, older adults may face stigma or lack the confidence to adopt technologies perceived as the domain of the young.

Traditional decision-making structures, such as village elders or religious councils, may also resist digital participation mechanisms if these are perceived as undermining their authority or bypassing customary channels. In such contexts, community members may defer to elders' decisions rather than engage with online platforms for services, governance, or civic participation.

These barriers are particularly resistant to change, as they are embedded in deep-seated cultural logics. However, evidence suggests that context-sensitive interventions—such as engaging with local leaders, promoting intergenerational learning, and designing gender-sensitive digital literacy programs—can foster gradual cultural transformation. For example, programs in rural Bangladesh that train women in digital skills with the support of community elders have reported increased digital participation among previously excluded groups (Rahman, Akter, & Hossain, 2021).

In conclusion, cultural barriers to digital participation are multifaceted and deeply interwoven with other forms of exclusion. Language, trust, and social norms must be addressed in tandem with technological and economic solutions to ensure equitable and meaningful digital inclusion. Culturally responsive strategies are essential for fostering participation that is not only accessible but also socially and ethically sustainable.

5. Case studies

Digital participation in developing countries is often constrained by a variety of barriers, including technological, social, and cultural challenges. These barriers limit access to and engagement with digital platforms and services, hindering opportunities for social inclusion, economic empowerment, and sustainable development. The following case studies from diverse regions around the world highlight the complex interplay of these factors and demonstrate how they manifest in different cultural, infrastructural, and policy contexts.

5.1. Technological Barriers: Access and Connectivity in Rural Areas

5.1.1. Case Study 1: Rural Connectivity Challenges in Sub-Saharan Africa

In rural Sub-Saharan Africa, access to reliable internet and technological infrastructure is one of the key barriers to digital participation. According to a report by the International Telecommunication Union (ITU), more than 70% of people in rural areas of Africa still lack access to the internet, primarily due to poor infrastructure, high costs, and electricity shortages. In rural Kenya, for instance, despite increasing mobile phone penetration, limited access to high-speed internet restricts the ability of communities to engage in e-commerce, online education, and digital governance services.

The "Kenya Connect" initiative, a project that aims to bring reliable internet to rural schools, illustrates the effort to overcome technological barriers. By setting up solar-powered Wi-Fi hubs in remote schools, this project provides students and teachers with access to educational resources and online learning platforms. Despite its successes, however, challenges remain in terms of the high initial setup costs and the ongoing maintenance of the technological infrastructure (Munyua, 2018). These technological limitations exacerbate inequalities, especially in rural regions, and hinder broader digital inclusion efforts.

5.1.2. Case Study 2: Internet Connectivity and Affordability in South Asia

In India and Bangladesh, internet access remains a significant barrier to digital participation, particularly among low-income urban populations and rural communities. In urban slums, where overcrowding and poverty prevail, residents often face high data costs and limited access to affordable devices. Despite rapid technological advancements, internet penetration remains uneven across the region.

The "Digital India" campaign, launched by the Indian government in 2015, aims to increase internet connectivity and ensure access to digital services for all citizens. However, while the campaign has expanded internet infrastructure, challenges related to affordability persist. Many low-income households in Indian cities still cannot afford regular internet access, limiting their participation in digital economies and e-governance initiatives (Nair & Prakash, 2017). Similarly, in Bangladesh, the government's efforts to expand digital services have been slowed by limited infrastructure in rural areas and the high costs of data services, which hinder widespread digital engagement.

5.2. Social Barriers: Gender Inequality and Digital Exclusion

5.2.1. Case Study 3: Digital Gender Divide in Afghanistan

In Afghanistan, gender inequality is a significant social barrier that affects digital participation. Women face multiple challenges, including cultural norms, lack of education, and limited access to technology. According to a report by the World Bank (2020), women in Afghanistan are 20% less likely to own a mobile phone than men, and their access to the internet is significantly lower. This digital gender gap is particularly pronounced in rural areas, where patriarchal norms restrict women's mobility and their ability to access education and economic opportunities through digital platforms.

The "SheMeansBusiness" initiative by Facebook and the Pakistan-based NGO "Code to Inspire" aims to bridge the digital gender gap by providing digital literacy training and online entrepreneurship programs to women in Afghanistan. The project has trained over 5,000 women in basic digital skills and social media marketing, providing them with the tools to participate in online business activities. However, ongoing social and cultural resistance, including concerns about women's visibility in public spaces, continues to present a significant challenge to broader digital inclusion efforts (Elmi, 2021).

5.2.2. Case Study 4: Digital Literacy and Gender in Rural Bangladesh

In rural Bangladesh, digital literacy remains a significant barrier for women, especially those living in conservative communities. The "One-Stop Digital Centres" program, initiated by the government with the support of international donors, seeks to improve digital literacy among women by providing access to mobile phones and internet-enabled services in remote areas. These centers also offer training in digital skills, such as basic computing, mobile phone usage, and online health services.

Despite the initiative's positive outcomes, significant social and cultural barriers remain. In rural Bangladesh, women's access to technology is still constrained by traditional gender roles that restrict their mobility and autonomy. Women who use mobile phones or access the internet are often subject to social scrutiny, and their participation in digital spaces may be discouraged by family members or community leaders (Hossain, Akter, & Islam, 2019). These gendered dynamics illustrate how digital participation is influenced by societal norms and the challenge of reconciling technology with entrenched social structures.

5.3. Cultural Barriers: Language, Trust, and Privacy Concerns

5.3.1. Case Study 5: Language and Cultural Relevance in Papua New Guinea

In Papua New Guinea, one of the most linguistically diverse countries in the world, the digital divide is compounded by the challenge of language. While the national language, Tok Pisin, is widely spoken, over 800 indigenous languages are used across the country, many of which lack digital content. As a result, much of the digital content available is not culturally or linguistically relevant, leading to limited engagement from local communities.

The "Digital Inclusion Initiative" launched by the Australian government in collaboration with local NGOs seeks to address these barriers by developing digital content in indigenous languages and training local communities in digital literacy. The initiative has been successful in raising awareness about the importance of digital participation but faces significant hurdles in terms of scaling up and addressing the needs of remote, language-diverse communities (Hawkins & Simpson, 2020). This case study underscores the importance of culturally and linguistically relevant content in fostering greater digital engagement in developing countries.

5.3.2. Case Study 6: Trust and Privacy Concerns in Zimbabwe

In Zimbabwe, a history of political instability, economic challenges, and widespread corruption has created a climate of distrust towards government-run digital platforms. Many citizens are reluctant to engage with online services due to concerns about data privacy, surveillance, and the misuse of personal information. According to a report by the African

Development Bank (2019) (Bank., 2019), privacy concerns have been a significant deterrent to digital participation in several African countries, including Zimbabwe.

To address this issue, the "Zimbabwean Digital Inclusion Initiative" has focused on increasing transparency and building trust in digital platforms by engaging community leaders in educating citizens about the benefits and safety of online services. However, the initiative faces challenges related to the entrenched mistrust of digital systems, and public acceptance of digital governance services remains low (Moyo, 2019). This case study highlights the cultural barrier of trust, which is critical to overcoming in efforts to promote digital inclusion in post-conflict or politically sensitive contexts.

Recommendations

To promote inclusive digital participation in developing countries, a comprehensive and integrated strategy is essential—one that simultaneously addresses infrastructure, affordability, digital literacy, culturally relevant content, and inclusive governance. A key starting point is infrastructure development, as robust digital infrastructure underpins access to all digital services. In many developing regions, especially rural areas, internet connectivity remains sparse and unreliable. According to the International Telecommunication Union (ITU, 2020), nearly 50% of the global population—primarily from rural and low-income communities—still lacks access to the internet. Governments, in collaboration with private actors, must prioritize the expansion of broadband networks, mobile towers, and cost-effective technologies like satellite internet and community networks, which have shown success in connecting remote areas (Cruz, Silva, & Rodríguez, 2019).

However, even with infrastructure in place, affordability remains a formidable barrier. The World Bank (2020) notes that over 3.7 billion people are unable to afford internet services or digital devices. Solutions include public-private partnerships to subsidize internet costs and government policies that lower taxes on devices. For example, Choi (2020) suggests that regulatory reforms encouraging market competition among service providers can drive down prices, improving affordability for low-income households. Innovative models such as micro-loans or pay-per-use financing for digital devices can also ease the financial burden for economically disadvantaged groups.

In parallel, developing digital literacy is crucial to ensure that access leads to meaningful use. UNESCO (2020) reports that over 40% of people in developing countries lack basic digital skills. Tailored training programs that consider age, gender, language, and disability can significantly improve digital inclusion. For instance, digital literacy initiatives in rural India have demonstrated positive impacts on women's economic participation and access to information (Sengupta & Kaur, 2020). Such programs should be integrated into formal education systems and offered in community hubs like libraries and NGOs, with additional support from global initiatives such as UNDP's "Digital Literacy for All."

Equally important is the creation of relevant and accessible digital content. The International Development Research Centre (2019) highlights that much digital content fails to reflect the languages and cultural practices of diverse populations. Governments and community organizations should support the development of local-language digital materials and community-driven content platforms. For example, the "Open Digital Platforms for the Commons" initiative in Latin America has empowered rural communities to produce and access digital content in native languages, promoting cultural preservation and local knowledge sharing.

Finally, inclusive digital governance frameworks must be established. These should ensure equitable access, protect user privacy, and prevent discrimination. Laws must safeguard digital rights, and advocacy efforts are needed to shift societal norms that restrict marginalized groups' digital engagement. International cooperation is vital in ensuring open internet access and responsible digital policy. Overall, achieving digital inclusion requires not only technological advancement but also policy reforms, educational outreach, and sustained investment in community capacity-building to bridge the digital divide and empower all citizens to participate fully in the digital age.

6. Conclusion

Digital technologies hold immense potential to drive inclusive development in the Global South by enhancing access to services, promoting economic inclusion, and enabling democratic participation. However, this promise remains unrealized for a substantial portion of the population in developing countries due to a complex interplay of technological, social, and cultural barriers. As this paper has shown, the digital divide persists and is often reinforced by structural inequalities that limit the ability of marginalized communities to access and effectively use digital technologies. Technological barriers, such as inadequate infrastructure, high costs of internet services and digital devices, and unreliable electricity supply, are among the most immediate constraints on digital participation. These

challenges are especially pronounced in rural and remote regions, where basic connectivity remains elusive. Even where infrastructure exists, the affordability of services continues to be a critical issue, particularly for low-income groups. These limitations underscore the urgent need for coordinated investment in digital infrastructure that extends beyond urban centers to include the most underserved populations. Digital literacy deficits remain a substantial obstacle to meaningful engagement with digital technologies. Many individuals in developing countries lack the requisite skills to navigate online environments, limiting their ability to benefit from digital tools in education, healthcare, and civic engagement. This challenge is compounded by intersecting forms of disadvantage, including gender, age, disability, and education level, which further hinder digital inclusion. Notably, women in particular face systemic barriers to accessing and utilizing digital technologies, resulting in a gendered digital divide that curtails their participation in economic and political life. Beyond technology and skills, social and cultural dimensions profoundly influence digital participation. Social inequalities related to income, geography, and ethnicity exacerbate exclusion, while cultural norms and values may discourage the adoption of digital tools or restrict their use to specific groups. Additionally, issues of trust, data security, and the perceived legitimacy of digital platforms shape user engagement, especially in contexts with limited institutional transparency. Addressing these multifaceted barriers requires more than isolated policy interventions. A holistic and inclusive approach is essential—one that integrates infrastructure development, affordability measures, education and digital literacy initiatives, and culturally sensitive content creation. Efforts must also prioritize gender equity and the empowerment of marginalized communities, ensuring that digital transformation processes do not replicate or exacerbate existing forms of social exclusion. Overcoming digital exclusion in the Global South demands sustained collaboration among governments, civil society, the private sector, and international development partners. Only through such coordinated and inclusive strategies can the transformative power of digital technologies be harnessed to foster equitable development, close the digital divide, and ensure that all individuals, regardless of their socio-economic status or geographic location, are empowered to participate fully in the digital age.

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