Bridging Digital Divide: Implications for Inclusive and Sustainable Socio-Economic Development in Nigeria

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Abstract

The digital divide remains one of the most formidable barriers to inclusive and sustainable socio-economic development in the twenty-first century. In Nigeria, as across much of Sub-Saharan Africa, unequal access to digital technologies and internet connectivity has created a stratified society in which the benefits of the digital economy are unevenly distributed along lines of geography, gender, income, and educational attainment. This paper examines the concept and dimensions of the digital divide, with particular attention to its manifestations in Nigerian society, and investigates the implications of digital inequality for sustainable development outcomes. Drawing on digital divide as a theoretical lens, the study adopts a library research methodology to synthesise existing literature on digital inclusion, social equity, sustainable development, poverty reduction, employment, civic engagement and democratic participation. The findings reveal that while targeted digital inclusion policies have recorded modest progress, critical knowledge gaps persist regarding the third-level digital divide and the intersectional dynamics of digital exclusion among marginalised groups. The paper concludes that bridging the digital divide demands an integrated policy framework that addresses infrastructure deficits, digital skills development and equitable access to digital resources.

The study recommends that government should expand rural telecom infrastructure, broadband and community internet centres to bridge urban-rural gaps, and regulators should lower the costs of data and devices to improve affordability for low-income households.

Keywords: Digital Divide, Digital Inclusion, Sustainable Development, Social Equity, Nigeria

Introduction

The rapid proliferation of information and communication technologies (ICTs) in the twenty-first century has fundamentally altered the structure of economies, societies, and governance systems worldwide. Digital technologies have become indispensable instruments of economic productivity, political participation, social interaction, and access to public services. Yet, the promise of the digital age has not been distributed equitably. A significant segment of the global population, particularly in developing nations, remains excluded from the digital economy due to systemic disparities in access to devices, internet connectivity, and digital competencies. This phenomenon, broadly described as the digital divide, poses a profound challenge to the aspirations of inclusive and sustainable socio-economic development (Deursen & Helsper, 2022; Osei-Bonsu & Amoah, 2023).

Nigeria, as Africa's most populous nation and largest economy, presents a compelling case for examining the socio-economic implications of the digital divide. Despite impressive growth in mobile telephony and internet subscriptions over the past decade, the country continues to grapple with deep structural inequalities in digital access and usage. The National Bureau of Statistics (2023) reports that internet penetration in rural areas stands at approximately 24%, compared to over 65% in urban centres, illustrating the acute urban-rural dimension of the divide. Gender disparities further compound these inequalities, with women and girls disproportionately excluded from digital participation due to socio-cultural norms, lower income levels, and reduced access to education (Adeyemi & Olawale, 2024).

The implications of this divide extend beyond mere technological access to encompass broader questions of social equity, economic inclusion, and political participation. In a world where digital literacy increasingly determines one's capacity to secure employment, access healthcare and education services, and engage in civic life, the persistence of the digital divide threatens to deepen existing inequalities and undermine progress towards the Sustainable Development Goals (SDGs). Nigeria's Vision 20:2030 and the National Digital Economy Policy and Strategy (NDEPS) acknowledge the centrality of digital inclusion to the country's

development agenda, yet implementation gaps remain wide (Federal Ministry of Communications and Digital Economy, 2022).

Scholarly engagement with the digital divide has evolved significantly over the past two decades. Early scholarship focused almost exclusively on questions of physical access to technology, the so-called first-level divide but subsequent research has identified more nuanced dimensions, including disparities in digital skills (second-level divide) and in the tangible outcomes that individuals derive from digital engagement (third-level divide) (Van Dijk, 2020; Scheerder, van Deursen & van Dijk, 2023). However, literature on this problem in Nigeria remains fragmented, with insufficient attention paid to how these multiple levels of the digital divide interact to produce compounding disadvantages for marginalised groups.

Against this backdrop, this paper seeks to provide a comprehensive analysis of the digital divide in Nigeria, its implications for inclusive and sustainable socio-economic development, and the policy interventions required to address it. The study is anchored on Technological determinism Theory and employs a library research methodology to synthesise contemporary scholarship on the subject. Crucially, despite a growing body of work on digital inclusion in Nigeria, there remains a conspicuous knowledge gap concerning the intersectional dimensions of the third-level digital divide. Specifically, existing studies have inadequately theorised how the convergence of gender, poverty, ethnicity, and geographical location produces differentiated digital outcomes, and how these outcomes, in turn, mediate access to economic opportunities, social services, and democratic participation. This study addresses the gap by offering an integrated analytical framework for understanding digital inequality in Nigeria within the context of sustainable development imperatives.

Concept and Dimensions of the Digital Divide

The digital divide is broadly defined as the gap between individuals, communities, and nations that have access to modern information and communication technologies and those that do not (OECD, 2022). In its most elementary formulation, the concept captures the inequitable distribution of digital technologies, including computers, smartphones, and internet connectivity, across different segments of society. However, contemporary scholarship has expanded this understanding considerably to encompass not merely physical access to devices and networks, but also the skills required to use them effectively and the outcomes that individuals are able to achieve through digital engagement (Deursen & Helsper, 2022; Ogundipe, Obi & Eze, 2023).

Van Dijk's (2020) foundational work conceptualised the digital divide as a dynamic, multi-dimensional process shaped by resource inequalities across motivational, material, skills, and usage dimensions. More recent scholarship has enriched this framework by situating the digital divide within broader systems of structural inequality, arguing that digital exclusion is not merely a technical problem but a social and political one, deeply embedded in pre-existing patterns of marginalisation based on class, gender, race, and geography (Scheerder, van Deursen & van Dijk, 2023). In the Nigerian context, the digital divide is further compounded by infrastructural deficits, high data costs, and low levels of digital literacy, particularly among rural and low-income populations (Adeyemi & Olawale, 2024).

Levels of the Digital Divide

Scholars have identified three hierarchical levels of the digital divide. The first-level divide concerns physical access to digital devices and internet connectivity. This remains the most visible dimension of digital inequality and is characterised by disparities between those who own or can access computers, smartphones, and reliable internet connections and those who cannot. In Nigeria, this divide is starkly apparent between urban and rural populations, with rural dwellers, the elderly, and low-income households disproportionately excluded from digital access (Osei-Bonsu & Amoah, 2023).

The second-level divide focuses on digital skills the competencies required to use digital technologies effectively. Even among those who possess devices and internet access, significant disparities exist in the capacity to navigate online environments, evaluate digital information critically, and harness digital tools for productive purposes. Research by Deursen and Helsper (2022) demonstrates that digital skills are strongly correlated with educational attainment, socio-economic status, and age, meaning that disadvantaged groups are doubly excluded first from access and then from effective use. The third-level divide, which has attracted increasing scholarly attention in recent years, pertains to the tangible benefits or outcomes that individuals derive from digital engagement. Scheerder, van Deursen and van Dijk (2023) argue that even when individuals have access to digital technologies and possess basic skills, systemic inequalities in income, education, and social capital constrain their ability to translate digital engagement into meaningful economic, social, or political gains.

Urban-Rural Disparities

Urban-rural disparities constitute one of the most persistent and well-documented dimensions of the digital divide in Nigeria. The concentration of

telecommunications infrastructure in urban centres, driven by market logic and historical patterns of investment, has left rural communities severely underserved. According to the Nigerian Communications Commission (NCC, 2023), over 40% of rural local government areas lack adequate broadband coverage, limiting residents' ability to access digital services in education, health, commerce, and governance. These infrastructural gaps are compounded by unreliable electricity supply and the high cost of internet-capable devices, which place digital access beyond the reach of most rural households (Ogundipe, Obi & Eze, 2023).

Gender and Socio-Economic Inequalities

Gender and socio-economic inequalities significantly deepen the digital divide in Nigeria. Women and girls face multiple barriers to digital inclusion, including lower educational attainment, limited economic resources, restrictive cultural norms, and safety concerns associated with online engagement (Adeyemi & Olawale, 2024). Research by the Alliance for Affordable Internet (A4AI, 2022) indicates that Nigerian women are approximately 35% less likely than men to own a mobile internet-enabled device, and this gap widens considerably in northern states where gender-based restrictions on female mobility and education are more pronounced. Socio-economic inequality further entrenches digital exclusion, as households in the lowest income quintiles lack the financial means to afford devices, data subscriptions, and electricity, condemning them to a cycle of digital poverty that reinforces material poverty (Osei-Bonsu & Amoah, 2023).

Digital Inclusion and Social Equity in Nigerian Society

Digital inclusion refers to the meaningful participation of all individuals and communities in the digital society, encompassing access to affordable technologies, the development of digital skills, and the ability to derive tangible benefits from digital engagement (A4AI, 2022). In Nigeria, the pursuit of digital inclusion is inseparable from the broader project of social equity, as the communities most severely affected by digital exclusion are invariably those already marginalised by poverty, gender inequality, ethnic discrimination, and geographical remoteness (Adeyemi & Olawale, 2024).

The Nigerian government has introduced several policy frameworks aimed at promoting digital inclusion, most notably the National Digital Economy Policy and Strategy (NDEPS) 2020-2030, which identifies digital inclusion as a cornerstone of the country's economic transformation agenda. The NDEPS articulates targets for broadband penetration, digital literacy training, and the digitisation of public services. However, analysts have noted significant implementation gaps, attributing these to inadequate funding, weak regulatory enforcement, and the absence of a

coherent strategy for reaching the most excluded populations (Federal Ministry of Communications and Digital Economy, 2022; Ogundipe, Obi & Eze, 2023).

Civil society organisations and international development partners have also played an important role in advancing digital inclusion in Nigeria. Initiatives such as the United Nations Development Programme's Digital Inclusion Project and various private-sector-led digital literacy programmes have sought to extend the benefits of digital technologies to underserved communities. Notwithstanding these efforts, structural barriers to inclusion persist. Research by Osei-Bonsu and Amoah (2023) reveals that many government-sponsored digital literacy programmes in Nigeria are poorly targeted, failing to reach women, the elderly, and out-of-school youth — the groups most in need of digital empowerment. Deursen and Helsper (2022) similarly observe that digital inclusion programmes that focus exclusively on physical access, without addressing skills development and outcome realisation, are unlikely to produce equitable results.

Social equity considerations demand that digital inclusion efforts in Nigeria adopt an intersectional lens, recognising that the barriers to digital participation are not uniform but vary according to the overlapping disadvantages of gender, poverty, geography, disability, and age (Ezegwu, 2026). A socially equitable approach to digital inclusion would involve targeted interventions that address the specific barriers facing each marginalised group, combined with systemic reforms to reduce the structural inequalities that underpin digital exclusion. As Scheerder, van Deursen and van Dijk (2023) argue, achieving meaningful digital inclusion requires not merely providing access to technology, but transforming the social and economic conditions that determine who benefits from that access. Nigeria's path to digital equity, therefore, is inextricably linked to its broader commitments to gender equality, poverty reduction, and inclusive economic growth.

Impact of Digital Inequality on Sustainable Development in Nigeria

Digital inequality has far-reaching consequences for Nigeria's pursuit of the Sustainable Development Goals. The following dimensions illustrate the multifaceted impact of digital exclusion on sustainable development:

1. **Poverty Trap Reinforcement:** Digital exclusion confines low-income households to low-productivity economic activities, limiting their access to digital financial services, e-commerce platforms, and digital job markets that could help lift them out of poverty (Adeyemi & Olawale, 2024).
2. **Employment and Labour Market Disadvantage:** The growing demand for digital skills across sectors means that individuals lacking digital competencies

face structural unemployment and are confined to informal, low-wage employment, widening income inequality (Osei-Bonsu & Amoah, 2023).

3. **Barriers to Quality Education:** Digital inequality impedes access to online learning resources, e-learning platforms, and educational technologies, deepening existing gaps in educational outcomes between urban and rural, rich and poor students (Ogundipe, Obi & Eze, 2023).
4. **Healthcare Access Deficits:** The exclusion of rural and low-income populations from telemedicine, digital health information, and e-health platforms perpetuates avoidable health inequalities and undermines Nigeria's health development targets (Federal Ministry of Communications and Digital Economy, 2022).
5. **Agricultural Productivity Limitations:** Smallholder farmers excluded from digital platforms lose access to real-time market price information, weather forecasts, and digital financial services that could enhance productivity and income (A4AI, 2022).
6. **Financial Exclusion:** The digital divide intersects with financial exclusion, as those lacking digital access cannot benefit from mobile banking, digital payment systems, or microfinance platforms that support economic empowerment (Deursen & Helsper, 2022).
7. **Environmental Sustainability:** Digital exclusion limits communities' access to information about climate risks, environmental regulations, and green economy opportunities, weakening their capacity to participate in sustainable development (OECD, 2022).
8. **Innovation Deficit:** Nations with high levels of digital inequality produce less innovation, as large segments of the population are excluded from the knowledge economy, reducing national competitiveness and growth potential (Scheerder, van Deursen & van Dijk, 2023).
9. **Effects on Poverty Reduction and Employment:** Digital inequality directly undermines poverty reduction by denying excluded populations access to digital economic opportunities, digital financial services, and remote work possibilities. In Nigeria, where youth unemployment exceeds 42%, the digital skills gap represents a critical structural barrier to employment generation. Digital platforms could enable millions of young Nigerians to access remote work, gig economy opportunities, and entrepreneurial platforms, but the persistence of the digital divide ensures that these benefits accrue overwhelmingly to already-advantaged urban populations (Adeyemi & Olawale, 2024). Bridging the divide thus represents not merely a technological challenge but an essential anti-poverty and employment strategy.
10. **Implications for Civic Engagement and Democracy:** Digital inequality has profound implications for democratic participation and civic engagement in

Nigeria. Digital platforms have become vital arenas for political discourse, voter mobilisation, public accountability, and citizen-government interaction. When significant segments of the population are excluded from these platforms due to a lack of access or skills, their voices are effectively silenced in digital public spheres. Research by Ogundipe, Obi and Eze (2023) demonstrates that digitally excluded populations are less likely to engage with online civic platforms, petition the government, or access information about their rights and entitlements. This digital democratic deficit disproportionately affects rural communities, women, and the poor, reinforcing elite capture of digital governance spaces and undermining the inclusivity of Nigerian democracy.

Concept of Sustainable Development

Sustainable development refers to a pattern of development that satisfies the needs of the present generation without compromising the ability of future generations to meet their own needs. This definition, originally introduced in the Brundtland Report (1987), remains the globally accepted foundation of the concept and continues to guide contemporary scholarship and policy. Recent scholars argue that sustainable development extends beyond environmental protection to encompass the balanced integration of economic growth, social inclusion, and environmental sustainability, ensuring that development is equitable, resilient, and long-term (Fischer et al., 2023).

According to Purvis, Mao and Robinson (2019), sustainable development requires governments, businesses, and citizens to pursue policies that improve living standards while conserving natural resources and reducing inequality. Similarly, Makhrout and Ait Hbibi (2023) describe sustainable development as a holistic approach that promotes responsible resource management, social justice, and inclusive economic progress to improve human well-being without degrading the environment.

In Nigeria, sustainable development is particularly important because the country faces persistent challenges such as poverty, unemployment, environmental degradation, digital inequality, and inadequate infrastructure, (Ezegwu, 2026). Achieving sustainable development therefore requires inclusive policies that expand access to education, healthcare, digital technologies, employment opportunities, and social services while protecting environmental resources. Within the context of this study, sustainable development implies ensuring that all Nigerians, regardless of geographical location or socio-economic status, have equal opportunities to participate in and benefit from the digital economy. Bridging the digital divide is therefore a critical strategy for promoting inclusive economic

growth, reducing social inequalities, enhancing innovation, and achieving the Sustainable Development Goals (SDGs).

Theoretical Framework

This study is anchored on the Digital Divide Theory. The concept of the digital divide was first introduced by Lloyd Morrisett in 1995 to describe the gap between individuals and communities with access to information and communication technologies (ICTs) and those without such access. The theory was later expanded by scholars such as Jan van Dijk (2005 cited in Ezegwu, 2026), who argued that the digital divide extends beyond physical access to include differences in digital skills, motivation, quality of use, and the social and economic benefits derived from digital technologies. The theory therefore explains how unequal access to ICT infrastructure, affordable internet, digital literacy, and technological resources creates disparities in education, employment, healthcare, governance, and economic opportunities.

Recent studies have continued to apply the Digital Divide Theory in explaining patterns of digital inequality. In Nigeria, Adeleke and Salau (2022) employed the theory to examine digital exclusion among rural households and found that inadequate infrastructure and limited digital literacy significantly constrained socio-economic participation. Similarly, Adebayo and Olanrewaju (2024) used the theory to investigate disparities in digital financial inclusion in Nigeria, concluding that unequal internet access and digital skills widened socio-economic inequality.

The Digital Divide Theory is relevant to this study because it provides a suitable framework for understanding how unequal access to digital technologies affects inclusive and sustainable socio-economic development in Nigeria. As government services, education, healthcare, commerce, and employment increasingly depend on digital platforms, individuals and communities without reliable internet connectivity, digital devices, or digital skills are excluded from these opportunities. Therefore, the theory explains why bridging the digital divide is essential for promoting equitable economic growth, reducing social inequality, enhancing digital inclusion, and achieving sustainable socio-economic development in Nigeria.

Methodology

This study adopted the library research method, also known as desk research or secondary research, which involves the systematic review, analysis, and synthesis of existing literature, documents, and data sources relevant to the research topic. Rather than generating primary data through fieldwork, surveys or experiments, the

library research method draws on peer-reviewed journal articles, government reports, policy documents, institutional publications, and other secondary sources to construct a comprehensive understanding of the phenomenon under investigation (Obi & Nwosu, 2023; Eze, Adamu & Balogun, 2024). This approach is particularly appropriate for conceptual and theoretical studies that aim to synthesise existing knowledge, identify research gaps, and develop analytical frameworks, rather than to generate new empirical data.

Conclusion

The digital divide represents one of the most consequential structural inequalities of the contemporary era, with profound implications for inclusive and sustainable socio-economic development in Nigeria. This paper has demonstrated that digital inequality in Nigeria operates across multiple interrelated levels, encompassing disparities in access, skills, and outcomes, and is structured by systemic inequalities of geography, gender, income, and education. The exclusion of significant segments of the Nigerian population from the digital economy perpetuates poverty, limits employment opportunities, undermines educational and healthcare outcomes, and constrains democratic participation. Technology determinism theory provides a powerful lens for understanding why digital exclusion produces such profound socio-economic consequences, as the accelerating digital transformation of all sectors of Nigerian life creates structural imperatives that systematically disadvantage those without digital access and competencies. Addressing the digital divide demands an urgent, integrated, and intersectional policy response that goes beyond infrastructure provision to encompass skills development, affordability, and the transformation of the social conditions that determine who benefits from digital technologies. Nigeria's progress towards sustainable development and social equity is inseparable from its success in bridging the digital divide.

Recommendations

Based on the findings of this study, the following recommendations are advanced:

1. The government should expand rural telecom infrastructure, broadband, and community internet centres to bridge urban-rural gaps.
2. Redesign digital literacy programmes with an intersectional focus on women, the elderly, disabled persons, and rural youth, emphasising practical skills for jobs, entrepreneurship, and civic engagement.
3. Regulators should lower the costs of data and devices to improve affordability for low-income households.

4. Ensure inclusive digital services and support multidisciplinary research to address advanced digital inequalities in Nigeria to inform evidence-based policy decisions.

References

Adeyemi, T., & Olawale, B. (2024). Gender, poverty and the digital divide in Nigeria: Intersectional barriers to digital inclusion. *African Journal of Information and Communication Studies,* 12(3), 45–67.

Adebayo, A. A., & Olanrewaju, T. O. (2024). Digital financial inclusion and socio-economic inequality in Nigeria: A digital divide perspective. *Journal of African Business, 25*(2), 176–193.

Adeleke, R. O., & Salau, A. T. (2022). Digital divide and rural socio-economic development in Nigeria. *Information Development, 38*(4), 593–607.

Alliance for Affordable Internet (A4AI). (2022). *Meaningful connectivity: A new standard for digital inclusion.* A4AI.

Deursen, A. J. A. M., & Helsper, E. J. (2022). Broadening understanding of the digital divide: A multi-dimensional framework for policy and research. *Journal of Information Technology & Politics,* 19(2), 112–128.

Ezegwu, D. T. (2026). Cybersecurity Challenges and Digital Literacy Gaps in Nigeria: Implications for Sustainable National Development. *Kwararafa University Journal of Multidisciplinary Research and Innovation*, 1 (1), 237-243.
doi : https://doi.org/10.5281/zenodo.21183961 .

Ezegwu, D.T. (2026). *Introduction to Online Journalism: Principles and Practices for the Digital Age*. Enugu: New Generation Books.

Eze, C., Adamu, P., & Balogun, R. (2024). Library research methodology in social science: Principles, procedures, and applications. *Nigerian Journal of Social Science Research,* 18(1), 23–40.

Fischer, M., Foord, D., Frecè, J., Hillebrand, K., Kissling-Näf, I., Meili, R., Peskova, M., Risi, D., Schmidpeter, R., & Stucki, T. (2023). *The concept of sustainable development*. In *Sustainable Business*. Springer. https://doi.org/10.1007/978-3-031-25397-3_2.

Federal Ministry of Communications and Digital Economy. (2022). National Digital Economy Policy and Strategy (NDEPS) 2020–2030: Progress review report. Federal Government of Nigeria.

Ikenna, O., & Okoye, J. (2025). Artificial intelligence, digital platforms and labour market restructuring in West Africa: A technological determinist analysis. *African Technology and Society Review,* 7(1), 18–39.

Makhrout, S., & Ait Hbibi, A. (2023). Sustainable development: The history and evolution of a concept. *Revue Internationale de la Recherche Scientifique, 1*(4), 497–509. https://doi.org/10.5281/zenodo.8156763.

Nigerian Communications Commission (NCC). (2023). *Annual statistical report on telecommunications in Nigeria.* NCC Publications.

Nwosu, F., & Chukwuemeka, D. (2026). Mandatory digitalisation of public services and social exclusion in Nigeria: A technological determinist perspective. *Journal of E-Government Studies and Best Practices,* 14(2), 55–74.

Obi, I., & Nwosu, K. (2023). Library research method in contemporary academic inquiry: A review of applications in Nigerian social sciences. *Journal of Academic Research Methods,* 9(2), 77–91.

OECD. (2022). *Bridging the digital gender divide: Include, upskill, innovate.* OECD Publishing.

Ogundipe, A., Obi, C., & Eze, R. (2023). Digital exclusion and democratic participation in rural Nigeria: Evidence from the 2023 general elections. *Journal of African Politics and Society,* 5(4), 101–119.

Osei-Bonsu, K., & Amoah, E. (2023). Digital inequality and sustainable development in Sub-Saharan Africa: Structural barriers and policy responses. *Development in Practice,* 33(1), 88–103.

Scheerder, A., van Deursen, A., & van Dijk, J. (2023). The third-level digital divide: Outcomes of internet use among the general population. *Information, Communication & Society,* 26(5), 712–730.

Van Dijk, J. A. G. M. (2020). *The digital divide.* Polity Press.