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Addressing the Framework & Mechanisms of Digital-Divide Issues & Challenges in Nigerian Information Society for Sustainable National Development in the 21st Century

Dr. Olubiyo Peter Olubunmi

University Library, Adeyemi Federal University of Education, Ondo, Ondo State, Nigeria

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The ability of Nigeria to create an inclusive, equitable, and productive information society is inseparably connected with the realization of sustainable national development in the 21st century where all citizens, irrespective of geographical location, gender, income level, age, and academic qualifications, would have access, utilization, and material benefits of digital information resources and technologies. Nonetheless, the information society in Nigeria is still incredibly and structurally divided. Although Nigerian Communications Commission (NCC) estimates 164.4 million active internet connections as of March 2024, making Nigeria the biggest internet market in Africa, the quality, cost, geographic reach, and digital literacy aspects of that connectivity highlight the presence of profound, systematic structural disparities that degrade equitable access to information, hinder economic performance, and jeopardize the realisation of Nigeria sustainable development goals. National Bureau of statistics (NBS) confirms that in 2023, the digital economy sector contributed 18.2% to GDP, and in Q1 2025, it contributed 14.19 to GDP- a phenomenal structural change is brought about by telecommunication, fintech, and ICT services. However, this economic contribution coincides with an information society where about 27 million Nigerians do not have access to any telecommunications infrastructure, more than 60% of the rural population is inadequately served by broadband, and Nigerian women are 29% less likely than men to be using mobile internet (GSMA, 2022). This paper presents an end-to-end, theoretically-based, and evidence-based analysis of the digital divide in the Nigerian information society. It interprets the concept and various dimensions of the digital divide; reviews the structures, policies and processes that Nigeria has implemented to overcome the digital divide; critically evaluates the challenges that have plagued the digital divide structures; evaluates the transformative role played by digital information resources in sustainable national development; maps a strategic path forward; and finally presents practical recommendations to policymakers, information professionals and development partners. The evidence used in the paper includes reports by the NCC industry, the NBS GDP, the ITU global data, empirical research by Nigerian universities, the review by the World Bank, and the recent evaluation of the Nigerian landmark 3 Million Technical Talent (3MTT) Programme, the largest tech talent accelerator in the world operated by the state.

Keywords: Digital Divide, Nigeria, Information Society, Sustainable Development, ICT Policy, National Development, Digital Inclusion, Internet Access, Digital Literacy, 3MTT, Fintech, NCC, SDGs, Rural-Urban Divide, Gender Digital Divide

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INTRODUCTION

Nigeria stands at a critical inflection point in its digital development trajectory. On one side of the ledger lies a story of remarkable digital transformation: the ICT sector contributing 19.78% of real GDP in Q2 2024, up from 14.07% in Q2 2020 (Trade.gov, 2025; TechCabal, 2024); data consumption reaching a historic 9.76 million terabytes (TB) in 2024, a 34.26% year-on-year increase (NCC, 2024; Technology Times, 2025); five unicorn technology companies (Interswitch, Flutterwave, OPay, Andela, Moniepoint) emerging from the Nigerian digital economy; and the 3 Million Technical Talent (3MTT) programme, described by the World Economic Forum as 'the largest technology talent accelerator in the world', training its first 31,270 fellows as of early 2024 and attracting 1.7 million applications from across all 774 local government areas (WEF, 2024; 3MTT, 2024). This is the Nigeria of Lagos's 'Africa's Silicon Valley' narrative, of Flutterwave processing $34 billion in transactions for clients including Uber and Microsoft, and of a digital economy projected to generate $18.3 billion by 2026 (Trade.gov, 2025; TechCabal, 2025).

On the other side lies an equally compelling but far less celebrated narrative: approximately 27 million Nigerians with no access to any telecommunications infrastructure whatsoever, as reported by the Centre for Information Technology and Development (CITAD) in January 2025 (Borgen Project, 2025); over 60% of the rural population, representing approximately 130 million Nigerians, poorly served by broadband networks; Nigerian women 29% less likely than men to use mobile internet, reflecting entrenched gender barriers to digital participation (GSMA, 2022; IGWEBUIKE, 2025); a National Broadband Plan (2020–2025) that ended with a 50.58% penetration rate in November 2025, well short of its 70% target (TechCabal, 2025; MSME Africa, 2025); and rural secondary school students in states from Kwara to Adamawa learning in ICT-deprived environments where lack of electricity, poor connectivity, and high poverty levels structurally exclude them from the e-learning opportunities their urban peers take for granted (PMC, 2021; ScienceDirect, 2021).

These two Nigerias, the Lagos-centric digital economy success story and the infrastructure-deprived, connectivity-excluded majority of rural and low-income Nigerians, constitute the digital divide challenge that this paper addresses. It is a challenge whose resolution is simultaneously a prerequisite for and an enabler of Nigeria's sustainable national development aspirations: the National Development Plan 2021–2025, the National Digital Economy Policy and Strategy (NDEPS) 2020–2030, and Nigeria's commitment to achieving the United Nations' Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation, and Infrastructure), and SDG 10 (Reduced Inequalities).

Theoretical Foundations

This paper draws on three interlocking theoretical frameworks that together provide a comprehensive analytical architecture for understanding Nigeria's digital divide. The first is Van Dijk's (2006, 2020) Sequential Model of Digital Access, which identifies four sequential categories of access barriers, motivational access, physical/material access, skills access, and usage access, and emphasises that addressing only one or two of these barriers (e.g., deploying infrastructure without addressing digital literacy) produces limited and unsustainable digital inclusion outcomes. The second is Amartya Sen's (1999) Capability Approach, which evaluates digital inclusion not by connectivity statistics alone but by whether digital access expands substantive human capabilities, for education, economic participation, health, political agency, and cultural expression. On this framework, Nigeria's digital divide is fundamentally a capability deprivation that limits human flourishing for hundreds of millions of citizens. The third is Human Capital Theory (Becker, 1964; applied to digital contexts by Anowor et al., 2025), which posits that investment in the digital knowledge, skills, and competencies of the population generates returns at both individual and national levels, providing the economic rationale for government investment in digital skills development programmes such as 3MTT.

Table 1: Theoretical Frameworks Applied to Nigeria's Digital Divide Context

Theory	Core Propositions	Application to Nigeria's Digital Divide
Van Dijk's Sequential Digital Access Model (2006, 2020)	4 sequential barriers: motivational, physical, skills, usage access	Nigeria's divide operates at all 4 levels: rural non-coverage (physical); illiteracy (skills); low awareness (motivational); poor content relevance (usage)
Sen's Capability Approach (1999)	Development = expansion of substantive freedoms and capabilities	Digital inclusion must be measured by capability gains, education, health, economic participation, not merely connectivity statistics

Continuation of Table 1

Human Capital Theory (Becker, 1964; Anowor et al., 2025)	Investment in knowledge and skills generates individual and social returns	3MTT programme rationale: training 3 million tech-skilled Nigerians generates GDP growth, employment, and export revenue
Information Poverty Theory (Chatman, 1996; Al-Zaman, 2023)	Information poverty = chronic exclusion from socially normalised information access	Nigeria's rural and low-income populations experience information poverty, compounding cycles of educational, economic, and health disadvantage

Table 1: Author's Synthesis (2024); adapted from Van Dijk (2020); Sen (1999); Becker (1964); Chatman (1996)

CONCEPT OF THE DIGITAL DIVIDE IN NIGERIA

Definition and Multi-Level Manifestation

The digital divide, in its most fundamental formulation, refers to the gap between those who have access to digital information and communication technologies (ICTs) and those who do not, a disparity that plays out across geographic, socioeconomic, gender, age, and educational dimensions (OECD, 2000; Van Dijk, 2020). In the Nigerian context, the digital divide manifests across at least four intersecting dimensions that together define the country's information society inclusivity challenge.

The first-level divide, physical/infrastructural access, concerns whether Nigerians have access to digital devices and internet connectivity of sufficient quality for meaningful use. Despite 164.4 million active internet subscriptions as of March 2024, the NCC (2023) reported that broadband penetration reached only approximately 45% in urban areas, while many rural communities still lack mobile towers, electricity supply, and broadband infrastructure (IGWEBUIKE, 2025). CITAD's January 2025 revelation that 27 million Nigerians lack access to any telecommunications infrastructure underscores the scale of this first-level exclusion. The rural-urban connectivity gap mirrors a more general development asymmetry: Lagos alone accounts for over 70% of Nigeria's tech startup activity (PlanetWeb, 2025), while northern states, particularly Kebbi, Yobe, Zamfara, and Sokoto, lag significantly in digital infrastructure density.

The second-level divide, digital skills and usage, concerns whether those with physical access have the literacy, competencies, and motivation to use digital technologies effectively. Research published in the PMC/NCBI database (2021) covering rural secondary schools across Kwara, Ekiti, Ebonyi, Bayelsa, Adamawa, and Kano during the COVID-19 pandemic identified lack of ICT strategies and policies, socioeconomic status, poor internet connectivity, electricity deficits, and high poverty levels as primary drivers of digital gaps in Nigerian remote communities. A 2024 study on digital inclusion in rural communities in Southern Kaduna reported that 14.7% of respondents cited lack of knowledge or digital skills and 13.2% cited poor internet connectivity as the main barriers to digital participation (Afropolitan Journals, 2024).

The third-level divide, digital outcomes, concerns whether digital engagement produces tangible life improvements. Nigeria's digital economy success, contributing 18.2% of GDP in 2023 and housing five unicorn companies, coexists with deeply unequal distribution of these benefits. PlanetWeb (2025) notes that Lagos accounts for over 70% of tech startup activity, while northern states lag significantly. This geographic concentration of digital economic value reproduces and deepens existing regional development inequalities, demonstrating that connectivity growth without equity-oriented policy produces third-level divide outcomes.

The fourth-level divide, the gender digital divide, deserves particular analytical emphasis in the Nigerian context. GSMA's Mobile Gender Gap Report (2022) found that Nigerian women are 29% less likely than men to use mobile internet, reflecting structural barriers including cultural and patriarchal norms that restrict female smartphone use, educational inequalities that suppress female digital literacy, economic dependence that limits women's autonomous technology spending, and safety concerns about online harassment. Corroborating research in IGWEBUIKE (2025) confirmed that rural Nigerian women experience all three components of digital inclusion as weak or entirely absent, with domestic caregiving responsibilities, cultural resistance to female technology use, and lack of gender-responsive digital literacy programmes further compounding their exclusion.

Table 2: Nigeria's Digital Divide, Statistical Profile (2022–2025)

Indicator	Value / Status	Source
Active internet subscriptions (March 2024)	164.4 million	NCC / SAMENA (2024)
National broadband penetration (end-2024)	44.43% (target: 70% by 2025)	NCC (2024); TechCabal (2025)
Nigerians without any telecom infrastructure (Jan 2025)	~27 million	CITAD / Borgen Project (2025)
Urban broadband coverage (NCC, 2023)	~45%	NCC (2023); IGWEBUIKE (2025)
Nigerian women less likely to use mobile internet	29% less likely than men	GSMA Mobile Gender Gap (2022)
Mobile data cost (entry-level 2GB, 2024)	4.2% of GNI per capita (target: 2%)	ITU / Borgen Project (2025)
National data consumption (2024)	9.76 million TB (+34.26% YoY)	NCC (2024); Technology Times (2025)
ICT sector GDP contribution (Q2 2024)	19.78% of real GDP	NBS / Trade.gov (2025)
3MTT Programme fellows (Phase 1, 2024)	31,270 (from 1.7M+ applications)	3MTT / WEF (2024)
Nigerian tech unicorns	5 (Interswitch, Flutterwave, OPay, Andela, Moniepoint)	Trade.gov (2025); PlanetWeb (2025)

Table 2: Compiled from NCC (2024); CITAD/Borgen Project (2025); GSMA (2022); ITU (2024); NBS/Trade.gov (2025); WEF (2024)

NIGERIAN INFORMATION SOCIETY: FRAMEWORKS AND MECHANISMS FOR DIGITAL DIVIDE REDUCTION

Overview of Policy Architecture

Nigeria has developed one of sub-Saharan Africa's most comprehensive digital economy policy architectures, reflecting the government's recognition of ICT as a central driver of sustainable national development. This architecture spans multiple levels, national vision documents, sectoral plans, regulatory frameworks, institutional mandates, and programmatic interventions, and involves multiple actors: the Federal Ministry of Communications, Innovation, and Digital Economy; the Nigerian Communications Commission (NCC); the National Information Technology Development Agency (NITDA); the National University Commission (NUC); the Universal Service Provision Fund (USPF); and an expanding range of private sector and development partner stakeholders. Together, these instruments constitute Nigeria's response to its digital divide challenge, a response that is impressive in its scope but constrained in its implementation, as the following analysis demonstrates.

The National Digital Economy Policy and Strategy (NDEPS) 2020–2030

The National Digital Economy Policy and Strategy (NDEPS) 2020–2030, launched by the Federal Government of Nigeria in 2019 under the mandate of the Ministry of Communications and Digital Economy, represents the country's most comprehensive overarching digital development framework. The NDEPS articulates eight 'pillars' of digital economy development: Developmental Regulation; Digital Literacy and Skills; Solid Infrastructure; Service Infrastructure; Digital Services Development and Promotion; Soft Infrastructure; Digital Society and Emerging Technologies; and Indigenous Content Development and Adoption. The strategy explicitly targets 70% broadband penetration, universal digital literacy across all socioeconomic strata, and Nigeria's position as Africa's leading digital economy by 2030 (FMCDE, 2020; Trade.gov, 2025).

The NDEPS's ambition is matched by its breadth and the political commitment that initially underpinned it. Its recognition that digital development requires simultaneous progress across infrastructure, skills, content, regulation, and service dimensions reflects a sophisticated understanding of Van Dijk's multi-level access model. However, the strategy's success depends on funding, coordination, and sustained implementation across political cycles, conditions that have historically proven difficult to maintain in Nigeria's governance environment. The NBS data confirming the ICT sector's growing GDP contribution, from 14.07% in Q2 2020 to 19.78% in Q2 2024, demonstrates that elements of the NDEPS are

producing measurable results. The simultaneous failure to achieve the 70% broadband penetration target demonstrates equally clearly that other dimensions of the strategy's vision remain unrealised.

The National Broadband Plan 2020–2025

The National Broadband Plan (NBP) 2020–2025, developed by the NCC in alignment with the NDEPS, set four key targets: 70% broadband penetration by 2025; minimum download speeds of 25 Mbps in urban areas and 10 Mbps in rural areas; effective coverage of at least 90% of the Nigerian population; and data affordability at no more than ₦390 per 1 GB (equivalent to approximately 2% of median income or 1% of minimum wage). As of the plan's concluding year 2025, all four targets were missed. Broadband penetration crossed 50% only in November 2025; urban speeds in many areas remain below 25 Mbps; population coverage falls far short of 90%, with 27 million Nigerians lacking any telecom infrastructure; and data affordability at 4.2% of GNI per capita in 2024 remained more than double the target level (TechCabal, 2025; MSME Africa, 2025; Borgen Project, 2025).

The NBP's implementation was constrained by several factors documented in the NCC's own 2024 Subscriber/Network Performance Report: high Right-of-Way (RoW) fees charged by some state and local governments that increased the cost of fibre deployment; damage and theft of fibre optic cables averaging 30–43 cuts daily; the SIM-NIN verification exercise that deactivated tens of millions of unlinked SIM cards; rising telecommunications sector operating costs (up 81.97% in 2024 to ₦4.58 trillion); and the macroeconomic impact of naira devaluation (over 50% since 2023) on import-dependent telecoms equipment costs (NCC, 2024; Nairametrics, 2024; Technext, 2025). However, the plan also produced significant achievements: Nigeria's CAPEX in the telecoms sector grew 175.37% in 2024 (to ₦2.71 trillion); broadband penetration grew from 39.85% in March 2020 to 50.58% in November 2025; and national data consumption tripled between 2020 and 2024 (NCC, 2024; TheCable, 2025).

The 3 Million Technical Talent (3MTT) Programme

Among the most significant and concrete information society intervention in Nigeria's recent history is the 3 Million Technical Talent (3MTT) Programme, launched by the Federal Ministry of Communications, Innovation, and Digital Economy in October 2023 under Minister Dr. Bosun Tijani. Designed to train three million Nigerians in in-demand digital and technical skills, including software development, data science, AI/machine learning, cybersecurity, UI/UX design, product management, and cloud computing, by 2027, 3MTT represents the government's most ambitious attempt to address the second-level digital divide: the skills gap that prevents connected Nigerians from deriving economic value from their connectivity.

The programme's Phase 1, delivered between December 2023 and March 2024, trained 31,270 fellows selected across all 36 states and the Federal Capital Territory, through a hybrid model combining self-paced online learning with in-person Applied Learning Cluster (ALC) sessions at 120+ partner organisations (3MTT, 2024; TechCabal, 2024). The programme received applications from 1.7 million Nigerians, across almost all 774 local government areas, for 30,000 initial places, demonstrating the enormous latent demand for digital skills development among Nigeria's predominantly young population, of which approximately 70% are under 35 years of age. Phase 2 (10% of target), launched in late February 2024, onboarded 270,000 additional fellows; Phase 3 (100%) is scheduled to run through 2027, targeting the full three million.

MTN Nigeria has committed ₦3 billion to the 3MTT Programme, enabling the training of over 90,000 Nigerians through 197 Applied Learning Cluster organisations, in what Minister Tijani described as a partnership that ensures 'opportunity is not limited by geography or circumstance, but driven by skill, inclusion, and shared purpose' (FMCIDE, 2025). The World Economic Forum characterised 3MTT as 'the largest technology talent accelerator in the world' in its September 2024 analysis, noting that it addresses both a domestic youth unemployment crisis and a global tech talent shortage simultaneously, positioning Nigeria as a potential net exporter of digital talent (WEF, 2024). TechCabal (2024) reported that the ministry aims to increase the digital economy's GDP contribution to 22% by 2027, using 3MTT as a critical lever.

Table 3: Nigeria's Key Digital Divide Addressing Frameworks, Components and Assessment

Policy / Programme	Period	Core Target / Mechanism	Assessment of Impact
National Digital Economy Policy & Strategy (NDEPS)	2020–2030	Africa's leading digital economy; 8 pillars of development	ICT sector GDP: 19.78% (Q2 2024) ↑ from 14.07% (Q2 2020) , structural transformation underway but regionally uneven
National Broadband Plan (NBP)	2020–2025	70% broadband penetration; 25/10 Mbps speeds; ₦390/1GB	MISSED: 50.58% penetration by Nov 2025; data costs remain 4.2% GNI per capita (target: 2%)
NCC Universal Service Provision Fund (USPF)	Ongoing	Rural connectivity; underserved area intervention fund	Progress made but scale of rural Nigeria (60%+ rural population) exceeds current fund capacity
3 Million Technical Talent (3MTT) Programme	2023–2027	3 million Nigerians trained in digital/tech skills; talent export strategy	Phase 1: 31,270 trained; Phase 2: 270,000; 1.7M+ applications; WEF: 'world's largest tech talent accelerator'
NUC Virtual Library	2002–ongoing	95,000+ e-journals for university academics via HINARI, AGORA, OARE	Significant for academic digital divide; awareness and utilisation remain suboptimal
Project 774 LG Connectivity	2024–ongoing	Internet connectivity to all 774 LGA secretariats	In implementation; aims to extend broadband to grassroots governance level
Project BRIDGE (90,000 km fibre)	2024–ongoing	90,000 km of new fibre optic backbone infrastructure	In progress; would make Nigeria Africa's 3rd-largest fibre backbone (after SA and Egypt)
Digital Literacy & Inclusion Programme (DLIP)	2021–ongoing	1 million digital skills trainees; targets women, rural communities, PWDs	Implementation data limited; gender-targeting important but requires scaling

Table 3: Author's Synthesis (2024); sources as cited throughout the paper

CHALLENGES TO THE FRAMEWORKS AND MECHANISMS

The Infrastructure Investment Gap and the Fibre Vandalism Crisis

The most fundamental and persistent challenge to Nigeria's digital divide reduction frameworks is the chronic gap between the infrastructure investment required and the investment actually deployed. Nigeria faces an estimated $100 billion annual infrastructure investment deficit (World Bank, 2019), a deficit within which digital infrastructure competes with electricity, roads, water, and healthcare for chronically scarce public capital. The NCC's 2024 report documents that the telecoms sector's CAPEX grew 175.37% in 2024, to ₦2.71 trillion ($1.8 billion), reflecting significant private sector investment. However, this investment is concentrated in commercially viable urban and peri-urban markets, with rural areas remaining underserved by a market logic that cannot justify infrastructure costs in low-density, low-income communities.

Compounding the investment gap is the crisis of telecommunications infrastructure vandalism. The NCC and industry operators have reported between 30 and 43 fibre optic cable cuts daily across Nigeria, a rate of destruction that directly undermines broadband expansion and resilience investments. Proshare (2024) reports that damage and theft of broadband fibre cables remain a major concern to regulators, with the destruction of telecommunications facilities impairing GSM operators' service delivery and impeding network expansion. Telecom operators have called for the Federal Government to criminalise damage to telecommunications assets and impose harsh punishments on offenders. The NCC's 2024 Executive Order on the Designation and Protection of Critical National Information Infrastructure (CNII) was a positive regulatory development in this direction, but enforcement remains a work in progress.

The Affordability and Cost-of-Living Squeeze

Data affordability, the ability of average Nigerians to purchase sufficient mobile data for meaningful digital engagement, represents a critical second-order barrier to the effectiveness of Nigeria's digital divide frameworks. The ITU's 2024 assessment found that the median price of an entry-level mobile broadband plan (2 GB per month) in Nigeria was 4.2% of GNI per capita, more than double the UN Broadband Commission's 2% affordability benchmark (Borgen Project, 2025). Nigeria's 89% reliance on 2G and 4G networks (as of April 2025), with limited 5G coverage and minimal fixed-line broadband penetration, means that the majority of Nigerians access the internet through mobile data plans whose cost represents a significant proportion of household income for low-income users.

The cost challenge has been exacerbated by Nigeria's broader macroeconomic conditions since 2023. The naira devalued by over 50% relative to the US dollar from 2023, driving up the naira cost of imported telecoms equipment and services. Total sector operating costs increased 81.97% in 2024 (to ₦4.58 trillion), as energy costs, inflation, and RoW charges surged (NCC, 2024; Technext, 2025). These cost pressures have been partly passed on to consumers through higher tariffs, at a time when household real incomes were simultaneously being compressed by inflation running at 20–30% annually. The combined effect of rising data costs and falling real incomes has widened the effective affordability gap for Nigeria's low-income majority, even as nominal connectivity statistics continue to improve.

The Rural-Urban Digital Chasm

Despite the NBP's universal coverage ambitions, Nigeria's rural-urban digital divide remains stubbornly entrenched. The NCC (2023) reports approximately 45% broadband coverage in urban areas against significantly lower coverage in rural communities, many of which lack even 3G mobile coverage. The comparative study published in Humanities and Social Sciences Communications (Nature, 2026) contrasting rural digital divides in China and Nigeria notes that while China's targeted rural broadband policies achieved 76% rural internet penetration by 2023 (up from 37% in 2016), Nigerian rural areas continue to lag due to what scholars attribute to decades of failed policies, poverty, and insecurity that prevent any chance of meaningfully narrowing rural-urban digital gaps.

The PMC/NCBI study (2021) of rural secondary schools across six Nigerian states provides some of the most vivid empirical documentation of the rural digital divide's educational consequences. Researchers found that the digital gaps in remote communities were driven by a compounding constellation of factors: lack of ICT infrastructure (no computer labs, no internet connectivity), unreliable electricity, socioeconomic deprivation, and a complete absence of state or federal ICT policy implementation at the school level. These findings confirm that for rural Nigerian students, the digital divide is not a marginal inconvenience but a fundamental barrier to educational quality and future economic opportunity, a structural exclusion from the knowledge economy that perpetuates cycles of rural poverty.

The Gender Digital Divide: A Compounding Inequality

Nigeria's gender digital divide is not merely a dimension of the broader digital divide but a compounding multiplier that deepens the exclusion of the country's most economically vulnerable populations. GSMA's (2022) finding that Nigerian women are 29% less likely than men to use mobile internet, despite mobile devices being the primary connectivity tool for the vast majority of Nigerians, reflects structural inequalities that digital policy frameworks have largely failed to address in a systematic way.

Research documented in IGWEBUIKE (2025) identified multiple intersecting barriers to women's digital participation in Nigeria's rural communities: patriarchal household roles that restrict women's time and autonomous decision-making; cultural norms that associate women's technology use with inappropriate social behaviour; economic dependence that limits women's control over household technology spending; illiteracy and educational disadvantage that suppress digital literacy; and a complete absence of dedicated budget lines or affirmative action provisions for rural women's digital empowerment in Nigeria's current digital economy policies. The ITU (2023) finding that women globally are 19% less likely to use mobile internet than men, with the gap even wider in sub-Saharan Africa, situates Nigeria's gender digital divide within a broader regional pattern that requires gender-responsive policy design, not generic connectivity expansion.

Digital Literacy Deficits and the Skills-Connectivity Mismatch

Even where physical connectivity is available, many Nigerians lack the digital literacy, skills, and motivation to use it productively, a second-level divide that Nigeria's policy frameworks have historically under addressed relative to

infrastructure investment. A 2024 study of digital inclusion in isolated rural communities in Southern Kaduna found that 14.7% of respondents reported lack of knowledge or digital skills as a barrier, and 10.3% expressed fear of making mistakes when using digital tools, a 'technophobia' dimension that indicates psychological barriers to digital participation beyond mere knowledge deficits (Afropolitan Journals, 2024). The empirical study by Anowor et al. (2025) on digital skills and youth employability in Nigeria confirms that weak digital infrastructure, affordability constraints, poor literacy, and ineffective policy execution collectively hinder youth economic transformation, the very outcome that digital inclusion is intended to produce.

The 3MTT Programme represents the most significant policy response to this digital literacy deficit. However, even 3MTT faces scale challenges: its three-million-trainee target by 2027, at a programme cost of $30 million, faces a challenge in that the ministry's 2024 budget was only ₦28.54 billion ($17 million), approximately half the required resources (TechCabal, 2024). The programme's success will also depend on its ability to connect trained talent with employment opportunities, avoiding the fate of earlier Nigerian youth employment initiatives (such as N-Power) that trained participants but failed to generate commensurate employment absorption.

IMPACT OF DIGITAL INFORMATION RESOURCES ON SUSTAINABLE NATIONAL DEVELOPMENT

The Macroeconomic Transformation

The relationship between ICT penetration and sustainable development in African countries is empirically well-established. A study published in Humanities and Social Sciences Communications (Nature, 2024) analysing panel data for African countries over the period 2000–2020 found cointegration evidence that mobile phone and broadband subscriptions significantly and positively affect sustainable development, and identified a bidirectional causality between internet usage and sustainable development, confirming that ICT investment and human development are mutually reinforcing. This theoretical prediction finds concrete validation in Nigeria's own data.

Nigeria's digital economy contributed approximately ₦18.44 trillion (roughly $23 billion) to GDP in 2023, approximately 18.2% of total GDP, up from 16.2% in 2021 (PlanetWeb, 2025). By Q2 2024, ICT's contribution to Nigeria's real GDP reached 19.78%, making it the largest contributing sector after oil and gas. The digital economy sector contributed ₦7 trillion in Q1 2025 (14.19% of the ₦49.34 trillion total real GDP), with telecommunications representing 80% of the Information and Communication sector's contribution (Technext, 2025). Foreign direct investment into Nigeria's digital sector saw a ninefold increase, from $22 million in Q1 2023 to $191 million in Q1 2024, reflecting growing global investor confidence in Nigeria's digital economy trajectory. Total digital financial transactions in Nigeria reached approximately ₦800 trillion in 2024, eclipsing traditional banking in transaction velocity and reach (Technext, 2025).

Fintech, Financial Inclusion, and the Digital Economy

Nigeria's fintech ecosystem represents the most visible and internationally recognised dimension of its digital economy, and one of the clearest demonstrations of how digital information resources can drive sustainable development outcomes. Flutterwave, Africa's most valuable fintech company ($3 billion valuation), has processed over $34 billion in transactions and provides payment infrastructure for global enterprises including Uber, Microsoft, AWS, and Netflix across 34 African countries (TechCabal, 2025; Contrary Research, 2024). Paystack processes over $250 million in monthly transaction volume, handling three billion API requests in Q4 2024 alone (TechCabal, 2025). OPay serves approximately 40 million registered users and reached an annual transaction volume of $50 billion in 2022. Moniepoint, which became Nigeria's sixth fintech unicorn in October 2024, raising $120 million in Series C funding including a $10 million Visa investment, serves millions of SMEs with digital banking services (Trade.gov, 2025; TechCabal, 2025).

The developmental significance of this fintech ecosystem extends beyond headline valuations. Approximately 38 million Nigerians remain unbanked as of 2024 (BusinessDay, 2024), but fintech platforms including OPay, PalmPay, and Moniepoint are progressively extending financial services to this population through mobile-first digital banking that bypasses traditional brick-and-mortar banking infrastructure. Total digital payments now account for approximately 70% of retail transactions in Nigeria (BusinessDay, 2024), demonstrating the structural shift from cash to digital financial services that digital inclusion enables. The McKinsey Global Institute's 2024 report projected that fintech could add up to $150 billion to Africa's GDP by 2027, with Nigeria's ecosystem positioned to capture a disproportionate share of this potential (WEF Africa, 2025).

Digital Information Resources in Education and Research

At the educational level, digital information resources, particularly through the NUC Virtual Library, have significantly expanded the research base available to Nigeria's 2.2 million university students and approximately 45,000 full-time academic staff. The NUC Virtual Library provides access to approximately 95,000 electronic journals and thousands of e-books through platforms including HINARI (health and life sciences), AGORA (food and agriculture), OARE (environment), and EBSCO Host, resources that, without digital infrastructure, would be financially inaccessible to most Nigerian university academics. This represents a meaningful narrowing of the information divide between Nigerian academics and their counterparts in information-rich developed-world universities.

However, the PMC study (2021) on digital gaps in rural secondary schools provides a sobering reminder that educational digital inclusion is highly uneven: while university students with stable campus connectivity can access these resources, secondary school students in rural communities across six surveyed states face digital environments so deprived that e-learning during the COVID-19 pandemic was simply not an option for many. This educational digital divide, between well-connected urban university campuses and poorly equipped rural secondary schools, has direct consequences for human capital development and social mobility, reproducing educational inequality and limiting the pool of talent that can eventually access Nigeria's growing digital economy.

Digital Health Information and Healthcare Delivery

Digital information resources are increasingly shaping healthcare service quality and access in Nigeria, with significant sustainable development implications. The mHealth (mobile health) sector is transforming health service delivery in underserved communities through telemedicine platforms, digital health record systems, community health worker support apps, and mobile disease surveillance systems. Nigeria's COVID-19 response relied heavily on digital communication channels, including social media, SMS alerts, WhatsApp health messaging, and telemedicine services, demonstrating how digital information infrastructure can directly save lives when effectively deployed. Research published in PMC (2025) on social and digital determinants of health in Africa confirms that digital determinants are increasingly influencing health outcomes across sub-Saharan Africa, with countries that invest in digital health infrastructure experiencing better service delivery metrics.

The rural healthcare access challenge documented by medRxiv (2026) is directly exacerbated by the rural digital divide: primary healthcare facilities in rural Nigeria lack digital health information systems, limiting their ability to access clinical guidance, report disease outbreaks, manage supply chains, and communicate with referral facilities. Narrowing the digital divide would therefore directly improve rural healthcare quality, a sustainable development outcome of direct relevance to Nigeria's SDG 3 (Good Health and Well-Being) commitments.

Table 4: Impact of Digital Information Resources on Nigeria's Sustainable Development Dimensions

SDG	Development Area	Evidence of Digital Information Impact
SDG 4 (Education)	Quality education; e-learning access	NUC Virtual Library: 95,000+ e-journals for 2.2M+ university students; BUT rural schools remain ICT-deprived (PMC, 2021)
SDG 8 (Work & Growth)	Fintech; digital employment; youth skills	5 unicorn companies; digital economy contributes 18.2% GDP; ₦800T digital transactions in 2024; 3MTT training 3M tech talents
SDG 9 (Infrastructure)	ICT infrastructure; broadband expansion	164.4M internet subscriptions; 90,000 km fibre expansion planned; broadband penetration 50.58% (Nov 2025)
SDG 3 (Health)	mHealth; telemedicine; health information	Digital COVID-19 response; mHealth platforms expanding; but rural digital divide limits health info access (PMC, 2025)
SDG 5 (Gender Equality)	Women's digital inclusion; gender equity	Women 29% less likely to use mobile internet (GSMA, 2022); gender-targeted interventions needed but underresourced
SDG 10 (Reduced Inequalities)	Rural-urban digital equity; geographic inclusion	Rural-urban broadband gap persists; 27M without any telecom access; Lagos accounts for 70% startup activity
SDG 16 (Institutions)	E-governance; digital public services	Project 774 LG Connectivity links LGA secretariats to internet; CNII Executive Order protects critical digital infrastructure

Table 4: Author's Synthesis (2024); evidence from NUC (2023); NCC (2024); GSMA (2022); PMC (2021, 2025); Trade.gov (2025)

WAY OUT TO THE CHALLENGES: STRATEGIC FRAMEWORK FOR INCLUSIVE DIGITAL TRANSFORMATION

Addressing Nigeria's digital divide requires a coordinated, multi-dimensional, adequately resourced, and equity-oriented strategic response that goes beyond connectivity expansion to address all four levels of the digital divide simultaneously. The following framework proposes strategic interventions across six dimensions:

Table 5: Strategic Framework for Inclusive Digital Transformation in Nigeria's Information Society

Strategic Pillar	Specific Interventions	Responsible Actors	SDG Target
1. Infrastructure Equity	Fast-track 90,000 km fibre; criminalise cable vandalism; rural tower mandate; solar-powered base stations	FGN; NCC; Telcos; World Bank; USPF	SDG 9.c
2. Data Affordability	Zero-rate education/health platforms; data subsidy for students; enforce 2% GNI affordability target	NCC; MoCIDE; ISPs; NUC; NCDC	SDG 10
3. Digital Literacy Scale-Up	Scale 3MTT to 3M target; national digital curriculum (primary–tertiary); community digital hubs (CITAD model)	MoCIDE; NITDA; NUC; SUBEB; 3MTT; NGOs	SDG 4, 8
4. Gender Digital Inclusion	Dedicated gender digital budget line; culturally sensitive female digital literacy programmes; device subsidies for women	MoCIDE; UN Women; NCWD; State Govts; NGOs	SDG 5
5. Local Content & Relevance	Fund digital content in Hausa, Yoruba, Igbo, Ijaw, and other major languages; support local OA repositories	NCC; NUC; NBS; NLNG; Media; Libraries	SDG 4, 16
6. Governance & Financing	Unified RoW framework; criminalise infra vandalism; digital divide reduction fund (TETFund/USPF/CSR/donors)	FGN; NCC; State Govts; World Bank; AfDB; AU	SDG 17

Table 5: Author's Strategic Framework (2024); adapted from NDEPS (2020); NBP (2020); WEF (2024); Van Dijk (2020)

Infrastructure: Completing the Backbone and Reaching the Last Mile

The in-progress Project BRIDGE, Nigeria's planned 90,000 km fibre optic backbone expansion announced in June 2024, is the single most critical infrastructure investment for narrowing the first-level digital divide. TheCable (2025) analysis projects that if the 90,000 km expansion is completed, it would position Nigeria as Africa's third-largest terrestrial fibre optic network (after South Africa and Egypt), providing the backbone capacity to extend affordable broadband to currently underserved local government areas. This infrastructure must be accompanied by fast-track policy action to criminalise fibre optic vandalism and establish a unified, nationally negotiated Right-of-Way framework that eliminates the patchwork of state and local government fee structures currently increasing fibre deployment costs by an estimated 30–40%.

Starlink's entry into Nigeria in February 2023, reaching over 65,000 active users by Q3 2024, demonstrates the role that Low-Earth Orbit (LEO) satellite internet can play in reaching the most remote and infrastructure-deprived communities. While Starlink's direct consumer pricing (NGN57,000/month + NGN318,000 hardware) remains beyond the reach of most rural Nigerians, Starlink's partnership with Africa Mobile Networks (AMN), providing backhaul for over 1,500 rural base stations in Nigeria, demonstrates a viable wholesale model for extending coverage without individual affordability barriers (Ecofin Agency, 2025; Tech in Africa, 2026). This model should be formalised and expanded through NCC-facilitated wholesale satellite backhaul agreements.

Digital Literacy: Building on 3MTT's Momentum

The 3MTT Programme's early success, 1.7 million applications for 30,000 Phase 1 places, WEF recognition as the world's largest tech talent accelerator, MTN's ₦3 billion corporate investment, demonstrates that Nigerians are eager for digital skills development opportunities and that public-private partnership can mobilise significant resources for this purpose. Building on this momentum requires several strategic extensions: first, ensuring that Phase 3's three-million-trainee target is adequately resourced (the current $30 million programme budget requires supplementation from TETFund, international development partners, and expanded corporate CSR); second, prioritising rural and northern-state inclusion in Phase 2 and 3 cohorts, where first-level divide barriers require additional support (device provision, offline learning materials, local-language instruction); and third, establishing robust employment placement and entrepreneurship support services that translate training into income, the critical link between digital skills and sustainable development outcomes.

Gender Digital Inclusion: From Aspiration to Budget

Closing Nigeria's gender digital divide requires moving from policy rhetoric to resource allocation. The Federal Ministry of Women Affairs, in partnership with the Ministry of Communications, Innovation, and Digital Economy, should establish a dedicated National Women's Digital Inclusion Fund, mobilising resources from the federal budget, UN Women, the World Bank's Women Entrepreneurs Finance Initiative (We-Fi), and major fintech and tech companies operating in Nigeria. This fund should support culturally sensitive female digital literacy programmes delivered through female-led community organisations; device financing schemes that give women and girls affordable access to smartphones; online safety and security training; and monitoring of gender disaggregated digital access metrics in all NCC and NITDA reporting.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Nigeria's digital divide is not a single problem with a single solution; it is a multi-dimensional, multi-level structural inequality that manifests differently across geography, gender, age, income, and education, and requires a correspondingly multi-dimensional, equity-oriented, and adequately resourced policy response. This paper has demonstrated that Nigeria's digital economy trajectory is genuinely remarkable: an ICT sector contributing nearly 20% of GDP, five technology unicorns, Africa's largest internet user population, and, most promisingly, the world's largest tech talent accelerator in the 3MTT Programme. These achievements represent real progress toward the information society that Nigeria's sustainable development aspirations require.

Yet the paper has equally demonstrated that this progress coexists with a digital divide that remains deep, geographically concentrated, gender-differentiated, and resistant to policy interventions that are not specifically designed to address its structural causes. The 27 million Nigerians without any telecommunications infrastructure, the rural students in Kwara, Ebonyi, and Adamawa excluded from digital learning, and the rural Nigerian women 29% less likely to use mobile internet than their male counterparts, these are the faces of a digital divide that Nigeria's impressive aggregate statistics obscure. Sustainable national development requires that their inclusion, not merely aggregate connectivity growth, becomes the primary metric of digital policy success.

Recommendations

- The Federal Government should enact a Telecommunications Infrastructure Protection Act that criminalises fibre optic cable theft and vandalism with mandatory custodial sentences, modelled on similar legislation in South Africa and India, to address the 30–43 daily cable cuts that undermine broadband network investment.
- The NCC should establish a mandatory universal broadband service obligation for all licensed mobile network operators, requiring them to extend 4G coverage to a minimum of 95% of each geopolitical zone's population within 36 months, with financial penalties for non-compliance.
- The Federal Government should establish a unified national Right-of-Way (RoW) framework, legislating maximum RoW fees at all levels of government, to eliminate the patchwork of state and local government charges that increase fibre deployment costs by an estimated 30–40%.
- The 3MTT Programme must secure additional funding, through TETFund contributions, mandatory tech company CSR levies, and World Bank/AfDB development financing, to achieve its three-million-trainee target by 2027, and must prioritise employment placement services alongside training delivery.
- A dedicated National Women's Digital Inclusion Fund should be established, with a ring-fenced annual allocation of at least ₦10 billion, to fund gender-targeted digital literacy programmes, device subsidy schemes, and online safety training specifically designed for Nigerian women and girls in rural and peri-urban areas.
- The NUC should mandate that all Nigerian universities implement full open-access institutional repositories and develop digital information literacy programmes covering database searching, e-resource navigation, and digital skills, positioning academic libraries as digital inclusion hubs for both students and surrounding communities.
- State governments should integrate digital literacy into the curriculum of public primary and secondary schools, establishing basic ICT skills training as mandatory from primary 4 upward, and equipping at least one computer laboratory per school in all 36 states within a five-year timeframe.
- The Federal Ministry of Communications, Innovation, and Digital Economy should commission an annual Nigeria Digital Inclusion Index, disaggregating broadband access, digital literacy, digital usage, and digital outcomes by geopolitical zone, gender, age cohort, and income quartile, to ensure that equity dimensions of the digital divide are tracked, reported, and held accountable alongside aggregate connectivity statistics.

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