

**Universal service  
funds in Africa**  
Policy reforms  
to enhance  
effectiveness



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**AFRICAN TELECOMMUNICATIONS UNION**  
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The African Telecommunications Union (ATU), a specialized agency of the African Union (AU) focusing on telecommunications and ICTs, also serving as the Regional Telecommunications Organization of the International Telecommunications Union (ITU) for Africa, is committed to attaining universal access and inter-country connectivity. The ATU emphasizes promoting appropriate telecommunications/ICTs policies, financing in-sector development, and advocating for the African Information Society's growth. In light of the digital divide, the ATU underscores the importance of accessible and affordable telecommunications/ICTs services for all.

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Acknowledging the necessity for inclusive communication technologies, the GSMA in collaboration with the ATU has undertaken this report on universal service funds (USFs). It is designed to update, refresh and stimulate our minds on the critical need for policy reforms to enhance the effectiveness of USF initiatives. The report provides analysis of the current status, success factors and challenges surrounding USFs in Africa. It proposes the policy, regulatory and operational interventions that could assist in fast-tracking connectivity.

# Executive summary



# Executive summary

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## The connectivity gap remains significant in Africa

Between 2012 and 2022, the number of people in Africa with mobile broadband access<sup>1</sup> more than tripled, from 114 million to almost 400 million. Despite this, Africa still has the greatest connectivity gap<sup>2</sup> of any region in the world, highlighting the impact of the barriers to mobile broadband adoption. As of December 2022, just over 1 billion people in Africa, or 72% of the region's population, were not connected. This accounts for more than a quarter of the total number of unconnected people globally.

Service providers' investments in network infrastructure over the last decade have reduced the coverage gap for mobile broadband networks in Africa from 56% of the population in 2012 to 13% by the end of 2022. While the decrease shows significant progress in extending connectivity across Africa, nearly 200 million people in the region today live in areas not covered by a mobile broadband network. The usage gap is even more substantial. As of December 2022, more than 800 million people, equivalent to three in five people, lived in areas covered by a mobile broadband network in Africa but did not subscribe to mobile broadband services.

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## Universal service funds can serve as a tool to close the connectivity gap

Governments in Africa and around the world have introduced policies to incentivise internet infrastructure rollout in underserved locations and stimulate demand for services among consumers. In Africa, at least 51 of the 54 countries in the region have introduced or are in the process of introducing the universal service fund (USF) mechanism as a means to deploy mobile broadband infrastructure in commercially unviable areas. The intention is to bridge the connectivity gap. In all cases, USFs are partly or entirely financed through contributions from telecoms service providers.

To understand the performance of USFs in Africa, the GSMA conducted an extensive study. This entailed a survey of stakeholders, including USF authorities, government ministries and service providers from 40 countries across the region. Results from the study highlight structural and operational challenges requiring urgent attention from policymakers and USF authorities. These findings inform recommendations for essential policy reforms to enhance the impact of funds on the connectivity gap.

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<sup>1</sup> Those subscribed to a 3G, 4G or 5G mobile internet service.

<sup>2</sup> Those who do not subscribe to a mobile internet service (for a variety of reasons).

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## How to improve the effectiveness of USFs in Africa

Political will among governments and policymakers in the region is an important first step in the journey to USF reform. This is fundamental for improvements to the USF legal framework, where required, as well as adherence to the core principles of an effective and successful USF – namely, accountability, clarity, service neutrality, transparency, sustainability and visibility. Beyond this, steps must be taken to address factors limiting performance and explore new ways to utilise the USF to enhance effectiveness in closing the coverage and usage gaps:

- **Adopt mechanisms to incentivise disbursement of funds** – Establish clear targets and use incentives to ensure effective and timely disbursement.
- **Implement an evidence-based contribution rate** – An evidence-based approach, in consultation with service providers, should be used to decide a suitable contribution rate.
- **Set clear and measurable targets for the USF** – Clearly define the parameters for USF projects and outline key success measures following implementation.
- **Prioritise stakeholder consultation** – Stakeholder consultation should not be a one-off or an occasional call for submissions; rather, it should be a continuous process of engagement, with direct contributions and feedback from service providers.
- **Use a data-led approach to select USF projects** – Data gathering and efforts to apply relevant insights to project selection should form part of the operational reform of USFs.

- **Ensure regular performance monitoring and reporting** – Regular reporting is paramount to provide visibility and accountability.
- **Establish a project costing system that accounts for overheads** – A comprehensive costing system should account for overheads and opex from the outset, with a sustainable solution that guarantees the long-term viability of a USF project.
- **Explore alternative funding mechanisms** – The ‘pay or play’ model adopted in Morocco is an example of an alternative model with the potential to incentivise investments in coverage expansion and tackle the challenges associated with the traditional USF model.
- **Build capacity and develop skills within the USF** – Focus on reskilling and upskilling existing personnel, recruiting new people and retaining qualified staff at the USF authority.
- **Engage with local communities on the benefits of connectivity** – Take steps to engage with consumers and community leaders to address any perceived concerns about digital technology.
- **Consider an independent governance structure** – Seek to minimise or eliminate red tape and political interference in the management of funds and the implementation of USF projects.

The GSMA Universal Service Funds in Africa Survey has revealed the increasing use of USFs for non-infrastructure projects. However, there is a lack of a systematic approach to these initiatives, based on data and evidence to ensure the optimum use of available funds. Also lacking is a monitoring and evaluation mechanism for their impact and to inform future evolution. As such, industry-wide collaboration is needed to define uniform rationale, scope, success measures and performance evaluation mechanisms to guide efforts to use USFs for non-infrastructure projects. This requires further study, beyond the scope of this report, to collect and analyse empirical data. This can then be used to generate insights to guide policymakers and other stakeholders on the use of USFs for non-infrastructure projects.

# 1 The connectivity gap in Africa





# 1.1

## The mobile broadband connectivity landscape

The connectivity landscape in Africa is changing rapidly. Between 2012 and 2022, the number of people in the region with mobile broadband access more than tripled, from 114 million to almost 400 million. Several factors have contributed to growth - notably, the expansion of mobile networks. The increasing affordability of mobile services and smartphones, and a growing range of digital content have also stimulated demand for connectivity.

Despite the progress, Africa still has the widest connectivity gap of any region in the world, highlighting the impact of the barriers to mobile broadband adoption. As of December 2022, just over 1 billion people in Africa, or 72% of the region's population, did not have access to the mobile internet. This accounts for more than a quarter of the total number of unconnected people globally and demonstrates the scale of the challenge to realise universal connectivity in Africa.

The unconnected can be grouped into two broad categories:

- those who live outside of areas covered by mobile broadband networks<sup>3</sup> (the coverage gap)
- those who live within areas covered by mobile broadband networks but do not yet subscribe to mobile broadband services (the usage gap).

Service providers' investments in network infrastructure over the last decade have reduced the coverage gap for mobile broadband networks in Africa from 56% in 2012 to 13% by the end of 2022 (see Figure 1). While the decrease in the coverage gap over the last decade shows significant progress in extending connectivity, nearly 200 million people in the region today live in areas not covered by a mobile broadband network. The scale of the coverage gap varies considerably across the region, from 30% or more in some countries (such as Burkina Faso and the Democratic Republic of Congo) to 1% or less in others (such as Morocco and South Africa).

Nearly 200 million people in the region today live in areas not covered by a mobile broadband network.

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<sup>3</sup> 3G and above.

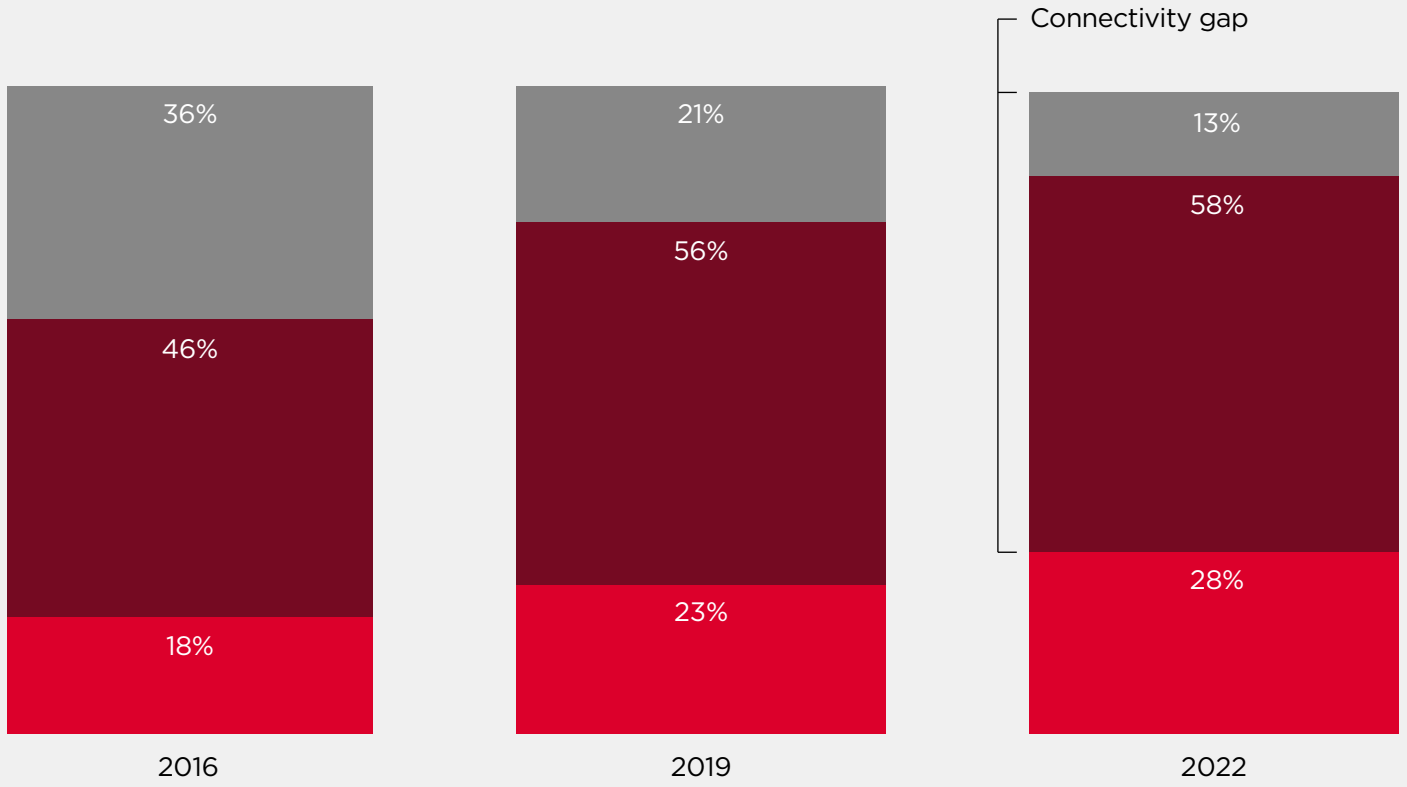
Figure 1

# The state of mobile internet connectivity in Africa

Percentage of population

Source: GSMA Intelligence

■ Connected ■ Usage gap ■ Coverage gap



The usage gap is even more substantial. As of December 2022, more than 800 million people, equivalent to three in five people, lived in areas already covered by a mobile broadband network in Africa but did not yet subscribe to mobile broadband services. The reasons for the usage gap are multifaceted and vary by country. However, in most cases, they relate to a lack of access to affordable smart devices, lack of relevant digital services, low levels of digital skills, and (increasingly) online safety and security concerns. These barriers to usage are particularly acute among certain segments of the population – notably, women, the elderly, those in rural areas and persons with disabilities.

As shown in Figure 1, the connectivity gap in Africa comprises both the coverage gap and usage gap. As such, efforts to close the connectivity gap should aim to address both challenges, with a particular emphasis on extending coverage to unserved and underserved populations, given that coverage is an important first step in bringing people online. This is necessary to achieve inclusive social and economic growth, particularly in a post-pandemic scenario where digital technologies and services underpin new initiatives to accelerate socioeconomic recovery and build more resilient and sustainable economies.

## 2 USFs and the coverage gap in Africa



# 2.1

## Coverage in context

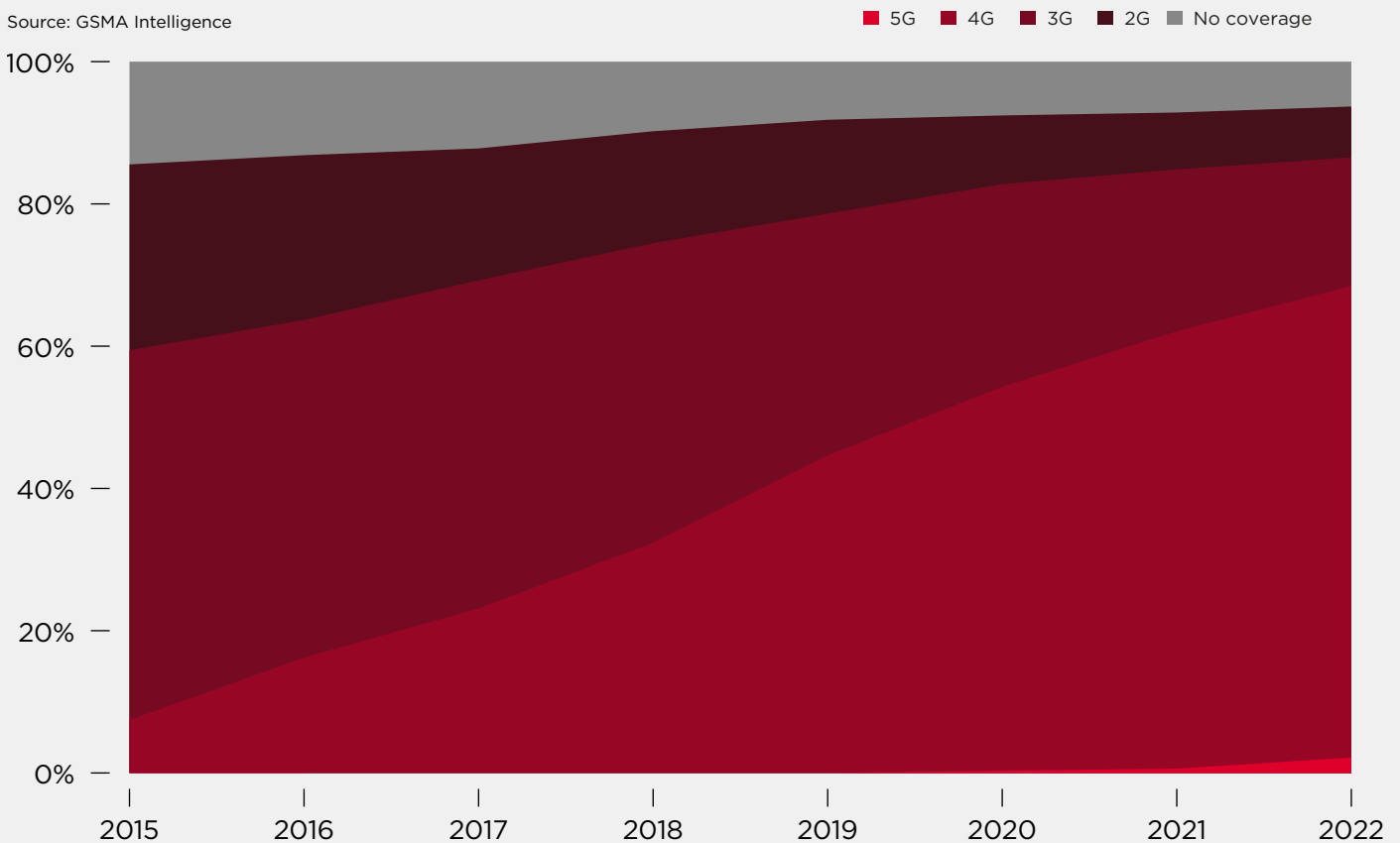
Service providers need to constantly invest to expand their network capacity, close coverage gaps and deploy new technologies. Providers across Africa have made substantial investments to close the coverage gap. In particular, 4G/5G coverage has more than doubled from 32% in 2018 to 68% of the population in 2022 (see Figure 2).

Figure 2

### Coverage by technology in Africa, 2015-2022

Percentage of population

Source: GSMA Intelligence



Closing the remaining coverage gap is primarily an economic challenge. Expanding mobile broadband networks becomes increasingly costly, while revenues for each additional mobile site decline as the number of people covered per new site becomes smaller. Furthermore, mobile broadband adoption would likely be lower in uncovered areas, as these are more likely to be low-income communities and encounter greater barriers in terms of digital literacy and skills.

Governments in Africa and around the world have consequently introduced policies to incentivise internet infrastructure rollout in underserved locations and to stimulate demand for services among consumers. Several approaches have been adopted in various jurisdictions to close the coverage gap. These include market-based reforms, public-private partnerships and USFs.

In Africa, at least 51 of the 54 countries in the region have introduced or are in the process of introducing the USF<sup>4</sup> mechanism as a means to deploy mobile broadband infrastructure in commercially unviable areas, with the intention of bridging the connectivity gap. In all cases, USFs are partly or entirely financed through contributions from telecoms service providers.



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<sup>4</sup> The fund has different names in different countries, including the universal service access fund (USAF) and universal service obligation fund (USOF). For consistency, this report uses universal service fund (USF).

# The concept of universal service

The underlying principle of universal service is to provide each individual with telecoms services at affordable prices. This is underpinned by the following three principles:



## Availability

The level of service is the same for all users in their place of work or residence, at all times and without geographical discrimination.



## Affordability

For all users, the price of the service should not be a factor that limits service access.



## Accessibility

All subscribers should be treated in a non-discriminatory manner with respect to the price, service and quality of service, in all places, without distinction of race, sex, religion, etc.

Universal service is generally regarded as being oriented towards providing service to individuals or households, whereas universal access is considered to be oriented towards providing service to communities.

# 2.2

## Overview of the coverage gap

To appreciate the role USFs can play in efforts to close the connectivity gap, an important first step is to quantify the extra investment needed to close the coverage gap. This refers to the additional capital and operational investment needed, beyond what is expected from the private sector, to achieve near-universal mobile broadband coverage.<sup>5</sup>

For this study, we have conducted in-depth analysis of the coverage gap in six countries: Benin, DRC, Mozambique, Nigeria, Tanzania and Zambia. These were selected from those with the largest coverage gaps in the region. The analysis has been carried out according to the following steps:

- Assess the current level of 2G and mobile broadband coverage, and model the expected returns from network expansion, based on infrastructure capex and opex (for costs) and expected adoption and ARPU (for revenues). This is based on current policies and market conditions. Where returns are positive, we assume that service providers will continue to deploy new networks.
- Model the impact of policy changes on coverage. We consider reforms on sector-specific taxation and enabling active infrastructure sharing, but other policies can also be considered to stimulate demand and reduce network costs. By reducing the cost of network deployments and/or increasing demand, the economics of network deployment improve, allowing service providers to sustainably extend coverage.
- The remaining uncovered populations will only be covered with additional investment (subsidies). We model this investment gap as the difference between total network costs (including capex and opex) and the expected revenues over an eight-year period (to 2030). In some areas, the costs are likely to be prohibitive, so alternative technologies may be required (see *Spotlight: The challenge of reaching 100% population coverage*).

Figure 3 summarises the different segments of expanding coverage. Further details of the methodology are provided in *Appendix*.

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<sup>5</sup> 'Near-universal' coverage refers to coverage close to 100% (usually in the 95–99% range). In the majority of countries, it is unlikely to be feasible to achieve population coverage that is genuinely 100%.

Figure 3

## Elements of coverage expansion

Source: GSMA Intelligence

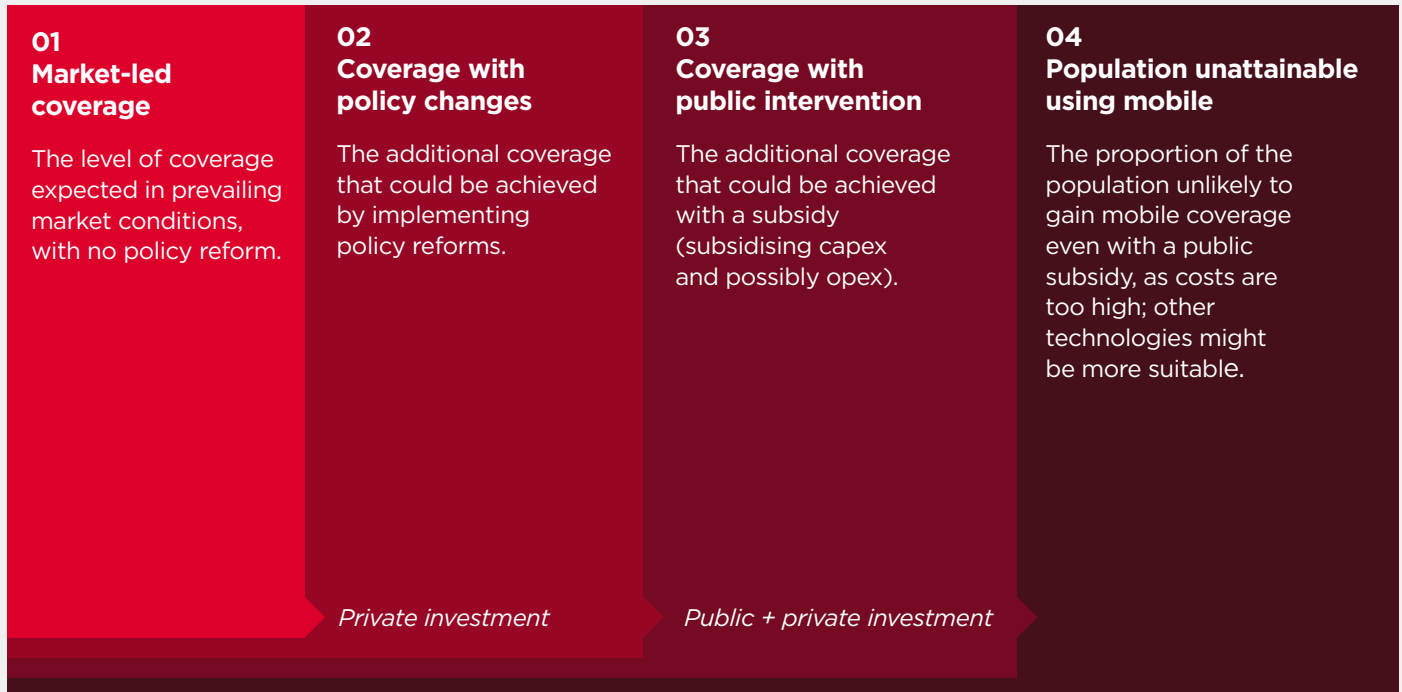


Figure 4 presents 2G and mobile broadband coverage in each of the six countries as of the end of 2022, along with the expected coverage to be delivered by service providers over the short to medium term (the 'market frontier'). In most countries, providers are already very close to the level of 2G population coverage that is commercially viable. The notable exception is DRC, which has the lowest 2G coverage at 75%, and where there is an opportunity to extend coverage with lower-cost rural sites.<sup>6</sup>

Most of the gains in 3G/4G coverage in recent years have come from upgrading existing 2G sites; this is expected to continue. A key driver has been the refarming of low-band spectrum for 3G and 4G (e.g. the 800 MHz and 900 MHz bands). Ensuring access to sufficient and affordable spectrum, including the refarming of existing spectrum so that it is technology-neutral, will be important for countries to close the 3G/4G coverage gap.

<sup>6</sup> Using Geospatial Analysis to Overhaul Connectivity Policies, World Bank and GSMA, 2022



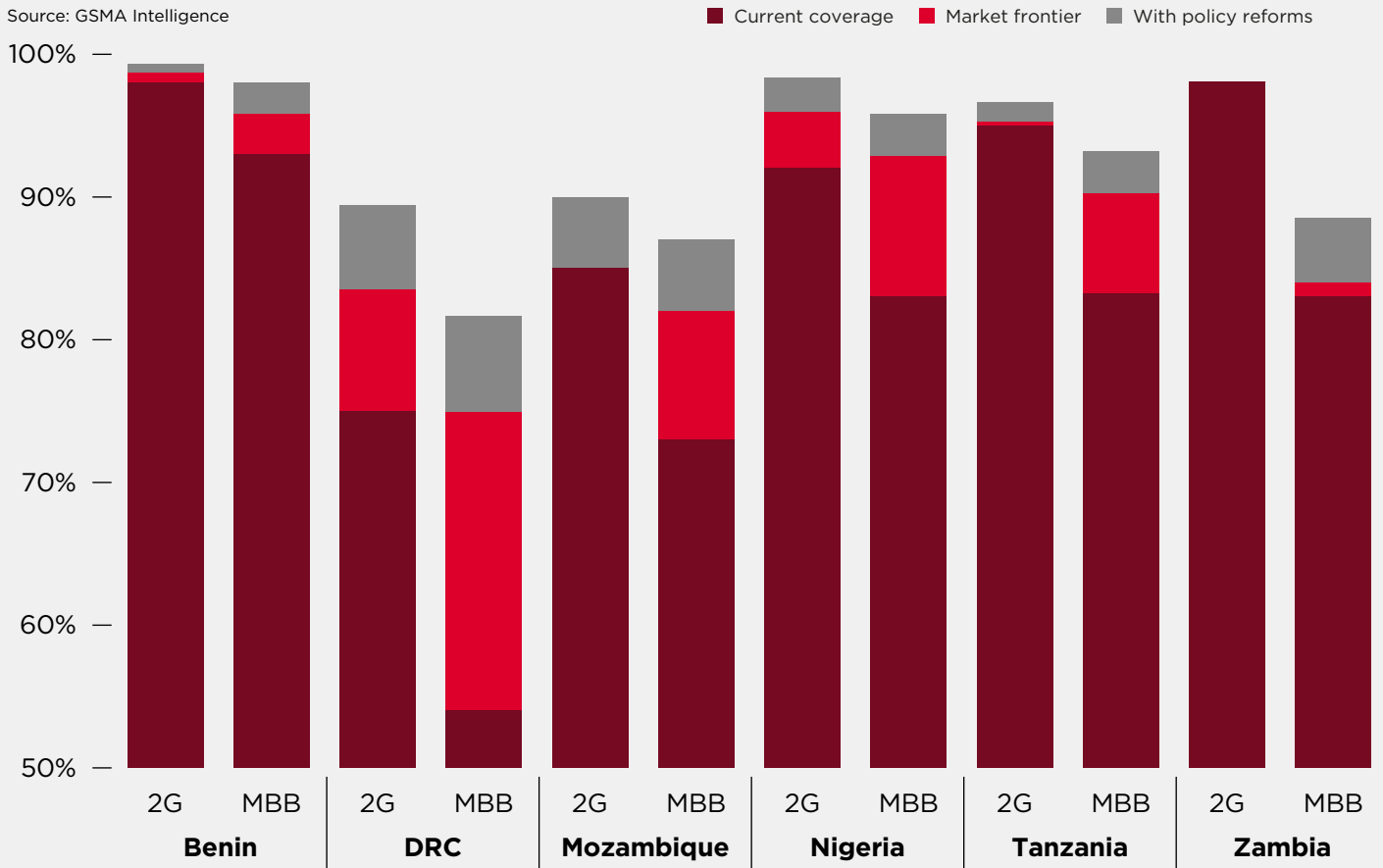
Figure 4 also shows the additional 2G and mobile broadband coverage that could be gained from policy reforms – specifically, the removal of sector-specific consumption taxes (e.g. excise duties in Zambia, Tanzania and DRC), the reduction of sector-specific taxes on service providers (e.g. in Benin) and network equipment import duties, and encouraging active infrastructure sharing. By reducing deployment costs and stimulating demand through more affordable mobile services and handsets, service providers could sustainably increase mobile broadband coverage by an additional 7 percentage points (pp) in DRC and 5 pp in Mozambique and Zambia.

Figure 4

## 2G and mobile broadband (MBB) coverage in the six focus countries

Percentage of population

Source: GSMA Intelligence



# 2.3

## The coverage gap analysed

While policy reforms can enable greater coverage, there will still be a significant proportion of the population in each country without mobile broadband coverage. This means there remains a gap in each country to be tackled if near-universal coverage is to be achieved. Table 1 presents the following analysis:

- The additional investment needed to achieve near-universal mobile broadband coverage under current market conditions (no policy reforms with respect to sector-specific taxation or enabling active sharing).
- The additional investment needed to achieve near-universal mobile broadband coverage assuming policy reforms are in place.
- The expected mobile broadband coverage that would be provided by service providers, without any additional public investment, assuming mobile broadband adoption in uncovered areas could reach 40%.<sup>7</sup>

**Note: This only quantifies the investment needed to close the coverage gap; it does not include financing to close the usage gap. Previous studies by the ITU<sup>8</sup> and Broadband Commission<sup>9</sup> have highlighted the additional investment needed to address barriers around ICT skills, content, affordability, and policy and regulation.**

The analysis demonstrates two key points:

- Policy reforms increase coverage but also reduce the amount of investment needed to close the coverage gap by up to 15%, depending on the country.
- Policies that increase demand help close the usage gap but also help close the coverage gap and reduce the investment needed to achieve widespread mobile broadband coverage, because more areas become profitable. In the six countries studied, if service providers expected mobile broadband adoption rates of 40%, they would be able to sustainably deploy networks to the vast majority of the population (from 94% in Mozambique to 99% in Benin and Nigeria). This would therefore also substantially reduce the coverage gap.

This has important implications for the management and use of USFs. When managed in the right way, USFs can play a role in helping service providers with coverage expansion – by subsidising network rollout in underserved areas.

<sup>7</sup> In many rural areas in the six study countries, mobile broadband adoption is below 10%.

<sup>8</sup> Connecting Humanity: Assessing investment needs of connecting humanity to the Internet by 2030, ITU, 2020

<sup>9</sup> Connecting Africa Through Broadband: A strategy for doubling connectivity by 2021 and reaching universal access by 2030, Broadband Commission, 2019. 21st Century Financing Models for Bridging Broadband Connectivity Gaps, Broadband Commission, 2021

Table 1

## Amount of investment needed to provide near-universal mobile broadband coverage

Source: GSMA Intelligence

	<b>Expected mobile broadband coverage without additional investment by 2030*</b>	<b>Expected coverage with additional investment</b>	<b>Investment gap (no policy reform), \$ million</b>	<b>Investment gap (with policy reform), \$ million</b>	<b>Coverage with 40% mobile broadband adoption</b>
<b>Benin</b>	98%	99.5%	30	26	99%
<b>DRC</b>	82%	98%	963	864	96%
<b>Mozambique</b>	87%	98%	144	124	94%
<b>Nigeria**</b>	96%	99.5%	461	407	99%
<b>Tanzania</b>	93%	99%	213	185	97%
<b>Zambia</b>	89%	99%	57	54	97%

Note: subsidies are calculated based on the amount needed to cover expected losses on unprofitable sites over an eight-year period.

\* Coverage without subsidy assumes policy reforms on taxation are applied.

\*\*Analysis for Nigeria assumes coverage can be deployed in all states, including those with ongoing conflicts.

**SPOTLIGHT**

# The challenge of reaching 100% population coverage

In many countries, achieving 100% population coverage using mobile broadband networks is unlikely to be feasible. This can be illustrated by taking the example of DRC, which currently has 75% population coverage for 2G networks and 54% mobile broadband coverage. This has been achieved with almost 6,000 mobile sites in the country. Expanding coverage in greenfield areas (those without mobile coverage from any technology) requires an increasing number of sites. For example:

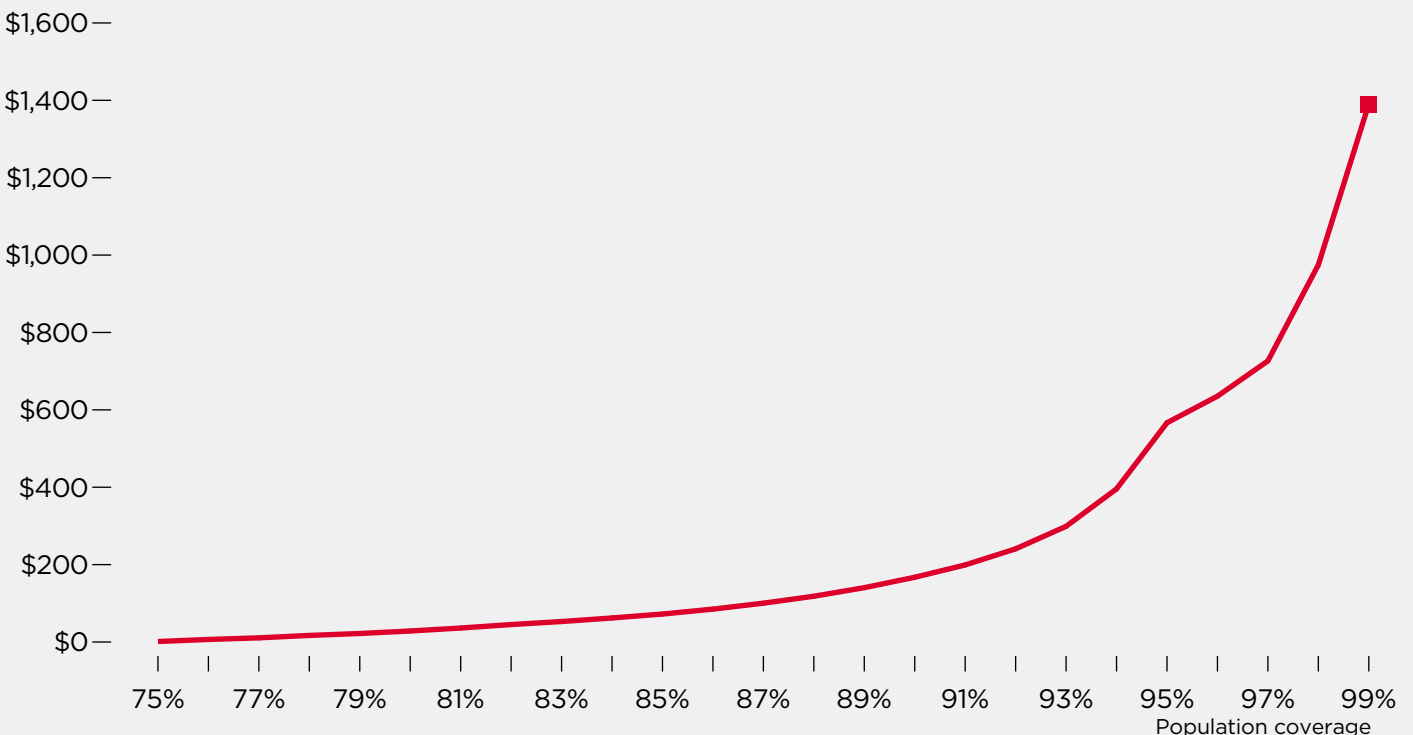
- to move from 75% to 80% coverage requires another approximately 150 sites
- to move from 90% to 95% coverage, 5,700 new mobile sites are needed
- to move from 98% to 99% coverage, more than 2,000 sites would be needed.

This is reflected in cost per covered person, as shown in Figure 5. When expanding coverage from 75% to 76%, the cost per covered person is just over \$7. This increases to around \$30 when reaching 80% coverage, almost \$200 at 90% coverage and more than \$600 at 95% coverage. While it is technically possible to achieve universal coverage with existing mobile technologies, at a certain point the additional investment needed becomes an order of magnitude (or sometimes several orders of magnitude) higher. These are areas that are remote and sparsely populated, with some sites covering no more than a few hundred people (sometimes even fewer).

Expanding coverage to these locations will therefore be extremely challenging using existing technologies, due to a combination of low population density and high costs. Providing coverage in a sustainable manner will likely require new innovations.

**Figure 5**  
**Cost per covered person in greenfield sites in DRC**

Source: GSMA analysis of data sourced from mobile operators, GSMA Intelligence, Facebook Connectivity Lab and Center for International Earth Science Information Network (CIESIN), household survey data and Group on Earth Observations.



# 3 USF survey findings: status, challenges and outlook



**The GSMA has conducted an extensive study to provide in-depth analysis of the status, success factors and challenges of USFs in Africa. The study aims to produce evidence to support policy reforms, where needed, to enhance the impact of existing funds on the connectivity gap. It includes survey responses from various stakeholders, including USF authorities, government ministries and service providers, in 40 countries across the region.**

This section highlights key findings from the survey and analysis of publicly available information, including published articles, interviews and reports from USF authorities, on the status, operations and outlook of USFs in the various countries.

## 3.1 Availability

At least 51 of the 54 countries in Africa have established or plan to establish a USF. Of the 40 countries surveyed for this study, 37 have established a USF, while three others – Ethiopia, Gambia and Namibia – are in the process of establishing one (see Figure 6).

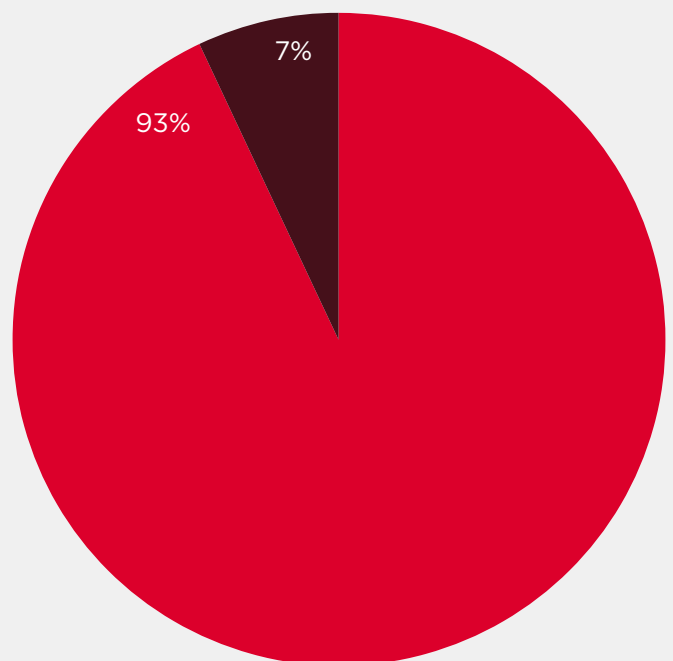
As observed in this study as well as previous studies from the African Telecommunications Union (ATU), ITU and GSMA, the performance level of USFs in Africa varies considerably, from active funds with consistent performance and reporting, to less active and dormant funds with irregular collection, disbursement and reporting. In a study of ATU member states, a third of respondents indicated that the USF in their country was dormant and not being used to advance universal access.<sup>10</sup>

Figure 6

The majority of countries in Africa have established a USF

Do you have a USF in your market? (N=40)

Source: GSMA Universal Service Funds in Africa Survey ■ Yes ■ No



<sup>10</sup> Survey on Spectrum Policies for Rural Connectivity in Africa, ATU-R, 2021

# 3.2 Governance

In all 40 countries surveyed for this report, the USF has been enshrined in law, or will be by the time of implementation, mostly through an Act of Parliament or (in a few cases) a decree. Legal frameworks specify the various elements of the USF and the roles and responsibilities of different stakeholders. They also indicate the level of independence in the management (collection, holding and disbursement) of fees and other important governance features that can impact the effectiveness of the USF.

The manner in which USF fees are managed varies significantly across the region. Some 70% of respondents to the survey indicated that the USF in their country is typically managed by a unit within the national regulatory authority (NRA). For example, the Uganda Communications Universal Service and Access Fund (UCUSAF) is administered by the Uganda Communications Commission (UCC), which provides technical and administrative support for the fund to lower its administrative costs.

A further 18% indicated that the USF is managed by a separate USF agency - a structure that potentially allows for greater autonomy, especially when accompanied by representation from different stakeholders, including service providers. Examples include the Ghana Investment Fund for Electronic Communications (GIFEC) and Côte d'Ivoire's Agence Nationale du Service Universel des Télécommunications (ANSUT).

Figure 7

## The USF sits within the NRA in the majority of countries

Which government agency is responsible for managing (collecting, holding and disbursing) the USF? (N=37)

Source: GSMA Universal Service Funds in Africa Survey

National regulatory agency

70%

Separate USF agency

18%

Government ministry

8%

Other

5%

In a minority of cases, the USF entity sits within a relevant ministry (8% of respondents). In others (5%), a hybrid system is in place. Examples include the following:

- In Senegal, the General Directorate of Public Accounting and the Treasury, a department of the Ministry of Finance and Budget, is responsible for collecting and holding the fees (Telecommunications Universal Service Development Fund), while the Coordination and Management Unit - under the Ministry of Communication, Telecommunications and Digital Economy - is responsible for disbursement.
- In Cameroon, the NRA collects the USF fees, which must be held by the Central Bank, while the Ministry of Post and Telecommunications authorises disbursements.





# 3.3 Funding

USFs are primarily funded through levies on the annual revenues of telecoms service licensees, with a range in Africa of 0.2% in South Africa to 3.5% in Chad, usually with some exclusions, such as value-added tax (VAT), interconnection fees and handset sales. In some countries, such as Botswana, Kenya and Tanzania, non-telecoms service providers (e.g. broadcasters, post and courier operators, and licensed online content providers) are required to contribute to the USF, but often at a reduced rate compared to telecoms service providers.

In addition to the levies on licensees, some countries have other sources of funds, including direct contributions from government budgets, proceeds from spectrum auctions, surpluses declared by the NRA, gifts and bequests, and contributions from international agencies such as the World Bank and the African Development Bank (AfDB). For example, in Tanzania, the parliament can appropriate funds to the USF; in Eswatini, funds from a surplus declared by the NRA can be channelled to the USF; and in Ghana the law allows for donors such as the World Bank, ITU and other development agencies to provide grants and loans to support connectivity programmes.

The collection of the USF fee has not been consistent in a fifth of the markets in the GSMA survey (see Figure 8) and several others across the region. Reasons include ongoing efforts to reform the USF; delays in establishing an enforcement mechanism; the inability of local authorities to contribute their share where the law requires them to; litigation from stakeholders challenging the USF fee rate; and a lack of resources and capacity to implement the overall operations of the USF.

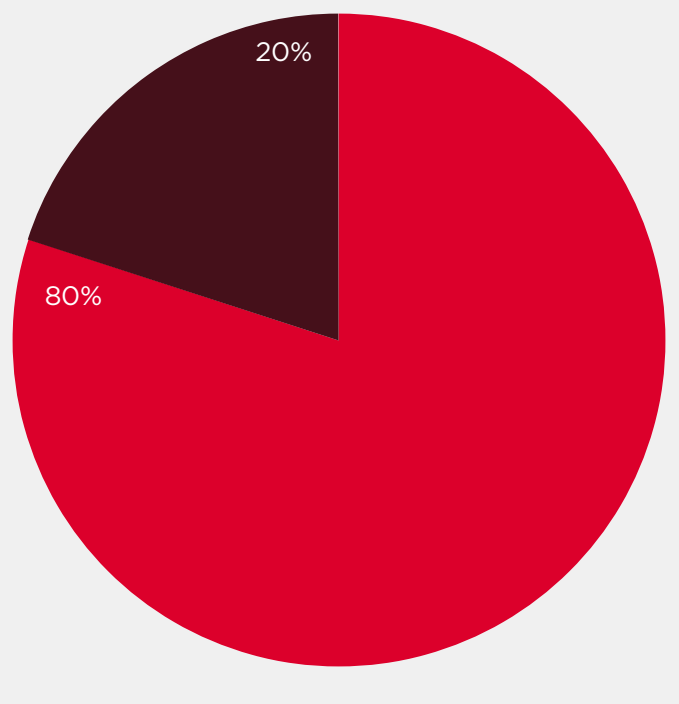
The inconsistent (or lack of) reporting on the collection of USF fees makes it hard to quantify the amount collected over time. However, the figures provided by survey respondents and reports published by USF authorities show service providers contributed at least \$1.5 billion to the USF purse across Africa during 2018–2022.

Figure 8

### USFs have been collected consistently since inception in the majority of countries

Has the USF been collected consistently every year since inception? (N=37)

Source: GSMA Universal Service Funds in Africa Survey ■ Yes ■ No



# 3.4 Implementation

The implementation of USFs varies considerably across Africa. This study grouped the implementation mechanism into three categories: disbursement method, recipients and types of project funded.

## 3.4.1 Disbursement method

The disbursement method can impact the transparency, certainty and accountability levels in the implementation of a USF. It can also define the types of company that can participate in the process and their capacity to deliver. Of the 34 survey responses on USF disbursement method, 15 respondents (44%) indicated that funds were primarily disbursed through directives from

authorities – usually the NRA or the government ministry that manages the fund. This is the least transparent and collaborative method, as service providers have little or no visibility of (or input into) the rationale behind most directives. Just under a third of respondents indicated that the process was carried out through competitive bidding and/or reverse auctions.

Figure 9

### The majority of funds are disbursed by directives from authorities

Please describe the mechanism for disbursement (N=34)

Source: GSMA Universal Service Funds in Africa Survey

Directive from authorities

15

Competitive bidding and reverse auction

12

Rural rollout subsidy at operators' request

5

Pay or play

1

Direct implementation by USF authority

1

## SPOTLIGHT

# Morocco's 'pay or play' and Ghana's shared rural mobile network

## Morocco

The Morocco Telecoms Act introduced the 'pay or play' mechanism, which provides service providers with two options:

- pay an annual contribution of 2% of gross revenue
- respond to tenders issued by the Universal Telecommunications Services Management Committee and opt to deliver a specific universal service programme in accordance with the conditions set by the committee, in lieu of payment.

All service providers are free to respond to tenders issued by the committee and to participate in a competitive bidding process. Any providers that would like to develop and execute their own universal service projects may also submit a proposal to the committee for review and approval. For service providers that choose the 'play' approach, they pay the difference (if any) between the full USF amount (2% of revenue) that would have been collected and the amount spent on delivering the USF project at the end of each financial year.

The mechanism was arrived at as a compromise between stopping the fund and doing nothing with the amounts collected. While it may have its drawbacks, it comes with positives, including giving service providers the opportunity to participate in the design of universal service projects; providing visibility on the projects to which funds are being directed; and ensuring service providers benefit directly from their contribution.

## Ghana

GIFEC uses an approach based on the direct implementation of USF programmes and projects. Some of these aim to roll out network infrastructure in underserved and very underserved areas, often in collaboration with service providers, equipment vendors and other implementation partners.

One such partner is Ascend Digital Solutions, which uses multi-operator core network (MOCN) and multi-operator RAN (MORAN) architectures to build shared 4G-enabled networks in rural areas. Ascend Digital Solutions has a 10-year concession to deliver a carrier-neutral network on a turnkey basis. This includes site selection, design, installation and engineering, as well as all relevant service-level agreements and key performance indicators that service providers are expected to maintain.

The rollout of the programme started in 2020, with financing from the Export-Import Bank of China and the technical solution from Huawei. Around 1,000 of the planned 2,600 sites have been deployed so far. It is expected to cover around 3.4 million people who have never been covered by a mobile broadband network. As of June 2023, around 1.1 million subscribers had connected to the shared network, using around 35 million voice minutes and 180 terabytes of data on a monthly basis.

This unique approach makes provisions for the following:

- commercial viability, with the telecoms regulator, the National Communications Authority (NCA) and service providers agreeing a tariff for traffic originating from the shared network
- full participation of service providers, tower companies and other ecosystem players represented on the board of GIFEC
- service continuity for customers, with rural networks designed in a contiguous manner.

This demonstrates the opportunity to work with a neutral third party with the right solutions to ensure technical and commercial viability of rural networks to deliver high-speed connectivity to underserved areas. Ascend Digital Solutions plans to replicate the model in other countries in the region where authorities and service providers decide to work on a similar collaborative model.

## 3.4.2 Recipients

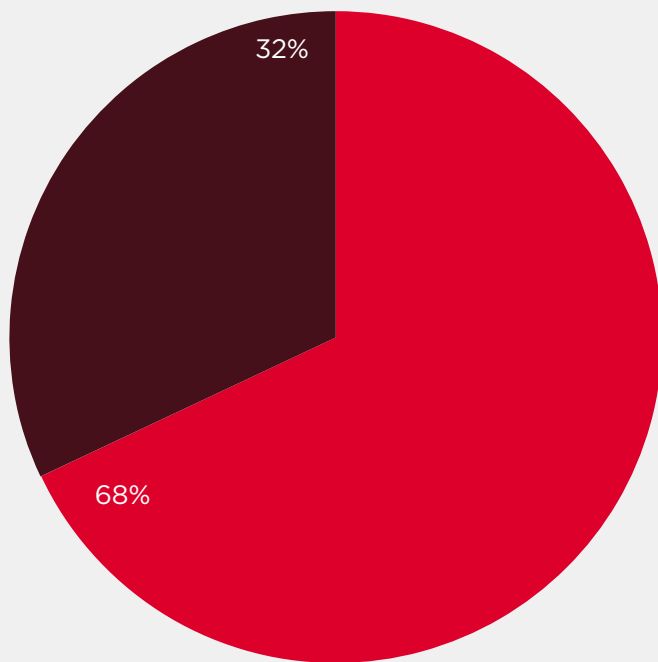
Although telecoms operators are the primary contributors to USFs, they are not the only organisations that can draw from it in the majority of countries in Africa. Two thirds of respondents to the survey indicated that other organisations, aside from operators and service providers, can access USF funds based on some of the disbursement methods highlighted in the previous section. Examples include public institutions, such as the police, hospitals and schools, for the development of e-services; digital content creators; and organisations that work with vulnerable communities such as women and those living with a disability.

Figure 10

### In two thirds of countries, non-operators can access USF funds

Apart from operators, can any other organisation (public or private) access USF funds? (N=34)

Source: GSMA Universal Service Funds in Africa Survey ■ Yes ■ No



## 3.4.3 Types of project funded

The types of project that USFs support can be grouped into two categories: infrastructure and non-infrastructure. On the infrastructure side, more authorities focus on mobile internet technologies than basic 2G connectivity. In many markets across the region, 2G coverage is almost ubiquitous, while the coverage gap for mobile broadband networks remains significant. Fewer countries indicated that USFs can also be used to fund backbone fibre and fixed-line rollouts – a situation that highlights the cost and complexity of fixed network infrastructure rollout in rural and remote locations.

Connectivity to schools and hospitals emerged as the top recipient area for USFs in the non-infrastructure category. Examples of projects funded in this area include the provision of internet connectivity, computers and other devices. More than 85% of respondents indicated funding for digital skills programmes, compared to just under 60% for device subsidies. Nearly two in five respondents indicated that the USF in their country could be used to subsidise service plans. For example, in Morocco, the USF has been used to zero-rate access to certain services and websites, such as SMS for vaccination appointments and websites for education.

The range of ‘other’ projects that could be funded by USFs in many countries in Africa is broad and raises questions around the risk of spreading USF resources too thinly, ultimately blunting their impact on efforts to close the connectivity gap. Examples of areas include e-government projects and internet services for government agencies; special schools for people with disabilities; smart agriculture projects; FM broadcasting expansion; construction of postal service centres; telemedicine and emergency services; teacher training; community radio projects; girls in ICT activities and projects supporting young women in ICT education; and online content and application development initiatives.

Although telecoms operators are the primary contributors to USFs, they are not the only organisations that can draw from it in the majority of countries in Africa.

Figure 11

# Mobile broadband networks and connectivity to schools and hospitals top the infrastructure and non-infrastructure projects funded by USFs

Describe the type of projects that qualify for USF funding (N=34)

Source: GSMA Universal Service Funds in Africa Survey

## Infrastructure projects

Mobile networks - 3G



Mobile networks - 4G



Mobile networks - 2G



Backbone fibre networks



Fixed networks



## Non-infrastructure projects

Connectivity to schools and hospitals



Digital skills programmes



Device subsidies



Others



Service plan subsidies



# 3.5 Monitoring and evaluation

Monitoring and evaluation is an essential part of any USF, given the urgency to close the connectivity gap and the need for transparency in the management of fees collected from service providers for that purpose. Regular evaluation and performance monitoring, complemented by public reporting of results, can also help prevent a ‘free-rider’ problem in the implementation process, which could manifest in multiple ways – for example, service providers and/or contractors taking USF funds without delivering projects, or organisations taking USF funds for projects and activities with no visible impact on the connectivity gap.

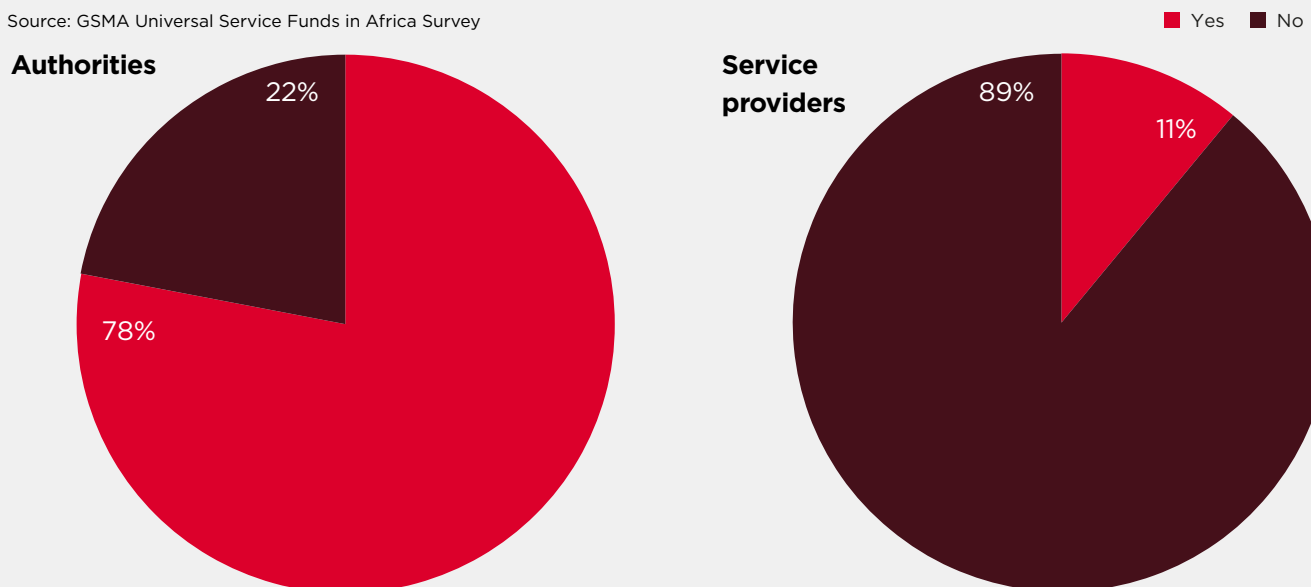
The survey for this study revealed significant variation in responses from authorities and service providers to the question on monitoring and evaluation (see Figure 12). Comparing responses from the same markets, 78% of authorities indicated that a system for monitoring and evaluation of the USF was in place, but this view was matched by only 11% of service providers.

Figure 12

## Significant variation in views of authorities and service providers on USF monitoring and evaluation

Is there a monitoring and evaluation mechanism in place to assess the performance of disbursed funds?

Source: GSMA Universal Service Funds in Africa Survey



The likely explanation for this difference is that while USF frameworks across the region have a requirement for regular monitoring and evaluation of activities (which the authorities have highlighted in their responses), in many cases this process is not actually happening – at least from the perspective of service providers, who play a critical role in the realisation of the USF promise.

This could be a result of several factors. For example, the USF may be inactive or underperforming; there could be a lack of transparency in the implementation of the USF; the USF authority could lack the skills and/or resources to properly monitor and evaluate performance; or the funds could be misused or spent on projects that are difficult or impossible to monitor and evaluate.

The view of service providers is supported by the lack of (or at best irregular) reporting of USF activities by the relevant authorities across Africa. This study found that less than a third of countries in the region publish detailed reports, including funds collected, expenditure and balance, on a periodic basis. Examples of countries with periodic reporting include Botswana, Kenya, Liberia, Nigeria, South Africa and Uganda. However, in many instances, the most recently published report dates back several years, indicating underperformance or inadequate monitoring and evaluation.

Less than a third of countries in the region publish detailed reports, including funds collected, expenditure and balance, on a periodic basis.



# 3.6 Outlook

The connectivity landscape in each country will evolve over time – as will the USFs, as authorities take steps to keep pace with emerging realities and market needs. Figure 13 outlines the expectations of authorities from the survey. The overwhelming majority (94%) are open to looking at best practices to improve the performance and impact of the USF in their market. We highlight these best practices in Chapter 4.

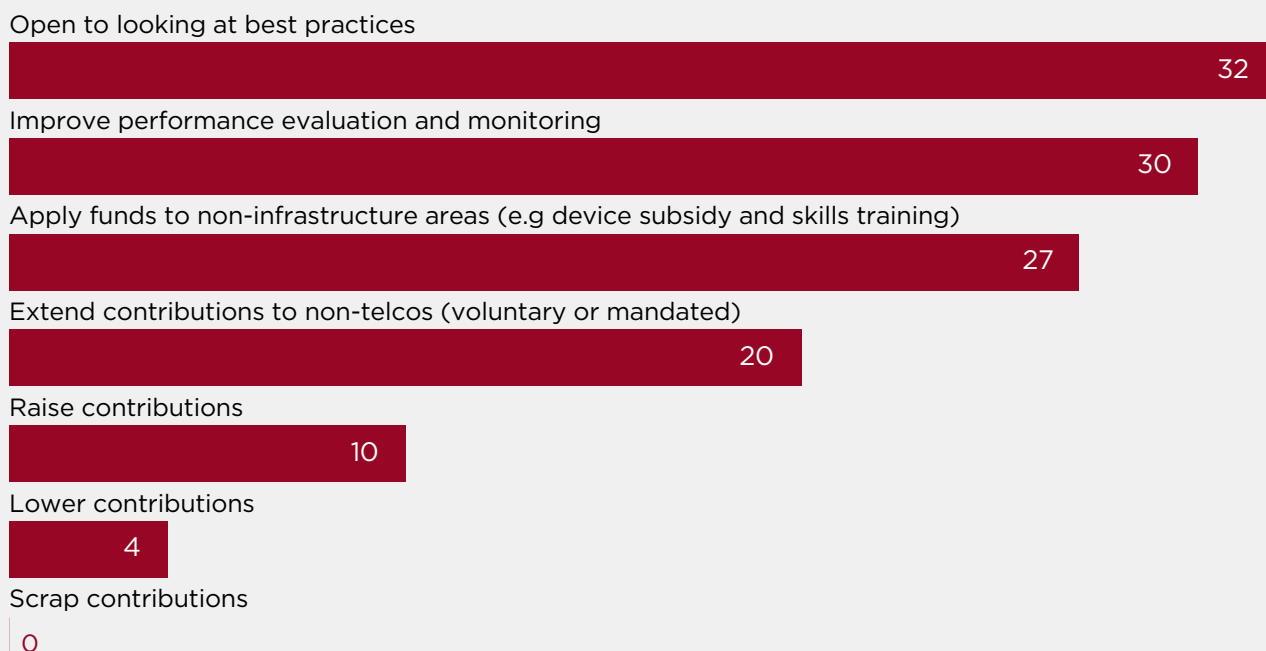
Some 88% of authorities intend to improve the monitoring and evaluation process of the USF in their market. This reflects the responses and analysis in the previous section and indicates the intent of authorities to improve the actual monitoring of USF activities, in line with the requirements stipulated in the legal framework. Just under 80% of respondents would like to apply more USF resources to non-infrastructure areas. This could have implications for the usage gap in some countries.

Figure 13

## Most USF authorities are open to adopting best practices and improving performance evaluation

What is the long-term plan for the USF in your market? (N=37)

Source: GSMA Universal Service Funds in Africa Survey





The other four options for this question focus on contributions to the USF. Nearly three in five respondents expect to extend contributions to non-telcos, either on a voluntary or mandated basis. This is supposedly other companies that derive value from connectivity and have an interest in seeing more people come online, but it is not certain how this could work in practice. More respondents (29%) intend to raise contributions than lower them (9%). However, the more urgent need is to improve the implementation and performance evaluation of what is currently being collected.

Finally, there is a lack of appetite to scrap the USF in countries across the region, despite the dormancy and underperformance of many funds. In this context, the challenge for all stakeholders, including USF authorities and service providers, is to maximise the potential of the USF mechanism to close the connectivity gap and bring the benefits of the internet to citizens. Chapter 4 outlines vital policy reforms, based on insights from the survey, to enhance the performance of USFs in Africa.



# 3.7

## Key challenges

Respondents to the survey highlighted several challenges around the USF in their market. These resonate with the findings from the secondary research element of this study, covering a range of sources including existing literature and analysis of published USF reports. Table 2 outlines the most common challenges identified in this study.

Table 2

### Key challenges affecting the performance of USFs in Africa

Source: GSMA Intelligence

Key challenge	Details
<b>Dormancy</b>	Although there is a general lack of public disclosure of funds collected and disbursed, the total unused amount held by 12 USF authorities that responded to the relevant question in the survey was \$265 million. This represents more than half the amount collected in these countries over the last five years.
<b>Regulatory flexibility</b>	While the legal framework of USFs provides certainty on key elements, such as governance and implementation, in many cases it also raises questions around flexibility (or lack of it) to accommodate the continuous evolution of the telecoms sector. For example, USFs may not yet appreciate the growing shift from voice to data and the investment requirements of mobile internet networks.
<b>Stakeholder consultation</b>	Service providers play a central role in the performance of USFs, as both contributors and executors. However, the majority of USF authorities do not sufficiently consult with them or offer visibility of the management of funds and the rationale behind implementation decisions. There are some best-practice examples in the region, such as Ghana, where service providers are represented on the board of GIFEC.
<b>Reallocation of funds</b>	There are concerns around the reallocation or misappropriation of funds on activities not remotely related to connectivity. The lack of regular reporting and performance evaluation fuels these concerns. Of the 10 USF authorities that indicated that all funds collected have been spent, less than half publish performance reports on a regular basis.

Table 2 continued

Key challenges affecting the performance of USFs in Africa

Source: GSMA Intelligence

Key challenge	Details
<b>Independence</b>	Political intervention or interference from other government agencies inevitably affects the performance of USFs. This appears to be a common feature in Africa and one exacerbated by governance scenarios where the USF authority does not function as a separate, independent unit. Lack of independence of the USF authority can affect the performance of the fund in terms of delays in budget approval, redirection of funds to other uses, and excessive bureaucracy for project approvals, resulting in redundant administrative costs that reduce the amount available for implementation.
<b>Institutional capacity</b>	USFs require skilled personnel throughout the entire project lifecycle, from planning and design to implementation and performance evaluation. Many USFs in Africa lack personnel with the required legal, technical and project management expertise to execute major projects, with ongoing issues around high staff turnover, particularly for leadership and technical roles, poor motivation among existing staff, and inadequate skills capacity for the tasks required.
<b>Supporting infrastructure</b>	Lack of supporting infrastructure – in the form of poor road networks, inadequate security and lack of grid electricity – is often not factored into the implementation of USF projects. This can lead to poorly executed or abandoned projects.
<b>Operating expenses</b>	Service providers face ongoing operating costs to maintain networks. These can be expensive, given the lack of supporting infrastructure, and uneconomical, given the lack of market potential in rural areas. If a workable solution is not found to the opex challenge, the appetite for coverage expansion in uneconomical areas – even with USF funding – will remain limited.
<b>Reliable data</b>	USFs in the region often lack relevant, reliable data on vital indicators, including coverage gaps, population density and mobility, and social and economic profiles, to design and analyse the sustainability of network projects. Poor planning leads to execution problems, a mismatch between allocated funds and project requirements, and conflicts between authorities and service providers.
<b>Transparency</b>	Most countries in this study do not have a formal public reporting process for USFs. This makes it difficult for contributors and other stakeholders to ascertain details of the management of funds and implementation of projects. The perceived transparency issue has the potential to create mistrust among stakeholders, to the detriment of the overall objectives of the USF.
<b>Clear objectives</b>	Many USF frameworks were designed at a time when the connectivity landscape looked different. As such, some objectives sound vague and contradictory when interpreted today – for example, the definition of underserved areas qualifying for USF projects.
<b>Overall impact assessment</b>	Most USFs in Africa are into their second or third decades. Even the most conservative estimates of the amount collected since inception would put the figure at more than \$5 billion. However, there has not been a comprehensive study of the overall impact of the USF since inception in any country in the region. The lack of empirical evidence on the impact of USFs to date can limit the ability of authorities to make informed decisions on the future of USFs.

# The need for industry-wide collaboration on non-infrastructure projects

The primary objective of a USF is to extend network infrastructure to remote locations not commercially viable for service providers. Given that a coverage gap persists in countries across Africa, it is important that USF authorities utilise the USF mechanism, where it exists, to roll out network infrastructure, including for radio access and backhaul, in underserved locations and bring the benefits of connectivity to excluded populations.

The GSMA Universal Service Funds in Africa Survey has also revealed the use of funds for non-infrastructure projects (see Sections 3.4.2 and 3.4.3). The rationale, scale and type of projects funded, and underlying legal mandate vary from country to country. However, a common thread is the lack of a systematic approach to these initiatives, based on data and evidence to ensure the optimum use of available funds. Also lacking is a monitoring and evaluation mechanism.

The broad, often undefined scope of non-infrastructure projects presents several challenges, including the following:

- They are more difficult to implement objectively, given the lack of sufficient data and assessment of the needs of potential beneficiaries.
- It is more challenging to assess their impact, as the intangible nature of many of the outcomes makes it hard to produce concrete evidence of their success or failure.
- They are more susceptible to abuse and can therefore quickly become unsustainable. For example, a recent study of the impact of the government-backed device subsidy scheme for select rural areas in Rwanda found that some subsidised handsets drifted from rural areas (where they were allocated) to urban centres.<sup>11</sup>

Against this backdrop, there is an urgent need for guardrails in the management of USFs, given the primary objective of the mechanism. In practice, this means:

- continuing to prioritise infrastructure projects, with a focus on ensuring a sustainable funding mechanism that accounts for the ongoing operating costs of cell sites in locations that are economically unviable
- avoiding an adverse impact on affordability for all other users – for example, an increase in the USF contribution rate or other sector-specific tax to finance such schemes.

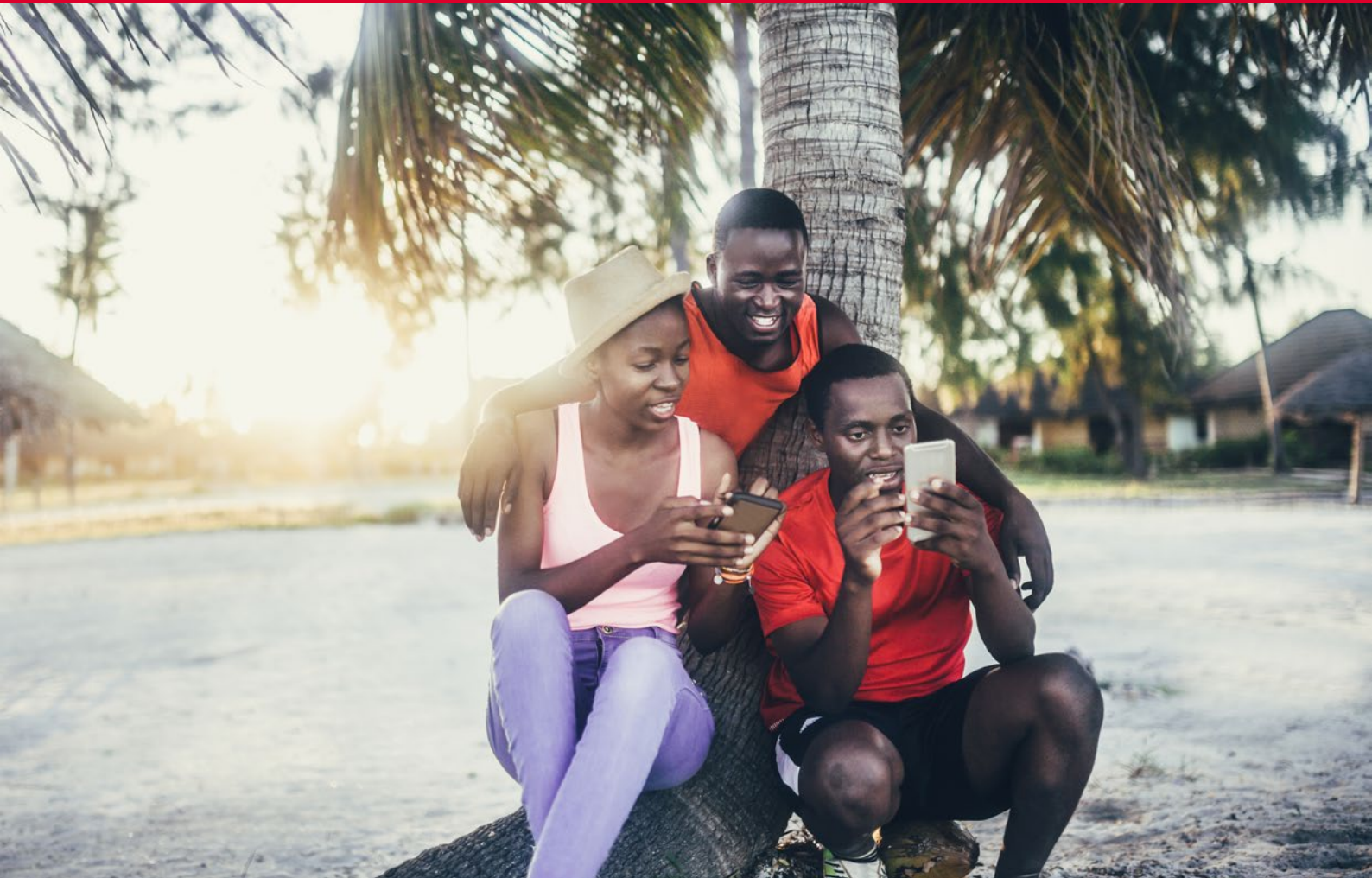
Industry-wide collaboration is needed to define uniform rationale, scope, success measures and performance evaluation mechanisms to guide any effort towards non-infrastructure projects. This requires further study, beyond the scope of this report, to collect and analyse empirical data. This can then be used to generate insights to guide policymakers and other stakeholders on non-infrastructure projects.

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<sup>11</sup> The Effect of Network Adoption Subsidies: Evidence from Digital Traces in Rwanda, Björkegren and Karaca, 2020

# 4

## Policy reforms to improve the effectiveness of USFs in Africa



Fundamentally, the USF mechanism is intended to supplement market-based policies to close the access gap by incentivising service providers to deploy infrastructure and services in remote and underserved locations.

With a coverage gap of nearly 200 million people and usage gap of just over 800 million, the scale of the challenge to realise universal connectivity in Africa underlines the need for the effective use of the USF.

Insights from the survey show that many USFs in Africa are underperforming and have become ineffective tools to close the connectivity gap. In view of the urgency to close the coverage gap and usage gap, it has become imperative to either reform critical structural and operational aspects of USFs across Africa to improve their effectiveness, or discontinue the USF approach.

Political will among governments and policymakers is an important first step in the journey to USF reform. This is fundamental for improvements to the USF legal framework, where required, as well as adherence to the core principles of an effective and successful USF – namely, accountability, clarity, service neutrality, transparency, sustainability and visibility. Beyond that, specific steps must be taken to address factors limiting performance and explore new ways to utilise USFs to enhance their effectiveness.

# 4.1

## Addressing the factors limiting the performance of USFs in Africa

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### Adopt mechanisms to incentivise fund disbursement

There is an urgent need to increase the disbursement rate of collected funds across the region. More than half the amount collected in the last five years has not been used, according to USF authorities responding to the question on disbursement in the survey. Improving the use of collected funds not only ensures the overall objectives of the USF are met; it also creates a virtuous cycle whereby the successful implementation of USF projects drives telecoms network use, which in turn generates financial resources that can be reinvested in efforts to connect more people.

USF authorities should establish clear targets to ensure effective and timely disbursement of funds. Simplifying the disbursement process, collaborating with stakeholders on project selection, and using incentives to increase the rate of disbursement will be critical in achieving this. For example, in Ethiopia, the soon-to-be-implemented Universal Access Framework Regulation provides for annual charges to be reduced proportionately if the USF is unable to sustain budgeted investment commitments or disbursements of more than 75% of revenues collected over two consecutive years.

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### Implement evidence-based contribution rates

Historically, contribution rates have been a source of dispute. There is no one-size-fits-all contribution rate for USFs; the rates in Africa range from 0.2% to 3.5% of gross revenue. USF authorities should take an evidence-based approach, in consultation with service providers and other stakeholders, to decide a suitable contribution rate. Additional mechanisms can be built into the process, such as reducing the contribution rate once certain coverage targets have been achieved or when funds are dormant and have not been disbursed.

The evidence must balance several key factors, including the following:

- the access gap that the USF seeks to address
- the investment required to close this gap over a period (e.g one year)
- the capacity of the USF authority to implement various aspects of USF projects (such as project design and performance monitoring) over the same period
- the capability of service providers to sustain a given level of contribution in view of other capex and opex requirements.

This assessment should be done periodically to ensure the contribution rate matches the need. An unsustainable contribution rate is essentially an additional tax on service providers that drives up the costs of service delivery. These costs are in most cases passed on to the consumer, which in turn negatively impacts digital inclusion targets. Additionally, a scenario where the USF lacks the capacity to effectively utilise contributed funds ends up denying service providers the opportunity to invest those funds into other critical areas of their operations.

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## Set clear and measurable targets for the USF

The USF framework and implementation strategy must outline specific and measurable targets, in line with the government's overall connectivity objectives. In practice, this means clearly defining the parameters for USF projects and outlining the key success measures following their implementation. These parameters should include clear milestones and achievements to be tracked over time, such as a detailed population coverage plan, project descriptions and associated project costs for a specific timeframe. In Algeria, for example, the Ministry of Post and Telecommunications has defined the priority underserved areas for USF projects as settlements with fewer than 2,000 people. This clarity means funds cannot be channelled to ineligible projects, and success can be measured by noting the number of such locations connected via the USF over time.

Having clear, measurable objectives leads to better utilisation of the available funds as all stakeholders focus on achieving those objectives. It also spurs greater confidence among stakeholders and engenders transparency and accountability in the selection of USF projects.

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## Prioritise stakeholder consultation throughout the entire project lifecycle

USF authorities administer the contributions to the fund, but service providers are at the forefront of the implementation of USF projects. A common thread in the survey responses from service providers was the lack of visibility of the project selection process and overall management of the fund. This is especially the case in markets where projects are selected and funds disbursed through directives from the USF authority or government agency.

It is best practice in the management of the USF to prioritise the participation of service providers and other stakeholders throughout the entire project lifecycle, from project selection and site design to implementation costs, timelines and performance evaluation. This aligns with the principle of transparency in the management of USFs and increases the potential for success through a broader range of viewpoints, expertise and efficiency gains in the implementation of projects.

Stakeholder consultation should not be a one-off or occasional call for submissions; rather, it should be a continuous process of engagement with direct contributions and feedback from service providers and other stakeholders on decision-making around the implementation of the USF. This is best achieved in a scenario where service providers and relevant stakeholders sit on a management board of an independent agency overseeing the activities of the USF. In Ghana, for example, representatives of all the mobile operators in the market and other stakeholders (e.g. tower companies and network equipment vendors) sit on the board of GIFEC.

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## Use a data-led approach to select USF projects

An important measure of the effectiveness of a USF project is the impact on beneficiaries. As such, it is crucial for the USF to be deployed in locations and for services where it can generate the most impact. This requires detailed data on service gaps as well as local economic and social factors that affect people's ability to connect to the internet.

Data gathering, analysis and efforts to apply relevant insights to project selection should therefore form part of the operational reform of USFs. In Uganda, for example, the USF authority has developed an extensive map of mobile coverage, including by technology, across the country, providing the necessary data to identify coverage gaps and inform project selection. Insights from service providers on coverage and usage gaps (and how to address them) are valuable throughout the selection process due to their strong experience and expertise.



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## Ensure regular performance monitoring and reporting

Most legal frameworks require USF authorities to regularly monitor the performance of USF projects and publish this in reports periodically (for example, quarterly or annually). Given the contributions to the USF purse from service providers and other stakeholders, regular reporting is paramount to provide visibility and accountability in the USF process. Furthermore, an independent audit system should be in place to ensure that process meets transparency requirements.

Best-practice performance reporting should include the following details and be on an annual basis at least:

- a recap of all the USF tenders held and results, and an overview of approved USF projects in progress (project description, coverage goals and timelines)
- performance of fund projects against targets
- status of funds collected and funds disbursed, as well as balance reserves
- explanation of any impediments or challenges encountered in the disbursement of funds
- an outline of targets and objectives for the next financial year.

Regular performance reporting not only provides visibility on the status of the fund; it generates much needed evidence to assess impact and inform decisions on critical issues, such as contribution rates, project selection and required subsidy levels. For example, in Senegal, the USF framework stipulates that the level of contribution to the USF can be reviewed after analysis of the achievements of the goals. Fewer than 10 markets in Africa currently provide performance reports on a regular basis, making this a critical USF reform issue for most countries in the region.

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## Establish a project costing system that accounts for overheads

Costing is a critical factor that can affect both the efficient utilisation of funds and successful completion of USF projects. An appropriate mechanism should be put in place to cost projects from end to end, considering extraneous circumstances that could impact the project at various stages – for example, inflationary pressures on site building materials, local currency devaluation and security costs. The costing system should also be flexible enough to adjust to change as required to mitigate the risk of project abandonment.

Historically, USF frameworks have only made provision for the cost of executing a project, with no consideration of the inevitable running costs required to ensure the long-term sustainability of the project. Many stakeholders have identified this as the main reason for some projects failing after completion. It is also a disincentive for network coverage expansion to certain remote locations, where service providers could incur high opex, partly due to the lack of supporting infrastructure, relative to the revenue potential from that location.

In this context, it has become critical for USFs to focus on the sustainability of funded projects – particularly the opex required to run telecoms networks in remote areas with no access to grid electricity, access roads or adequate security.

A comprehensive costing system should account for overheads and opex from the outset, with a sustainable solution that guarantees the long-term viability of the USF project. To achieve this, cost neutrality should be entrenched in the USF framework as a minimum criteria for infrastructure-based USF project selection. This calls for flexibility in the USF framework and continuous collaboration between USF authorities, service providers and other stakeholders to account for the overhead costs associated with a given project.

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## Explore alternative funding mechanisms

Most USFs operate a basic model of collecting funds from contributors and disbursing to recipients as subsidies to cover part or the entire cost of extending coverage to an underserved location. However, insights from the survey and existing literature show this model is susceptible to challenges, resulting in the poor performance or even dormancy of the USF. Common issues include the diversion of USF resources to non-related purposes, a lack of capacity within the USF authority to manage available funds, increased potential for political interference, and poor project design leading to abandonment.

To minimise these challenges and maximise the potential of the USF, policymakers should explore alternative mechanisms for the implementation of USF projects. As highlighted earlier, the 'pay or play' model adopted in Morocco is an example of an alternative method with the potential to both incentivise investments in coverage expansion and tackle many of the challenges associated with the traditional model.

Where an alternative mechanism is adopted, it is important that it works for the local market. This means it must be the product of extensive consultation with the industry and other relevant stakeholders, and based on clear measurable targets to assess its impact over time. It also requires political will to effect the necessary reforms to the existing framework and create an enabling environment to explore new options.

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## Build capacity and develop skills within the USF

The effectiveness of a USF can only be as strong as the people managing it. As such, every USF authority must have personnel with the required skillsets and experience to properly design, implement and monitor projects. This may involve the reskilling and upskilling of existing personnel, recruitment of new staff, and efforts to retain qualified staff at the USF authority. The resource commitment required to achieve this should form part of the USF reform process.

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## Engage with local communities on the benefits of connectivity

In some instances, the process of setting up USF sites in remote locations has been delayed or prevented due to pushback from local community leaders. This is often based on misinformation and unfounded concerns around the safety of wireless networks. In markets where this is an issue, policymakers should engage with consumers and community leaders, creating awareness of the benefits of connectivity and addressing any perceived concerns about digital technology more broadly.

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## Consider an independent governance structure

In scenarios where funds are dormant or underperforming, it may be necessary to reconsider the organisational structure of the USF authority and explore the potential benefits of an independent agency or multistakeholder committee. Efforts to reform USFs in Africa should seek to minimise or eliminate red tape and political interference in the management of funds and implementation of USF projects.

A separate agency with a clear strategy and annual programme for the implementation of USF projects provides the best opportunity for independence and accountability. For example, it is not held back by the budget cycle of a supervising agency or department, and there is greater opportunity for other stakeholders, including service providers, to participate.

The majority of USFs in Africa are currently managed by a unit within an NRA or government ministry. In this scenario, the USF unit should be given financial autonomy, and independent management should be put in place to ensure funds are disbursed without cumbersome approvals or unwanted delays.

# Complementing the USF with necessary policy reforms

USFs on their own are not a panacea for the connectivity gap in Africa. Rather, they should be viewed as a complementary mechanism to vital policy levers and market-based solutions to close the coverage gap and stimulate demand for connectivity. This allows USFs to be better targeted to where needed, such as where there is a market failure rather than a regulatory failure.

In this context, it is important for governments and policymakers to continue to implement necessary policy reforms in key areas as a primary means of bringing connectivity to underserved populations. For markets across Africa, policy reforms are required in the following areas to support the continued rollout of mobile networks and technology upgrades, as well as to improve the affordability of devices and services.



– **Taxation** – Policymakers can directly improve the availability and affordability of telecoms networks, devices and services by reducing the tax burden on service providers and users. Tax-free zones in rural areas should also be considered as a way to boost investments in such areas.



– **Spectrum** – The early assignment of sufficient amounts of spectrum at the right price and conditions can have a major impact on coverage by driving greater network investment. Initiatives such as the reduction or removal of spectrum fees for USF sites or rural sites in general should be considered to reduce the cost of running sites.



– **Infrastructure deployment** – Less red tape for new base stations, fast approval processes for rights of way, and regulatory support for infrastructure sharing can all help improve coverage.



– **Technology-neutral licensing** – With the shift to more mobile broadband and other advanced networks, a technology-neutral approach will permit faster, more cost-effective deployment.



– **Unified licensing regime** – This is essential to facilitate the planning of resources critical to service delivery.



– **SIM registration** – Simplified, inclusive processes for SIM card registration are critical to avoid discrimination against vulnerable groups such as women, and the rural community.



– **Liberalisation of fibre rollout** – Where service providers are restricted in terms of fibre network rollout, governments should look to liberalise the market and introduce the competition that is key to innovation and investment. Competition in the fibre market can drive down the cost of infrastructure rollout in rural areas.



– **Investment in supporting infrastructure** – Investing in infrastructure, such as grid electricity, security and access roads, delivers social good and reduces the cost of rollout.

# Appendix



# A1

## Connectivity landscape

Figure A1

### Usage gap

Percentage of population

Source: GSMA Intelligence

■ 31-50% ■ 51-70% ■ >70%

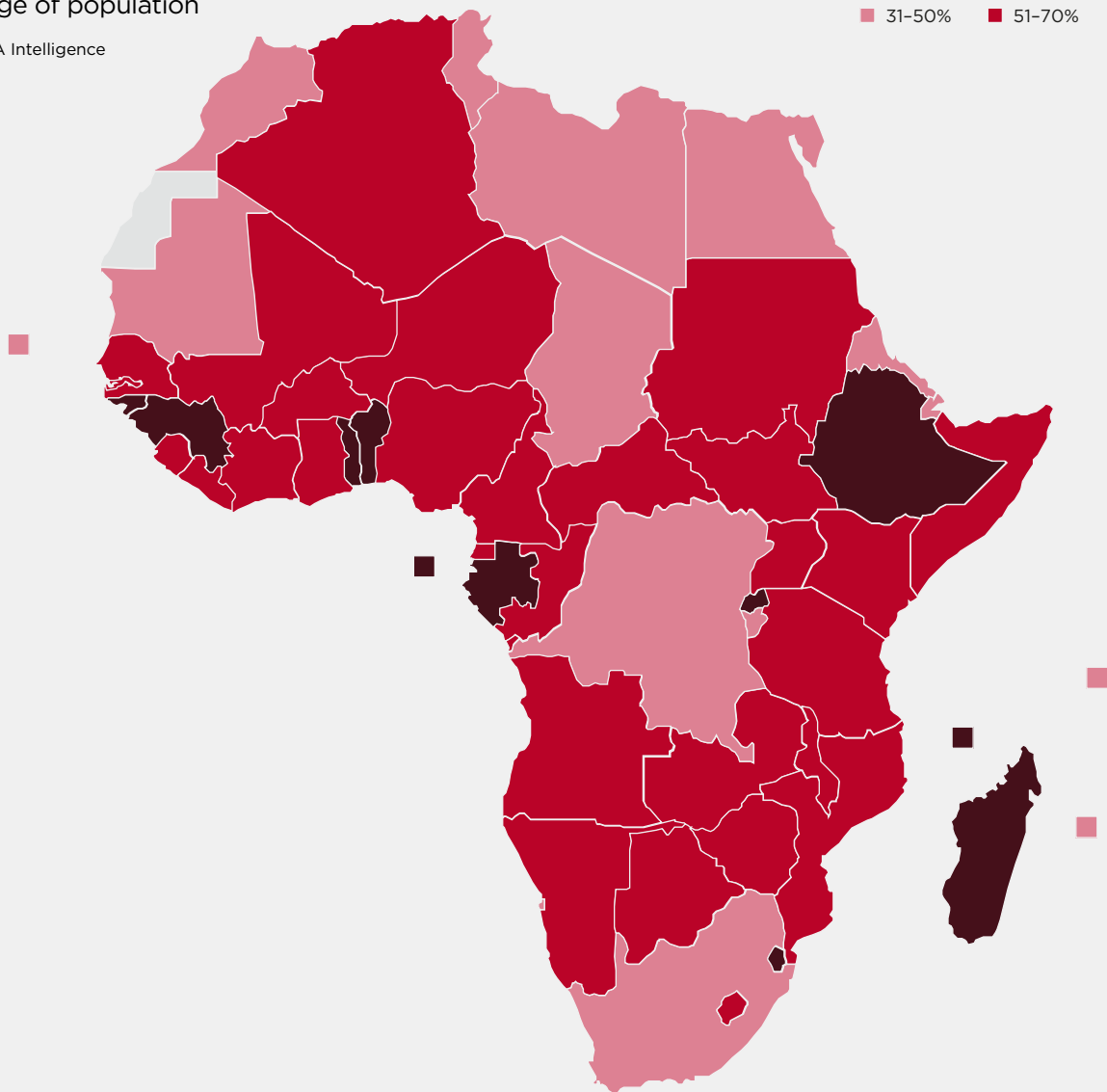


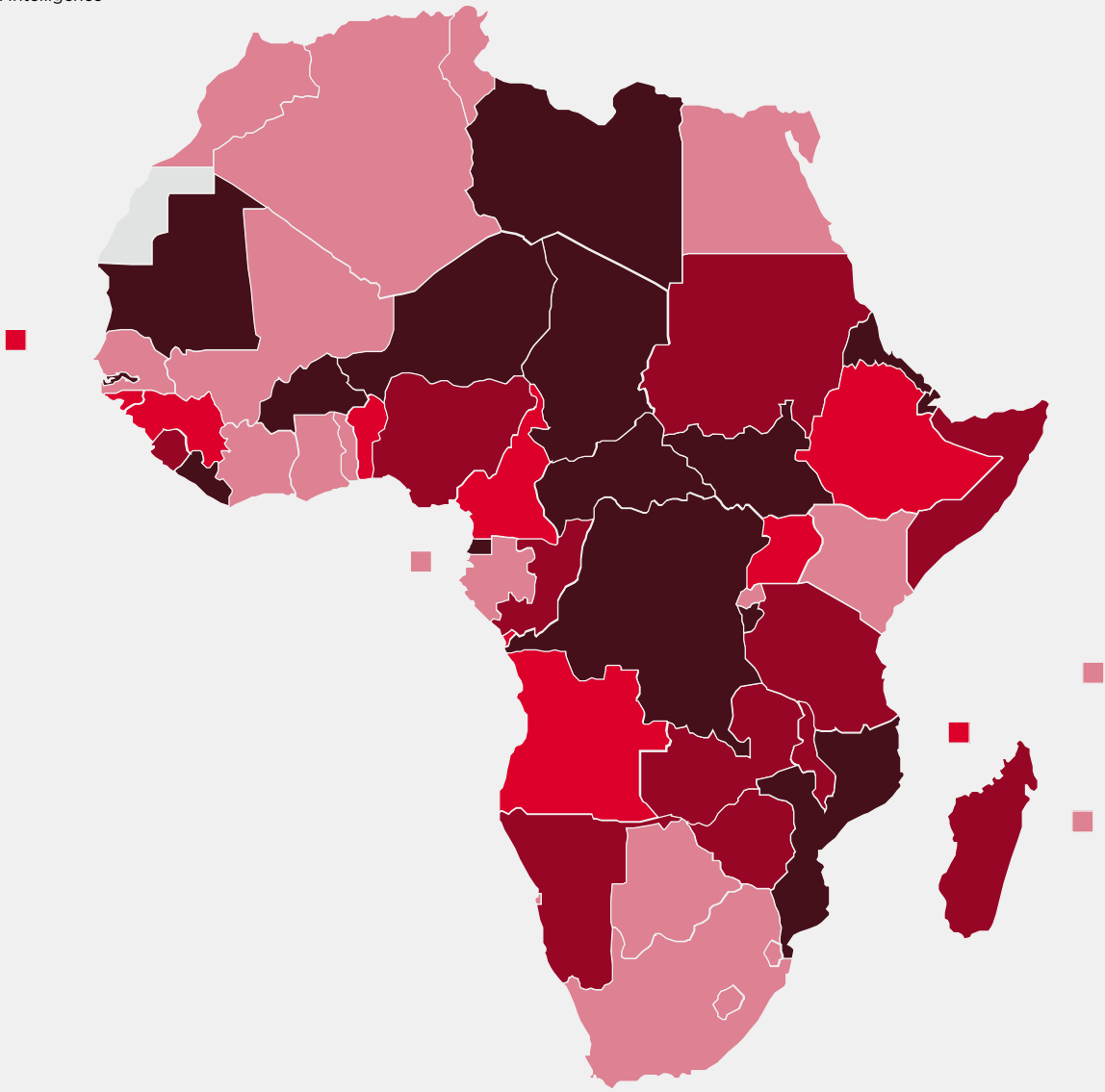
Figure A2

# Coverage gap

Percentage of population

Source: GSMA Intelligence

0-5% 6-10% 11-20% >20%



# A2

## Coverage and investment gap methodology

To model the investment gap for coverage in six countries, we leveraged the model developed in the study by the World Bank and GSMA.<sup>12</sup> Four countries were included in that study – Benin, Nigeria, DRC and Tanzania. In each country, we used geospatial techniques to carry out hyper-granular supply and demand analysis, leveraging data from the GSMA Mobile Coverage Maps<sup>13</sup> as well as data from household surveys, night-light imagery and geospatial population distributions. This allowed us to calculate, for each population settlement in a country, coverage by technology (2G, 3G, 4G) and the level of adoption for mobile and mobile internet services.

Based on this data, a model was developed to emulate the decision-making process of service providers when considering whether to invest in 2G/3G/4G network expansion. The model is focused on the ‘last mile’ of infrastructure, i.e. the mobile site that connects with the end user as well as the backhaul link that connects sites to the core network. Investments in the ‘first mile’ (e.g. international cables) and ‘middle mile’ (e.g. backbone, IXPs) are important in terms of increasing network capacity (especially in urban areas). However, based on the current and expected levels of data usage in rural areas across the six countries, service providers have sufficient last-mile network capacity to meet demand in uncovered areas. The most significant barriers are around coverage in the last mile.

The analysis was based on a net-present value (NPV) approach at the level of individual sites, where service providers decide whether to invest based on the expected revenues and the associated capital and operating costs from either upgrading an existing site (from 2G to 3G/4G) or deploying a new site (where no coverage exists). For each site, we assess profitability, considering the relevant country weighted average cost of capital (WACC) over a period of eight years. The ‘market frontier’ represents the aggregate number of sites that are profitable (with non-negative NPV), i.e. where supply (costs) is equal to demand (revenues). This gives the expected level of coverage that will be provided by the private sector.

The next step was to assess the impact of different policy levers on costs and/or adoption. This in turn can impact the profitability of new sites, which can then increase (or decrease) expected coverage and therefore change the market frontier. The policy reforms we consider in the study include the following:

- encouraging and enabling voluntary active infrastructure sharing in the radio access network
- removing sector-specific taxes on consumption, including mobile excise duties in DRC, Tanzania and Zambia
- removing import duties on network equipment (this does not apply to Tanzania and Zambia, which no longer apply such duties)
- reducing sector-specific taxes on service providers where these were significantly higher than regional benchmarks – for example, in Benin (where such taxes exceed 20% of recurring revenues) and Nigeria (where providers are subject to a number of local site taxes and fees).

<sup>12</sup> Using Geospatial Analysis to Overhaul Connectivity Policies, World Bank and GSMA, 2022

<sup>13</sup> [www.mobilecoveragemaps.com](http://www.mobilecoveragemaps.com)

Lastly, for sites that remain unprofitable even after policy reform, we calculated the level of additional investment needed to achieve near-universal access. There were then some remaining population segments where, given the high cost, alternative technology solutions are likely to be needed.

We did not have the same level of granular modelling for Mozambique and Zambia. For these countries, we modelled the expansion of coverage using data sourced from the European Commission's Joint Research Centre, which maps populations at a 1 km spatial resolution.<sup>14</sup> This dataset clusters population into rural and urban categories, which allowed us to model sites in rural areas. A hypothetical network was then built, with a mobile site placed at the centre of each rural population grid and each site ordered based on the number of people covered (i.e. the site covering the most people was assumed to be deployed first, followed by the site covering the next most people etc.). We then estimated the number of sites needed to achieve universal coverage, based on existing levels of 2G and mobile broadband coverage. Further details of this approach can be found in the 2023 GSMA study, *Connectivity Gaps in Latin America*, which modelled the investment gap for mobile broadband coverage using the same approach.

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<sup>14</sup> <https://ghsl.jrc.ec.europa.eu/datasets.php>



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