ATU-R REPORT

MOBILE BROADBAND USAGE GAP IN AFRICA

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EXECUTIVE SUMMARY

The African Telecommunications Union (ATU) commissioned this comprehensive study to examine the persistent mobile broadband usage gap in Africa. Despite significant infrastructure investments (80% submarine cable connectivity and network deployments achieving 90-100% population coverage), a huge part of the continent's population (approximately 1 billion people) remains excluded from mobile broadband services. This paradox reveals that infrastructure deployment alone cannot bridge the mobile broadband usage gap.

The study identified twelve key findings based on responses from fifteen administrations regarding the current state of mobile broadband usage. These responses covered legal, regulatory, technical and socio-economic aspects. Twelve of these findings constitute barriers, while one (*Leverage NTN for Rural & Remote Services*) represents a potential opportunity.

These barriers are prioritised based on five criteria: population impact, economic impact, urgency, multiplier effect and feasibility. They are organised into three priority tiers (critical, high and medium) and three categories (fundamental, enabling/constraining and structural).

RANK	BARRIER	PRIORITY	CATEGORY	PRIMARY RATIONALE
1	Device Affordability Crisis	Critical	Fundamental	Without affordable devices, all other solutions are irrelevant; affects hundreds of millions directly
2	Severe Urban-Rural Digital Divide	Critical	Fundamental	Excludes large territory where millions live; perpetuates inequality and constrains development
3	Dependency on Non-Local Mobile Contents	Critical	Fundamental	Threatens digital sovereignty and economic value capture; strategic long-term impact
4	Volatile Taxation Scheme	High	Enabling/Constraining	Creates investment uncertainty with multiplier effects on other barriers
5	Higher Taxes	High	Enabling/Constraining	Directly increases costs for consumers; compounds affordability crisis
6	Pricing Not Development-Oriented	High	Enabling/Constraining	Transforms mobile broadband into luxury; excludes majority from digital economy

RANK	BARRIER	PRIORITY	CATEGORY	PRIMARY RATIONALE
7	Non-Strategic Low-Band Use	High	Enabling/Constraining	Most cost-effective rural solution underutilized; worsens urban-rural divide
8	Massive Inland Fiber Coverage Gaps	High	Enabling/Constraining	Fundamental infrastructure bottleneck limiting quality even where coverage exists
9	Energy Infrastructure Gap	High	Enabling/Constraining	Fundamental operational constraint inflating costs, deterring rural investment, and imposing hidden charges on end users
10	Digital Access Divide	Medium	Structural	Complex, multi-dimensional result of other barriers widening through feedback loops
11	Gender Inequalities in Usage	Medium	Structural	Affects ~200 million women; reflects broader structural societal issues
12	Weak Institutions	Medium	Structural	Foundational but slower-changing; enables and exacerbates other barriers

The analysis identifies five reinforcing loops that perpetuate digital exclusion:

(1). The **Affordability Loop**, where '*Volatile Taxation Scheme*' and '*Higher Taxes*' lead to low adoption, which creates poor infrastructure economics, forcing governments to maintain high taxes,

(2). The **Rural Exclusion Loop**, where '*Severe Urban-Rural Divide*' drives urban migration, making rural markets smaller and less attractive for investment,

(3). The **Content Dependency Loop**, where '*Dependency on Non Local Content*' leads to foreign platform dominance and economic extraction, and

(4). The **Investment Loop**, where '*Weak institutions*' create policy instability, forcing high-tax compensation that deters investment and perpetuates institutional weakness.

(5). The **Energy Connectivity Loop**, where inadequate energy infrastructure prevents network deployment, which means no connectivity.

Five vicious circles have been perpetuating mobile broadband exclusion: *the Poverty Trap*, *Infrastructure Economics Trap*, *Rural Exclusion Trap, Content Dependency Trap, and Institutional Weakness Trap*. These cycles explain why the usage gap persists despite technological advancement and economic growth.

To bridge the mobile broadband usage gap in Africa, the study identifies eleven strategic intervention points to address the twelve identified barriers, to break five

vicious circles, and create positive cascade effects throughout the mobile broadband ecosystem.

These strategic intervention points are distributed among three groups: *High Leverage Intervention, Systemic Intervention,* and *Structural Intervention*.

The eleven strategic interventions provide 100% coverage of all twelve identified barriers.

STRATEGIC INTERVENTION POINT		BARRIER		
		CRITICAL	HIGH	MEDIUM
HIGH-LEVERAGE INTERVENTIONS	Progressive Device Affordability Subsidy Program	Device Affordability crisis	—	- Digital access Divide - Gender inequalities gap
	Mobile App Ecosystem Development Fund	Non-Local Content Dependency	—	Digital Access Divide
	Satellite-Terrestrial Hybrid Deployment	Severe Urban-Rural Divide	Massive inland fiber coverage gaps	—
SYSTEMIC INTERVENTIONS	Comprehensive Tax Reform Package	—	- Volatile Taxation Scheme - Higher Taxes	Weak Institutions
	Development-oriented Pricing Regulation	—	*Pricing scheme not oriented toward development*	Digital access Divide
	Strategic Low-Band Spectrum Reallocation	Severe Urban-Rural Divide	Non-Strategic orientation for low Frequency bands	—
	Inland Fiber Acceleration Program	—	- Massive Inland Fiber coverage Gaps - Pricing scheme not oriented toward development	—
	Green Energy for Connectivity Program	Severe Urban-Rural Divide	- Energy Infrastructure gap	Massive inland fiber coverage gaps
STRUCTURAL INTERVENTIONS	Institutional Capacity Building	—	- Volatile Taxation Scheme - Higher Taxes - Pricing scheme not oriented toward development	Weak Institutions
	Digital Literacy & Skills Program	—	—	Digital access Divide
	Gender-Targeted Mobile Access Program	—	—	- Gender inequalities gap - Digital Access Divide

The set of strategic intervention points breaks all five identified vicious circles:

1. Poverty Trap: Progressive Device Affordability Subsidy Program + Comprehensive Tax Reform Package + Development-oriented Pricing Regulation break affordability-adoption-economics cycle
2. Infrastructure Economics Trap: Comprehensive Tax Reform Package + Strategic Low Band Spectrum Reallocation + Inland Fiber Acceleration Program + Satellite-Terrestrial Hybrid deployment create sustainable economics
3. Rural Exclusion Trap: Strategic Low Band Spectrum Reallocation + Inland Fiber Acceleration Program + Satellite-Terrestrial Hybrid deployment + Green Energy for Connectivity Program + Coverage obligations ensure inclusion
4. Content Dependency Trap: Mobile App Ecosystem Development Fund + Digital literacy & Skill Program create local production and consumption,
5. Institutional Weakness Trap: Institutional Capacity Building + Successful reforms create self-reinforcing strengthening.

Recommendations are made for ATU and African administrations.

(a) Recommendations for ATU

ATU should commit to strengthening the capacity of its member states through targeted knowledge-sharing and policy development initiatives, by organizing three capacity building workshops on *Tax reform program*, *establishing low-cost smartphone Policy and Strategy*, and *building Mobile Broadband deployment Policy and Strategy*.

	CAPACITY BUILDING ON TAX REFORM PROGRAM	CAPACITY BUILDING ON ESTABLISHING LOW-COST SMARTPHONE POLICY AND STRATEGY	CAPACITY BUILDING ON MOBILE BROADBAND DEPLOYMENT POLICY AND STRATEGY
OBJECTIVE	• Provide members states with knowledge of the best international practices for designing and implementing tax reforms. • Foster an understanding of mobile broadband taxation frameworks, including the taxation of the digital economy. • Enable member states to develop actionable national tax reform roadmaps.	• Provide policymakers with frameworks for developing national low-cost smartphone policies and strategies. • Share best practice from countries that have successfully implemented affordable smartphone programmes. • Enable participants to draft actionable national strategies for the deployment of affordable smartphones.	• Strengthen the capacity of Member States to design and implement effective mobile broadband policies. • Enable participants to develop comprehensive national strategies for the deployment of mobile broadband
SUCCESS METRICS	• Number of participants trained (target: at least 30 member states)	• Number of participants trained (target: at least 30 member states)	• Number of participants trained (target: at least 30 member states)

	CAPACITY BUILDING ON TAX REFORM PROGRAM	CAPACITY BUILDING ON ESTABLISHING LOW-COST SMARTPHONE POLICY AND STRATEGY	CAPACITY BUILDING ON MOBILE BROADBAND DEPLOYMENT POLICY AND STRATEGY
	• Participant satisfaction rate (target: 85% or above rating workshop as good or excellent) • Number of case studies tax reform action plans developed during the workshop • Number of member states initiating or advancing tax reform legislation within 12 months	• Participant satisfaction rate (target: 85% or above) • Number of case studies of low-cost smartphone strategy drafts developed during the workshop • Number of member states adopting device affordability policies within 12 months	• Participant satisfaction rate (target: 85% or above) • Number of national mobile broadband deployment strategies case studies developed during the workshop • Number of member states adopting mobile broadband policies within 12 months

(b) Recommendations for African Administrations

Each African administration should consider its own situation and find its way forward based on the information of this study, and trigger the implementation of corresponding strategic interventions points. The following recommendations have been made for each strategic intervention point.

Progressive Device Affordability Subsidy Program	
Priority Tier	Critical
Implementation Timeframe	Immediate implementation (6 months)
Description	Launch a comprehensive device affordability program combining taxation reform, progressive subsidies, innovative financing, and bulk procurement leveraging to reduce unit costs.
Expected Impact	Expected to increase mobile broadband adoption within 2 years. Breaks the affordability loop and poverty trap.

Mobile App Ecosystem Development Fund	
Priority Tier	Critical
Implementation Timeframe	24 months
Description	Create a fund through contributions from governments, development banks, and tech companies (as part of market access agreements).
Expected Impact	Breaks the content dependency trap by creating local developer support leading to viable platforms, user adoption, economic value retention, and ecosystem strengthening.

Satellite-Terrestrial Hybrid Deployment	
Priority Tier	Critical
Implementation Timeframe	18-36 months for hybrid network deployment
Description	Deploy satellite-terrestrial hybrid solutions combining LEO (Low Earth Orbit) satellite initial coverage with terrestrial infrastructure in demand centers.
Expected Impact	Achieves universal coverage including the most remote and challenging areas.

Comprehensive Tax Reform Package	
Priority Tier	High
Implementation Timeframe	12 months for legislative reform and implementation
Description	Implement coordinated taxation reform establishing long-term stability and reducing extractive burden.
Expected Impact	Creates investment certainty leading to increased infrastructure deployment.

Development-Oriented Pricing Regulation	
Priority Tier	Medium-high
Implementation Timeframe	12 months for regulatory framework development and enforcement
Description	Implement regulatory framework ensuring development-oriented rather than extractive pricing.
Expected Impact	Transforms mobile broadband from luxury to accessible service for majority population.

Strategic Low-Band Spectrum Reallocation	
Priority Tier	High
Implementation Timeframe	12-18 months for reallocation and licensing
Description	Ensure each country allocates sufficient low-band spectrum for rural mobile broadband deployment.
Expected Impact	Dramatically improves rural coverage economics, enabling commercial deployment in previously unviable areas.

Inland Fiber Acceleration Program	
Priority Tier	High
Implementation Timeframe	18-36 months for accelerated deployment
Description	Accelerate inland fiber deployment using innovative low-cost technologies and infrastructure sharing mandates.
Expected Impact	Resolves fundamental infrastructure bottleneck limiting service quality even where coverage exists.

Green Energy for Connectivity Program	
Priority Tier	High
Implementation Timeframe	18–36 months for deployment and scaling of solar-hybrid power systems
Description	Deploy solar-hybrid power systems for telecommunications systems in off-grid and unreliable-grid areas, and create regulatory incentives for green energy adoption across the telecommunications sector.
Expected Impact	Breaks the Energy-Connectivity reinforcing loop by eliminating diesel dependency, creates cross-sector multiplier effects by powering schools, health facilities, agricultural processing, etc.

Institutional Capacity Building	
Priority Tier	Medium
Implementation Timeframe	36-60 months for sustained capacity development
Description	Strengthen regulatory and policy institutions through comprehensive capacity building.
Expected Impact	Creates foundation enabling all other interventions to succeed. Strong institutions enable stable, predictable policies that encourage investment.

Digital Literacy & Skills Program	
Priority Tier	Medium
Implementation Timeframe	24-36 months for nationwide program deployment
Description	Implement comprehensive digital literacy and skills development program at national scale.
Expected Impact	Transforms device ownership into tangible development outcomes across multiple sectors. Enables financial inclusion through mobile money adoption.

Gender-Targeted Mobile Access Program	
Priority Tier	Medium
Implementation Timeframe	24-36 months for comprehensive program implementation
Description	Implement gender-targeted interventions addressing multiple dimensions of women's digital exclusion.
Expected Impact	Market doubling effect: addressing women's barriers doubles the addressable market, and larger markets improve infrastructure economics (lower costs, better service quality), benefiting all users while advancing gender equality.

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1 INTRODUCTION

Demand for mobile broadband has grown exponentially over the past decade and is expected to continue as people demand access to high-quality mobile broadband services wherever they live, work and travel. Innovation continues to drive the development of new mobile devices and applications, and in the future, machines and devices will increasingly use wireless data. As a result, mobile networks will need to increase capacity and improve quality to meet the future needs of businesses and consumers.

This trend is also evident in Africa, where the broadband connectivity landscape is rapidly changing. "*Between 2012 and 2022, the number of people on the continent with mobile broadband access more than tripled, from 114 million to nearly 400 million*[1]". Despite this progress, Africa still has the largest connectivity gap of any region in the world, highlighting the impact of barriers to mobile broadband adoption. To date, just over 1 billion people in Africa, or 72% of the region's population, lack access to mobile broadband services. This illustrates the scale of the challenge to make mobile broadband a reality in Africa.

It is in recognition of this reality that African Telecommunications Union (ATU), whose mission is "*to accelerate the development of telecommunications/ICT [...] to achieve an inclusive information society and strong digital economies [...] in Africa*," has included in its 2023-2027 strategic plan a strategic intervention aimed at "*promoting the extension of reliable and affordable broadband connectivity to unconnected rural areas and closing the mobile broadband usage gap*".

The objective of the "*Mobile Broadband Usage Gap in Africa study*" is to conduct an in-depth analysis of the conditions (legal, technical, economic, social) for mobile broadband usage and adoption in Africa in order to formulate recommendations that are likely to address the identified shortcomings.

The methodology used to conduct this study consists of two phases:

- The first phase involves gathering information from African administrations through a questionnaire. This information is then analysed to map the current state of the mobile broadband usage environment in Africa, including the institutional, legislative and regulatory framework, technical infrastructure, connectivity, services, tariffs, taxation and user profiles.
- The second phase involves producing a preliminary draft report on the mobile broadband usage gap in Africa. This report sets out strategic guidelines based on conclusions drawn from comparing the current state of mobile broadband usage with international best practices.

The first phase was underpinned by two principles: the need to obtain information from all regional groups[2] to ensure greater representativeness and reflect the current state more accurately, and the need to obtain input from key countries with extensive experience of mobile broadband usage.

[1] Universal Service Funds in Africa, Policy reforms to enhance effectiveness, GSMA, October 2023;
[2] 5 regional groups: EACO, ECCAS, ECOWAS, AICTO, SADC

Fifteen (15) African administrations responded to the questionnaire. Out of the 15 key administrations identified, six responded to the questionnaire, representing 40%. These responses came from ATU's five regional groups.

Given the strong similarities in mobile broadband usage across African countries, regardless of the regional group considered, these responses are large enough to provide a representative overview of the current state of mobile broadband usage in Africa.

This report is divided into two sections. The first part uses responses to the questionnaire to describe the operational environment for mobile broadband in Africa. It covers institutional, legislative and regulatory frameworks, technical infrastructure, connectivity, usage, services, tariffs and taxation. It also provides an analysis of this environment.

The second part provides broad guidelines for reducing the mobile broadband usage gap in Africa. This involves reducing the gap between the African continent and other continents, between African administrations, and between regions within the same Administration. The guidelines highlight barriers relating to institutional, legislative and regulatory frameworks, technical infrastructure, connectivity, usage, services, tariffs and taxation.

The report ends with a conclusion and a series of recommendations.

2 MOBILE BROADBAND USAGE LANDSCAPE IN AFRICA

This section provides an overview of the mobile broadband landscape in Africa. It covers the legislative and regulatory framework, tariffs and related taxes, infrastructure, connectivity, and end-users' usages.

2.1 Mobile Broadband Policy, Legislation and Regulations

Figure 1 shows some factors governing mobile broadband in Africa. It appears that ten out of 15 administrations (66,67%) report having a policy on mobile broadband. Similarly, 11 administrations (73.3%) have a strategy to promote the development of mobile broadband.

Technology neutrality is a key element in the implementation of mobile broadband in Africa, as 11 administrations (73.3%) have announced that is an important enabler of promoting mobile broadband.

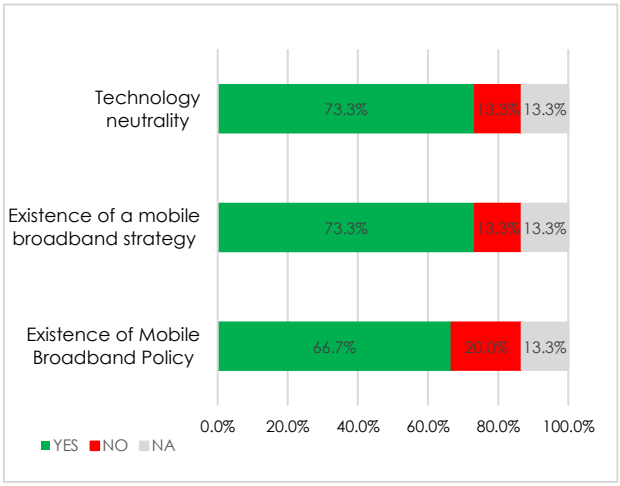


Figure 1:Description of factors governing mobile broadband in Africa (Source: Author)

The survey reveals a unanimous finding: all administrations reported having the infrastructure-sharing principle in place, as required by law and implemented by operators.

The fact that the majority of Administrations have a policy and an implementation strategy for mobile broadband suggests institutional maturity, as well as a favorable legislative and regulatory framework. This is emphasized by the inclusion of technology neutrality and infrastructure sharing as a key enabler.

2.2 Mobile Broadband Taxation and Tariffs

2.2.1 Taxation

Figure 2 shows how certain taxes are applied in the electronic communications sector.

Taxes on mobile data, which generally range from 14% to 26%, appear to be the most consistently applied tax instrument across Africa.

Taxes on user terminals show the most volatility across Africa. While most countries apply rates between 12% and 19%, some countries are dramatic outliers at around 40%.

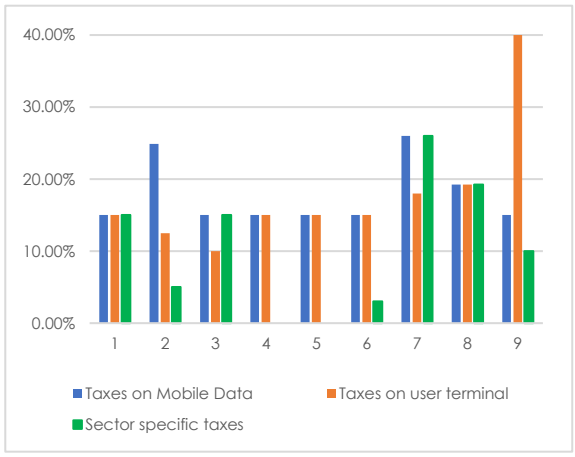


Figure 2:Description of mobile broadband taxation in Africa (Source: Author)

This suggests either a distinct policy choice or a structural difference in how terminal taxation is defined.

Sector-specific taxes show the greatest inconsistency. Some countries apply relatively high rates (19% and 26%), while others apply very low rates (2% and 5%).

This indicates that sector-specific taxation varies significantly depending on national policy priorities or regulatory frameworks.

2.2.2 Tariffs

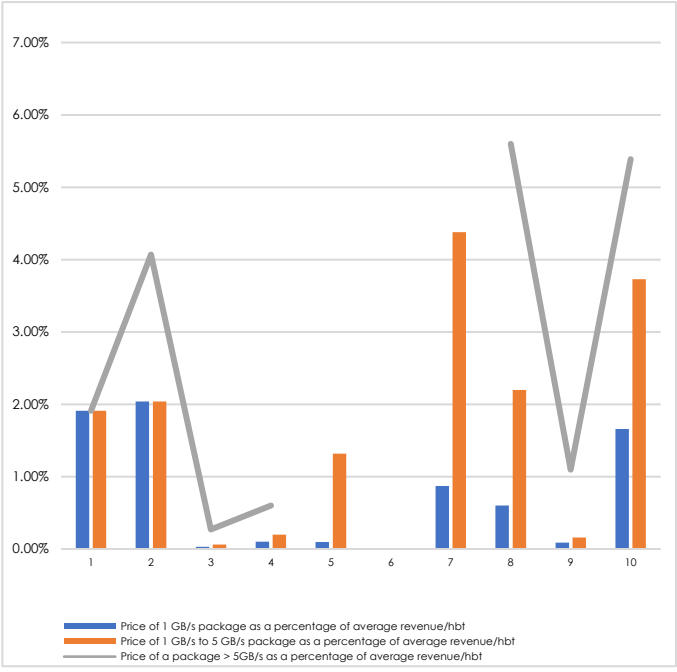


Figure 3: Mobile data affordability in Africa (Source: Author)

Figure 3 shows that, in terms of mobile data costs, Africa can be divided into three clusters:

(a) The first consists of affordable markets where data is accessible to a broader population;

(b) The second consists of moderate markets with middle-income accessibility issues and greater volatility in larger packages;

(c) The third cluster consists of markets experiencing an affordability crisis, which creates digital exclusion for data-intensive services.

Analysis of mobile broadband tariffs reveals an affordability crisis in many African countries, where large data packages can cost up to 5.6% of the average income, effectively making the internet a luxury rather than a basic utility.

Such pricing structures perpetuate digital exclusion and limit the potential for economic development.

The 18-fold difference in accessibility between the best and worst performing countries suggests that affordability is primarily constrained by policy choices, market structure and infrastructure investment, rather than the level of economic development.

Countries that offer affordable data packages demonstrate that solutions exist. The key lies in political willpower, courageous regulation and strategic infrastructure investment to make data accessible to all income levels and unlock the full potential of the digital economy.

2.3 Mobile Broadband Infrastructures

2.3.1 Terrestrial Networks

2.3.1.1 Frequency bands

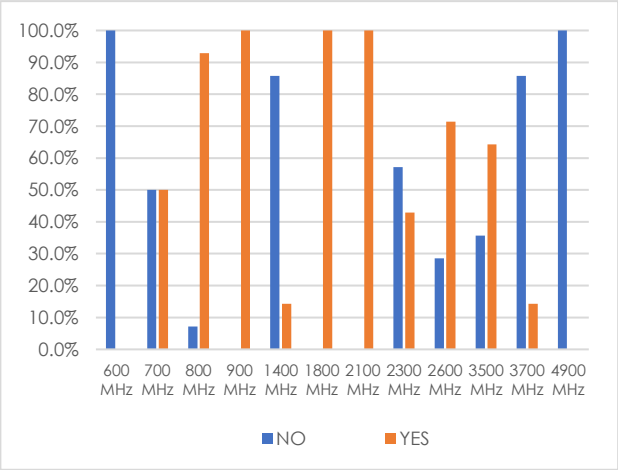


Figure 4: Frequency bands allocated for Mobile in Africa (Source: Author)

Figure 4 gives indication of frequency bands allocated for mobile across Africa.

The 600 MHz band shows 100% non-allocation, meaning no African country has allocated this band for mobile broadband. For the 700 MHz, the rate of 50% indicate a gradual adoption trend. The 800 MHz band shows a significant jump in allocation, with a rate of 93%, making it one of the most widely allocated bands on the continent.

The 900 MHz, 1800 MHz and 2100 MHz bands reach a rate of 100%, making them the most universally adopted band across Africa, confirming that these mid-band frequencies form the core of mobile broadband infrastructure across the continent.

Allocation rates vary from 2300 MHz onwards. The 2300 MHz band is allocated at around 43%, the 2600 MHz band at around 72%, and the 3500 MHz band at around 65%. The 3700 MHz band drops to around 13%, while the 4900 MHz band shows no allocation.

This reflects the fact that higher frequencies require denser infrastructure investment and are better suited to urban, high-capacity environments, which many African countries may not yet prioritize.

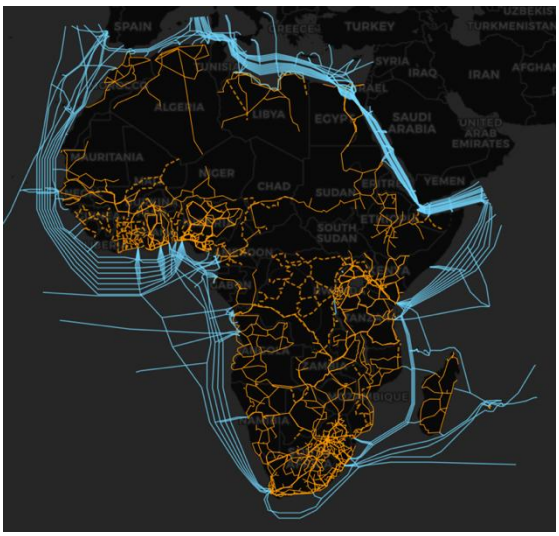
2.3.1.2 *Fiber optic*

Administrations did not provide data on their fiber optic networks. However, information regularly updated in various databases (as described in Figure 5) shows that considerable progress has been made in developing fiber optic infrastructure on the continent.

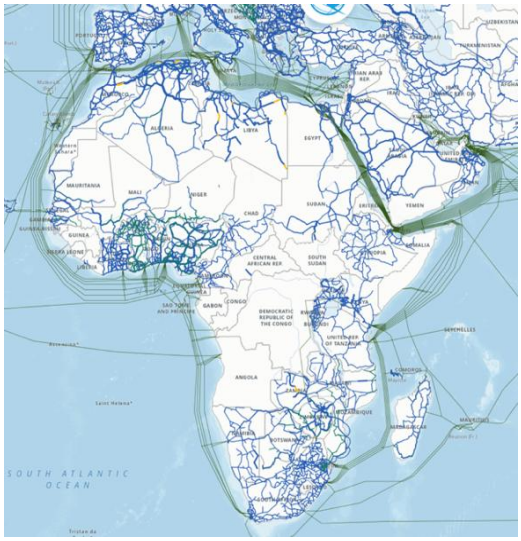
Nevertheless, the rollout of this infrastructure still faces significant challenges in terms of total coverage (not all of a country's territory is covered), redundancy and cross-border integration.

Much investment is needed to ensure that fiber optic infrastructure truly contributes to inclusive economic development.

Figure 5: Overview of fiber optic networks in African Administrations



Source: Afterfibre[3]



Source: ITU[4]

2.3.1.3 *Energy supply*

In their responses to the questionnaire, all of the administrations stated that the energy supply represented one of the most significant operational cost components of mobile broadband network infrastructure.

In off-grid and unreliable grid areas, operators must deploy and maintain independent power solutions, typically in the form of diesel generators, battery banks, or increasingly solar-hybrid systems, to keep base stations operational.

The cost of diesel fuel alone can account for 30–50% of a rural cell site's total operating expenditure, and the logistics of supplying fuel to remote areas adds further cost and complexity.

[3] https://afterfibre.opentelecomdata.org;

[4] https://bbmaps.itu.int/bbmaps/;

2.3.1.4 *Submarine cables connectivity*

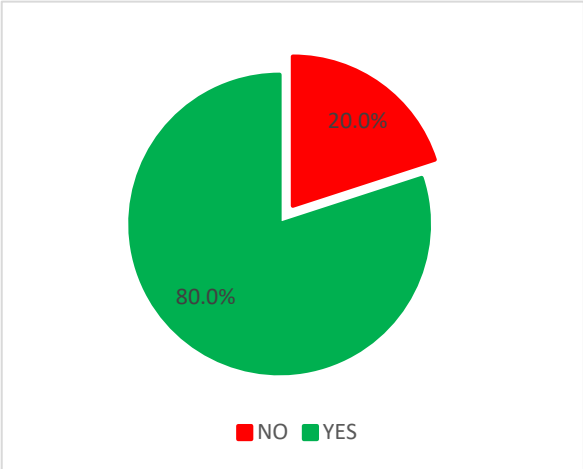


Figure 6: Submarine cables connectivity (Source: Author)

Figure 6 gives indication on submarines cable connectivity in Africa.

80% connectivity rate is a relatively encouraging figure, suggesting that submarine cable infrastructure has reached a significant portion of Africa.

This means that most African administrations have at least one submarine cable landing point, which is essential for international data exchange, digital commerce, and access to cloud-based services.

However, 20% remains without submarine cable connectivity. This represents a non-trivial number of nations, potentially around 10 or more countries, which are likely landlocked nations and are facing a structural disadvantage in terms of international connectivity and digital competitiveness.

Figure 7 shows that connectivity to submarine cables does not equal capacity.

Being connected to a submarine cable does not necessarily mean a country has adequate bandwidth (3 out of 8 that responded have a national capacity less than 200 GB/s).

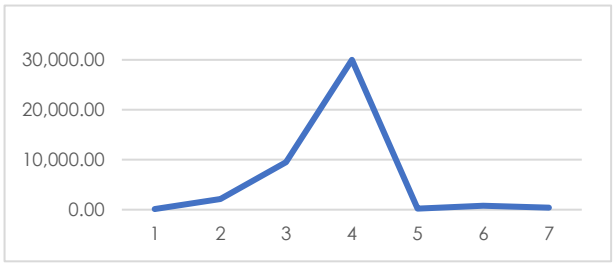


Figure 7: Submarine cables capacity (Giga Byte/s) (Source: Author)

Some connected countries have limited capacity, leading to congestion, high latency, and unreliable performance, especially during peak demand or in the event of cable disruptions.

2.3.2 Non-Terrestrial Networks (NTN)

Non-terrestrial networks encompass a range of technologies that operate outside ground-based infrastructure.

These include geostationary satellites (GEO), low-earth orbit satellites (LEO) such as Starlink, medium-earth orbit satellites (MEO), as well as high-altitude platforms (HAPs) like balloons.

Responses highlight a near-universal adoption, which reflects a real need.

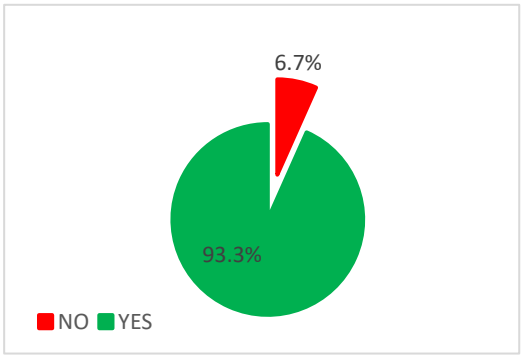


Figure 8: Use of Non-Terrestrial Network (Source: Author)

Indeed, the 93.3% adoption rate is exceptionally high and signals that, African administrations and operators have collectively recognized that terrestrial infrastructure alone cannot cover the continent's vast and often rugged geography.

Figure 9 shows that there is a significant asymmetry between downlink and uplink, a structural characteristic of satellite broadband systems, which is acceptable for consumer browsing or streaming.

However, this asymmetry becomes a serious limitation for applications requiring substantial upload capacity, such as cloud computing, video conferencing, remote healthcare, or e-commerce platforms — all of which are expected to grow in Africa.

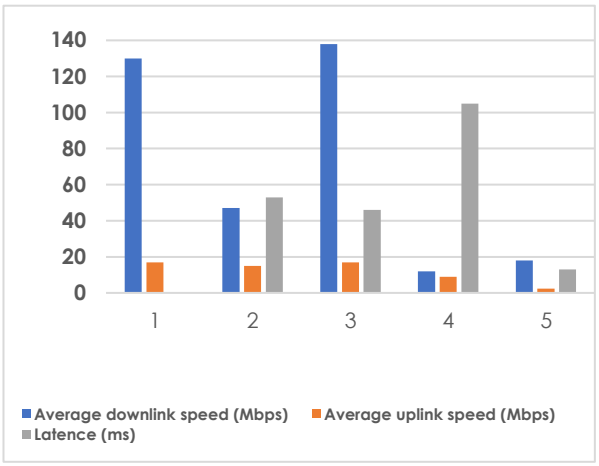


Figure 9: NTN QoS indicators (Source: Author)

The earlier finding that 93.3% of African countries use NTN must be nuanced, as being connected via NTN does not guarantee meaningful broadband quality. Countries served by slower, higher-latency systems may experience connectivity that is insufficient for modern digital services.

For Africa to fully leverage digital infrastructure for economic growth — particularly in sectors like agriculture, health, education, and finance — uplink speeds need to improve. This may require hybrid solutions combining NTN with terrestrial backhaul networks.

2.3.3 Devices affordability

Figure 10 shows that smartphone costs reveal a stark digital divide across Africa, with three categories emerging:

- the first category of countries has smartphone costs amounting to around 10% of income per capita;
- the second category of countries has smartphone costs amounting to around 20%; and
- the third category of countries has smartphone costs amounting to almost 50%.

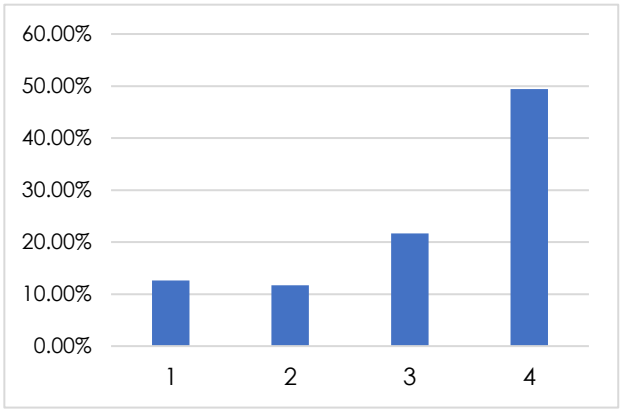


Figure 10: Average cost of a smartphone relative to average income per capita (Source: Author)

This variation suggests significant intra-continental disparities, likely reflecting differences in national income levels, import duties, taxation policies, and local market dynamics.

In any case, when half of the average income per capita is needed to purchase a basic digital tool, smartphones become a luxury item rather than essential infrastructure.

This creates a vicious circle whereby those who would benefit most from mobile broadband connectivity, for example for mobile banking, education, healthcare access and economic opportunities, are the least able to afford it.

2.4 Mobile Broadband Connectivity

2.4.1 Coverage

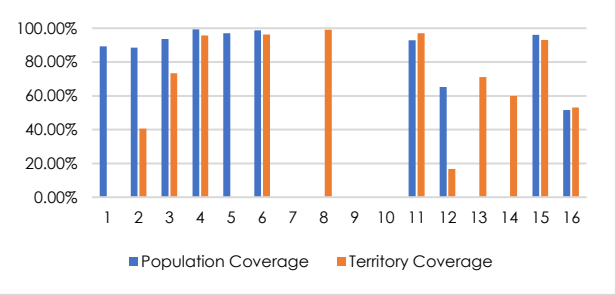


Figure 11: Population coverage vs Territory coverage (Source: Author)

Figure 11 reveals a stark disparity between population and territory coverage across nearly all countries.

This is characterized by high population coverage and low territory coverage, with an average gap of approximately 30–40 percentage points between the two in most cases.

It means that while African telecommunications operators have successfully connected the majority of the population through urban-focused strategies, vast geographic areas remain unconnected.

Closing this gap requires innovative technology deployment, supportive regulatory frameworks, creative financing, and a shift from purely commercial metrics to inclusive connectivity goals.

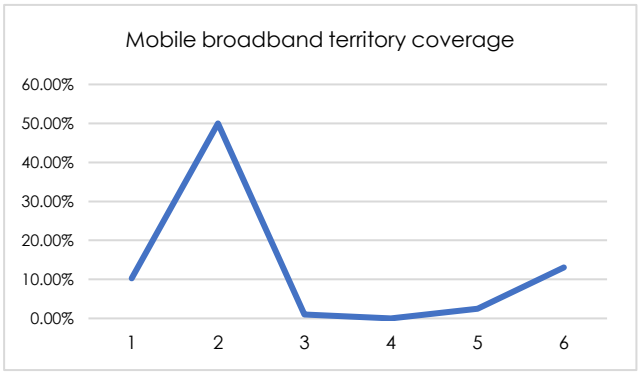


Figure 12: Mobile broadband coverage (Source: Author)

Figure 12 showing the coverage of mobile broadband across African countries reveals a striking pattern with significant implications for development.

Firstly, infrastructure coverage is extremely unequal, indicating that vast portions of these territories lack mobile broadband infrastructure entirely.

Secondly, this coverage gap has profound socioeconomic impacts. In countries where coverage is sparse, rural populations are almost entirely excluded from digital services. This creates a severe urban–rural digital divide, with opportunities and development concentrated in small covered areas, typically capital cities.

Thirdly, the lack of mobile broadband coverage means that administrations remain dependent on traditional economic activities with limited growth potential. They also experience brain drain, as educated young people migrate to connected urban areas, and face barriers to accessing global markets.

2.4.2 Subscribers

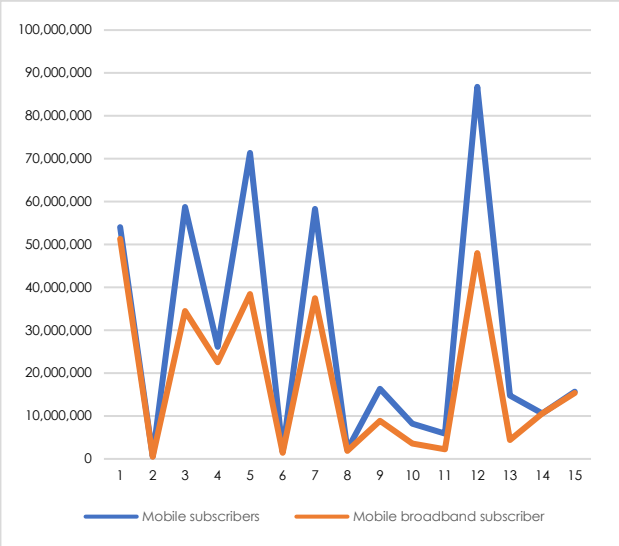


Figure 13: Mobile subscribers and mobile broadband subscribers (Source: Author)

Figure 13 shows that there are extreme disparities across the continent, with market sizes ranging from very small countries or regions to major telecommunications markets.

Mobile broadband penetration lags behind overall mobile subscriptions. Throughout most data points, mobile broadband subscribers represent only a fraction of total mobile subscribers.

This gap indicates that many mobile users have basic voice/SMS services but lack data connectivity, highlighting a digital access divide even among mobile phone owners

2.5 Mobile Broadband Usage

2.5.1 Usage by Gender

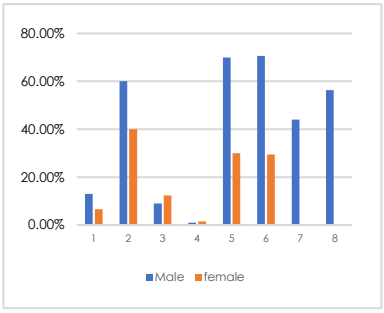


Figure 14: Mobile broadband usage via Laptop by gender (Source: Author)

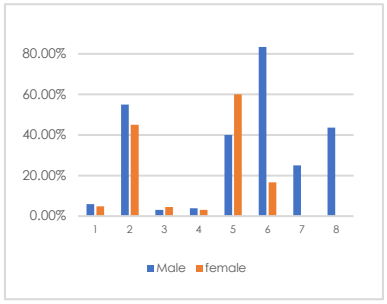


Figure 15: Mobile broadband usage via Tablet by gender (Source: Author)

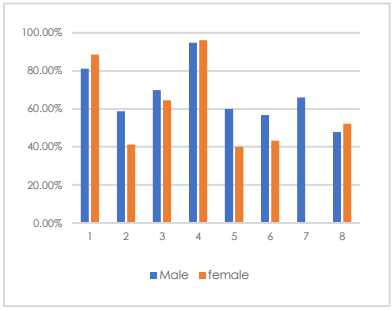


Figure 16: Mobile broadband usage via Smartphone by gender (Source: Author)

Figure 14 reveals significant and persistent gender disparities in digital access and technology usage, with males consistently dominating laptop-based mobile broadband usage.

Figure 15 shows a similar pattern for tablet usage, indicating that gender disparities in digital access transcend specific device types and reflect deeper structural inequalities in resource allocation, decision-making power and digital opportunity within households and societies.

However, unlike laptops and tablets, Figure 16 shows that smartphone usage rates are consistently high (40–95%) for both genders, indicating their widespread adoption as the primary gateway to mobile broadband access in Africa.

While section 2.3.3 showed that, to some extent, smartphones are unaffordable for African citizens, they remain more affordable than laptops or tablets.

Their multifunctional nature — communication, social media, mobile money and internet access — makes them a priority purchase for both genders.

This validates the mobile-first approach to digital development in Africa, where smartphones often serve as the only means of internet access for vast populations, particularly women.

2.5.2 Usage by age group

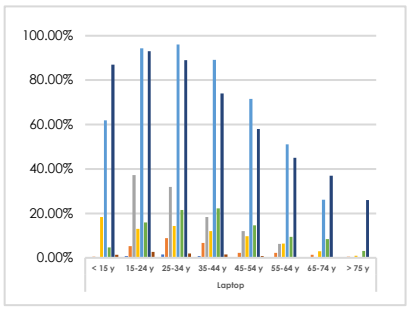


Figure 17: Mobile broadband usage via Laptop by age group (Source: Author)

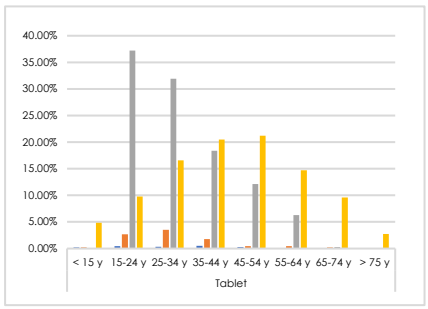


Figure 18: Mobile broadband usage via Tablet by age group (Source: Author)

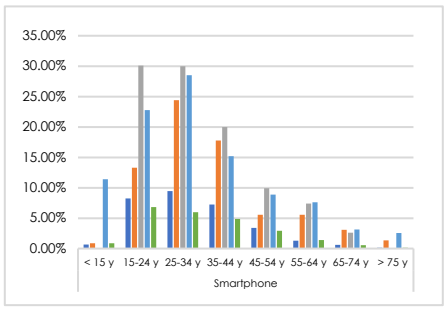


Figure 19: Mobile broadband usage via Smartphone by age group (Source: Author)

Figure 17 and Figure 18 reveal that the 15-24 and 25-34 age groups have the highest devices (laptop and tablet) usage rates. This aligns with expectations as laptops and tablets remain predominantly a tool of the student and working-age populations who rely heavily on internet for education and work. This situation raises concerning implications for digital inclusion among seniors.

Figure 19 shows that unlike laptops and tablets which concentrate heavily in the 15-34 age range, smartphone usage shows more balanced distribution across age groups, with significant adoption extending into middle age (35-54 years). This observation regarding the democratization of smartphone usage is consistent with the findings of section 2.5.1.

2.5.3 Mobile apps

Two of the three questions put to the administrations concerned the number of mobile app downloads and the number of mobile apps developed in the country and available on various platforms.

The results of the 20% response rate highlight the need for better data infrastructure and capacity building in terms of tracking digital metrics. It may also be necessary to consider alternative data collection methods, such as direct measurement from app stores or mobile network operators, rather than relying on administrative reports.

2.6 Analysis

This section examines the mobile broadband landscape outlined above, highlighting significant opportunities and major challenges. The description covers policy, legislation and regulatory frameworks, taxation, tariffs, infrastructure deployment, coverage and usage.

2.6.1 Mobile Broadband Policy, Legislation and Regulatory frameworks

Majority of administrations have a mobile broadband policy, a strategy to promote mobile broadband development and recognize technology neutrality as an important enabler.

Defining a mobile broadband policy and developing and implementing an associated strategy will establish a legal framework based on robust institutions, legislation and regulations.

Alongside the adoption of technological neutrality, this creates an environment that encourages infrastructure investment and service deployment, while reducing barriers to innovation and competition.

> *Box # 1: Weak institutions*
>
> The absence of a mobile broadband policy, and consequently an implementation strategy, prevents the development of robust institutions and favourable legislation.

Infrastructure sharing allows multiple operators to share the costs of towers, fiber backhaul, and passive infrastructure (power supply, physical sites, ducts). By sharing infrastructure, operators can split capital and operational expenditure. This significantly reduces the per-operator cost of serving low-revenue areas, making the rollout of services to these areas more economically viable.

This mechanism will be a means to extend broadband services to underserved and remote areas, where infrastructure investment might otherwise be limited, thereby accelerating network rollout.

> *Box # 2: Infrastructure sharing as a leverage for bridging the gap*
>
> Continental consensus on infrastructure sharing should be maximised on reducing the mobile broadband usage gap

2.6.2 Mobile broadband Taxation and Tariffs

2.6.2.1 Taxation

In most countries, the tax base includes taxes on mobile data, taxes on terminals and sector-specific taxes. The different policy choices across countries have led to significant differences in taxes on terminal, which create significant barriers to device ownership.

This high and inconsistent level of taxation increases the total cost of mobile broadband access, which particularly affects low-income users.

> *Box # 3: Volatile taxation scheme and higher taxes*
>
> A volatile tax system hinders digital adoption and investment, while high taxes increase consumer costs, creating a usage gap that restricts economic growth and digital inclusion.

2.6.2.2 Tariffs

For the data package pricing across Africa measured as percentage of average revenue per inhabitant, three distinct market clusters were identified: affordable

markets (<0.5% of income), moderate markets (1-2% of income) and crisis markets (up to 5.6% of income).

This difference in pricing is primarily policy and/or structural.

> *Box # 4: Pricing scheme for economic development*
>
> To prevent mobile broadband access from becoming a luxury that causes severe digital exclusion, administrations must create the conditions necessary for implementing economic development-oriented pricing policies.

2.6.3 Mobile Broadband Infrastructures

2.6.3.1 Terrestrial networks

2.6.3.1.1 Frequency band

Analysis of the allocation of spectrum across different frequency bands for mobile broadband services shows that the spectrum allocated to mobile broadband is harmonized. Low bands are not yet being used to their full potential, despite the fact that they are critical for rural coverage due to better propagation.

> *Box # 5: Non-strategic use of spectrum*
>
> Even though they are essential to reducing the digital divide, low frequency bands suffer from underutilisation and lack of strategic decision-making.

2.6.3.1.2 Fiber optic

The deployment of fiber optics in Africa has two aspects: a significant amount of fiber optics has been deployed along the coastline, but coverage is sparse further inland. This massive interior coverage gaps create a digital desert affecting millions of people.

This challenge is exacerbated by the lack of a reliable energy supply in many inland regions. Fiber routes require active equipment to be powered at regular intervals, and the absence of grid electricity along deployment corridors increases both capital and maintenance costs, which further deters investment in inland fiber infrastructure.

> *Box # 6: Fiber optic as a platform for development*
>
> To reduce deployment costs by 60%, administrations should encourage the deployment of innovative low-cost fibre optic technology, enabling fibre optic infrastructure to deliver digital services on a large scale.

2.6.3.1.3 Energy supply

Shared energy infrastructure, including co-located solar mini-grids serving multiple tower operators and surrounding communities, offers a pathway to reduce per-operator energy costs while extending electrification benefits beyond the telecommunications sector.

> *Box # 7: Energy as a shared infrastructure priority*
>
> Reliable energy is a prerequisite for the sustainable deployment of mobile broadband. Infrastructure-sharing frameworks should prioritise shared energy solutions, particularly solar-hybrid power systems, to reduce per-operator costs and extend electrification to underserved communities.

2.6.3.1.4 Submarine cables

Submarine cables ring is impressive and show strong progress in international connectivity for Africa. However, the value of these international cables cannot be fully realized until terrestrial fiber reaches inland populations.

Connecting Africa's coasts to each other and to the world is only half the battle; connecting Africa's interior to its coasts is equally critical and remains the continent's greatest digital infrastructure challenge.

2.6.3.2 Non-Terrestrial Networks (NTN)

The majority of African administrations have adopted NTN, reflecting a dual recognition: firstly, that terrestrial infrastructure alone cannot cover Africa's vast and rugged territory; and secondly, that satellite connectivity solutions are almost universally recognized as an alternative.

However, high adoption rates do not guarantee a meaningful level of broadband quality, as the significant downlink/uplink asymmetry in satellite broadband systems is inadequate for modern digital services.

Box # 8: Leverage NTN for Rural & Remote Services

To accelerate rollout of high-quality, affordable services, hybrid solutions combining NTN with terrestrial backhaul networks could be deployed to serve unserved areas.

2.6.3.3 Devices affordability

Smartphone costs relative to per capita income vary widely across Africa, with three categories defined. The first category costs up to 10% of income, the second costs between 10% and 20%, and the third costs at least 50%. These high costs mean that smartphones are a luxury rather than essential infrastructure.

Box # 9: Devices affordability crisis

Affordability of smartphones in Africa remains a pivotal concern. The financial burden of purchasing an entry-level device remains significant. This harsh reality hinders connectivity and exacerbates the digital divide.

2.6.4 Mobile Broadband Connectivity

2.6.4.1 Coverage

Findings in terms of coverage are mixed: while most countries have high population coverage (90–100%), their territorial coverage varies (17–97%), resulting in an average gap of 30-40 percentage points.

Three profiles have been identified: countries with balanced coverage (both indicators >90%); countries with coverage concentrated in urban areas (high population, moderate territory); and countries with highly urbanized coverage (e.g. 65% of the population but only 17% of the territory).

This result, which quantifies the coverage gap, is consistent with findings of other studies on this topic, particularly the state of mobile internet connectivity 2023 by GSMA[5].

> *Box # 10: Severe urban-rural digital divide*
>
> Rural populations are excluded from mobile broadband services limiting access to digital services. This perpetuates regional inequality, accelerates urban migration, and constrains economic diversification in rural areas.

2.6.4.2 Subscribers

The key findings show that there are extreme disparities in market size across the continent. Mobile broadband penetration lags significantly behind total mobile subscriptions.

Mobile broadband represents only a fraction of total subscribers in most markets. Finally, many users have basic voice and SMS capabilities, but lack data connectivity.

> *Box # 11: Digital access divide among mobile phone owners*
>
> Device ownership does not guarantee digital inclusion.

2.6.5 Mobile Broadband Usage

2.6.5.1 Usage by gender

The key findings show that males consistently dominate in Laptop and tablet usage, but for smartphone usage, there is a gender parity. These gender disparities reflect structural inequalities in resource allocation and opportunity.

> *Box # 12: Smartphone as great equalizer for gender-based digital access*
>
> Smartphone relative affordability compared to laptops/tablets make them a priority purchase for both genders, suggesting targeted smartphone affordability plans could rapidly close gender digital divides.

2.6.5.2 Usage by age group

The key findings show that mobile broadband usage in Africa is driven by a very young population (highest usage in 15-24 and 25-34 age groups).

> *Box # 13: African youth unprecedented opportunities*
>
> *Africa offers considerable opportunities in mobile broadband usage, driven by its unique demographics.*

2.6.5.3 Mobile Apps

The key findings show low response rates about Mobile apps. This result can be explained by the fact that the mobile applications sector in Africa is still in its infancy and does not rank as a priority compared to other issues, such as health, education and infrastructure.

The absence of a local mobile application ecosystem would mean that African users would be dependent on other solutions, resulting in most of the economic

[5] https://www.gsmaintelligence.com/research/the-state-of-mobile-internet-connectivity-2023;

value generated by them being captured by other platforms, while their data would be stored, analyzed and monetized elsewhere.

Box # 14: Risk of dependency on mobile apps

The continent is already lagging behind in other areas and could fall further behind in mobile app sector, becoming a mere consumer market with no production capabilities or control over its strategic digital content.

2.7 Key Barriers

This section identifies the key barriers to developing mobile broadband usage in Africa. Based on analysis of section 2.6, barriers identified are as follows:

1. "***Device affordability crisis***": Affordable devices directly affect millions of end-consumers. Without this principle, even the best infrastructure, services and policies would be useless.
2. "***Severe urban-rural digital divide***": Excluding a huge part of African continent where millions of people live, perpetuates inequality and hinders the continent's balanced development.
3. "***Dependency on non-local mobile contents***": This is a matter of digital sovereignty, as without a local ecosystem, Africa loses control of its digital future, its data, and the economic value generated by its citizens.
4. "***Volatile taxation scheme***": Volatile taxation creates unpredictability, which puts investors off and causes them to seek opportunities elsewhere.
5. "***Higher taxes***": Increasing taxes will continuously restructure the balance of supply and demand because taxes are passed on directly to the price, and therefore to the end consumer, forcing them to readjust their budget.
6. "***Pricing scheme not-oriented toward development***": Non-developmental pricing transforms mobile broadband from a tool for mass empowerment into a luxury for the elite, excluding the majority of Africans from digital economic participation and perpetuating poverty and inequality.
7. "***Non-strategic orientations for low frequency bands***": Low frequency bands (600 MHz, 700 MHz and 800 MHz) are the most cost-effective solution for rural coverage due to their superior propagation characteristics. Failure to deploy them strategically leaves a vast population unconnected and perpetuates the urban-rural digital divide.
8. "***Massive inland fiber optic coverage*** gaps": While Africa has impressive submarine cable connectivity on its coasts, fiber optic penetration inland is sparse, creating a fundamental infrastructure bottleneck that prevents the realization of mobile broadband's full potential.
9. ***Energy infrastructure Gap"***: Unreliable or absent electricity supply constrains mobile broadband deployment and usage on two fronts. On the supply side, it inflates operating costs for network operators. On the demand side, it imposes hidden costs on end users who must pay to charge devices at commercial charging stations or travel to electrified areas, adding a recurring expense.

10. "***Digital access divide***": The digital access divide is not static. It actively widens through feedback loops and operates across multiple overlapping dimensions (urban-rural, health-based, age-based, etc.).
11. "***Gender inequalities in usage***": In Africa, women are 15% less likely than men to own a mobile phone and 37% less likely to use mobile internet[6]. This represents approximately 200 million African women excluded from digital connectivity despite living in areas with coverage.
12. "***Weak Institutions***": The absence of a mobile broadband policy and an implementation strategy to enable incentive-based legislation and a regulatory framework will result in weak institutions. Consequently, such institutions, alongside outdated legislation and ineffective regulatory frameworks, could create an environment of uncertainty, leading to market failures and deterring investment, thereby preventing the mobile broadband sector from reaching its potential.

[6] https://www.gsma.com/wp-content/uploads/2025/12/The-Mobile-Gender-Gap-Report-2024.pdf;

3 BRIDGING MOBILE BROADBAND USAGE GAP IN AFRICA

3.1 Methodology

3.1.1 Prioritization

Barriers explained in previous section are ranked by priority.

The prioritization methodology considers the following five criteria:

(1). **Population impact**: Number of people affected,

(2). **Economic impact**: Effect on growth and development,

(3). **Urgency**: Need for immediate action,

(4). **Multiplier effect**: Potential to catalyze other improvements,

(5). **Feasibility of resolution**: Possibility of effective intervention.

3.1.2 Priority tiers

Based on the evaluation across these five criteria, barriers are assigned to one of three priority tiers:

(a) **Critical**: Fundamental obstacles that make mobile broadband use impossible if left unresolved. Highest scores across all five criteria. Immediate action required.

(b) **High**: Significant barriers with substantial impact on multiple dimensions. High scores on most criteria. Action needed within 1 year.

(c) **Medium**: Important barriers that compound other issues. Moderate to high scores on several criteria. Should be addressed within 2-3 years.

3.2 Barrier priority ranking

Table 1 presents all barriers ranked by priority, with their assigned tier and brief rationale

RANK	BARRIER	TIER	PRIMARY RATIONALE
1	Device Affordability Crisis	Critical	Affects hundreds of millions directly; without affordable devices, all other solutions are irrelevant
2	Severe Urban-Rural Digital Divide	Critical	Excludes large part of territory where millions live; perpetuates inequality
3	Dependency on Non-Local Mobile Contents	Critical	Threatens digital sovereignty and economic value capture; strategic long-term impact
4	Volatile Taxation Scheme	High	Creates investment uncertainty; multiplier effect on other barriers
5	Higher Taxes	High	Directly increases costs for consumers; compounds affordability crisis

RANK	BARRIER	TIER	PRIMARY RATIONALE
6	Pricing Scheme Not Oriented Toward Development	High	Transforms broadband into luxury; excludes majority from digital economy
7	Non-Strategic Orientation for Low Frequency Bands	High	Most cost-effective rural solution underutilized; directly worsens urban-rural divide
8	Massive Inland Fiber Optic Coverage Gaps	High	Fundamental infrastructure bottleneck; limits quality even where coverage exists
9	Energy Infrastructure Gap	High	Fundamental operational constraint inflating costs, deterring rural investment, and imposing hidden charges on end users
10	Digital Access Divide	Medium	Complex, multi-dimensional; result of other barriers; widens through feedback loops
11	Gender Inequalities in Usage	Medium	Affects ~200 million women; reflects broader structural issues
12	Weak Institutions	Medium	Foundational but slower-changing; enables/exacerbates other barriers

Table 1: Barriers ranked by priority

3.3 The Three Fundamental Barriers

These three barriers are designated as CRITICAL because they represent fundamental obstacles that, if left unresolved, make sustainable mobile broadband usage virtually impossible. Each scores highest across all or most evaluation criteria.

3.3.1 Rank 1: Device Affordability Crisis

1st Critical Barrier	
Population Impact	Directly affects hundreds of millions who cannot afford smartphones (up to 50% of annual income in some countries)
Economic Impact	Massive: without devices, entire digital economy potential remains untapped
Urgency	Immediate: every day of delay excludes millions from economic opportunities
Multiplier Effect	High: affordable devices enable access to education, healthcare, finance, commerce
Feasibility	Moderate to High: policy changes (tax reform, subsidies) can show rapid results

Table 2: Device affordability crisis evaluation

Without affordable devices, even perfect infrastructure, favorable regulations, and excellent content are useless. This is the most direct barrier between people and mobile broadband access.

Device ownership is the absolute prerequisite for any mobile broadband usage (no device, no possibility of connection).

3.3.2 Rank 2: Severe Urban-Rural Digital Divide

2nd Critical Barrier	
Population Impact	Excludes tens of millions in rural areas (huge part of territorial coverage gap)
Economic Impact	Perpetuates regional inequality, drives harmful migration, constrains agricultural productivity
Urgency	High: gap is widening as urban areas advance while rural areas stagnate
Multiplier Effect	Very High: rural connectivity unlocks agriculture, health, education for entire regions
Feasibility	Moderate: requires infrastructure investment but proven solutions exist (low-band spectrum, fiber, NTN)

Table 3: Severe Urban-Rural digital divide evaluation

Excluding a huge part of the continent's territory perpetuates inequality and undermines balanced development. Rural populations cannot participate in digital economy, access essential services, or improve productivity. Without rural connectivity, Africa cannot achieve inclusive, equitable development.

3.3.3 Rank 3: Dependency on Non-Local Mobile Contents

3rd Critical Barrier	
Population Impact	Affects all digital users: millions become mere consumers without production capacity
Economic Impact	Enormous: economic value generated by Africans captured by foreign platforms; data exported
Urgency	High: window of opportunity closing as foreign platforms establish dominance
Multiplier Effect	Very High: local app ecosystem creates jobs, retains value, enables African solutions
Feasibility	Moderate: requires coordinated policy, investment, and capacity building

Table 4: Risk of dependency on non-local mobile contents evaluation

This is fundamentally about digital sovereignty and economic self-determination. Without a local content ecosystem, Africa loses control of its digital future, its data, and the economic value its citizens generate. Africa becomes a pure consumer market with no production capabilities. The low survey response rate (1 in 5 countries) shows this critical issue is being neglected.

These three barriers represent existential threats to Africa's digital future. Device affordability is the gateway to access, urban-rural divide is about equitable development, and content dependency is about economic sovereignty. Without resolving all three, Africa cannot build a sustainable, inclusive, and sovereign digital economy.

3.4 The Six Enabling/Constraining Barriers

These six barriers are designated as high priority because they significantly enable or constrain the mobile broadband ecosystem. They score high on most criteria and directly affect the critical barriers of section 3.3.

The high tier barriers are the mechanisms through which systemic problems manifest. Volatile and high taxation create affordability problems. Non-developmental pricing compounds exclusion. "Non-strategic spectrum use" and "fiber gaps" directly cause the urban-rural divide.

3.4.1 Rank 4: Volatile Taxation Scheme

1st High Barrier	
Population Impact	High: Affects all potential and current users across the continent
Economic Impact	High: Creates an unpredictable business environment that elevates risk premiums on capital
Urgency	Medium: Tax policies are reversible, and while delay is costly, it doesn't create irreversible path dependencies.
Multiplier Effect	High: Resolving tax volatility would cascade positive effects through pricing, affordability, and investment dimensions
Feasibility	High: Requires political will rather than new technology or massive capital

Table 5: Volatile Taxation Scheme evaluation

This is a root cause barrier that can be resolved relatively quickly through policy reform. It is a force multiplier: addressing it catalyzes improvements across affordability, investment, coverage, and quality dimensions simultaneously.

3.4.2 Rank 5: Higher Taxes

2nd High Barrier	
Population Impact	High: directly price out hundreds of millions of potential users
Economic Impact	High: Creates an unpredictable business environment that elevates risk premiums on capital
Urgency	Medium: Tax policies are reversible, and while delay is costly, it doesn't create irreversible path dependencies.
Multiplier Effect	High: creates cascading negative effects and compounds both demand-side (affordability) and supply-side (investment) constraints simultaneously
Feasibility	High: Requires political will rather than new technology or massive capital

Table 6: Higher Taxes evaluation

If combined with "Volatile Taxation scheme", these two tax-related barriers form a critical leverage point for improving mobile broadband usage inclusion across Africa.

3.4.3 Rank 6: Pricing scheme not oriented toward development

3rd High Barrier	
Population Impact	High: affects a significant percentage of population through exclusionary pricing
Economic Impact	High: risks straining network infrastructure and reduces operator revenue for reinvestment
Urgency	Medium: Persistent structural problem rather than an immediate crisis
Multiplier Effect	High: Pricing structure determines the entire digital economy's accessibility
Feasibility	High: Unlike taxation (government policy), this is market-based but regulators have levers to mandate development-oriented pricing

Table 7: Pricing not-development oriented evaluation

This barrier is particularly important because it determines the fundamental orientation of the digital economy - whether it serves the elite or enables broad-based development.

3.4.4 Rank 7: Non-strategic Low-band use

4th High Barrier	
Population Impact	High: affects millions rural Africans live in areas where mobile broadband deployment is economically impossible at current spectrum allocations
Economic Impact	High: affects not just individual users but entire regional economies locked out of digital transformation
Urgency	Medium-High: if countries complete digital TV transitions, there's political momentum for spectrum release
Multiplier Effect	High: it is THE binding constraint for rural coverage. If fixed, multiple problems cascade toward resolution
Feasibility	Medium-High: Spectrum reallocation involves complex political economy

Table 8: Non-strategic low-band-use evaluation

This barrier exemplifies a structural technical constraint that no amount of investment, pricing reform, or other interventions can overcome - physics requires low-frequency spectrum for cost-effective rural coverage.

3.4.5 Rank 8: Inland fiber optic coverage gaps

5th High Barrier	
Population Impact	High: affects everyone in inland regions with a quality bottleneck that prevents meaningful digital economy participation
Economic Impact	High: Economic consequences are severe and multi-dimensional. Direct costs include lost productivity, reduced business opportunities, and inability to participate in digital commerce
Urgency	Medium: Communities are functioning, albeit with significant limitations
Multiplier Effect	High: Creates extensive cascading effects across multiple systems
Feasibility	Medium: Requires sustained capital deployment over decades

Table 9: inland fiber coverage gaps evaluation

Inland fiber coverage gaps refer to the lack of fiber optic infrastructure in rural and inland regions, resulting in limited or no high-speed internet connectivity. This infrastructure deficit creates significant disparities between urban and rural areas, affecting access to essential digital services, economic opportunities, and participation in the digital economy.

3.4.6 Rank 9: Energy Infrastructure Gap

6th High Barrier	
Population Impact	Affects hundreds of millions in off-grid areas; rural populations disproportionately impacted where electrification rates can fall below 20%
Economic Impact	Inflates network operating costs by 30–50% in off-grid areas; suppresses infrastructure investment in regions most in need of connectivity
Urgency	High: energy costs compound daily; every day of diesel dependence erodes operator viability and delays rural deployment
Multiplier Effect	Very High: reliable energy enables tower deployment, improves service quality, reduces pricing, and enables device charging—unlocking participation across the entire barrier chain
Feasibility	Moderate to High: solar-hybrid solutions are commercially proven and declining in cost; policy frameworks for shared energy infrastructure can accelerate deployment

3.5 The Three Structural Barriers

These three barriers are designated as medium priority not because they are unimportant, but because they are either resultant from other barriers (digital access divide), reflect broader social structures (gender inequality), or are foundational but slower-changing (institutional frameworks).

3.5.1 Rank 10: Digital access divide

1st Medium Barrier	
Population Impact	High: affects the broadest population base, cutting across geographic, socioeconomic, age and educational boundaries.

1st Medium Barrier	
Economic Impact	Medium-High: perpetuates income inequality as digital skills become essential for employment
Urgency	Medium: digital exclusion is permanent for many populations
Multiplier Effect	Medium: Addressing root causes resolves this
Feasibility	Medium: Multiple dimensions requiring coordinated interventions

Table 10: Digital access divide evaluation

This barrier goes beyond infrastructure to include affordability of devices and services, digital literacy gaps, and unequal distribution of benefits from digital transformation. It is both a cause and consequence of other socioeconomic inequalities.

3.5.2 Rank 11: Gender inequalities in usage

2nd Medium Barrier	
Population Impact	High: Millions of women excluded
Economic Impact	Medium:
Urgency	Medium: Requires cross-sectoral intervention
Multiplier Effect	Medium: Reflects broader structural inequality
Feasibility	Medium: Gender gaps would persist due to structural factors

Table 11: Gender inequalities in usage evaluation

3.5.3 Rank 12: Weak institutions

3rd Medium Barrier	
Population Impact	Medium-High: institutional weakness affects indirectly consumers
Economic Impact	Medium-High:
Urgency	Medium: Institutional reform can be undertaken at any point
Multiplier Effect	High: Enables all other barriers
Feasibility	Medium: Requires: staff training, legal reforms, political independence, resource allocation, cultural change

Table 12:Institutional/regulatory frameworks evaluation

Institutional frameworks are foundational but require long-term capacity building that shows results over years, not months. These should be addressed within years through sustained, strategic programs.

3.6 Interconnected nature of barriers

It is important to note that these barriers do not operate in isolation; rather, they form an interdependent system, so addressing each one individually does not yield satisfactory results.

They are deeply interconnected and often reinforce each other, creating vicious cycles that perpetuate mobile broadband usage exclusion and economic inequality. However, this same interconnectedness also creates opportunities.

Understanding these interconnections is therefore essential for implementing strategic interventions that, if carried out at pivotal moments, can trigger improvements in several areas simultaneously.

The analysis identified the following four types of interconnections:

1) Direct causal links: where one barrier causes or worsens another;
2) Compound effects: where multiple barriers combine to create worse outcomes;
3) Reinforcing loops: where barriers feedback loops that intensify problems;
4) Enabling relationships: where fixing one barrier enables progress on others.

3.6.1 Direct causal links

	BARRIER	LINKED BARRIER	CONSEQUENCE	
1	Device Affordability Crisis	Digital Access Divide	Without affordable devices, citizens cannot access mobile broadband, directly widening the digital access divide	- Device ownership is the absolute prerequisite for mobile broadband usage. When smartphones cost up to 50% of annual income, a large part of the population is excluded from digital participation, regardless of coverage or service availability. - A smaller user base means a smaller digital market, which weakens infrastructure economics and reduces incentives for content development, compounding the divide.
2	Volatile taxation scheme	Device affordability crisis	Unpredictable taxes increase device costs	- When tax policy is unpredictable, ecosystem face uncertainty about future costs. - To protect against worst-case scenarios, risk buffers into prices is built. - Volatile taxation discourages long-term supply contracts and volume commitments that could reduce costs through economies of scale
3	Volatile taxation scheme	Digital Access Divide	Tax instability deters infrastructure investment, keeping markets small and	- An unpredictable tax environment discourages long-term investment in network infrastructure, particularly in underserved areas where return on investment timelines are already extended.

	BARRIER	LINKED BARRIER	CONSEQUENCE	
			widening the access divide	- Reduced investment leads to smaller markets, lower adoption, and fewer digital services, reinforcing the divide between those with access and those without.
4	Higher taxes	Device affordability crisis	Higher taxes rate directly increase device costs	- Taxes, and sector-specific levies are passed through to consumers either partially or fully, - Reduces taxes improve affordability immediately
5	Higher taxes	Pricing Scheme Not Oriented Toward Development	Higher taxes inflate operator costs, which are passed through to tariffs, driving non-developmental pricing	- When sector-specific taxes reach 19–26%, operators compensate by raising tariffs. This transforms data pricing from development-oriented to extraction-oriented, placing mobile broadband beyond the reach of most citizens. - Countries with lower tax burdens demonstrate that affordable pricing is achievable, confirming that taxation is a policy-driven, not market-driven, constraint on pricing.
6	Pricing Scheme Not Oriented Toward Development	Digital Access Divide	Extractive pricing excludes price-sensitive populations from digital participation	- When data costs reach up to 5.6% of income in crisis markets, mobile broadband becomes a luxury. This creates a two-tier digital society: a connected elite and excluded masses. - The 18-fold difference in pricing between best and worst performing countries demonstrates that affordability is primarily determined by policy choices and market structure, not by economic development level.
7	Non-strategic low band use	Severe Urban-Rural Digital Divide	Makes rural coverage 3-5x more expensive, rendering it economically unviable	- Low-band spectrum (sub-1 GHz) is the only economically viable frequency for wide-area rural coverage, as it propagates over longer distances and penetrates obstacles more effectively. When this spectrum is allocated to non-strategic uses such as broadcasting or military applications, operators must deploy 3–5 times more towers on higher bands to achieve equivalent coverage. - This cost multiplication renders rural deployment commercially unviable for private operators, ensuring that only urban and peri-urban areas receive coverage and directly widening the urban-rural digital divide.

	BARRIER	LINKED BARRIER	CONSEQUENCE	
8	Massive Inland fiber coverage gaps	Severe Urban-Rural Digital Divide	No backhaul makes rural deployment economically unviable	- Without fiber backhaul, mobile networks in rural areas cannot deliver quality service even if towers are built
9	Energy Infrastructure Gap	Severe Urban-Rural Digital Divide	Towers inoperable or prohibitively expensive in off-grid areas, directly widening the rural divide	- In off-grid areas, diesel fuel costs alone can account for 30–50% of a rural cell site's total operating expenditure. These costs make rural tower deployment economically unviable, even where spectrum and backhaul are available. - On the demand side, end users in off-grid areas must pay to charge devices at commercial charging stations or travel to electrified areas, imposing a hidden recurring cost that further suppresses adoption.
10	Weak Institutions	Volatile taxation scheme	Weak governance enables frequent policy changes	- Where governance structures are weak, tax policy becomes subject to frequent political changes, ad hoc decisions, and inconsistent enforcement. Without institutional checks and balances, tax regimes shift unpredictably with each change in administration or fiscal pressure. - The absence of independent regulatory bodies and transparent policy-making processes means that tax changes can be introduced without industry consultation, impact assessment, or transition periods, creating the volatility that destabilizes the investment environment.
11	Weak Institutions	Higher Taxes	Weak governance creates fiscal pressure, leading to compensatory higher taxation on the telecom sector	- Weak institutions lack diversified revenue bases and robust fiscal frameworks. Telecommunications, as one of the most visible and easily taxable sectors, becomes a disproportionate target for revenue extraction to fill budget shortfalls. - Political instability and short-term governance horizons drive fiscal decisions toward immediate revenue generation rather than long-term digital development, resulting in sector-specific levies, excise duties, and regulatory fees that cumulatively raise the effective tax burden on mobile operators and consumers.

Table 13: Direct causal links

3.6.2 Compound effects

	BARRIER COMBINATION	RESULTING BARRIER	
1	Device affordability crisis + Severe Urban-Rural Digital divide + Energy Infrastructure Gap + Pricing scheme not oriented toward development + Gender inequalities usage	Digital access divide	- Digital access divide isn't a single problem requiring one solution, but a convergent outcome requiring coordinated intervention on multiple fronts. - Addressing affordability alone won't fix the access divide if coverage is unavailable. - Building coverage won't help if devices and data are unaffordable
2	Digital access divide + Weak Institutions	Dependency on non-local content	- This is a structural problem - market size alone might be overcome with strong institutions, or weak institutions might be compensated by large markets, but the combination is lethal to local content development
3	Inland fiber coverage gaps + non-strategic low band use + pricing not-development oriented	Severe urban-rural divide	- Building fiber alone won't work if spectrum is wrong and pricing is extractive. Reallocating spectrum won't work if there's no backhaul. All three must be addressed together to cross the viability threshold

Table 14: Compound effect

3.6.3 Reinforcing loops

A reinforcing loop occurs when a barrier contributes to conditions that reinforce the original barrier, creating a self-perpetuating cycle.

Five reinforcing loops are identified as follows: Affordability loop, Rural Exclusion Loop, Content Dependency Loop, Investment loop and Energy Connectivity Loop.

3.6.3.1 Affordability Loop

Volatile Taxation scheme + Higher Taxes → *Low adoption → Small market → Poor infrastructure economics →* ***Volatile Taxation scheme + Higher Taxes***

High and volatile taxes imposed by governments lead to devices and services becoming expensive. Consequently, few people adopt these devices and services, which keeps the market small.

As a result, infrastructure economics do not work, pushing operators into financial difficulty and exposing the government to budgetary pressures and low digital economy growth.

Consequently, the government maintains or increases taxes, and the cycle repeats.

3.6.3.2 Rural Exclusion Loop

Severe Urban-Rural Digital Divide → *Urban migration → Smaller rural market → Less investment incentive →* ***Severe Urban-Rural Digital Divide***

A lack of rural connectivity pushes economic activity and people to cities, which leads to the depopulation of rural areas. The remaining rural market becomes even smaller and less attractive, which pushes operators to deprioritize rural coverage, thereby deepening the urban-rural digital divide and creating more migration.

Consequently, operators do not cover rural areas because they are not economically viable, but the lack of coverage makes them even less viable by driving out the population.

This dynamic is compounded by energy poverty: areas lacking reliable electricity cannot sustain mobile infrastructure, and the absence of connectivity removes the economic incentive for energy investment, creating a dual exclusion that reinforces rural depopulation.

3.6.3.3 Content Dependency Loop

Dependency on non-local content → *Foreign platform dominance → Economic extraction → Less capital for local development →* ***Dependency on non-Local content***

In the absence of local alternatives, users adopt foreign platforms, which then achieve market dominance and push profits out of Africa. Consequently, fewer funds are available to develop local platforms, resulting in a weak ecosystem and users continuing to rely on foreign platforms.

3.6.3.4 Investment Loop

Weak Institutions → *Volatile taxation scheme → High risk → Higher Taxes → Limited investment → Weak economic base →* ***Weak Institutions***

Weak institutions lead to policy instability, creating investment risk. This pushes governments to compensate for low investment by raising taxes.

High taxes then deter further investment, keeping the economy weak. A weak economy means less tax revenue, creating budgetary pressure and preventing institutional strengthening, thus perpetuating the cycle of weak institutions.

3.6.3.5 Energy-Connectivity Loop

No reliable energy supply → *Towers cannot operate or are prohibitively expensive → No mobile broadband coverage → No digital economic activity → No demand signal for grid extension or mini-grid investment →* ***Continued energy poverty***

In areas without grid electricity, the cost of powering mobile infrastructure through diesel generators is prohibitive for low-revenue rural sites. Without connectivity, these areas cannot develop the economic activity that would justify energy infrastructure investment. The absence of energy investment means towers remain unviable, and the cycle perpetuates itself.

3.6.4 Enabling relationships

The concept of 'Enabling Relationships' demonstrates how interventions on specific barriers can have a positive, cascading effect throughout the system, creating multiple benefits. Four Enabling Relationships are identified.

3.6.4.1 Fix Weak Institutions → Enables stable taxation → Improves affordability → Increases adoption

Strengthening institutions enables governments to commit to stable policies, allowing for rational business planning and reducing risk premiums. This makes tax reform possible in the form of reduced rates and increased stability, without the risk of it being reversed.

Lower, stable taxes improve affordability, increasing market adoption and generating tax revenue through volume rather than rates, thus making lower taxes fiscally sustainable. This creates a virtuous cycle — the reverse of the affordability loop.

3.6.4.2 Strategic Low-Band Deployment → Improves rural coverage → Enables rural apps → Reduces content dependency

Allocating low-frequency spectrum to mobile broadband makes rural deployment economically viable. This will improve rural coverage and create a rural user base.

These users will require rural-specific content, such as information on agriculture, local commerce and government services. This demand makes the development of local content viable, as it creates a larger addressable market. More local content will reduce dependency on foreign platforms.

This is an elegant solution: a technical decision (spectrum allocation) catalyzes economic, social and strategic benefits (rural viability, rural connectivity and content sovereignty).

3.6.4.3 Fiber Deployment→ Enables quality service → Increases value proposition → Improves affordability perception

Deploying fiber backhaul enables higher-quality, higher-speed mobile broadband services. This deployment could be approached from a sharing perspective to reduce per-kilometer deployment costs and accelerate rollout timelines in order to improve the quality of services. Better service increases the perceived value of connectivity. When the value proposition improves, so does the willingness to pay. This makes the price seem more affordable, even if it doesn't change.

Additionally, better infrastructure reduces operational costs, enabling lower prices. This creates a dual improvement in affordability: better value and potentially lower prices

3.6.4.4 Gender Equality Programs→ Doubles market size → Improves economics → Accelerates all other improvements

Addressing barriers to women's digital participation, such as affordability programs, relevant content, digital literacy and safety, will encourage more women to enter the market. This approximately doubles the addressable market, and a larger market improves infrastructure economics.

Better economics enables lower prices, better service and more investment. All interventions become more effective in a larger market. This has a multiplier effect: not only do more people benefit, but the larger market also makes other interventions more viable.

3.7 Cascade effect

The barriers create a cascade effect, whereby problems stemming from foundational issues flow through intermediate mechanisms to result in ultimate exclusion.

This shows why merely addressing surface-level symptoms (e.g. the digital access divide) without tackling root causes (e.g. institutional weakness and taxation) is ineffective in creating lasting change.

The Table 15 show how barriers flow from institutional weakness through to mobile broadband exclusion.

STAGE	BARRIER CHAIN	RESULT
FOUNDATION	*Weak Institutions*	Unpredictable governance
POLICY	→ *Volatile Taxation Scheme*	Policy uncertainty
FISCAL	→ *Higher Taxes*	Increased costs
MARKET	→ *Pricing scheme not oriented toward development*	Luxury positioning
ACCESS	→ *Device Affordability Crisis*	Devices too expensive
ADOPTION	→ Low Smartphone Penetration	Small market
ECONOMICS	→ Poor Infrastructure ROI	Limited investment
INVESTMENT	→ *Massive Inland Fiber coverage Gaps* + Non-Strategic orientation for low Frequency bands	Inadequate infrastructure
ENERGY	→ Energy Infrastructure Gap	Towers inoperable
COVERAGE	→ *Severe Urban-Rural Divide*	Part of territory uncovered
PARTICIPATION	→ *Digital Access Divide*	Part of population excluded despite devices
INEQUALITY	→ *Gender inequalities gap*	Women doubly excluded
SOVEREIGNTY	→ *Dependency on non-local contents*	Foreign platform dominance
OUTCOME	→ Mobile broadband exclusion	Perpetuated poverty

Table 15: Complete cascade

This cascade illustrates why tackling symptoms (such as the digital access divide and gender inequalities gap) without addressing the root causes (such as *weak institutions, Volatile taxation scheme and pricing non developmental oriented*) only produces temporary and superficial improvements. The cascade will reassert itself unless these foundational issues are resolved.

Conversely, strengthening institutions creates a positive cascade: stable policy → predictable investment → lower costs → higher adoption → better economics → more infrastructure → reduced divide → increased inclusion.

3.8 Vicious Circles

Section 3.6.3 illustrates that reinforcing loops make barriers self-perpetuating. These vicious circles explain why mobile broadband usage gap persists and even widens despite technological advancement and economic growth.

The following section described the vicious circles.

3.8.1 Poverty Trap

VICIOUS CYCLE 1: POVERTY TRAP	
1	*Device Affordability Crisis* → citizen cannot afford devices/data
2	*Digital Access Divide* → citizen cannot participate in digital economy
3	Limited Economic Opportunities → Poverty persists
4	Continued Poverty → citizen cannot afford access
5	CYCLE REPEATS → Gap widens

Table 16: Poverty Trap

Breaking Point: Requires external intervention to break the cycle—subsidies, affordable financing, price regulation. Market forces alone cannot break this poverty trap.

3.8.2 Infrastructure Economics Trap

VICIOUS CYCLE 2: INFRASTRUCTURE ECONOMICS TRAP	
1	**Volatile Taxation Scheme + Higher Taxes + Pricing scheme not oriented toward development** → Low adoption
2	Small Market → Poor infrastructure ROI
3	Limited Investment → **Inland fiber coverage gaps + Severe Urban-Rural coverage gaps + Energy Infrastructure Gap**
4	Poor Service Quality + High operational energy costs→ Low value perception
5	Operators Maintain High Prices → CYCLE REPEATS

Table 17: Infrastructure economics Trap

Breaking Point: Requires coordinated action to increase adoption (affordability) and infrastructure (spectrum, fiber, sharing, Energy) simultaneously. Cannot be solved sequentially.

3.8.3 Rural Exclusion Trap

VICIOUS CYCLE 3: RURAL EXCLUSION TRAP	
1	**Severe Urban-Rural Digital Divide + non-strategic orientation for low Frequency bands + Massive Inland Fiber Optic Coverage Gaps +Energy Infrastructure Gap** → No connectivity

VICIOUS CYCLE 3: RURAL EXCLUSION TRAP	
2	No Digital Services → Limited economic opportunity
3	Youth Migrate to Cities → Rural depopulation
4	Smaller Rural Market → Less investment incentive
5	Continued No Coverage → CYCLE REPEATS

Table 18: Rural exclusion trap

Breaking Point: Requires regulatory mandates (coverage obligations), subsidized deployment (universal service funds), strategic infrastructure (low-band spectrum, affordable fiber), and energy solutions (solar-hybrid tower power, mini-grid co-location). Pure market-based approaches will fail.

3.8.4 Content Dependency Trap

VICIOUS CYCLE 4: CONTENT DEPENDENCY TRAP	
1	**Dependency on Non-Local Mobile Contents** → Dependency on foreign platforms
2	Foreign Platform Dominance → Economic value extracted abroad
3	Data & Revenue Leave Africa → Less capital for local development
4	Limited Local Investment → No app ecosystem development
5	Continued Foreign Dependency → CYCLE REPEATS

Table 19: Content Dependency trap

Breaking Point: Requires deliberate policy intervention: funding for local developers, local content requirements, data sovereignty policies, support for African tech startups.

3.8.5 Institutional Weakness Trap

VICIOUS CYCLE 5: INSTITUTIONAL WEAKNESS TRAP	
1	**Weak Institutions** → Volatile Taxation Scheme
2	Policy Uncertainty → High investment risk
3	High Risk → Expensive capital → Limited investment
4	Limited Economic Growth → Low government revenue
5	Cannot Fund Strong Institutions → CYCLE REPEATS

Table 20: Institutional weakness trap

Breaking Point: Requires long-term capacity building with external support, political commitment to institutional independence, and protection from capture. This is a generational challenge requiring sustained effort.

3.9 Strategic interventions points

This section analyses 11 strategic intervention points identified to bridge the mobile broadband usage gap in Africa. These interventions are strategically designed to address the 12 identified barriers across three categories (fundamental, enabling/constraining, and structural), break five vicious cycles, and create positive cascade effects throughout the mobile broadband ecosystem.

The eleven strategic intervention points are:

1. Progressive Device affordability Subsidy Program,
2. Mobile App Ecosystem Development Fund,
3. Satellite-Terrestrial Hybrid Deployment,
4. Comprehensive Tax Reform Package,
5. Development-oriented Pricing Regulation,
6. Strategic Low-Band Spectrum Reallocation,
7. Inland Fiber Acceleration Program,
8. Green Energy for Connectivity Program
9. Institutional Capacity Building,
10. Digital Literacy & Skills Program,
11. Gender-Targeted Mobile Access Program.

The eleven (11) intervention points were selected based on their ability to:

- address multiple barriers simultaneously through interconnected effects,
- break vicious cycles that perpetuate mobile broadband exclusion,
- create positive cascade effects triggering improvements across multiple dimensions,
- maximize impact relative to implementation complexity and resource requirements,
- target leverage points where intervention can catalyze systemic change.

These strategic intervention points are distributed among three groups: High Leverage Intervention, Systemic Intervention, and Structural Intervention.

3.9.1 High Leverage Intervention

High Leverage Intervention comprise the following points: **Progressive Device affordability Subsidy Program, Mobile App Ecosystem Development Fund and Satellite-Terrestrial Hybrid Deployment.**

These three points target critical barriers with maximum systemic impact, addressing fundamental obstacles that, if left unresolved, make sustainable mobile broadband

usage virtually impossible. Each represents a point of maximum leverage where intervention creates cascading positive effects across the entire ecosystem.

3.9.1.1 Progressive Device affordability Subsidy Program

Device affordability represents the most fundamental barrier to mobile broadband usage. Without an affordable device, even perfect infrastructure, favorable regulations, and excellent content are rendered useless. This barrier directly affects millions of potential users across Africa, where smartphone costs can reach 50% of average annual income in crisis markets.

Primary Barrier Addressed	Device affordability crisis
Secondary Barriers Addressed	- Digital access Divide - Gender inequalities in usage
Population impact	Device ownership is the absolute prerequisite for mobile broadband access. In markets where devices cost 50% of average income, over 70% of the population is effectively excluded from digital participation
Economy impact	The device affordability barrier suppresses digital economy development across all sectors (mobile banking, e-commerce, digital agriculture, telemedicine, and e-learning all depend on device ownership)
Multiple effect	Solving device affordability enables participation in the digital economy, which increases demand for connectivity services, improves infrastructure economics through larger markets, enables access to essential services, and creates conditions for local content consumption and development.
Breaking the Poverty Trap	This intervention directly breaks the poverty trap vicious cycle where high device costs lead to low adoption, which creates small markets, resulting in poor infrastructure economics and continued high costs. By subsidizing devices, adoption increases, markets expand, infrastructure economics improve, costs naturally decrease, and sustainable affordability emerges.
Gender Equality Multiplier	Research shows smartphones serve as the 'great equalizer' for gender-based digital access. Unlike laptops and tablets where males dominate usage 3:1, smartphone usage shows gender parity. Device affordability programs that prioritize smartphones can rapidly close gender digital divides while doubling the addressable market

Table 21: Progressive device affordability subsidy program

3.9.1.2 Mobile App Ecosystem Development Fund

The critically low survey response rate (20%) regarding local mobile app development highlights that Africa's app sector remains in its infancy. Without a local content ecosystem, Africa becomes a pure consumer market with no production capabilities or control over its digital content.

The Content Dependency Loop perpetuates foreign platform dominance: No local alternatives → Users adopt foreign platforms → Market dominance achieved → Economic value extracted → Less capital for local development → Continued dependency.

This represents an existential threat to digital sovereignty—billions in economic value leave Africa annually, user data is stored and monetized elsewhere, and the continent has no control over algorithms, content moderation, or platform policies affecting African users.

Primary Barrier Addressed	Dependency on Non-Local Contents
Secondary Barriers Addressed	Digital access Divide
Digital Sovereignty Crisis	Economic value generated by African users is captured by foreign platforms. User data is stored, analyzed, and monetized outside Africa. No African control over platform policies, algorithms, or content moderation
Strategic Economic Loss	Billions of dollars in economic value leave Africa annually through platform profits. Prevents emergence of African tech champions (like Indonesia's Gojek or China's WeChat)
Missed Local opportunities	Local content creators understand African contexts, languages, and needs better. Rural-specific applications (agriculture, local commerce, traditional medicine) not served by global platforms. Cultural and linguistic diversity requires localized solutions
Enabling Relationship with Infrastructure	Strategic low-band deployment creates rural user base → Rural users demand rural-specific content → Local content development becomes viable → Reduced foreign platform dependency.
Breaking Content Dependency Trap	Fund creates: Local developer support → Viable local platforms → User adoption → Economic value retention → Capital for further development → Ecosystem strengthening

Table 22: Mobile app ecosystem development fund

3.9.1.3 Satellite-Terrestrial Hybrid Deployment

Africa's vast geography and low population density create areas where terrestrial infrastructure alone cannot achieve economic viability. While 93.3% of African administrations have adopted NTN, recognizing that satellites are essential for universal coverage, current satellite solutions face critical limitations in upload/download balance.

Hybrid solutions combining satellite initial coverage with terrestrial backhaul in demand centers enable economically sustainable service in low-density areas.

Primary Barriers Addressed	Severe Urban-Rural Digital Divide
Secondary Barriers Addressed	Inland fiber optic coverage gaps
Geographic Imperative	Africa's 30.4 million km² includes deserts, mountains, rainforests, and archipelagos where terrestrial deployment is physically challenging or economically impossible. Low population density in many regions means terrestrial infrastructure cannot achieve ROI without decades-long timeframes.
Quality Transformation	Current satellite broadband shows severe asymmetry (download 10-20x faster than upload), insufficient for modern services. Hybrid approach Satellites provide initial coverage + Terrestrial backhaul handles capacity = Meaningful broadband quality enabling productive uses (telemedicine uploads, agricultural data, remote education participation).
Economic Complementarity	Satellites serve sparse areas where terrestrial fails economically. Terrestrial serves higher-density areas more cost-effectively. Together achieve universal coverage at optimized total cost, reducing dependency on perpetual subsidies.
Energy Integration	Hybrid deployment must incorporate energy provisioning as an integral component. Solar-hybrid power systems should be specified as a standard requirement for all satellite ground stations and terrestrial base stations in off-grid areas. Co-locating energy generation with telecommunications infrastructure reduces per-site energy costs and can extend electrification benefits to surrounding communities, creating additional economic justification for deployment.
Breaking Rural Exclusion Trap	Current: no coverage → Urban migration → Smaller rural market → Less investment → Worse coverage.

	Hybrid solution: Satellite enables initial coverage → Economic activity retention → Market viability → Terrestrial investment → Sustainable rural connectivity.

Table 23: Satellite-Terrestrial Hybrid development

3.9.2 Systemic intervention

Systemic interventions comprise the following points: **a comprehensive tax reform package; development-oriented pricing regulation; strategic low-band spectrum reallocation; an inland fiber acceleration program and Green Energy for Connectivity Program**.

These interventions address the infrastructure and market mechanisms that enable or constrain the mobile broadband ecosystem. Together, they create a platform for sustainable growth by improving affordability, infrastructure economics and market structure.

3.9.2.1 Comprehensive Tax Reform Package

The combination of volatile (unpredictable policy changes) and high taxes (19-26% sector-specific in some countries) creates compounding negative effects. Taxation represents a root cause barrier that governments can resolve relatively quickly through policy reform, making it a high-leverage point within systemic interventions.

Tax reform is a force multiplier catalyzing improvement across affordability, investment, coverage, and quality simultaneously.

Primary Barriers Addressed	- Volatile Taxation Scheme - Higher Taxes
Secondary Barriers Addressed	Weak Institutions
Force Multiplier Effect	Single policy change improves affordability (lower taxes reduce costs), investment (stable regime encourages infrastructure deployment), coverage (better economics enable rural expansion), and quality (operators can upgrade networks).
Breaking Affordability Loop	Current: High/Volatile Taxes → Low adoption → Small market → Poor economics → Fiscal pressure → Maintain/Increase taxes. Reformed: Stable/Lower Taxes → Higher adoption → Market expansion → Improved economics → Volume-based revenue → Sustainable lower rates.
Institutional Linkage	Successful tax reform requires and strengthens institutions. Demonstrates institutional maturity and creates credibility for future policy initiatives.

Table 24: Comprehensive Tax reform package

3.9.2.2 *Development-Oriented Pricing Regulation*

Current pricing reveals three market clusters: affordable (<0.5% of income), moderate (1-2%), and crisis (up to 5.6%). The 18-fold difference between best and worst performers demonstrates that affordability is primarily determined by policy choices and market structure, not economic development level.

When data costs 5.6% of income, mobile broadband becomes a luxury creating a two-tier society: digitally connected elite vs. excluded masses. Regulatory intervention is necessary because market forces alone will not achieve development-oriented pricing.

Primary Barriers Addressed:	Pricing scheme not oriented toward development
Secondary Barriers Addressed	Digital access divide
Market Failure Correction	Oligopolistic markets enable premium pricing targeting high-income urban users. Insufficient competition and little incentive for inclusive pricing.
Development vs. Extraction	Current pricing maximizes short-term profit extraction. Development-oriented pricing prioritizes market expansion and inclusion. Volume-based models maintain profitability at lower prices (proven by affordable-market countries)

Table 25: Development-Oriented Pricing Regulation

3.9.2.3 *Strategic Low-Band Spectrum Reallocation*

Low-frequency spectrum (600 MHz, 700 MHz and 800 MHz) offers a unique technical opportunity that cannot be provided by any other means.

Low-band signals propagate 2-3x farther than mid-band, penetrate buildings/vegetation better, each base station covers 3-5x the area, and capital expenditure per km² is 60-70% lower.

Yet much, low-band spectrum remains allocated to legacy broadcasting services with declining viewership. Strategic reallocation transforms rural infrastructure economics making coverage commercially viable.

Primary Barriers Addressed	- Non-strategic Low-band use - Severe Urban-Rural Digital Divide
Technical Superiority	No amount of investment in mid/high-band can replicate low-band rural coverage economics
Cascading Benefits	Rural coverage → Rural user base → Demand for rural content → Local content viability → Reduced foreign dependency

Breaking Rural Exclusion:	Low-band deployment → Viable coverage → Activity retention → Market sustainability → Continued investment

Table 26: Strategic Low-band Spectrum Reallocation

3.9.2.4 Inland Fiber Acceleration Program

While Africa achieved impressive submarine cable connectivity (80% of countries, massive capacity), inland fiber remains sparse creating a fundamental bottleneck.

Mobile towers require fiber backhaul for quality broadband; Fiber backhaul reduces drastically mobile network operating costs, enabling better service quality and development-oriented pricing. Innovative low-cost deployment (aerial deployment, micro-trenching, infrastructure sharing) can reduce costs by 60%.

Primary Barriers Addressed	Massive Inland fiber optic coverage gaps
Secondary Barriers Addressed	Pricing scheme not oriented toward development
Backhaul Bottleneck:	International submarine capacity underutilized due to lack of inland distribution
Multi-Service Platform	Fiber enables mobile backhaul (primary), enterprise connectivity (revenue), government networks (public services), 5G foundation—improving infrastructure economics
Energy Prerequisite	The acceleration program should incorporate energy provisioning along fiber corridors, leveraging shared infrastructure models to deploy solar-powered repeater stations. This dual-purpose approach addresses both the fiber gap and the energy gap simultaneously, improving the economics of both investments.
Dual Affordability	Better backhaul → Higher quality → Increased perceived value + Lower operating costs → Potential price reduction.

Table 27: Inland Fiber Acceleration Program

3.9.2.5 Green Energy for Connectivity Program

Energy is a prerequisite for all infrastructure-dependent interventions. Without reliable power, cell towers cannot operate, fiber equipment cannot function, and end users cannot charge devices.

A dedicated program to deploy solar-hybrid power at telecommunications sites addresses the root constraint enabling all other infrastructure interventions to succeed.

Primary Barriers Addressed	Energy Infrastructure Gap, Severe Urban-Rural Digital Divide
Secondary Barriers Addressed	Massive Inland Fiber Optic Coverage Gaps, Pricing scheme not oriented toward development
Core components	Mandate solar-hybrid power for all new tower deployments in off-grid areas; integrate mini-grid development with tower deployment to extend electrification to surrounding communities; create regulatory incentives for green energy adoption in the telecommunications sector.
Breaking Energy-Connectivity Loop	Current: No energy → No towers → No connectivity → No economic activity → No energy investment. Reformed: Solar-hybrid deployment → Viable tower power → Connectivity established → Economic activity emerges → Demand for expanded energy → Sustainable energy ecosystem.
Cross-Sector Multiplier	Tower-mounted solar systems with community mini-grids create benefits beyond telecommunications: powering schools, health facilities, agricultural processing, and small enterprises. This transforms tower sites into community development anchors, generating social and economic returns that improve infrastructure investment economics.
Feasibility	High. Solar-hybrid tower power is commercially proven and declining in cost. Policy frameworks can accelerate adoption through renewable energy mandates and shared infrastructure incentives.

3.9.3 Structural intervention

Structural interventions comprise ***institutional capacity building, Digital Literacy program, and a Gender-targeted mobile access program***.

These three interventions build foundational capacity and address deeply embedded social and institutional barriers. Although they require longer timeframes, they are essential for sustainable transformation and address the root causes that enable all other interventions to succeed.

3.9.3.1 Institutional Capacity Building

Although classified as a medium priority due to the longer timeframes (showing results over years), institutional strength represents the root cause of many policy-related barriers. Indeed, weak institutions create the foundation for multiple barriers through the cascade effect described in section 3.7.

Furthermore, the Institutional Weakness Trap explained in section 3.8.5 shows that a vicious cycle is created whereby weak institutions lead to policy instability, investment risk, compensatory higher taxes, limited investment, weak economic base, and perpetuation of weakness. Breaking this requires external support, political commitment to independence, technical skills development.

Primary Barriers Addressed	Weak institutions
Secondary Barriers Addressed	- Volatile Taxation Scheme - Higher Taxes - Pricing scheme not oriented toward development
Foundational Nature:	Strong institutions enable stable, predictable policies. Weak institutions create volatility deterring investment. Institutional capacity determines implementation effectiveness
Enabling Other Interventions:	Strong institutions enable tax reform success. Institutional capacity required for pricing regulation. Credible enforcement depends on institutional strength
Generational Challenge	Long-term capacity building with sustained effort required. Protection from capture and political interference is essential

Table 28: Institutional Capacity building

3.9.3.2 Digital Literacy & Skills Program

The digital divide encompasses multiple dimensions beyond infrastructure and affordability, including digital literacy, skills, and ability to extract value from digital connectivity. Without skills, device ownership does not translate to socioeconomic benefit, and device subsidy investments fail to generate development outcomes.

Digital skills enable productive uses: mobile money adoption (financial inclusion), digital agriculture information (productivity improvement), e-learning participation (human capital development), e-commerce engagement (market access expansion), and telemedicine utilization (health outcomes), etc.

Primary Barriers Addressed	Digital access divide
Value Realization:	Digital literacy transforms device ownership into tangible development outcomes across financial inclusion, agricultural productivity, education access, and health services
Multi-Dimensional Divide	Access Divide (infrastructure/devices, addressed by other interventions) + Usage Divide (ability to use tools, requires skills training) + Value Divide

	(capacity to leverage for benefit, requires advanced skills).
Local Content Synergy:	Digital literacy enables local content consumption and creation. Higher skills allow user feedback improving apps. Advanced users become content creators themselves

Table 29: Digital Literacy & Skills program

3.9.3.3 Gender-Targeted Mobile Access Program

Women are 37% less likely than men to use mobile internet even in coverage areas, representing approximately millions of African women excluded from digital connectivity despite living in areas with infrastructure.

Gender-targeted programs create a multiplier effect—addressing women's barriers approximately doubles the addressable market, improving infrastructure economics for all users while advancing gender equality as a fundamental development objective.

Primary Barriers Addressed	Gender inequalities in usage
Secondary Barriers Addressed	Digital access divide
Multidimensional Gender Barriers	Device affordability, Digital literacy (women have lower confidence and less access to training), Relevant content (platforms don't address women's specific needs: maternal health), Social/cultural barriers (restrictions on women's technology use in some contexts), Safety concerns (online harassment, privacy risks). Economic barriers (lower incomes, less financial autonomy).
Market Doubling Effect	Addressing women's barriers doubles addressable market. Larger market improves infrastructure economics (lower costs, better service quality). Benefits all users while advancing gender equality
Breaking Gender Gap Cycle:	Current: Women excluded → Market half potential size → Poor economics → Less investment → Continued exclusion. Reformed: Gender programs → Women included → Market doubles → Better economics → Lower costs → More inclusion → Even more women online

Table 30: Gender-Targeted Mobile Access Program

3.10 Intervention synergies and comprehensive impact

3.10.1 Barrier-Intervention Coverage Matrix

The eleven strategic interventions provide 100% coverage of all twelve identified barriers:

- All 3 CRITICAL barriers directly addressed by high-leverage interventions,
- All 6 HIGH priority barriers directly addressed by systemic interventions,
- All 3 MEDIUM priority barriers directly addressed by structural interventions,
- Multiple interventions target each barrier, creating redundancy and mutual reinforcement.

STRATEGIC INTERVENTION		BARRIER		
		CRITICAL	HIGH	MEDIUM
HIGH-LEVERAGE INTERVENTIONS	**Progressive Device Affordability Subsidy Program**	Device Affordability crisis	—	- Digital access Divide - Gender inequalities gap
	Mobile App Ecosystem Development Fund	Non-Local Content Dependency	—	Digital Access Divide
	Satellite-Terrestrial Hybrid Deployment	Severe Urban-Rural Divide	Massive inland fiber coverage gaps	—
SYSTEMIC INTERVENTIONS	**Comprehensive Tax Reform Package**	—	- Volatile Taxation Scheme - Higher Taxes	Weak Institutions
	Development-oriented Pricing Regulation	—	*Pricing scheme not oriented toward development*	Digital access Divide
	Strategic Low-Band Spectrum Reallocation	Severe Urban-Rural Divide	Non-Strategic orientation for low Frequency bands	—
	Inland Fiber Acceleration Program	—	- Massive Inland Fiber coverage Gaps - Pricing scheme not oriented toward development	—
	Green Energy For Connectivity Program	Severe Urban-Rural Divide	- Energy Infrastructure Gap	Massive Inland fiber coverage gaps
STRUCTURAL INTERVENTIONS	**Institutional Capacity Building**	—	- Volatile Taxation Scheme - Higher Taxes - Pricing scheme not oriented toward development	Weak Institutions

STRATEGIC INTERVENTION		BARRIER		
		CRITICAL	HIGH	MEDIUM
	Digital Literacy & Skills Program	—	—	Digital access Divide
	Gender-Targeted Mobile Access Program	—	—	- Gender inequalities gap - Digital Access Divide

3.10.2 Breaking All Vicious Circles

The set of strategic intervention points breaks all five identified vicious cycles:

1. Poverty Trap: Progressive Device Affordability Subsidy Program + Comprehensive Tax Reform Package + Development-oriented Pricing Regulation break affordability-adoption-economics cycle
2. Infrastructure Economics Trap: Comprehensive Tax Reform Package + Strategic Low Band Spectrum Reallocation + Inland Fiber Acceleration Program + Satellite-Terrestrial Hybrid deployment create sustainable economics
3. Rural Exclusion Trap: Strategic Low Band Spectrum Reallocation + Inland Fiber Acceleration Program + Satellite-Terrestrial Hybrid deployment + Green Energy for Connectivity Program + Coverage obligations ensure inclusion
4. Content Dependency Trap: Mobile App Ecosystem Development Fund + Digital literacy & Skill Program create local production and consumption,
5. Institutional Weakness Trap: Institutional Capacity Building + Successful reforms create self-reinforcing strengthening.

4 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

The study shows that mobile broadband usage gap in Africa is not a single problem but rather a set of systemic complex interconnected barriers that reinforce each other through causal links, compound effects, reinforcing loops and self-reinforcing exclusion traps.

The study shows that a successful intervention requires a systemic approach based on strategic interventions at key points that can address multiple barriers simultaneously, with a focus on fundamental reforms (institutions, policies) that enable technical solutions (spectrum, infrastructure) and market interventions (affordability, content).

Eleven keystone interventions – ***Progressive Device affordability Subsidy Program, Mobile App Ecosystem Development Fund, Satellite-Terrestrial Hybrid Deployment, Comprehensive Tax reform Package, Development-oriented Pricing Regulations, Strategic Low-Band Spectrum Reallocation, Inland Fiber Acceleration Program, Green Energy for Connectivity Program, Institutional Capacity Building, Digital Literacy & Skills Program, Gender-targeted Mobile Access Program*** – form the foundation. These interventions break multiple loops simultaneously, resolve barriers across all categories, and enable other interventions to succeed.

The path is clear. The necessary interventions have been identified. The only question now is whether African leaders will seize this historic opportunity to bridge the usage gap and secure the continent's mobile broadband future. Each African administration should consider its own situation and find its way forward based on the information in this report.

Now is the time to act. Device costs are declining globally, low-band spectrum is becoming available through the digital dividend and WRC-23 Final Acts, innovative deployment technologies such as micro-trenching and LEO satellites are maturing, and solar energy costs have fallen by over 85% in the past decade making green-powered telecommunications infrastructure increasingly viable. If action is delayed, vicious circles will deepen and foreign platforms will establish unassailable dominance.

If Africa demonstrates the necessary political will and institutional commitment, and if it engages in regional cooperation and sustained implementation, it can transform its mobile broadband landscape within 3-5 years.

It can evolve from being a continent where mobile broadband is a luxury for the elite, to becoming a continent where it is a universal platform for economic opportunity, social mobility and African agency in the global digital economy.

4.2 Recommendations

Recommendations are made for ATU and African administrations.

4.2.1 Recommendations for ATU

ATU should commit to strengthening the capacity of its member states through targeted knowledge-sharing and policy development initiatives, by organizing three capacity building workshops on Tax reform program, establishing low-cost smartphone Policy and Strategy, and building Mobile Broadband deployment Policy and Strategy.

Details of these workshops are as follows:

	CAPACITY BUILDING ON TAX REFORM PROGRAM	CAPACITY BUILDING ON ESTABLISHING LOW-COST SMARTPHONE POLICY AND STRATEGY	CAPACITY BUILDING ON MOBILE BROADBAND DEPLOYMENT POLICY AND STRATEGY
OBJECTIVE	• Provide members states with knowledge of the best international practices for designing and implementing tax reforms. • Foster an understanding of mobile broadband taxation frameworks, including the taxation of the digital economy. • Enable member states to develop actionable national tax reform roadmaps.	• Provide policymakers with frameworks for developing national low-cost smartphone policies and strategies. • Share best practice from countries that have successfully implemented affordable smartphone programmes. • Enable participants to draft actionable national strategies for the deployment of affordable smartphones.	• Strengthen the capacity of Member States to design and implement effective mobile broadband policies. • Enable participants to develop comprehensive national strategies for the deployment of mobile broadband
ACTIONS BY ATU	• Define the scope, themes and target audience of the workshop in consultation with the member states. • Establish the terms of reference (ToR) for recruiting tax reform experts and recruit said experts. • Develop and distribute invitations and registration materials to member states and stakeholders. • Secure the venue and necessary technological infrastructure for a hybrid or in-person event. • Prepare the workshop agenda, background documents and pre-workshop surveys. • Develop and distribute workshop materials, case studies and toolkits.	• Define the scope, themes and target audience of the workshop in consultation with the member states. • Establish the terms of reference (ToR) for recruiting experts in device affordability, digital inclusion policy, and manufacturing ecosystems and recruit said experts. • Develop and distribute invitations and registration materials to member states and stakeholders. • Secure the venue and necessary technological	• Define the scope, themes and target audience of the workshop in consultation with the member states. • Establish the terms of reference (ToR) for recruiting experts in leading experts in spectrum management, broadband policy, and network deployment and recruit said experts. • Develop and distribute invitations and registration materials to member states and stakeholders.

	CAPACITY BUILDING ON TAX REFORM PROGRAM	CAPACITY BUILDING ON ESTABLISHING LOW-COST SMARTPHONE POLICY AND STRATEGY	CAPACITY BUILDING ON MOBILE BROADBAND DEPLOYMENT POLICY AND STRATEGY
	• Arrange translation and interpretation services as needed.	infrastructure for a hybrid or in-person event. • Prepare the workshop agenda, background documents and pre-workshop surveys. • Develop and distribute workshop materials, case studies and toolkits. • Arrange translation and interpretation services as needed.	• Secure the venue and necessary technological infrastructure for a hybrid or in-person event. • Prepare the workshop agenda, background documents and pre-workshop surveys. • Develop and distribute workshop materials, case studies and toolkits. • Arrange translation and interpretation services as needed
ACTIONS BY EXPERT (S)	• Conduct comprehensive study of taxation models across all ATU member states, documenting current practices, rates, and impacts • Identify and document successful tax reform case studies from within Africa and globally • Prepare technical presentations, case studies, and policy briefs tailored to African contexts • Deliver keynote sessions and technical modules on tax reform best practices • Guide participants in developing country-specific tax reform action plans • Offer one-on-one advisory sessions to national delegations on specific reform challenges • Prepare a comprehensive post-workshop report with findings and recommendations	• Conduct a landscape analysis of the challenges and opportunities surrounding smartphone affordability in Africa. • Prepare technical presentations on policy frameworks, fiscal instruments and regulatory approaches to reduce device costs. • Develop case studies from successful programmes and establish working groups to assess countries' device affordability gaps. • Deliver keynote and technical sessions on device ecosystem strategies. • Guide participants in developing national low-cost smartphone policy roadmaps. • Prepare a post-workshop synthesis report with policy recommendations and benchmarks.	• Conduct a comprehensive review of mobile broadband policies and deployment challenges across African member states. • Prepare technical modules on mobile broadband deployment. • Develop case studies on successful mobile broadband deployment models. • Deliver keynote sessions on mobile broadband policies and strategies. • Prepare a post-workshop report with policy and strategy recommendations.
TIMELINE	• Months 1–2: ▪ Planning and concept development, expert	• Months 1–2: ▪ Concept development, expert	• Months 1–2: ▪ Concept development, expert

	CAPACITY BUILDING ON TAX REFORM PROGRAM	CAPACITY BUILDING ON ESTABLISHING LOW-COST SMARTPHONE POLICY AND STRATEGY	CAPACITY BUILDING ON MOBILE BROADBAND DEPLOYMENT POLICY AND STRATEGY
	recruitment, stakeholder consultations ▪ Finalize agenda, distribute invitations, launch registration • Months 3: ▪ Pre-workshop surveys and needs assessment by experts ▪ Expert preparation of materials, case studies, and presentations • Month 4: ▪ Workshop delivery (5 days) ▪ Post-workshop report	identification, and stakeholder mapping ▪ Finalize agenda, confirm speakers, launch registration and invitations • Month 3: ▪ Landscape analysis and pre-workshop survey by experts ▪ Preparation of materials, case studies, and strategy templates • Month 4: ▪ Workshop delivery (5 days) ▪ Post-workshop report	recruitment, baseline study commissioning ▪ Finalize agenda, confirm speakers, distribute invitations • Month 3: ▪ Baseline study completion and pre-workshop analysis by experts ▪ Preparation of training materials, case studies, and policy templates • Month 4: ▪ Workshop delivery (5 days) ▪ Post-workshop report
KEY STAKEHOLDERS	• ATU Secretariat • Member States • Associated Member		
SUCCESS METRICS	• Number of participants trained (target: at least 30 member states) • Participant satisfaction rate (target: 85% or above rating workshop as good or excellent) • Number of case studies tax reform action plans developed during the workshop • Number of member states initiating or advancing tax reform legislation within 12 months	• Number of participants trained (target: at least 30 member states) • Participant satisfaction rate (target: 85% or above) • Number of case studies of low-cost smartphone strategy drafts developed during the workshop • Number of member states adopting device affordability policies within 12 months	• Number of participants trained (target: at least 30 member states) • Participant satisfaction rate (target: 85% or above) • Number of national mobile broadband deployment strategies case studies developed during the workshop • Number of member states adopting mobile broadband policies within 12 months

4.2.2 Recommendations for African Administrations

Each administration must analyze its own situation in order to identify its barriers as and trigger the implementation of corresponding strategic interventions points.

Following recommendations have been made for each strategic intervention point, which is assessed across five dimensions: priority tier (Critical/High/Medium), implementation timeframe, description, justification, and expected impact.

4.2.3 High-Leverage Interventions

Progressive Device Affordability Subsidy Program	
Priority Tier	Critical
Implementation Timeframe	Immediate implementation (6 months)
Description	Launch a comprehensive device affordability program combining taxation reform, progressive subsidies, innovative financing, and bulk procurement leveraging to reduce unit costs.
Expected Impact	Expected to increase mobile broadband adoption within 2 years. Breaks the affordability loop and poverty trap.

Mobile App Ecosystem Development Fund	
Priority Tier	Critical
Implementation Timeframe	24 months
Description	Create a fund through contributions from governments, development banks, and tech companies (as part of market access agreements).
Expected Impact	Breaks the content dependency trap by creating local developer support leading to viable platforms, user adoption, economic value retention, and ecosystem strengthening.

Satellite-Terrestrial Hybrid Deployment	
Priority Tier	Critical
Implementation Timeframe	18-36 months for hybrid network deployment
Description	Deploy satellite-terrestrial hybrid solutions combining LEO (Low Earth Orbit) satellite initial coverage with terrestrial infrastructure in demand centers.
Expected Impact	Achieves universal coverage including the most remote and challenging areas.

4.2.4 Systemic Interventions

Comprehensive Tax Reform Package	
Priority Tier	High
Implementation Timeframe	12 months for legislative reform and implementation
Description	Implement coordinated taxation reform establishing long-term stability and reducing extractive burden.
Expected Impact	Creates investment certainty leading to increased infrastructure deployment.

Development-Oriented Pricing Regulation	
Priority Tier	Medium-high
Implementation Timeframe	12 months for regulatory framework development and enforcement
Description	Implement regulatory framework ensuring development-oriented rather than extractive pricing.
Expected Impact	Transforms mobile broadband from luxury to accessible service for majority population.

Strategic Low-Band Spectrum Reallocation	
Priority Tier	High
Implementation Timeframe	12-18 months for reallocation and licensing
Description	Ensure each country allocates sufficient low-band spectrum for rural mobile broadband deployment.

Expected Impact	Dramatically improves rural coverage economics, enabling commercial deployment in previously unviable areas.

Inland Fiber Acceleration Program	
Priority Tier	High
Implementation Timeframe	18-36 months for accelerated deployment
Description	Accelerate inland fiber deployment using innovative low-cost technologies and infrastructure sharing mandates.
Expected Impact	Resolves fundamental infrastructure bottleneck limiting service quality even where coverage exists.

Green Energy for Connectivity Program	
Priority Tier	High
Implementation Timeframe	18–36 months for deployment and scaling of solar-hybrid power systems
Description	Deploy solar-hybrid power systems for telecommunications systems in off-grid and unreliable-grid areas, and create regulatory incentives for green energy adoption across the telecommunications sector.
Expected Impact	Breaks the Energy-Connectivity reinforcing loop by eliminating diesel dependency, creates cross-sector multiplier effects by powering schools, health facilities, agricultural processing, etc.

4.2.5 Structural Interventions

Institutional Capacity Building	
Priority Tier	Medium
Implementation Timeframe	36-60 months for sustained capacity development
Description	Strengthen regulatory and policy institutions through comprehensive capacity building.
Expected Impact	Creates foundation enabling all other interventions to succeed. Strong institutions enable stable, predictable policies that encourage investment.

Digital Literacy & Skills Program	
Priority Tier	Medium
Implementation Timeframe	24-36 months for nationwide program deployment
Description	Implement comprehensive digital literacy and skills development program at national scale.
Expected Impact	Transforms device ownership into tangible development outcomes across multiple sectors. Enables financial inclusion through mobile money adoption.

Gender-Targeted Mobile Access Program	
Priority Tier	Medium
Implementation Timeframe	24-36 months for comprehensive program implementation
Description	Implement gender-targeted interventions addressing multiple dimensions of women's digital exclusion.
Expected Impact	Market doubling effect: addressing women's barriers doubles the addressable market, and larger markets improve infrastructure economics (lower costs, better service quality), benefiting all users while advancing gender equality.

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