

FINANCING UNIVERSAL ACCESS TO DIGITAL TECHNOLOGIES AND SERVICES

GSR-21 DISCUSSION PAPER

(FOR COMMENTS BEFORE EDITING AND PUBLICATION)



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The views expressed in this paper are those of the author and do not necessarily reflect the opinions of ITU or its Membership.

Please send your comments on this paper at: gsr@itu.int by 30 June 2021

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1. EXECUTIVE SUMMARY

COVID-19 has led to unprecedented limitations on people's mobility, imposed by governments seeking to curb the spread of the airborne virus and to avert crises in unprepared health systems across the world. Following the varying levels of restrictions put in place globally at different periods throughout 2020 and into 2021, people have been forced to turn to e-learning, remote working, online shopping, and even virtual funerals. The pandemic has opened the door to the use of digital technology in ways never before imagined and has made real the meaning of the prefixes "e-", "remote," "virtual," "online," and "distance." During this time, digital technology has been crucial – for those with access. Perversely, while on one hand the crisis has led to the fast-tracking of digital adoption in countries that already had some level of digitalization, on the other it has exposed digital inequalities which are particularly large in less developed economies. Never has the impact of the digital divide been so glaring.

A sense of urgency was already felt as countries sought to meet fast approaching dates for meeting national broadband plan targets and digital transformation strategies linked to the global 2030 Sustainable Development Goals deadline. Now, with economies still battling the effects of COVID-19 and some still in the throes of second and third waves, many countries will seek to stimulate post-pandemic recovery through infrastructure investment. Past experience coming out of the 2008/9 global financial crisis has shown us that recovery will need to be facilitated by public investment (financial and non-financial). Governments will have to find ways to ensure economic growth and productivity through harnessing innovative business models and strategies that support the expansion of broadband networks as well as digital adoption, usage, and inclusion.

Over the last 20 years, just as the sector has evolved and become more central in people's lives, there have been significant shifts in the approach to funding universal access. These shifts have occurred in the broader development financing sphere, as well as specifically in the infrastructure space, and need to be carried through into the public broadband and digitalization funding mindset. Whether it is pooling financial resources, sharing open access infrastructure, or leveraging public money to raise private funds, the goal is to stretch limited financial and non-financial resources as far as possible. To that end, key trends include:

- a) Using a combination of monetary and non-monetary, or in-kind contributions, based on the needs of the project and the various strengths of collaborative financiers;
- b) Making smarter investments and thus a move away from "funding" (out of a moral imperative) to "financing", which is more commercially grounded and relates to making good investments, while contributing to socio-economic development;¹ and
- c) Collaboration between governments, commercial banks, development finance institutions, the private sector, and bilateral and multilateral donor organisations to meet funding gaps is increasing, including through "blended finance" or the

¹<https://www.undp.org/content/undp/en/home/blog/2017/7/13/What-kind-of-blender-do-we-need-to-finance-the-SDGs-.html>

strategic use of development finance to mobilise additional finance for sustainable development in developing countries.

[Part A](#) of this paper provides the context for the collaborative and high impact UA financing required to bridge the digital divide. It explains why broadband and digital transformation matter, i.e. for economic growth and inclusion; and explains that a key factor that deters investment is risk. There are several types of risks to be mitigated – governments have a key role to play in reducing macro-economic, political, and regulatory risk which will in turn reduce costs and increase investment. The priorities for financing are explored in [section 3](#), as are the potential funders for digital transformation. It is noted that there is a myriad of potential financiers of UA, and that public money should only be used where private capital does not intend to go, or where there will be a significant step change brought about by the injection of public money without distorting competition.

[Section 4](#) addresses the fact that the funding gap is not monolithic. It begins to look at what gaps exist from the “homework gap” and the “gender gap” to the “infrastructure gap,” and the challenges that the significant costs of closing them bring. It is acknowledged, however, that in the medium term, the most significant funding gap (in quantum) is that related to the deployment of broadband networks that support digitalization. Although the costs related to encouraging adoption, usage, and innovation are low relative to infrastructure deployment and maintenance costs, the risks associated with them are higher. Furthermore, all costs must be dealt with in parallel to create a people-centred and holistic user experience. Ultimately, this section of the report proposes that the fundamental funding policy and regulatory challenge is to make servicing rural and low-income areas and populations “worth” the risk for the private sector and other co-investors.

In [Part B](#), the financing toolkit is introduced. In this part of the report the principle of ‘blended finance’ to mobilise private investment is introduced. This is an important approach that carries through the rest of the report. Various funding instruments are discussed with a particular focus on Structural Funds, including the Universal Access and Service Funds (“Fund” or “USAF”). The Fund journey has been bumpy, so much so that in many countries it is time to rethink the concept and institution. [Sections 8](#) and [9](#) provide alternative models for Funds, including co-investing Funds and Funds of Funds. These models have achieved some level of success in addressing more high-risk financing, such as that in relation to SME development and accelerators. Elements from these models are proposed as well as a way forward for USAF2.0 as its scope extends beyond infrastructure to digital transformation. Of course, just as there is no single finance solution for UA, there is no single response to the question about the role and relevance of the 92 Funds currently operational across the world, nor is there a single model for any future USAF2.0. The answers will differ depending on the country context and each Fund’s historical performance which is informed by its legal and institutional framework, and administrative and operational capacity, in addition to a number of other factors that are explored.

In [Part C](#), the discussion turns to the non-financial mechanisms that are available to mitigate risk – regulatory and policy incentives. Collaboration, pooling, and leveraging are key themes – as much so for non-financial incentives as for financial approaches. To that end, this section suggests some policy and regulatory actions that can assist to encourage investment in infrastructure, and promote adoption, innovation, and

digital inclusion. They range from ‘dig once’ and ‘dig smart’ policies which address the infrastructure investment challenges, to regulatory sandboxes which can facilitate innovation. All of the regulatory measures in this section, including regulatory forbearance, are discussed as means of lowering costs and reducing risk – ultimately facilitating financing.

[Part D](#) addresses programs, projects, and practices. The business models for deploying various supply side and demand side projects and initiatives are the focus of this section. These range from traditional Private Public Partnerships (“PPPs”) on the supply side to bottom-up community-based wireless broadband models. On the demand side, the practices are wide ranging and address digital literacy gaps as well as gaps in adoption by individuals, households, strategic public institutions like schools and hospitals, and SMEs. This requires innovative thinking that shifts the focus from connecting people to networks to connecting people to people via networks.

In conclusion, this report emphasises that, given the various funding gaps, the myriad of funders and financiers, and the significant capital requirement – pooling, collaboration, and cooperation will be central to financing universal access to digital technologies and service. In addition to the infrastructure funding challenges for high-cost, low margin, rural and remote areas and underserved communities, there are additional funding requirements relating to facilitating people’s participation in the digital era, i.e. digital adoption, innovation, and digital inclusion. Ensuring the effective participation of vulnerable and marginalised communities, in particular, needs to be an intrinsic part of all universal access initiatives and projects. The economic cost of exclusion is higher than the cost of closing the infrastructure, affordability, gender, and other gaps that persist as the world becomes increasingly digitised.

PART A – THE UNIVERSAL ACCESS FINANCING CONTEXT

2. THE UNIVERSAL SERVICE IMPERATIVE: WHY IT MATTERS

2.1 Social Returns: It Matters for Inclusion

In 2020, the world experienced an almost overnight shift to a digital future that was not expected to arrive for at least another decade or so in many countries. Suddenly, students had to shift to distance learning, employees had to adapt to online meetings, and “non-essential” workers such as consultants, teachers, technicians, lawyers, and farmers had to figure out how to plough their trades virtually. COVID-19 found about half of the world unprepared for this shift. Needless to say, regardless of the region or country, the brunt of the problem has been borne disproportionately by people in rural and remote areas where there is no or insufficient connectivity. It has been experienced by the poor and people from already marginalised and vulnerable communities, such as women, the elderly, children, and persons with disabilities.

Globally, only 55 percent of households are connected to the internet. This is despite the fact that in 2020, about 85 percent of the world had 4G coverage. Europe’s internet penetration is 1.5 times the global average, while Africa lags the furthest behind with penetration being 6 times lower than the global average. This is despite the significant gains that have been made over the past 20 years in terms of the rolling out of mobile networks which are the main way in which people in developing countries achieve voice and broadband access. Virtually all urban areas in the world are covered by a mobile broadband network, but gaps subsist in rural areas. A rural woman in Africa is at least 4 times less likely to live in an area with 4G coverage than her counterpart in Europe, CIS, the Americas or Asia Pacific, which all have 100 percent urban 4G coverage.² However, even where networks are present, adoption in many countries is low – indicating that there are other gaps linked to gender, digital literacy, and relevant local content that are pervasive. In the current economic climate this is concerning, but more so when one considers that by 2022, 60 percent of global GDP will be digitised – deepening the impact of exclusion for those that are left out³.

At the current rate, developing countries are unlikely to meet the Broadband Commission for Sustainable Development’s targets of 65 percent broadband user penetration by 2025.⁴ This supports the need to urgently find innovative ways to close the gaps and find creative solutions to finance universal access.

² ITU Facts and Figures 2020

³<https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/02/Digital-Equity-Policy-Brief-W20-Japan.pdf>

⁴ <https://digitalregulation.org/access-for-all/>

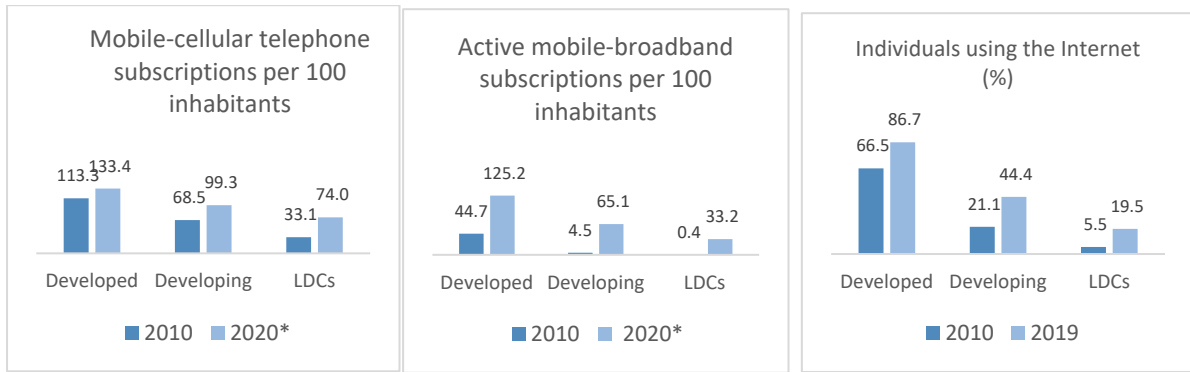


Figure 1: The evolution of ICTs over the past decade
 Source: ITU, estimates (2020).

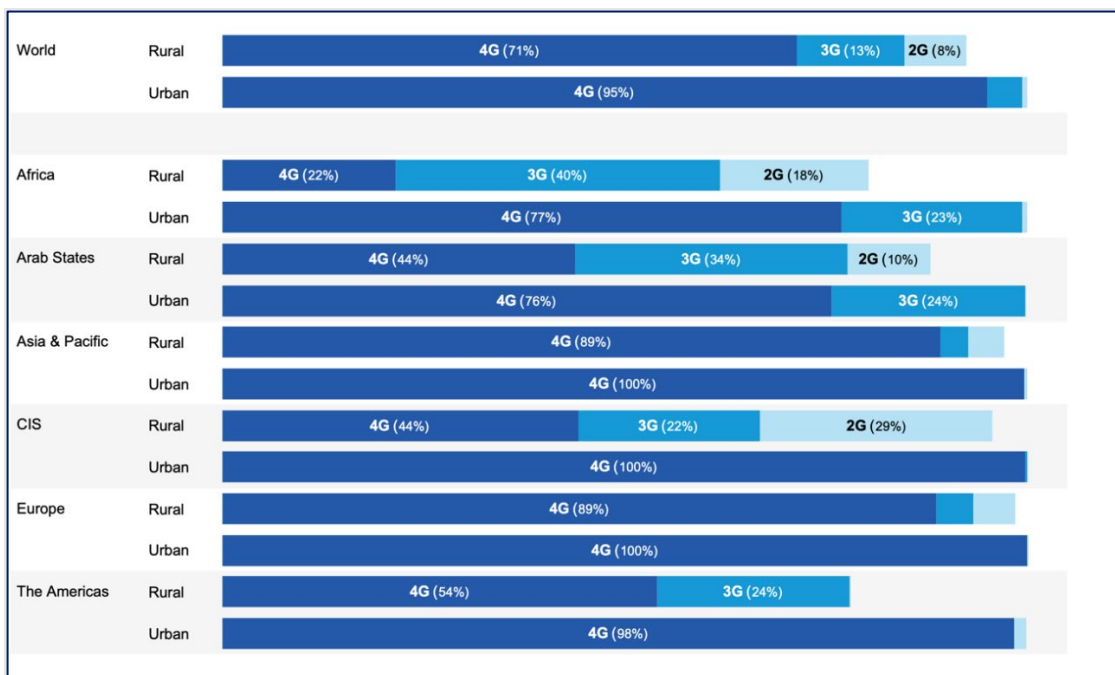


Figure 2: Rural/Urban Divides
 Source: ITU Estimate (Facts and Figures 2020)

2.2 Economic Returns: It Matters for Economic Growth

Economies of all sizes have contracted, and public debt levels have increased dramatically because of the COVID-19 crisis. As with all economic crises, the most recent being the global financial crisis in 2008, infrastructure investment is likely to be a key part of any stimulus or recovery packages. However, the difference between 2008 and today in technological terms is significant. Since then, technology has become more pervasive, and more economies are becoming digitised. Over the past two decades, there has been a change in the understanding of what constitutes universal access and service to ICTs, as broadband has been introduced, and it along with digitalization and digital transformation have emerged as factors that underpin the digital economy and digital society.

The use of digital technologies and digitised data enabling people interact with each other and increasingly with machines (M2M) and “things” (Internet of Things, IOT) is

extensive. Running on broadband, digitalization includes digital services infrastructure, connectivity, and digital transformation at individual, household, business, and government levels. Given the all-encompassing nature and effect of digitalization, universal access and service has to facilitate digital inclusion such that all people have the capability to use the internet to access the opportunities that it presents. This includes women, youth, the elderly, persons with disabilities, and other vulnerable and marginalised communities.

The magnitude of the impact of broadband on society and economies is reflected in the 2020/21 stimulus packages that have been put forward in response to the pandemic. Notably, many Least Developed Countries with smaller fiscal room have not been in a position to put in place aggressive spending plans to mitigate the COVID-19 shock. Accordingly to date, the spending plans of countries in sub-Saharan Africa represent on average 0.26 percent of GDP compared to the average of countries in Europe and Central Asia, and North America at 9 percent and 11.5 percent of GDP, respectively.⁵ By way of example:

- a) The Australian Treasury released its 2020–2021 budget, which calls for a record budget deficit and USD 218.1 billion in stimulus spending. The budget includes USD 3.3 billion in spending on broadband and 5G infrastructure in the Economic Recovery Plan for Australia.⁶
- b) The American Rescue Plan Act (2021) includes USD 7.1 billion in emergency connectivity funding for remote learning and USD 1 billion for the Technology Modernization Fund (TMF). In addition, the United States infrastructure plan announced this year includes USD 100 billion over 8 years to ensure that everyone in the country, especially the 35 percent of Americans in rural areas with no broadband access at all, are covered.⁷
- c) In Andorra, key above-the-line measures were put in place amounting to 2.6 percent of 2020 GDP (€65 million). The telecommunications and electricity public enterprises provided discounts on the monthly bills of firms that had to completely suspend activities or that experienced a significant decline in their business (€5.1 million, 0.2 percent of 2020 GDP), as well as the possibility of paying the bills in up to 12 monthly instalments. In November 2020, the government approved subsidies on electricity and telecommunication services to the businesses most affected by the pandemic that had already received the government's support for rent/mortgage payments as well as those businesses whose workers are under either temporal suspension of work contracts or short-time work arrangements.⁸

⁵ IMF COVID Policy Response Tracker: <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>

⁶ <https://budget.gov.au/2020-21/content/overview.htm>

⁷ <https://www.whitehouse.gov/briefing-room/legislation/2021/01/20/president-biden-announces-american-rescue-plan/>

⁸ <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>

- d) In Peru, the government approved S/ 3 billion (0.5 percent of GDP) to attend the COVID-19 health emergency and approximately S/ 7 billion (1.1 percent of GDP) in direct transfers to support vulnerable households during the national lockdown period. Under the second wave, the government launched a program to bring free internet to local and rural areas and close digital infrastructure gaps (*Todos Conectados*).⁹
- e) In December 2020, Scottish Government announced that as part of its support for economic recovery, an additional £11.8 million would go towards helping businesses to adopt digital technologies and improve their digital capability. Building on the success of existing digital support programmes, £10 million funding would be provided for financial incentives and expert advice to support businesses to invest in digital and continue their digital journey. The Data Lab, Scotland’s innovation centre for data and artificial intelligence.¹⁰

Stimulus as a Funding Mechanism

The \$1.9 trillion American Rescue Plan (“ARP”) includes provisions geared at covering the cost of broadband service and devices, broadband infrastructure deployment, broadband mapping and broadband adoption. The rules for use of these funds have not yet been distributed but, broadly¹¹:

- a) **The Emergency Connectivity Fund** (\$7.171 billion) – Reimburses schools and libraries for providing free broadband service (and connected devices) to students and patrons at their homes.
- b) **The Coronavirus Capital Projects Fund** (\$10 billion) – Funds to states, territories, and Tribal governments to carry out critical capital projects directly enabling work, education, and health monitoring, including remote options, in response to the pandemic. The funding could be limited to broadband and broadband adoption.
- c) **The Local Fiscal Recovery Fund** (\$350 billion) – Distribute funds to municipalities and counties, tribes, territories and states to keep first responders, frontline health workers, teachers, and other providers of vital services safely on the job as states, local governments, Tribes, and territories roll out vaccines and fight to rebuild Main Street economies. Digital inclusion is assumed to be an eligible use of funds.
- d) **The Homeowners Assistance Fund** (\$9.961 billion) – Grants to states to administer programs assisting homeowners with mortgage payments and related costs including internet service.

⁹ <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>

¹⁰ <https://www.gov.scot/news/harnessing-digital-for-economic-recovery/>

¹¹ <https://www.digitalinclusion.org/blog/2021/03/25/digital-equity-stimulus-funding/>

The approach of many economic recovery plans is to put public funds specifically behind extending high-speed broadband connectivity as the socio-economic impact of broadband on the economy is now well documented and recognised. Recently, the ITU modelled the impact of broadband relative to existing penetration and found that it affects developed and developing country economies differently:

- a) **The higher a country or region’s current fixed broadband penetration, the more significant the economic impact.** A 10-percentage point increase in fixed broadband would have a GDP impact of between 0,6 percent (Commonwealth of Independent States) and 2,9 percent (Europe, high income countries). It would have no impact on GDP in Africa or in low-income European countries¹²;
- b) Countries and regions with lower levels of economic development and lower relative mobile penetration experience a greater economic contribution of mobile broadband. A 10 percent increase in mobile broadband would have an impact on GDP of between about 0.5 percent (Asia and Pacific) and 2,5 percent (Africa). It would have no impact on GDP in high income European countries¹³.

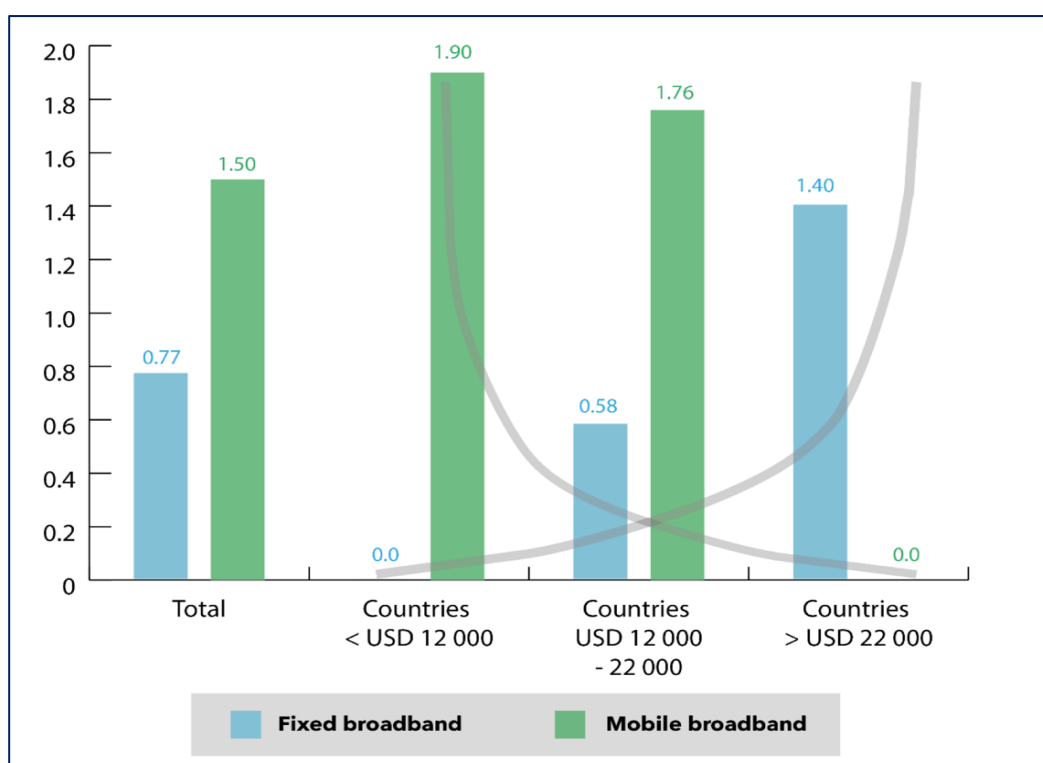


Figure 3: GDP growth impact of an increase in 10 percent of broadband penetration (in %), globally, by level of development, Source: ITU¹⁴

¹² https://www.itu.int/dms_pub/itu-d/opb/pref/D-PREF-EF.BDR-2020-PDF-E.pdf

¹³ https://www.itu.int/dms_pub/itu-d/opb/pref/D-PREF-EF.BDR-2020-PDF-E.pdf

¹⁴ https://www.itu.int/dms_pub/itu-d/opb/pref/D-PREF-EF.BDR-2020-PDF-E.pdf

Universal access in the digital era goes beyond extending networks – it is concerned with the *use* of those networks and frames broadband as a key enabler of digitalization. Digitalization is evidenced throughout society, whether it is in fintech applications that enable mobile money and mobile wallets so that anyone with a mobile phone can be ‘banked’, or e-health and online education services which have had a transformative effect and significant economic impact. On a global scale, the economic impact of digitalization is on par with that of mobile broadband, with a greater impact being felt by advanced economies. This makes sense as by 2016, the Digital Economy already represented USD 11.5 trillion, or 15.5 percent of global GDP – about 18 percent of GDP in developed economies and 10 percent in developing economies, on average. The digital economy had grown two and a half times faster than global GDP over the previous 15 years, almost doubling in size since 2000.¹⁵

As the ITU study shows, a 10 percent increase in digitisation results in an increase of 2.62 percent in total factor productivity, a primary driver of GDP¹⁶. Analysis Mason reports that a 1 percent increase in residential connectivity penetration in Sub-Saharan Africa should lead to 0.47 percent growth in the number of firms and enterprises connected to the Internet and should have higher productivity (10 percent higher in the services sector, 20 percent in information and 5 percent in manufacturing). According to Statista, the worldwide app economy will experience a CAGR of 37 percent, growing from USD1.3 trillion in 2016 to USD 6.3 trillion on 2021.¹⁷

Thus, on all levels, extending broadband networks, increasing digital access, and investing in broadband and digitalization makes economic sense. Public investment will play a key role in leveraging private capital and will also have positive economic consequences.

2.3 Financial Returns: It has to be “Worth” the Risk

Governments and Regulators can play a critical role in reducing political and regulatory risk, as well as macroeconomic risks, through creating enabled environments in the ICT sector as well as in vertical sectors like environmental affairs, transport, and finance. Reducing risk has the effect of lowering investment costs and thus funding needs.

A major barrier to closing the digital divide is funding, or lack thereof. This relates to funding of networks, as well as the financing of access where networks are present. Whereas network funding relates to infrastructure and connectivity, access funding is focused on the development of programmes and initiatives which enable people to understand and appreciate the value of being connected. These include initiatives relating to local content development, skills development and training.

¹⁶ https://www.itu.int/dms_pub/itu-d/opb/pref/D-PREF-EF.BDR-2020-PDF-E.pdf

¹⁷ <https://www.statista.com/statistics/267209/global-app-economy/>

The current 71 percent rural and 95 percent urban 4G coverage globally has been achieved mainly by private capital invested by mobile operators, tower companies, and ISPs. Despite this rosy picture at a global level, there are real gaps between regions and countries and both rural and urban coverage are disproportionately skewed towards developed countries. The gaps exist in areas that are considered commercially unviable because they are high cost and/or high risk at an infrastructure level. At an adoption level, low take up of service by communities is due to low income or lack of digital literacy thereby increasing risk due to uncertain returns. Put simply, low adoption means fewer customers, less traffic, and less revenue – despite high network investment. Given that risk is necessarily expensive, the public sector has to assume responsibility for identifying potential risks within its purview and find ways to incentivise private capital thus making achieving UA worth the risk.

While technical and operational risks are broadly in investors’ control, they are exposed to different levels of political and regulatory risk, and macro-economic and business risk when they invest in broadband and digitalization. These risks exist throughout the value chain and lifecycle of a project and may serve to limit funding or increase its cost in different ways depending on where in the project capital is injected. In infrastructure projects, the risk is highest at development phase when the costs are highest, at construction phase, operation phase, and exit or termination phase. To add complexity to the challenges, a single project may require several funding models over its lifecycle which can be up to 20 years.

Risk Categories	Development Phase	Construction Phase	Operation Phase	Termination Phase
Political and regulatory	Environmental review	Cancellation of permits	Change in tariff regulation	Contract duration
	Rise in pre-construction costs (longer permitting process)	Contract renegotiation		Decommission Asset transfer
	Currency convertibility			
	Change in taxation			
	Social acceptance			
	Change in regulatory or legal environment			
	Enforceability of contracts, collateral and security			
Macroeconomic and business	Prefunding	Default of counterparty		
	Financing availability		Refinancing risk	
			Liquidity	
			Volatility of demand/market risk	
	Inflation			
	Real interest rates			
Exchange rate fluctuation				
Technical	Governance and management of the project			Termination value different from expected
	Environmental			
	Project feasibility	Construction delays and cost overruns	Qualitative deficit of the physical structure/ service	
	Archaeological			
	Technology and obsolescence			
Force majeure				

Figure 4: Classification of risks linked to infrastructure Source: OECD

The risks related to initiatives targeted at stimulating service uptake (demand side) present themselves differently. They are closely linked to trust, or lack thereof, and inhibit users from taking up services and transacting online. They also run the risk of preventing service providers, intermediaries, and ISPs from offering services that they might not be paid for if demand is not confirmed, or for which be penalised if there is regulatory or legal uncertainty in the cybersecurity or electronic transactions regime, for example. Given the various elements involved in demand side and adoption projects, there is no single project lifecycle that can be referred to. However, these initiatives tend to be short term and high risk given the lack of market or business model precedence where innovation is involved, and the skills required for execution. Adoption stimulation projects are also often ‘too small’ for large investors, even though their impact in terms of innovation, job creation, and productivity might be significant. As is the case in supply side projects, risks associated with financing demand side projects can best be mitigated through enabling policies and strategies that engender trust both by and between government, businesses, and consumers.

3. PRIORITIES: CONNECTIVITY, ADOPTION AND INCLUSION

As discussed above, enabling policies, plans, and strategies are a risk mitigation tool in and of themselves. A clear policy and regulatory framework sets the tone for the sector and makes a critical contribution to investment decisions. This section explores the relationship between the policy framework and the critical decisions of what and how to fund.

3.1 Funding Follows Good Policy

Broadband and digitalization frameworks should include a visionary policy, a time-bound strategy, and clear and measurable plans supported by a budget to enable the achievement of the agreed broadband and digitalization goals. The challenge is to weave policy imperatives into financing decisions. On one hand, good policy will result in increased investment, as discussed above. On the other, it can be used to support public funding where, despite an enabling framework, private capital does not go. The linking of digital policy and strategy to funding is seen in the European Union (“EU”), where funding issued by the European Structural and Investment Funds (“ESI Funds”) requires that the beneficiary country meets ex ante conditions in order to qualify for financing. This standard, set at a national level, to access regional funding can be applied in principle when funds are expected to flow from national level, i.e. Funds, to projects. In this instance, policy can require that funding be compliant with specific regulatory conditions, such as those relating to open access and infrastructure sharing, is a condition of funding.

Case Study: EU ExACs – Linking Strategy, Policy and Regulation to Funding

The European Structural and Investment Funds (“ESI Funds”) support economic development and cohesion and rest on the presence of an enabling policy environment. All funding requires that ex ante conditionalities (“ExAC”) are met before funds may flow. General ExACs include requirements that:

- a) **Policy and strategic frameworks** must be in place to ensure that the strategic documents at national and regional level which underpin ESI Funds’ investments are of high quality and in line with commonly agreed standards;
- b) **Regulatory frameworks** must be clear to ensure that implementation of operations co-financed by ESI Funds complies with the EU legislative framework; and
- c) There must be sufficient administrative and institutional capacity.

The ex-ante conditionalities that apply specifically to universal broadband and digital growth investment in the EU are:

- a) **Digital Growth Strategy and Plans:** A strategic policy framework for digital growth should be in place to stimulate affordable, good quality and interoperable ICT-enabled private and public service and increase uptake. This includes uptake by citizens belonging to vulnerable groups, businesses and public administrations including cross border initiatives;
- b) **Next Generation Network (“NGN”) Infrastructure Strategy and Plans:** The existence of national or regional NGN Plans which take account of regional actions in order to reach the Union high-speed Internet access targets, focusing on areas where the market fails to provide an open infrastructure at an affordable cost and of a quality in line with the Union competition and State aid rules, and to provide accessible services to vulnerable group.¹⁸

EU Ex Ante Conditionalities

Digital Growth

- Strategic policy framework
- Good quality, interoperable, ICT enabled, private and public services
- Increase uptake by all - including vulnerable groups, business, and public administration
- Cross border initiatives

Next Generation Networks

- National and regional NGN plans which take into account regional actions
- Meet high speed internet access targets
- Focus on areas where markets fail to provide affordable, high quality, open infrastructure in line with competition and state aid rules
- Services accessible to vulnerable groups

¹⁸ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013R1303>

3.2 Funding Priorities

At a national level, funding priorities should be derived from the policy priorities. They furthermore are limited to the addressing the gaps identified in a given country due to insufficient funding through other sources. In the early 2000's when many Funds were established in law as a response to the critical need to finance UA, the priority was to rollout broadband infrastructure. Little consideration was given to demand side strategies in many countries and this gap flowed through into the public funding sphere. Currently, about 70 percent of operational Funds' legislation does not provide for funding of demand side initiatives.¹⁹

Broadly, priorities in the digital era can be split into four categories – funding and financing for (1) connectivity; (2) adoption and usage by individuals, strategic public institutions and SMEs; (3) research and innovation; and (4) digital inclusion which cuts across the other categories.

- (1) **Improve connectivity, digital networks, and access** – supply side strategies which focus on encouraging investment in the deployment of last mile and backbone network infrastructure, which is the main priority for enabling broadband access and the extension of networks. On a local level, it includes investment in data centres and local Internet Exchange Points (IXPs). These types of connectivity-based interventions will reduce costs, increase productivity for businesses, efficiency of public services and access to digital opportunities for all.
- (2) **Support adoption** to create an inclusive digital society and a digital economy – which benefits from digital opportunities, via financing of demand side interventions:
 - a) **Individual and strategic public institution support** which is necessary to increase demand. The focus is on investing in digital literacy, promoting uptake and usage. Historically, the financing of this gap has been left to government, academia, donor agencies, civil society and communities to address.
 - b) **Digitise and support industry and in particular SMEs** to ensure that businesses, SMEs, digital and non-tech industries can benefit from digital innovations to create a higher value chain and to scale up. Funding should be locally oriented and meet the needs of the community in terms of creating decent jobs and other opportunities. This will in turn boost investment.
 - c) **Digital literacy, skills development and relevant content development** will assist to increase uptake and usage of people where broadband networks has been deployed. Funding should be geared at projects that prioritise the promotion of the participation of women, children and other members of marginalised groups.

¹⁹ According to country responses to the ITU annual ICT regulatory survey, and reported on the ITU Eye, 2019

- (3) **Investment in research and development (R&D) and SMEs** to facilitate the development of innovative digital technologies. The SME funding gap is significant, with SMEs finding it difficult to raise finance for relative high risk, untested innovative business, despite the significant economic contribution they make. Furthermore, in terms of innovation, new technologies like drones, Internet of Things (IoT), machine to machine technologies, Artificial Intelligence, and augmented and virtual reality will require funding to make it past start up and into mainstream stages. Given that they too are 'untested', the availability of financial support to facilitate them may be limited. These new innovations are likely to be key fast tracking the achievement of SDGs in locally relevant ways.
- (4) **Digital Inclusion support**, ensuring that all finance provided includes requirements for the inclusion and promotion of participation of women, persons with disabilities, the elderly, and any other marginalised or vulnerable groups in society. This has also been the preserve of civil society and donor agencies, in the main.

The above priorities are indicative and should be informed by country-specific national priorities. National policy and institutional framework should always inform the utilisation of the various public funding instruments that exist in a country, whether they are sovereign funds, Universal Access and Service Funds, or other mechanisms. Overall, as described in this section, any positive impact from policy, regulatory and institutional reforms will translate into increases in capital spending and decreases in the need for public funding.

3.3 Beneficiaries

Beneficiaries of public funding have historically been operators and equipment providers who then used the funding and financing to deploy and run networks. In some cases, they have included individuals and public institutions such as schools and hospitals. They may have received subsidies via regulatory and fiscal incentives including vouchers, discounts, and schemes such as 'e-rates.'

Digitalization has brought about an extension in funding priorities, most notably an increased focus on digital adoption and the affordable and easy use of broadband networks. This has resulted in a focus on non-regulated and non-governmental priorities like SMEs, and on innovation. This results in a recasting of the potential beneficiaries of UA funding and financing on two levels. Digital UA beneficiaries:

- a) Are broadened to include SMEs, research institutions, and business accelerators which do not fall within the ICT sector regulatory framework, although they positively influence digitalization and digital uptake and usage; and
- b) May include financial intermediaries like private equity firms and venture capitalists who will then on-invest or co-invest with in the above (see Fund of Fund discussion in [section 8](#)). It can, however, be argued that these intermediaries are vehicles rather than beneficiaries since they will ultimately finance beneficiaries.

In all instances, the principle remains that the provision of public funding should be administered in a way that does not give an undue preference for a beneficiary of public funding over its competitors.

4. FUNDING GAPS

4.1 Overview

Estimating the cost of connecting the unconnected by 2030 is a mammoth task.

- a) On one hand, the ITU's Connecting Humanity Report (2020) estimates that USD 428 billion is needed to connect the 3 billion unconnected to the internet (aged 10 and above) by 2030. This bears in mind the fact that more than 12 percent of the unconnected live in remote, rural locations where traditional networks are not easily accessible.²⁰ As a result, a significant portion of the funding required is to finance CAPEX.
- b) On the other hand, according to Boston Consulting Group, it will cost five times as much (about USD 2.1 trillion) to merely halve the current connectivity gap and in so doing increase the percentage of high speed internet users from 53 percent to 80 percent by 2025. BCG suggests that this will translate to almost 100 percent use in high income countries, 80 percent use in middle income countries, and 70 percent in low income countries.²¹

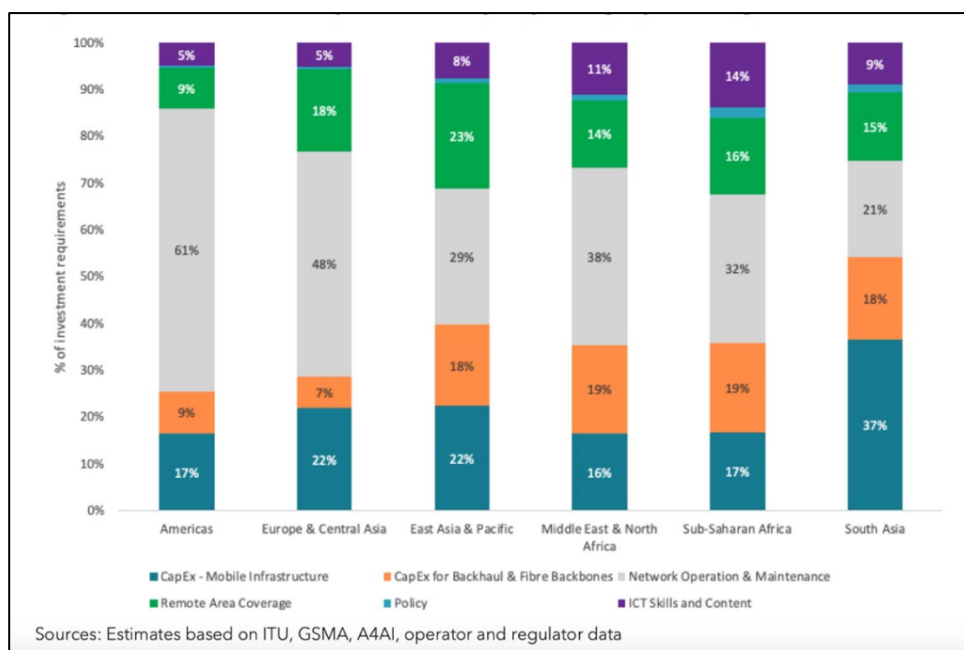


Figure 5: Investment requirement by region, Connecting Humanity Report²²

²⁰ https://www.itu.int/dms_pub/itu-d/opb/gen/D-GEN-INVEST.CON-2020-PDF-E.pdf

²¹ <https://www.bcg.com/publications/2020/plan-to-bring-high-speed-internet-access-to-two-billion-people>

²² Connecting Humanity: Assessing investment needs of connecting humanity to the Internet by 2030 (ITU, 2020) - https://www.itu.int/dms_pub/itu-d/opb/gen/D-GEN-INVEST.CON-2020-PDF-E.pdf

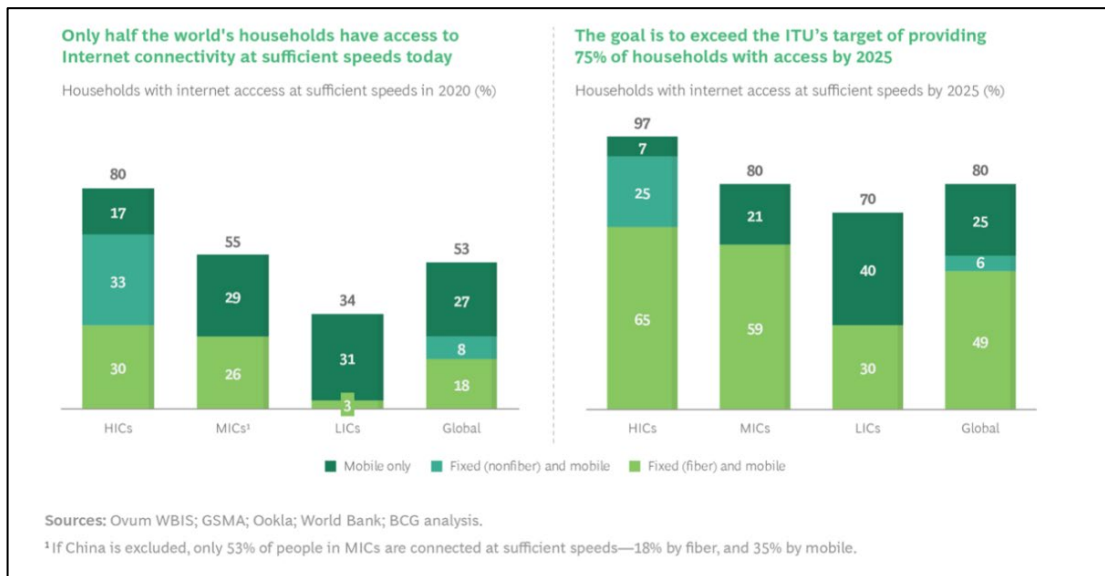


Figure 6: Narrowing the Global Divide by 2025²³

The reality is that there is no single digital divide that needs to be addressed, but rather a number of elements of gaps that contribute to the digital divide. It is important that countries identify and address the ‘sub-gaps’ recognising that they are interrelated. Gaps that have been identified in many jurisdictions include:

- Infrastructure gaps**, revealed through market gap analysis and mapping of infrastructure to reveal areas of limited coverage. BCG proposes that around USD 1.5 trillion will be required globally to rollout and operate infrastructure, with initial CAPEX accounting for about USD 0.5 trillion by 2025.²⁴ The gap between the available estimates is significant. However, it is clear that most of the capital will have to go to CAPEX in LDCs, and in rural and remote areas within a country. This will cover both backhaul and fibre backbone infrastructure and mobile infrastructure at the access level.
- Gaps in adoption**, uptake, and usage, evidenced by penetration rate. BCG suggests that driving adoption will require USD0.6 trillion globally over 5 years enabling 100 million households to adopt and use the internet where there is coverage;²⁵
- Skills gaps**, which need to be addressed through ICTs and digital literacy in the school programmes as well as targeted programmes for out of school and on the job learners. In Sub-Saharan Africa, it is estimated that over 230 million jobs will require digital skills by 2030, resulting in almost 650 million training opportunities according to the International Finance Corporation (“IFC”). It estimates that Sub-Saharan Africa has a USD130 billion investment opportunity in digital skilling through 2030.²⁶
- SME development and innovation gaps**. About half of formal SMEs do not have access to formal credit. They are forced to rely on internal funds or friends

²³ <https://www.bcg.com/publications/2020/plan-to-bring-high-speed-internet-access-to-two-billion-people>

²⁴ <https://www.bcg.com/publications/2020/plan-to-bring-high-speed-internet-access-to-two-billion-people>

²⁵ <https://www.bcg.com/publications/2020/plan-to-bring-high-speed-internet-access-to-two-billion-people>

²⁶ Digital Skills in Sub-Saharan Africa, Spotlight on Ghana:

https://www.ifc.org/wps/wcm/connect/38390d15-e30e-4d6e-b0d2-bb09f6146efa/Digital+Skills+Report_Flyer_5-22-19_web.pdf?MOD=AJPERES&CVID=mHwcBU8

- and family, to launch to start up their businesses. In emerging markets, approximately 131 million or 41% of formal SMEs have unmet financing needs.²⁷
- e) **“Homework gaps” or gaps in school connectivity.** As a result of COVID-19 school closures, 94 percent of learners across the world had to learn at home – not all of these learners had reliable internet access. The ITU-UNICEF led GIGA Initiative²⁸ which identifies the mapping of schools, school connectivity, access to digital public goods to ensure meaningful connectivity and the like will inform the school connectivity strategy in a country. It will also facilitate the calculation of school connectivity funding gaps. UNESCO’s e-school initiative is another example.
 - f) **Disability gaps,** which refer to how much less likely persons with disabilities are than non-disabled persons to own or use ICTs and digital technologies. Around 15 percent of the world’s population, or an estimated one billion people are persons with disabilities²⁹; and only one in 10 people have access to assistive technology that can improve their connectivity and quality of life.³⁰
 - g) **Gender gaps,** which lead to lower adoption and usage of ICTs and digital technologies by women, woman-owned SME participation, employment and digital literacy.

What the various estimates have in common is that the funding required for each of these gaps, as well as for achieving the SDGs holistically is significant and more than any single funding actor can handle. The investment requirements and the types of projects and initiatives to be funded vary from region to region as they are influenced by the type of network selected for implementation, the region’s population density, geography and topology, and the cost of labour and regulation in a country for infrastructure. The costs of closing demand side gaps are affected by different factors including literacy, availability of relevant local content, high device costs and SME development, amongst others.

4.2 Measuring the Infrastructure Gaps

The traditional universal access model that was applied primarily to the quantification of the extension of fixed, 2G and 3G networks, measures coverage and affordability. It identifies the market access gaps by determining what geographic areas and which communities are likely to remain unserved by commercial activity. It considers where private capital is, where private capital will go soon based on technical and financial plans provided to regulators (market efficiency gap), where a once-off subsidy is needed to spur private sector investment (smart subsidy zone), and where private capital is not likely to ever go and long term investment is needed (true access gaps).

While helpful in terms of identifying coverage and affordability gaps, the traditional market gap analysis model will not lead to the identification of all of the areas needing attention in a digital era. On one level, while it makes provision for a focus on future rollout due to information asymmetries between the regulator or USAF and the

²⁷ <https://digitalfrontiersinstitute.org/2020/10/06/promoting-digital-and-innovative-sme-financing/>

²⁸ Giga aims to connect every school to the internet, and every young person to information, choice and opportunity. Giga – Connect every school to the Internet (gigaconnect.org)

²⁹ World Health Organisation

³⁰ GSMA: https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2020/12/GSMA_Principles-for-driving-the-digital-inclusion-of-persons-with-disabilities_Final-accessible-file.pdf

operators, this analysis is often limited. In addition, it excludes consideration of gaps relating to more subjective areas of digital literacy, local content, and language. If anything, relying on traditional market gap analysis alone might further delay the urgent action required to address universal access in a holistic manner, particularly in developing countries.

Given the urgency of getting everyone connected, broadband access gaps have to pre-empt rollout to a greater extent in addition to the previous market gap analysis model. The 2009, EU Broadband Guidelines address this by following a colour-coded schema of areas that should be awarded funds and taking into account not only existing infrastructure but also operator's concrete forward looking investment plans to deploy such networks in the near future.³¹ In terms of the schema, areas with no broadband infrastructure are considered "white" and are more likely to receive aid, while "black" areas, with at least two or more broadband network providers, and "grey" areas, with just one, may find it harder to pass a state aid market test which seeks to limit market distortion (see *United States Infrastructure Funding Gap* below). In terms of updated guidance, grey areas would need to demonstrate a 'step change' to qualify for assistance, and funding in the more competitive black areas are exceptional as the risk of crowding out private funding in such areas is highest. Like traditional market gap analysis used in many developing countries, this analysis produces an evidence-based approach to identifying and quantifying the gaps in a way that takes into account operators' future rollout plans.

Regardless of technology choice – and the choices are many, from wireless broadband to fibre and satellite and beyond – infrastructure is a long term investment. Beyond the initial financial outlay required to build out networks, additional ongoing investments are required to maintain and upgrade infrastructure. Furthermore, particularly in developing countries, consideration needs to be given to the readiness of the community, and the locality of the region for broadband infrastructure. This includes the availability of electricity, which is a key dependency for broadband, the absence of which will increase the costs on deployment and delay its timeframes. With this in mind, policymakers should factor in the impact of upfront costs, even if they are indirectly related to broadband. This is in addition to considering the potential cost savings associated with various technologies when it comes to longevity of the build, extensions and upgrades.

³¹ The broadband State aid rules explained - an eGuide for Decision Makers , Wik Consult -:
https://ec.europa.eu/regional_policy/sources/conferences/state-aid/broadband_rulesexplained.pdf

United States Infrastructure Funding Gap

The estimated cost of closing the infrastructure gap in the United States is USD 80 billion. According to the US Federal Communications Commission (FCC) in 2017, the total upfront Capex required to deploy FTTP to the 14 percent of locations lacking access in the US would be about USD 80 billion but, because of the shape of the cost curve, about 98 percent coverage could be attained for USD 40 billion. The definition of “broadband internet” in the US includes a minimum download speed of 25 Mbps and an upload speed of 3 Mbps. In 2017 about 19 million Americans—roughly 6 percent of the population—did not have broadband access. The vast majority of those, roughly 14.5 million, were based in rural areas.³²

Closing the Infrastructure Gap in Africa

The cost of closing the infrastructure gap in Africa by 2030 is USD 100 billion. Nearly 1.1 billion new unique African users must be connected to achieve universal, affordable, and good quality broadband internet access by 2030 at a cost of about USD 100 billion over the next decade. Approximately USD90 million of that amount would be required to fund Sub Saharan Africa alone. Nearly 250,000 new 4G base stations and at least 250,000 kilometres of fibre across would have to be deployed across the region, alongside satellite and Wi-Fi based solutions to reach the nearly 100 million that live in remote areas that are currently out of reach of traditional cellular mobile networks. The assumption for this costing is that good quality broadband internet is an average download speed of at least 10 Mbps and is technology neutral.³³

From Last Mile to Edge

The world requires 428 billion dollars to close the digital gap from 2020 to 2030. Africa needs 100 billion dollars of that to provide connectivity. Africa will also need 500’000 kilometres of fibre over the next ten years. The approach to building this new architecture will be different to the last mile of the 20th century. The architecture of the last mile must consider the latest developments in Edge Cloud, and Edge compute. Edge server infrastructure and accessories will be more than five times bigger than hyper-scale public cloud. Therefore, the language of the last mile must transform to edge because of the 50 billion IoT devices to be connected to the new infrastructure. Funding this unique ecosystem will also be driven by blockchain hence the need for a different funding model.

Also, the Telco edge cloud or last mile will need to be decoupled from the traditional network. Regulators will need to liberalize the edge network because of the quantum and complexity of IoT devices and architecture that will cut across Agri, Health, Education, Manufacturing, Auto and many other sectors. The introduction of wifi6 is another compelling issue for deregulation. For example, funding connected cars will be different from the traditional model of funding the last mile. There must be a consideration for fractional ownership and tokenization models of the last mile. This means putting the ownership of the last mile on the blockchain to facilitate fractional ownership. This approach exposes the last mile asset to blockchain funds placed on initial Coin offerings (ICOs) and Security Token Offerings (SCOs).

³² FCC’s Broadband Progress Report: <https://www.fcc.gov/document/improving-nations-digital-infrastructure>

³³https://www.broadbandcommission.org/Documents/working-groups/DigitalMoonshotforAfrica_Report.pdf

The funding and financing of the last mile will benefit from a market-creation perspective that addresses non-consumption. Globally 3.7 billion people don't have internet access; in Africa, more than 700 million people lack stable and affordable electricity, and 258 million youths and adolescents are not in school. These digitally excluded populations are ready for Market creation. The exponential growth of the internet of things and the billions of devices connect to the internet point to the last mile of the digital era. The last mile represents the IoT proliferation on the Edge. Edge is the modern reconfigured last mile and a foundation for the next-generation internet. The last mile is changing from basic internet connectivity to a place of significant value add with new applications leading to the creation of new markets. The last mile is no longer just about traditional communication networks but about the emerging Edge ecosystem.

In framing the funding and financing of the last mile, it is clear the unit of analysis has shifted. Advances in technology make it possible to focus on Edge high-performance compute, storage, and network beyond human communication. This results in a lower cost of data transport, decreased latency, and local data compliance. The focus shifts from voice to enable next-generation applications of connected machines. This age of the internet and the internet of things provides new opportunities. Last-mile connectivity is a disruptive tool allowing access to products and services beyond human communication that were once out of reach.

The last mile is about unlocking markets with sustainable long-term impact. The last mile of the internet of things era is about unlocking and connecting education with Edtech, increasing yields for food security with Agritech, universal health with Healthtech, mitigating climate change with green energy microgrids and reducing Carbon dioxide emissions with connected auto. Enabling the Edge for all is redefining the last mile.

Furthermore, Edge computing and networking space has seen growing Open-Source projects to enable organizations to deploy edge applications at a fraction of the cost and limit the risks of vendor lock-in while facilitating standardization across the industry.

Source: Andile Ngcaba, Founding Partner & Chairman, Convergence Partners.

4.3 Measuring the Adoption Gaps

Estimating the cost of closing the multiple gaps that are linked to adoption and usage is complex. On the adoption side, the cost varies depending on the aspect of adoption and usage being addressed, i.e. digital literacy, skills development, affordability, or connectivity for strategic public institutions and SMEs. It is also dependant on the skills and capacity available in a country and the prevalence of relevant and local content. Given the various elements involved there is no single lifecycle for demand side interventions, however these initiatives tend to be short, “soft” and high risk.

Digital adoption will have different impacts on different players in the digital value chain. A key consequence of adoption is an increase in traffic which in turn will increase internet service providers' revenue and operator's average revenue per user (“ARPU”). The increase in traffic will put pressure on networks that will be required to have sufficient capacity to support more users – this could require additional investment.

Closing the Digital Literacy Gap in Africa

The Broadband Commission estimates that it would cost USD 18 billion to fund the digital literacy gap in Africa, i.e. the skills development and content development to enable the nearly 1.1 billion new unique users that must be connected to achieve universal, affordable, and good quality broadband internet access by 2030 in Africa ³⁴

5. WHO IS FUNDING BROADBAND AND DIGITAL TRANSACTIONS?

Broadband and digitalization funding is diverse. Just as the reach of the ICT sector has expanded, across sectors and throughout the economy, the investment landscape has changed and possibilities for potential sources of funding have also increased. Funding needs have extended beyond broadband infrastructure, and yet there is a distinct set of actors who have historically been focused on this area. Today, financiers include actors involved in supporting the attainment of broadband skills, digital literacy and innovation. As discussed in Part A, because digital transformation matters across sectors, the approach to funding digital universal access is making way for an interest in and a need for a collaborative approach.

5.1 Infrastructure Funding Actors

Infrastructure investors tend to be risk averse and long term. Traditionally the private sector – the fixed and wireless network operators, tower companies, ISPs, and sometimes equipment vendors – were the main funders of ICT infrastructure. Recently, this pool of financiers has been complemented by investors in data centres, digital platforms and content providers. The ICT policy framework in developing economies has focused on enabling private participation and has not specifically promoted the use of multilateral and bilateral donor and DFI funding to rollout infrastructure in the same way as the energy and transport sectors have. Compared to economic infrastructure sectors like energy (USD 12.1 billion), banking and financial services (USD 11.8 billion), the USD 600 million spent by Development Finance Institutions in 2017 /18 on financing ICT was minimal.³⁵ The spending by these institutions on ICT projects has historically been significantly less than other sectors, despite the central role that broadband plays in development and the alignment of broadband projects with their development mandates. As projects in the ICT sector become more complex and more expensive, and their impact becomes more pervasive, there is increasingly a need to further expand the investment pool and find new ways, including via blended finance which is discussed in [section 6](#), to leverage private capital in combination with public and development funding.

³⁴https://www.broadbandcommission.org/Documents/working-groups/DigitalMoonshotforAfrica_Report.pdf

³⁵OECD (2019). Amounts mobilised from the private sector by development finance interventions See: <https://issuu.com/oecd.publishing/docs/amounts-mobilised-from-the-private-sector-by-dev-fi>

In addition to the private sector, the potential actors in the infrastructure funding space include:

- a) Development financial institutions, such as the African Development Bank (“AfDB”), the European Investment Bank (“EIB”), the European Bank for Reconstruction and Development (“EBRD”), Asian Development Bank (“ADB”), the Inter-American Development Bank (“IDB”) and International Monetary Fund (“IMF”). DFI funding for infrastructure is often backed by developed countries and provides loan guarantees as direct financing or, in some cases, equity contribution to a project proven to benefit the development of underserved countries or region.³⁶
- b) Multilateral and bilateral agencies such as the International Telecommunication Union and the World Bank which can provide financial and in kind support to projects
- c) Similarly, global aid agencies such as those from the United States (“USAID”), Germany (“GIZ”), Canada (“CIDA”) and Sweden (“SIDA”) and bilateral DFIs like the French Proparco and Germany’s KfW can provide financial and in kind support to projects that meet developmental goals.
- d) Private-philanthropic investors, these include foundations, non-profits, impact investors with sub-commercial return expectations, etc.
- e) Banks and private-commercial investors including private equity firms, venture capital firms, and impact investors with commercial return expectations.
- f) Government can make contributions from the budget at national, regional and municipal levels, this includes financial support given through structured funds like Universal Service and Access Funds, which are financed by private sector contributions

New Actors in the ICT Funding Landscape

Impact Investment Funds, often used in social sectors such as education and health, combine financial returns with positive social, environmental and/or governance outcomes. Given the social impact of broadband and digitalization, these funds become relevant to this sector in the Digital Era. The sources of these funds vary greatly and can include any or all of governments and DFIs, foundations, pension funds and private sector, amongst others.

³⁶Submarine Cables: Structuring and Financing Options. Saliency White Paper. See: https://saliencyconsulting.ae/wp-content/uploads/2018/09/Submarine_Cables_Structuring_and_Financing_Options_Jan_2015.pdf)

5.2 Adoption and Innovation Funding Actors

Funders that are involved in the financing of initiatives and investments that contribute to the adoption of broadband and innovation tend to have a higher risk appetite and be more interested in returns in the short term. In addition to the funders mentioned above, key stakeholders that can play a role in financing adoption and innovation-related projects and initiatives include:

- a) Local content providers, data centre providers, telecom operators, and global digital platform providers whose core business relate to and depend upon elements of digital adoption, usage and inclusion;
- b) Private equity and venture capitalists, who seek to monetise “the next big idea” by investing in innovation and technically-oriented entrepreneurs primarily through incubation hubs and accelerators; and
- c) The government, academia, NGOs, and donor organisations interested in local content development, advancing the digital agenda, meeting the SDGs and creating jobs.

All of the actors in the digital value chain, can along with Universal Service and Access Funds and other structural funds, play an important role in increasing digital literacy, jump-starting the development of SMEs and promoting digital content ecosystems by investing in relevant, local business process and content to help build a user base large enough to reach the critical mass point and therefore decrease the need for funding.

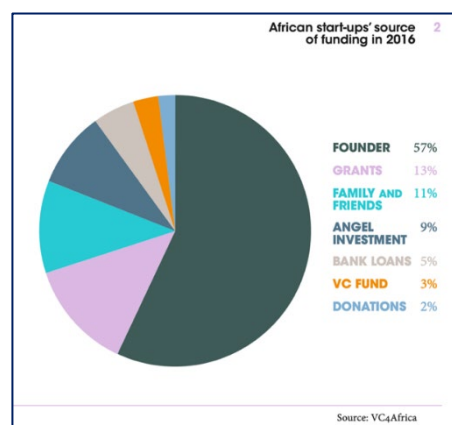
New Players in the SME and Innovation Game

Asset managers, pension funds, and private equity funds which participated in financing ICT infrastructure such as undersea cables and mobile networks, are now complemented by **venture capital funding**, which is ideal for higher risk, innovative start-ups. Venture capital is well suited to invest early when a company begins to commercialize its innovation but does not have the balance sheet to attract private equity investment. It fills the void between sources of funds for innovation (e.g. corporations, government bodies, and the entrepreneur’s friends and family) and traditional, lower-cost sources of capital available to ongoing concerns with solid balance sheets. The venture capitalist requires a sufficient return on capital to allow it to exit successfully by selling more mature companies on to private equity funds and other investors.³⁷

³⁷ <https://hbr.org/1998/11/how-venture-capital-works>

Venture Capital in Africa, 2016

Venture capital and angel investment represented only 12 percent of the total pool of funding invested across all African tech start-ups in 2016. Within FinTech specifically, the emerging markets pale in comparison to the rest of the world in terms of VC-backed capital. In 2016, although FinTech investments increased by deal value – over USD 13.8 billion was deployed to a variety of FinTech companies globally, more than double the value of VC investment in FinTech in 2014 – investment remained dominated by China, the US, and the UK. With the exception of India (with USD 272 million across 82 FinTech investments in 2016) and Brazil (with USD 161 million in value in 2016), the global proportion of VC supporting FinTech development across the rest of Africa, Asia, and Latin America is minimal.



Source: VC4Africa and The Mastercard Foundation Partnership for Finance in a Digital Africa : <https://www.financedigitalafrica.org/wp-content/uploads/2017/12/FiDA-Snapshot-11-What-ecosystem-improvements-will-unlock-investment-in-digital-finance.pdf>

5.3 Digital Inclusion: Key Actors

Too often, digital inclusion funding is lumped together with adoption funding as discussed in 5.2 above. However, inclusion funding has to cut across all initiatives relating to connectivity – from infrastructure to adoption and usage. Thus, the key actors for funding inclusion are not NGOs and donor organisations, but all financiers. This approach moves inclusion from being a peripheral issue to a mainstream one core to broadband rollout and digitalization.

Actor	Sweet Spot	Role in Blended Finance
Public and philanthropic donors	Medium risk, medium term Primary consideration of social and economic returns	<ul style="list-style-type: none"> a) Convene different stakeholders b) Provide grants for technical assistance to develop projects and make initiatives investable. Grants are especially important in riskier countries and less mature sectors. c) De-risk projects through the use of several de-risking instruments d) Advocate for the sustainable development agenda e) Increase sustainable development impact of investments
Private-philanthropic investors (Foundations, non-profits, impact investors with sub-commercial return expectations, etc.)	Short term, high risk Primary consideration of social and economic returns	Given their higher risk tolerance, are well positioned to experiment in projects, sectors, and/or geographies with high potential development impact and influence capital flow through demonstration as well as by taking subordinated positions

Actor	Sweet Spot	Role in Blended Finance
Development Finance Institutions	Long term, low risk Primary consideration of social and economic returns; financial returns also key	<ul style="list-style-type: none"> a) Signal the market about commerciality of certain investment opportunities through demonstration b) Provide large ticket sizes (compared to other public investors and private-philanthropic sources) c) Mitigate risks by taking risk layers, providing guarantees, etc. d) A critical intermediary to get institutional investors on board as they can meet the ticket size and risk-return expectations of institutional investors and get them on board
Private-commercial investors	<p>Private Equity – medium to long term, medium to low risk; Consideration of financial return on investment</p> <p>Venture Capital – short term, high risk; Consideration of financial return on investment</p> <p>Impact Investors – Medium to long term, medium to low risk; Consideration of financial return on investment as well as social and economic impact</p>	<ul style="list-style-type: none"> a) Hold the resources necessary to bridge the funding gap to achieve the SDGs b) Can manage a large spectrum of investments, from small venture stage to large size investment c) Play an important role in aggregation
Institutional investors, including pension funds and insurance	Long term, low risk Consideration of financial return on investment for institutional investors (sometimes by nature combined with socio-economic impact)	<ul style="list-style-type: none"> a) Have the resources necessary to bridge the funding gap to achieve the SDGs b) Due to large amount of capital held, have to deploy capital in large amounts, limiting their ability to invest in smaller propositions c) Focus on less risky sectors and countries due to low risk appetite
Banks (especially those based in emerging markets)	Long term, low risk Consideration of financial return on investment	<ul style="list-style-type: none"> a) Aggregating role at the national level b) Often small scale investments (or larger projects through scale syndicated loans) c) Focus on less risky sectors due to low risk appetite. Guarantee mechanisms in combination with technical assistance often effective to demonstrate new business models

PART B – THE FINANCING TOOLBOX

6. BLENDED FINANCE

6.1 Context

With the broad range of potential financiers discussed in Part A and the number and magnitude of connectivity, adoption, SME, innovation and inclusion gaps, it is necessary to find strategic ways to pool resources to increase the available funding to close the related funding gaps. Collaboration is the name of the game, and the complementary roles and mandates of the various finance actors facilitates this.

Blended finance allows organisations that have different objectives to collaborate and invest alongside each other while achieving their own financial and/or developmental objectives and is described by the World Economic Forum and the OECD as “the strategic use of (development finance and philanthropic) funds to mobilise private capital flows to emerging and frontier markets.” Overall, according to the OECD, between 2012 – 2018, the development finance sector mobilised about USD 205 billion from the private sector (across sectors) through issuing guarantees, syndicate loans, direct investment in companies, issuing credit lines and co-financing projects. The bulk of the private sector funding was raised on the back of guarantees (39 percent) followed by syndicated loans (18 percent) and direct investment (18 percent).³⁸

6.2 Blending as a Tool

As a structuring approach, blended finance is a tool in the financing toolbox. It is not a panacea. The IFC cautions that it has a very specific context and should only be used when the “public benefit of a project exceeds the returns to private investors”, usually because there are externalities, market failures, affordability constraints, or information deficiencies in the market that prevent dynamic development of the private sector.³⁹ Where blended finance is applied, it should seek to develop and encourage future sustainable commercial markets.⁴⁰ In this report, blended finance is presented as a tool. In addition, the principles of leveraging, mobilising, and catalysing that underpin it are elevated as they are considered valuable for financing universal access to broadband and digital technologies in general.

³⁸ <https://issuu.com/oecd.publishing/docs/amounts-mobilised-from-the-private-sector-by-dev-fi>

³⁹ <https://openknowledge.worldbank.org/bitstream/handle/10986/30377/125904-BRI-EMCompass-Note-51-BlendedFinance-April-13-PUBLIC.pdf?sequence=1&isAllowed=y>

⁴⁰ <https://openknowledge.worldbank.org/bitstream/handle/10986/30377/125904-BRI-EMCompass-Note-51-BlendedFinance-April-13-PUBLIC.pdf?sequence=1&isAllowed=y>

Good Practice Guidance

In funding broadband infrastructure, the public sector should ensure that the intervention meets three criteria ⁴¹

- a) **Leverage:** use of funds should be structured to attract private capital;
- b) **Impact:** investments should seek to drive social, environmental and economic progress and to meet the national targets and close universal access and SDG gaps; and
- c) **Returns:** financial returns for private investors should be in line with market expectations, based on real and perceived risks.

6.3 Blending for Additionality

The blended finance investment decision is not just about pooling resources, it has to demonstrate that there is an overall anticipated development impact, and that there is what the IFC describes as ‘additionality’ being introduced by the public, developmental and philanthropic funders, i.e. it is not substituting or crowding out private investment; to the contrary it should ‘crowd it in.’

Additionality is an important concept in blended finance. It refers to the extent to which development oriented public money leads to private investment which would not have otherwise been made were it not for public investment. Additionality could be financial, i.e. the provision of financing on terms not available from the market, including mobilisation; or non-financial, i.e. non-commercial risk mitigation, technical assistance and strengthening regulatory and policy environments.⁴² It looks at all forms of return so that in addition to meeting development goals, a project should also ensure financial returns for private investors that are in line with market expectations, based on real and perceived risks.

⁴¹http://www3.weforum.org/docs/WEF_Blended_Finance_A_Primer_Development_Finance_Philanthropic_Funders.pdf

⁴² <https://www.ifc.org/wps/wcm/connect/768bcbe9-f8e9-4d61-a179-54e5cc315424/202011-New-IFC-Discussion-Paper.pdf?MOD=AJPERES&CVID=no0db6M>

Financial Additionality	Non-Financial Additionality
<ul style="list-style-type: none"> • Financing structure: Providing terms that are necessary for the investment but are not readily available on the market. Due to their development mandate, higher risk tolerance, long-standing presence in emerging markets, DFIs can provide long tenor, extended grace period and denomination of loans in specific currencies. • Innovative financing structure and instruments: Providing innovative financing structures or instruments that may lower the cost of capital, mitigate commercial risks or bring other financial attributes not available from the market. • Resource mobilisation: Mobilising capital from commercial banks, institutional investors, private sources and (under certain conditions) other DFIs. Due to their syndication expertise, credit rating, convening power and privileges, DFIs are often able to mobilise these resources more effectively and efficiently. • Own-account equity: Provision of equity that addresses risk capital gaps faced by certain types of investors, enhances financial soundness of a project and/or credit-worthiness of the client. 	<ul style="list-style-type: none"> • Non-commercial risk mitigation: Providing comfort to clients and investors that political or regulatory risk are adequately mitigated. Non-commercial risk mitigation could be implicit (DFI lending its name and due diligence reputation to the project), or explicit (DFI providing non-commercial risk cover). • Policy, institutional, regulatory change: Triggering or supporting change in policy or regulatory frameworks to reduce sector risk or risk perceptions, improve capital flows and enhance sector development practices. • Knowledge, innovation and capacity building: Providing sector and market knowledge, expertise and innovation, as well as building public and private capabilities, that are essential for project design, risk mitigation and realization of expected development outcomes. • Standard setting: Raising environmental, social and governance standards applied by projects and clients.

Figure 7: Determining Additionality; Source IFC 202043

In conclusion, the principles of blended funding can be applied to the use of public funds, including USAFs, which have many of the same characteristics of development and philanthropic funds. The ultimate goal of the investment is the fulfilment of an element of the public interest, i.e. meeting social and economic objectives; and simultaneously unlocking commercial investment. This will result in sustainable investment. The concept of additionality and the attainment of the SDGs are at the core of this approach to finance. With this context, the paper turns to understanding what other tools are available to finance UA.

⁴³IFC (2020) The Why and How of Blended Finance. Recommendations to Strengthen the Rationale for and Efficient Use of Concessional Resources in Development Finance Institutions' (DFI) Operations (Discussion Paper) See: <https://www.ifc.org/wps/wcm/connect/768bcbe9-f8e9-4d61-a179-54e5cc315424/202011-New-IFC-Discussion-Paper.pdf?MOD=AJPERES&CVID=no0db6M>

7. FUNDING INSTRUMENTS

7.1 Overview

There are many flavours of funding that can be applied differently depending on the type of initiative or project. For example, projects addressing connectivity and pricing challenges will differ. They range from the state ownership at the most ‘intrusive’ level of public to regulation, incentives and in-kind support ([section 7](#)). In between these two extreme ends of the public funding spectrum are other mechanisms such as subsidies, guarantees, grants and loans issued through structured funds such as the USAF, sovereign funds and partnerships with development, multilateral and bilateral agencies.

Both debt and equity are used to overcome funding barriers for both low and high risk projects. The various financial products include established instruments such as bonds and notes, loans and micro-finance and SME finance, all of which have been used by public and private institutions and DFIs to finance ICT infrastructure, services and devices for decades. An effective funding mix in a country includes (1) risk mitigation mechanisms; (2) financial solutions; and (3) non-financial incentives discussed in [Part C](#).

Table 1: Financing Toolbox Overview

	Risk Mitigation Mechanisms	Financial Solutions
Objective	Reduced investment risk and link funds received to specific targets and outcomes.	Mobilise private finding from capital markets.
Principles	Results / outcomes based	Commercially driven
Established Instruments	<ul style="list-style-type: none"> a) Grants b) Subsidies (including UASF and State Aid) c) Guarantees d) Demand aggregation (advance market commitments) 	<ul style="list-style-type: none"> a) Bonds and Notes b) Infrastructure Bonds c) Loans d) Micro-finance e) SME finance f) Private Equity Funds
Next Generation Instruments	Social Impact Bonds	<ul style="list-style-type: none"> a) Digital Bonds b) Impact Investing Funds c) Venture Capital funds d) Fund of Funds

7.2 Risk Mitigation Mechanisms

7.2.1 Overview

The risk mitigation measures discussed in this section serve to reduce investment risk as well as to link funds received to specific targets and outcomes. [Section 2.3](#) discussed the risk associated with both infrastructure and adoption initiatives. Subsidies and guarantees are classic government-issued financial instruments that mitigate investor risk. In addition, governments may use demand aggregation to mitigate risk through, amongst others, availability payments and offtake agreements. Each of these instruments is discussed in this section.

7.2.2 Grants and Subsidies

Subsidies are government issued incentives, usually in the form of cash, grants or a targeted tax cut. They can be used at multiple stages in the investment process to either demonstrate a beneficiary's business case or reduce business model risk. For example, through digital literacy programmes or local content and platform development. They can also be used to improve the developmental impact of a project through funding. For example, the mainstreaming of a service such that it is relevant for persons with disabilities, women or other marginalised communities.

In the ICT sector, subsidies are intended to encourage network deployment or local manufacturing by businesses and increase affordability by individuals. Subsidies can be issued via structural funds such as USAFs, digital connectivity funds, and national development banks which enable a project to attract maximum private capital in conjunction with public funding. Importantly, modern subsidies can incentivise delivery in terms of how they are structured (in tranches) and how they are measured. In order for subsidies to be effective they must be outcomes based and linked to certain policy conditions such as the ExACs discussed in [section 3](#).

Case Study:

Structural Funds for Broadband Network Financing in French Guiana

Given specific geographic and demographic challenges, digital coverage is a challenge for the French Guiana regional authority (Collectivité Territoriale de Guyane, or CTG). The EU funded project for the design and installation of a local fibre optic infrastructure aimed to solve some of the broadband access issues the area.

Sharing Infrastructure

This project is characterised by infrastructure sharing to ensure the coherent deployment of digital infrastructure across French Guiana, as defined in its Territorial Road Map for Digital Development (Schéma Directeur Territorial d'Aménagement Numérique de La Réunion, or SDTAN). The new fibre optic network was designed to benefit:

- a) Municipalities;
- b) Public Wi-Fi connection points;
- c) Sites of economic interest (public authorities, business zones); and
- d) The future fibre to the home (FTTH) network.

Providing the Population with a Fibre Optic Connection

The first phase in the deployment of fibre optic infrastructure (FTTH) will enable operators to provide Saint-Laurent-du-Maroni with a high speed internet connection in the near future. This project involves the digging of 85km of trenches and the laying of 345 km of fibre optic cables.

Total Investment and European Funding

Total investment for the 'Design and Installation of a Local Fibre Optic Infrastructure' project is EUR 6 367 086; the European Regional Development Fund contribution is EUR 2 564 025 through the Guiana Regional Council Regional Operational Programme for the 2014-2020 programming period. The investment falls under the 'services and applications for citizens' and 'urban areas' priorities.

Source: https://ec.europa.eu/regional_policy/en/projects/france/lamenagement-numerique-de-louest-guyanais

7.2.3 Guarantees

Risk mitigation instruments include guarantees and insurance which do not comprise direct financing, but protect financiers against regulatory, liquidity and sometimes technology risks. This makes it possible for them to get commercial finance at a lower cost. Guarantees and insurance protect the investor if the borrower defaults and therefore mitigates risk. There are several flavours of guarantee that can be considered:

- a) **Minimum revenue guarantees** where there is the possibility of commercial viability, however demand is uncertain. This would apply for guaranteeing rollout in areas where the market gap arises due to uncertainty about the volumes of traffic. However, this needs to be approached with caution as governments providing guarantees do not want to do so at the expense of quality of service since the customers and revenue are guaranteed.
- b) **User subsidies may also be considered as a form of guarantee** in order to increase demand and in so doing increase revenues, subsidies can be provided to categories of vulnerable users ideally via a Universal Service and Access Fund or other well established public sector scheme.

Some of the disadvantages of guarantees and insurance are that:

- a) They are not ideal for rural and remote areas where the level of commercial viability is likely to be too low for guarantees to be used;
- b) There is a significant amount of risk that is transferred to the guarantor, which is the public financing agency, however the guarantor has limited ability to control the risks;
- c) There may be an impact of broader fiscal debt; and
- d) The guarantee is tailored to each project and therefore the transaction costs can be high.

7.2.4 Demand Aggregation (Advance Market Commitments)

Demand aggregation mitigates risk by giving investors the comfort that there will be users (and revenue) for their networks or takers for their services and devices. This can be done through availability payments, offtake agreements, and other contractual mechanisms.

In Private Public Partnerships (see section 17.2 on business models), availability payments are made for performance, irrespective of demand. Governments can use these where there is no predictable direct revenue, for example in low income areas. They can also be used in scenarios where end users do not pay for the use of public facilities via a user fee, but rather via a broader tax pool.⁴⁴ Public Wi-Fi or aggregated government demand to service schools or e-government initiatives, are such instances, where the service is generally available to users who may not pay directly for the service.

⁴⁴<https://www.oecd.org/finance/private-pensions/Infrastructure-Financing-Instruments-and-Incentives.pdf>

In this case, public funds are used to pay the private partner for the provision, maintenance and operation of the network and services. This may be complemented by fees paid by the public entity to ensure the delivery of broadband.⁴⁵ Another type of structure is offtake agreements which allow the private sector to invest on the back of a commitment to supply a minimum amount of capacity at a pre-agreed price. This guarantees a certain amount of revenue upfront.

7.3 Creative Financial Solutions

Financial products, like the sector itself, have evolved over the years. Some key developments that demonstrate how technology is influencing the finance sector for the benefit of the ICT and other sectors are highlighted hereunder. Using technology enabled solutions facilitate the funding instruments already discussed in this section and adds a technology twist to them, reduces the cost of financing and speeds up the pace of the transaction. Speeding up the transaction time is important as financing processes can be lengthy and therefore expensive:

- a) **Infrastructure bonds**, secured or services by the cash-flows of a project are used to raise debt. The lifecycle of bonds – from the time that they are issued to the settlement – has now been sped up through the emergence of digital bonds which apply distributed ledger technology, artificial intelligence/machine learning, big data analytics and cloud computing.⁴⁶ Digital bond issuances, such as the recently announced 100m euro 2-year bond European Investment Bank digital bond (see the *UNICEF Cryptocurrency Fund announces its largest investment in start-ups in developing and emerging economies case study* below) make finance available at a faster pace. Additionally, a high profile digital bond such as this may pave the way for market players to adopt blockchain technology for the issuance of financial securities.
- b) **Crowdfunding** can include equity and non-equity funding, for businesses as well as for projects and causes. Crowdfunding feeds off of momentum which can be generated by (1) the project, cause or business or (2) the reputation of investors that have already committed to the transaction. It also can lead to relatively fast securing of finance at a low cost.
- c) **Bitcoin and cryptocurrencies** are starting to be used for development financing. In this context organisations and funders can use a decentralised impact exchange to create verified impact claims, essentially “proof of impact.” This proof can be used to access social impact bonds and government subsidies. The data from these impact claims becomes a part of a global impact ledger, governments, and researchers can access to make informed decisions and optimise impact initiatives.⁴⁷

⁴⁵ <https://www.oecd.org/finance/private-pensions/Infrastructure-Financing-Instruments-and-Incentives.pdf>

⁴⁶ <https://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/fintech/new-fintech-applications-in-bond-markets/>

⁴⁷ <https://jbba.scholasticahq.com/post/106-crypto-philanthropy-new-financing-for-social-impact>

UNICEF Cryptocurrency Fund announces its largest investment in start-ups in developing and emerging economies⁴⁸

UNICEF reported that it is “seeing the digital world come at us more quickly than we could have imagined – and UNICEF must be able to use all of the tools of this new world to help children today and tomorrow...The transfer of these funds – to eight companies in seven countries around the world – took less than 20 minutes and cost us less than USD 20. Almost instant global movement of value, fees of less than 0.00009 percent of the total amount transferred, and real-time transparency for our donors and supporters are the types of tools we are excited about.”

The beneficiaries included technology related projects selected from almost 40 start-ups that graduated from the UNICEF Innovation Fund. They went through technical evaluations, quality assessments of their open-source tech solutions, evidence of impact and more:

- a) Afinidata (Guatemala) is further developing its AI-based app to provide parents with personalized early childhood educational activities.
- b) Avyantra (India) is expanding the functionality of its health app which uses data science to support frontline health workers in the early diagnosis of neonatal sepsis.
- c) Cireha (Argentina) is scaling the reach of its accessible app in three countries to help more children with speech impairments communicate using symbols.
- d) OS City (Mexico) is issuing blockchain-based government assets, heading towards issuing 1,000 blockchain IDs to allocate children’s educational diplomas.
- e) Somleng (Cambodia) is scaling its low-cost Interactive Voice Response platform by partnering with the Government of Cambodia to send vital information about COVID-19.
- f) Utopic (Chile) is transitioning its learning game from VR to WebVR and empowering educators to assess, track, and help improve children’s reading skills from their homes during COVID-19 containment measures and beyond.

Source: UNICEF press release, June 2020

⁴⁸ <https://www.unicef.org/press-releases/unicef-cryptocurrency-fund-announces-its-largest-investment-startups-developing-and>

First digital bond on a public blockchain launched by the European Investment Bank in a multibank collaborative effort⁴⁹

On 27 April 2021, the European Investment Bank (EIB) launched a digital bond issuance using blockchain deploying distributed ledger technology for the registration and settlement of digital bonds. This was done in collaboration with Goldman Sachs, Santander and Société Générale. In partnership with Banque de France, the payment of the issue monies from the underwriters to the EIB has been represented on the blockchain in the form of CBDC. The EUR 100m 2-year bond, placed with key market investors, represents the market’s first multi-dealer led, primary issuance of digitally native tokens using public blockchain technology.

Source: European Investment Bank press release, April 2021

8. STRUCTURAL FUNDS

	Structural Funds
Objective	To facilitate the attainment of national goals and targets
Principles	Transparent application
Established Instruments	<ul style="list-style-type: none"> a) Subsidies b) Grants c) Guarantees d) Loans
Next Generation Instruments	<ul style="list-style-type: none"> a) USAF2.0 b) Fund of Funds c) Co-investment

8.1 Introduction to Structural Funds

Structural funds are financial tools set up to implement national (Uganda, Peru, Chile, Hong Kong) and regional (European Structural and Investment Funds (ESI Funds)) policies. USAFs are common ICT specific structural funds, especially in developing countries. They aim to ‘close gaps’ and reduce geographic, income, gender and other structural disparities in a given society. Given these objectives, the bulk of structural funds’ financing tends to be directed a rural and remote areas or to low income, vulnerable and marginalised communities. The use of structural funds requires that there be a delicate balance between the use of public money in areas where market failure has been identified, and the crowding out of investment.

⁴⁹ <https://www.eib.org/en/press/all/2021-141-european-investment-bank-eib-issues-its-first-ever-digital-bond-on-a-public-blockchain>

Structural funds can provide support through a range of funding instruments including subsidies, grants and loans to ensure that no one is left behind. Some may soon follow the EIB model of using innovative instruments like crypto-currencies and digital bonds for development funding.

As the costs of funding UA to broadband and digital technologies and services has increased, and as the actors involved in the funding landscape become more in number and type, there is a need to consider ways in which structural funds can be strengthened and positioned for partnerships. This section looks at established models, i.e. Co-Investment Funds and Fund of Funds, that may provide lessons for USAFs in particular as they reform to keep up with sector development and financing trends such as blended financing.

8.2 National, Regional and Community Level Intervention: USAFs

Funded primarily through levies imposed on operators as part of “pay” strategies in the traditional universal service funding “pay or play” equation, USAF’s have been set up in some markets as one of the mechanisms to finance the closing of the gaps between rural and urban areas, the rich and the poor and men and women, amongst and within countries. Funds seek to stimulate investment by private sector through subsidies, grants, loans and other funding instruments.

The concept of the Fund has been embraced in about half of the world (100 countries). Most of the established Funds (67) are relatively mature in that they were already established and operational by 2010. Today, Africa (35), Americas (22), and Asia Pacific (22) have the highest number of Funds.

Overall, there has been a growth in the number of operational Funds, with most of these being in Africa and Latin America; however, in the Arab States, Asia Pacific and CIS, the number of operational Funds declined between 2015 and 2019. In Europe, there are a number of funds that have been established which play in digital markets – some niche and some general. These include funds supporting digitalization of vertical sectors like agriculture and health, and other structural funds supporting regional connectivity such as the European Structural Investment Funds. Others support adoption by SMEs and entrepreneurs.

The performance of Funds has been mixed, with many being criticised for over-collection or underutilisation. In addition, notwithstanding the effectiveness of any given Fund, the ICT and digital landscape has changed drastically over the last 20 years necessitating a review of individual Funds as well as the Fund strategy. [Section 9](#) discusses USAF2.0 which is a strengthened more effective Fund that benefits from the lessons of first-generation Fund experiences of the last two decades, as well as other types of structural funds such as those discussed in the remainder of this section.

8.3 Regional Level Intervention: State Aid and ESI Funds

There are seven European Structural and Investment Funds (ESI Funds, ESIFs), with one being particularly relevant for the purposes of this analysis. Under the Cohesion Policy the European Regional Development Fund (ERDF) is a fund whose priorities are divided into the thematic areas of (1) innovation and research, (2) the digital

agenda, (3) support for SMEs and (4) the local carbon economy. Notably, unlike USAFs, the ERDF is not sector specific, although it does have thematic areas. The ERDF has a Managing Authority, which in the EU context, is akin to a USAF. The Managing Authority may be a national ministry, a regional authority, a local council, or another public or private body that has been nominated and approved by a Member State.⁵⁰ ESI Funds have to be aligned with State Aid rules which require that any public financing does not serve to distort competition.

8.4 Funds for Innovation

8.4.1 Overview

With the need to fund beyond networks, it is important to have an understanding of government back Fund models that are applied for encouraging skills development, growth and innovation, a role USAFs will have to consider going forward given digitalization and its economic and social impact.

These models appear to be complementary to traditional USAF models, with lessons that can be learned for future application especially where the mandate and scope of the Fund change to acknowledge digitalization. Two types of funds for consideration to inform reformed Funds are: (1) co-investment funds; and (2) Fund of Funds. Importantly while these funds design programmes, their main objective is to improve access to funding. They are key because they:

- a) Pool resources and tap into the funds of a number of public and private actors;
- b) Lean on private sector expertise in fund management and administration, addressing a weakness of many USAFs;
- c) Rely on the sector expertise of the Funds and their role as intermediaries; and
- d) Focus on SME development, R&D and innovation funding .

These funds recognised that there is mutual benefit that can be derived from working with other funders and financiers to invest in certain transactions. They therefore have as a key characteristic co-invested and the pooling of resources.⁵¹ These principles apply in commercial transactions and are carried through to public and developmental funding with the objective of deriving impact and leveraging private investment in the cases of the Republic of Korea and New Zealand which have turned to collaborative approaches including structural funds established by the government to support market reform, economic growth, employment, investment and structural change in the ICT and related sectors.

⁵⁰ https://ec.europa.eu/regional_policy/en/policy/what/glossary/m/managing-authority

⁵¹ <https://www.nortonrosefulbright.com/en/knowledge/publications/12c81c8a/private-equity-funds-and-co-investment>

8.4.2 Co-investment / Risk Sharing Funds

Co-investment funds use public money to match private investment. Typically these Funds focus on seed funding and work by matching public funds with those of approved private investors, increasing the funding pool. They furthermore, like the publicly funded European Investment Fund, provide finance using a number of finance instruments (loans, guarantees, etc) via private funds and banks. Co-investment in this case is seen not only as a way to leverage private money, but also a driver in building, growing and professionalising the seed and early stage investment market by providing a more structured investment process.⁵²

The New Zealand Seed Co-investment Fund (SCIF) was set up to support the development of the angel equity finance market and creating more innovative, knowledge-intensive, high value firms and start-ups to grow and scale within New Zealand. The role of the Fund is to intermediate funds between investors and technology-based start-ups, increasing the depth of specialist skills needed to assess and manage early stage investments, increasing the scale and enhancing networks for early stage investment, catalysing investments that would not have been made without the programme, minimising fiscal risk and covering costs.⁵³

In another case, the European Investment Fund (Fund Manager) is a PPP Fund with the European Investment Bank (61.4 percent), the EU (31 percent) and private investors (7.6 percent) as shareholders. The private investors are financial institutions. Co-investments are based on market terms and conditions. A recent example is the AI Co-Investment Facility established in 2020 in response to a gap identified in Europe's artificial intelligence sector which has shown potential but has a substantial funding gap.⁵⁴

⁵²

https://www.researchgate.net/publication/271964857_Policies_for_Seed_and_Early_Stage_Finance_FINDINGS_FROM_THE_2012_OECD_FINANCING_QUESTIONNAIRE/download

⁵³ <https://www.nzgcp.co.nz/assets/Media/Pressrelease-SCIF-Nov19.pdf>

⁵⁴ http://www.eif.europa.eu/who_we_are/shareholder/index.htm

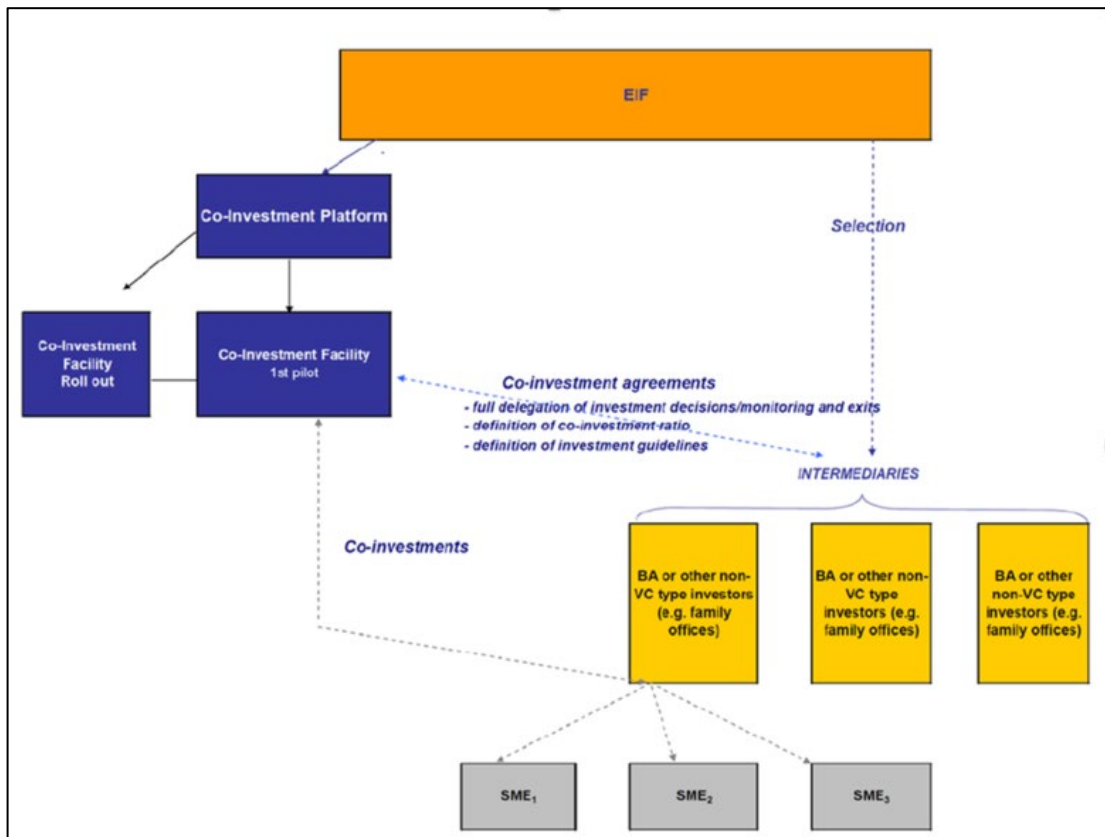


Figure 8: Co-investment Fund model (European Investment Fund Xase) ⁵⁵

8.4.3 Fund of Funds

A Fund of Funds is a pooled fund that invests in other funds. Financing of a micro-finance institutions could also be a fund of funds. A fund of funds model used by private equity firms, this could be an instructive approach for financing development projects. A government-backed Fund of Funds can adopt the strategy of investing in a private funds that make the actual investment decisions in order to achieve broad diversification and asset allocation where investors can get broader exposure with reduced risks in relation to, amongst others, inflation and counterparty risk, compared to investing directly in projects. Eligible private funds must prove their capability and that they are able to attract a certain minimum amount from the private sector before they get support from the Fund of Funds. ⁵⁶

This approach was mooted in New Zealand, and a good practical example is the Korea Fund of Funds which combines the interests of different government agencies with distinct policy objectives. The Korean government in 2005 pooled all of funds in the country that support an aspect of SME development into a single vehicle (the Fund of Funds). There is now a single Fund of Funds which has 5 funding streams focussing on SMEs, cultural content industries, film, broadcasting and telecommunications and IP/patents. The Fund of Funds then invests in venture capital funds, experts in their field, who invest directly in SMEs. The basis of the concept is the use of public funds to mobilise private capital which can then be invested in SMEs. The alternative would

⁵⁵ https://www.researchgate.net/figure/Structure-of-Koreas-Fund-of-Funds_fig4_271964857

⁵⁶ <https://www.treasury.govt.nz/sites/default/files/2019-08/deepening-early-stage-capital-markets-dev-18-sub-0316-4163334.p>

be for each of the separate funds, with varying levels of expertise, funding and risk appetite, to provide loans or guarantees to SME beneficiaries. In this case, fund management is handled by a specialist fund manager (KVIC) that, keeping the commitments of each agency in separate accounts, co-invests in the creation of new funds, each of which meet the terms initially set by the corresponding government agency. Within that framework there is flexibility to provide the right incentives for the private sector to participate. Additionally the Fund of Funds model, with investors from a number of sectors from health to education to labour and even the regulator, the Korea Communications Commission, lends itself to a holistic, whole of government approach to financing projects and economic impact.

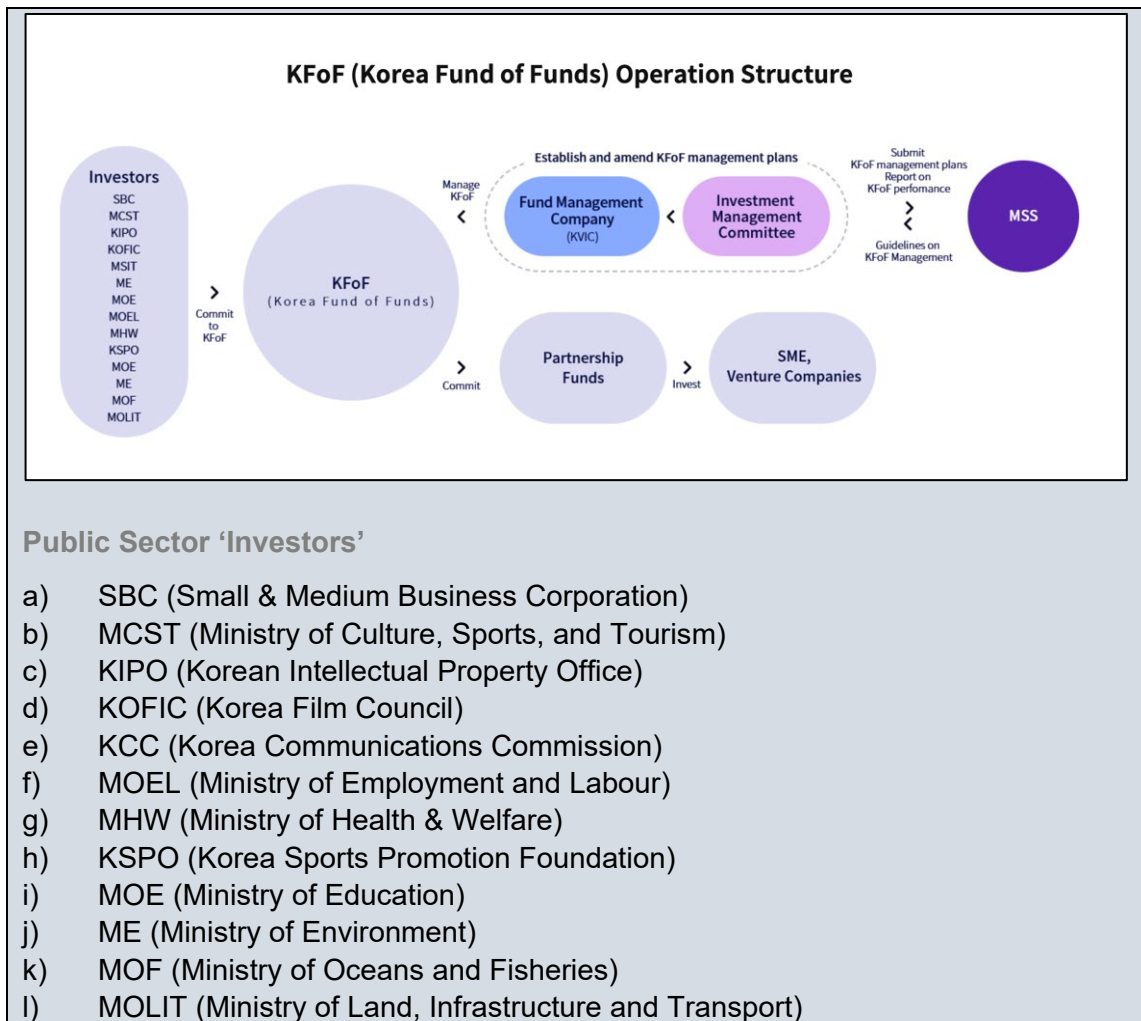


Figure 9: Structure of Korea's Fund of Funds⁵⁷

⁵⁷ https://www.researchgate.net/figure/Structure-of-Koreas-Fund-of-Funds_fig4_271964857

Structural Fund Models across the Digital Value Chain				
	State Aid and Regional Funds	USAF	Co-Investment Fund	Fund of Funds
At a principle level, these funds have many similarities:				
a) Funding provided should not have the effect of distorting the market. b) Funding should be transparent and accountable c) Annual audit reports should be published d) Eligibility requirements should be clear and available for all to considers e) Projects should exist within a pre-defined strategy and operating programme				
Example	European Union ESI read with State Aid Guidelines	92 countries, mainly developing countries and emerging markets	New Zealand Seed Co-Investment Fund European Investment Fund	Korean Fund of Funds
Primary source of Funding	Government	Operator Levies	Government and private investors	Government and private investors Reinvest dividends
Fund manager	Managing Authority (responsible for an operating programme) Ministry, Regional Authority, Local council, or other public or private body nominated by a Member State	USAF Independent or situated in a Ministry, or Regulatory Authority	Government Backed Fund investing via private equity or venture capital	Government Backed Fund via private equity or venture capital
Objectives	Developmental mandate, limited to cases of market failure (network extension or step change)	Developmental – market access gaps in high cost, low income areas Sometimes demand side	Demand side R&D Innovation SME development	Demand side Innovation SME development Early stage start ups

8.5 Key Observations

As seen in this report, the monolithic Fund does not exist. The broadening of the potential projects and beneficiaries in the digital landscape and the move to a whole of government approach to policy requires a reconsideration of the structure of USAFs which are quite narrowly focused on the ICT sector (and in some cases still on telecommunications due to the fact that their legislation has not been amended). Some key findings from an analysis of Regional Funds, Co-investment/ Risk Sharing Funds and Fund of Funds models that can assist in designing USAF2.0 include:

- a) At a principle level, these funds have many similarities:
 - i) Funding provided should not have the effect of distorting the market;
 - ii) Funding should be transparent and accountable;
 - iii) Annual audit reports should be published;
 - iv) Eligibility requirements should be clear and available for all to consider; and
 - v) Projects should exist within a pre-defined strategy and operating programme.
- b) Funding must be clearly linked to regional and national policy. Policy is a critical input to create an enabling environment, but also to ensure that private capital is not crowded out in the process of issuing grants, subsidies and loans. Regional funds display this trait strongly.
- c) Adding a new layer of "intermediary" could assist USAFs that do not have the requisite capacity to make investment decisions. And could address the temptation of USAFs to implement projects (rather than fund the implementation of projects) which has been a weakness of Funds. To this end, the New Zealand co-investment case is instructive. It has a clear developmental component which is to build local industry to ensure the economy is resilient to global disruptions like COVID-19 and to create decent jobs.
- d) The Fund of Funds approach sees the 'fund' make indirect investments as it leaves financial investment decisions to fund managers that have commercial experience, skills and track records. However, since they use government money, they are forced to develop portfolios that have a developmental impact linked to national goals. This addresses some of the challenges historically experienced by USAFs of lack of capacity, experience, transparency and accountability. However, it also moves the Fund one step away from the projects and may compromise the Fund's ability to be outcomes based.
- e) Importantly, as the fund model evolves, "additionality" must be demonstrated to ensure that the funding pool is increased and that there is loyalty to the development objectives of financing.
- f) There is a need for a fund to focus. While funding gaps may be identified on both the supply and demand side, the funds in this section are able to focus on a specific segment of the market and pool resources to address it in a targeted manner. One single USAF model may not be perfect for a country – a country may implement a traditional USAF model for infrastructure and connectivity projects, and other co-investment or fund of funds models for SME development, R&D and development.

9. USAF2.0: EVOLVING THE USAF FOR EFFECTIVENESS AND RELEVANCE

9.1 Introduction to USAF

Traditional Universal Access and Service Funds need to evolve. Evolution is not just a response to some Fund's chequered history given the well-documented case studies on non-performing Funds; but is also imperative in response to evolution in the digital and financial services sectors. It is difficult to conceive that the Funds established in the early 2000's to close circuit switched voice gaps and extend mainly Public Switched Telephone Network ("PSTN") infrastructure, nearly 20 years ago, are suitable for the current digital environment. It is equally hard to believe that the financial instruments that were valid two decades ago have not been complemented by new funding approaches like crowdsourcing and digital bonds. Even those Funds that have been successful, would need to be reviewed and reforms applied as necessary to remain relevant and therefore effective.

What is needed is USAF 2.0, which is aligned with the broader digital transformation process, and with the ICT and economic policy, strategy and legal framework of a country. It appreciates the magnitude of the UA challenge and its impact on socio-economic development. USAF2.0 also appreciates that there are several actors – private sector, private sector and developmental – with access to different financial and non-financial resources, varying risk appetites, and that need to play a role in bridging the digital divide. It therefore appreciates the need for collaboration and the importance of adopting blended finance principles and using the money that has been collected to leverage other funding. This reformed Fund is outcomes based and shifts from being transfer/absorption oriented to being growth enhancing.

History has shown that a key aspect of USAF2.0 is that it has to be properly resourced and well capacitated, especially from a human resource and institutional perspective. Funds that have been able to use monies effectively and efficiently have been those with good governance and the administrative capacity to build assess opportunities, project pipelines, organise competitive bidding, least cost subsidy or reverse auction tender processes, and run effective internal controls. This section discusses USAF2.0 and how to achieve it, in particular in countries where Funds are already operational and need to reform in order to be modernised.

9.2 Context of Fund Review

USAFs have had an uneven track record. Despite the numerous successful Funds, there have been a number of Funds that are weak or stagnant. The main challenges that have been identified include some that have been discussed earlier in this report, i.e.:

- a) Funds that have over-collected or collected but not spent for sector development;
- b) Funds that have provided subsidies for unsuccessful projects, or for inefficient use in projects;
- c) Funds with questionable governance that have been accused of mismanagement and corruption;

- d) Funds that have not been able to coordinate amongst different levels of government and different affected government departments (e.g., education, infrastructure, health); and
- e) Non-transparent and unaccountable Funds.

These and other challenges have led to calls, primarily by operators, for a reduction in USAF levies or a justification of them. As a result of the poor performance of Funds, in some countries there is a sense of apathy around them with a lack of interest by the industry in participating in Fund projects – Funds are failing in some countries to give out subsidies to mobilise private capital. Examples exist of countries where there have been least cost bids, but operators have not even expressed interest to participate. The coordination in some markets between the Fund and the operators stops at the collection of USAF contribution. This reduces the Fund contributions to an additional sector tax. If Funds are not properly managed, then fund levies could have the effect of increasing the cost of communications and the burden on consumers.

On the other hand, some Funds have been successful. Effective Funds such as those in Singapore, the United States, Canada and Pakistan are able to collect and disburse their monies on relevant projects; and are transparent, with successful track record and with good governance frameworks.

The question then arises, is there still a role for Funds in the current digital environment? Rephrased, the question should be, are there still funding gaps that prevent people from adopting and using the internet and being included in the digital economy? The answer, as demonstrated in [section 4](#), is yes. These gaps are on both the supply and demand side.

Are Funds the best way to close these gaps? The answer will differ depending on the country context and each Fund's historical performance which is informed by its legal and institutional framework, and administrative and operational capacity. However, what the evidence does confirm is that Funds are not the only way to address these goals; and increasingly it is patently clear that they cannot so while acting alone – collaboration and partnerships are critical.

9.3 Steps to Review Funds

By end of 2020, 100 countries reported having operational USAFs. In these countries, laws have been passed establishing the Fund which set out its specific mandate, the scope of its funding, the eligible beneficiaries and the governance frameworks for the operations of the Fund. They also, importantly, set out the key parameters for collection of funds; in all cases the main funding mechanism is a “pay” obligation which is a levy imposed on industry players. While the legal framework enables the USAF, in many ways given the passage of time and the related changes in technology, services and applications that are now available, it can serve to inhibit it. After following the key steps to review the Fund strategy, policy and institutional frameworks, it is critical that countries enshrine these changes in an appropriate legal instrument.



Figure 10: Steps to Review Funds

In reviewing Funds, countries should:

- a) **Conduct an audit of the Fund and its performance** – this should look at (1) issues such as the level of collections, disbursements, transparency and accountability, as well as (2) the project performance and its impact on meeting UA goals and targets. A consideration of the former, is important to understand the functioning of the Fund and the level of trust it has engendered since its establishment.
The performance assessment should be objective and not political, i.e. the Fund should be active, where a Fund has been inactive or disbursed less than 60 percent of its fund for a defined period, a review of the Fund should be instituted. It would be reasonable to propose a 2-year period given that contributions are made annually. If the Fund is to play a role in bringing about a digital economy, especially in collaboration with other stakeholders, it has to be well capacitated and managed and trusted in order for its evolution to be accepted. Public consultation on the Fund performance and on any proposals for its evolution or modernisation is critical. In addition all findings should be made public.
- b) **Map current policies, goals and priorities** – this should consider the broadband plans, digital agendas, digital inclusion strategies, and other policy instruments that define the national vision and set targets against which UA gaps will be measured and for which project types will be identified. This step is important for determining the focus of the Fund and ensuring the relevance of its programs and projects. It is noted that there may be competing goals and priorities – however the Fund should establish key themes that assist it in prioritisation. The themes should be linked to where the cost impact can be derived – for example connectivity, SME support and affordability initiatives could be priority areas identified in a UASF strategy.
- c) **Conduct a funding analysis and map the current financing and funding environment** – this includes both assessing the cost of financing the identified gaps and digital inclusion, and identify the key players that can contribute in cash and in kind to funding UA through understanding the funding landscape.

Consider what the Fund's role can be in coordinating funding or contributing to a larger pool of required funds needed to finance UAS.

- d) **Map the institutional framework** – consider the current allocation of roles and responsibilities in the national landscape for policy development, ICT and digital regulation, financing of infrastructure and demand side strategies, ICT project implementation, digitalization and e-government, amongst others. An understanding of where the Fund fits in light of some of the new organisations that provide non-financial support such as ICT Commissions and Agencies responsible for policy implementation, and complementary and competing vertical funding bodies such as Digital SME Funds, funds providing loans and grants for connecting schools, agriculture projects and health facilities, and Covid Relief Funds amongst others.
- e) **Map current regulations that facilitate or inhibit UA** – a process should be undertaken to identify strengths and weaknesses in the regulatory framework and make recommendations on non-financial mechanisms that can be explored to lower costs and risks, and regulatory incentives that can be put in place to facilitate UA and promote investment by the private sector to complement the work of the Fund.
- f) **Conduct a market gap analysis**— understand the current market gaps based on an understanding of the current and anticipated market players, network coverage and rollout, sector revenues, ARPUs and pricing. On the demand side, consider e-government, school and hospital connectivity, and entrepreneurship gaps, as well as challenges with digital literacy.
- g) **Determine the status of digital inclusion** by women, children, persons with disabilities, the elderly and other identified marginalised and vulnerable groups.

These steps will answer questions about the role, relevance and positioning of the Fund and underpin its evaluation. As an outcome of this assessment, it will arise that broadly there are two categories of Funds, those that have functioned effectively (such as in Colombia, United States, Uganda) and those that are considered ineffective. Following the above steps will inform the best approach for operational Funds to evolve to USAF2.0, or in the case of low disbursing or non-functioning Funds, may reveal that the Fund has outlived its relevance.

9.4 Low Utilisation Funds

Without disbursing the money effectively or in some cases at all, many Funds fail to achieve the very goals they were established to meet to finance projects that will address the challenges of affordability, accessibility and network availability. In terms of 2019 ITU data, of the 52 operational Funds that provided information, 20 had disbursed less than 50 percent of the amounts that had been collect – 3 of the Funds had not disbursed any money at all. Given the prevalence of this challenge globally, it is possible that the low-disbursement challenge is a function of the Fund framework. The gap between the high disbursing and low disbursing Funds is significant. Of the Funds that reported that they had disbursed, 21 percent had spent all of what they had received – these included Funds in Japan, Hong Kong, China, Iran, Papua New Guinea, St Vincent and Grenada and Saudi Arabia.⁵⁸

⁵⁸ ITU Eye, 2019

Funds that have failed to disburse the monies that they have collected require a different approach to Fund reform. Rather than reform, they should question their very existence. It might be necessary to either dissolve the Fund and make a decision on how to utilise money already collected; or to “pause” the Fund, put it in ‘Fund Rescue’ and put a temporary moratorium on the collection of further funds until the appropriate institution arrangements can be made to ensure its effectiveness. The key factors that the Fund must take into account in evaluating its relevance and what the next steps are:

- a) Whether its collection framework is appropriate (i.e., does money collected go into a separate, ringfenced Fund or the general government budget)?
- b) Whether the legal and regulatory framework enables it to disburse effectively (this can be assessed by reviewing definitions of UA and targets, definitions of eligible beneficiaries, scope of programmes – demand and innovation as well as supply)?
- c) Whether the institutional arrangements are strong enough to enable it to be effective (measure for reporting and accountability, separate board, separate bank accounts)?

If any of these are not in place it could warrant a “freeze” in collections until they are addressed. The remainder of this section discusses how these factors can be addressed in order to reform Funds. If several of these factors are not in place, depending on the reasons why, it may require the closure of the Fund. The figure below sets this out.

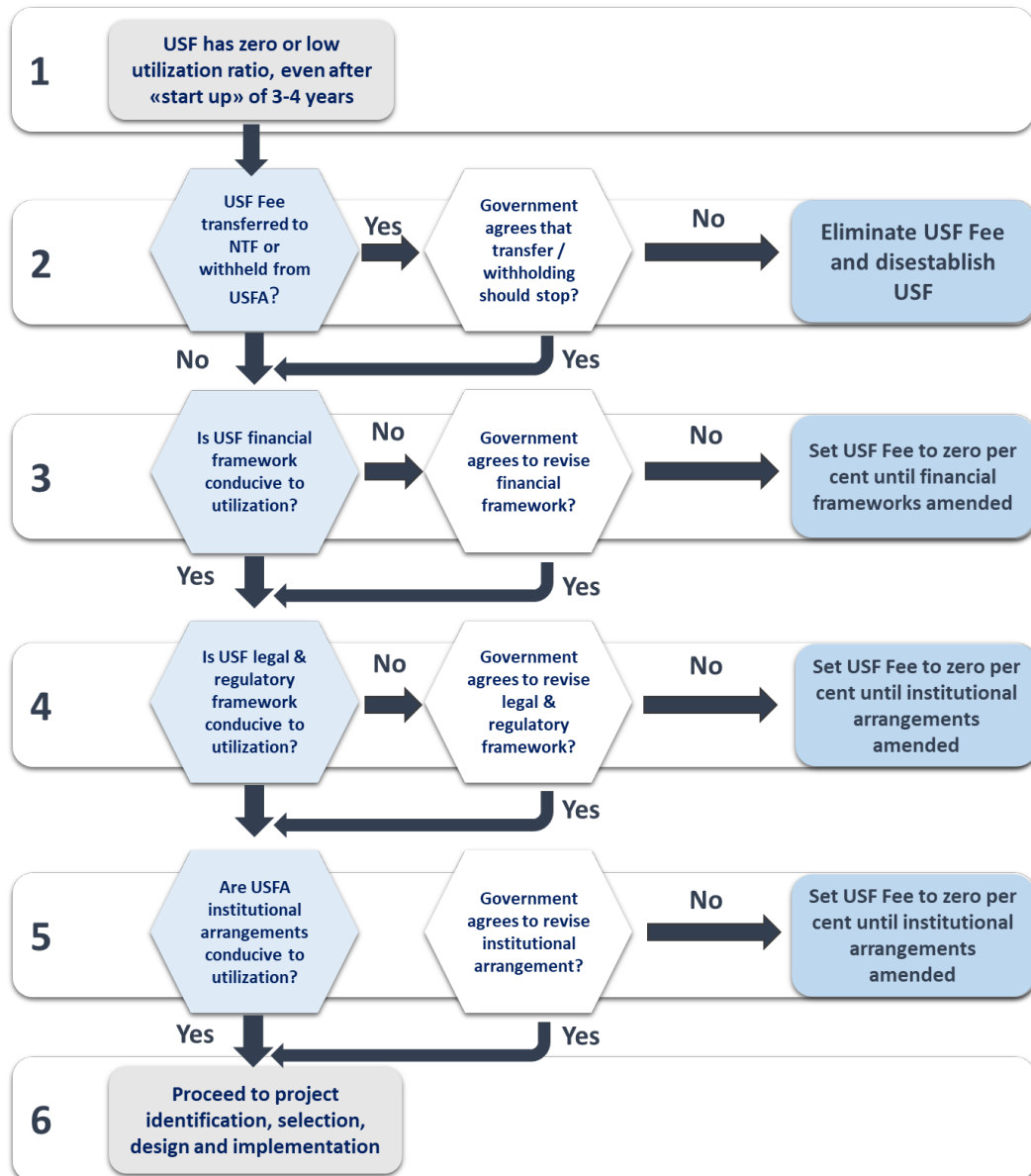


Figure 11: USF2.0 Decision Tree

9.5 Scope of Funds

Funds that have not disbursed a significant portion of the money that they have collected might find themselves between a rock and a hard place. Reform, changing the rules of the game while there is unspent money in the bank will require significant stakeholder buy in, especially from the operators who contributed to the Fund. This is because when the money was collected, it was designated by law for specific uses primarily linked to the closing of voice gaps and extension of fixed line access (93 percent of operational Funds).

Since the establishment of first-generation Funds, wireless services have become prevalent; notwithstanding this, given the gap between pace of technological change and that of legislative change, in Africa and the America's 27 percent and 50 percent of operational Funds, respectively do not include individual mobile services in their definition of universal access. Technically, this prevents them from funding such projects. In addition, many Fund frameworks:

- a) Do not cater for adoption and usage and do not include end users as potential beneficiaries;
- b) Do not mention digital inclusion and access for marginalised and vulnerable communities. In fact, in 2019, only 13 Funds included women and girls in their definitions, and 65 countries include service for the elderly in their definitions of UA; and
- c) Make specific provision for the support of projects that connect schools and health centres, but not other strategic public institutions that are central to a given community such as police stations, or financial centres.

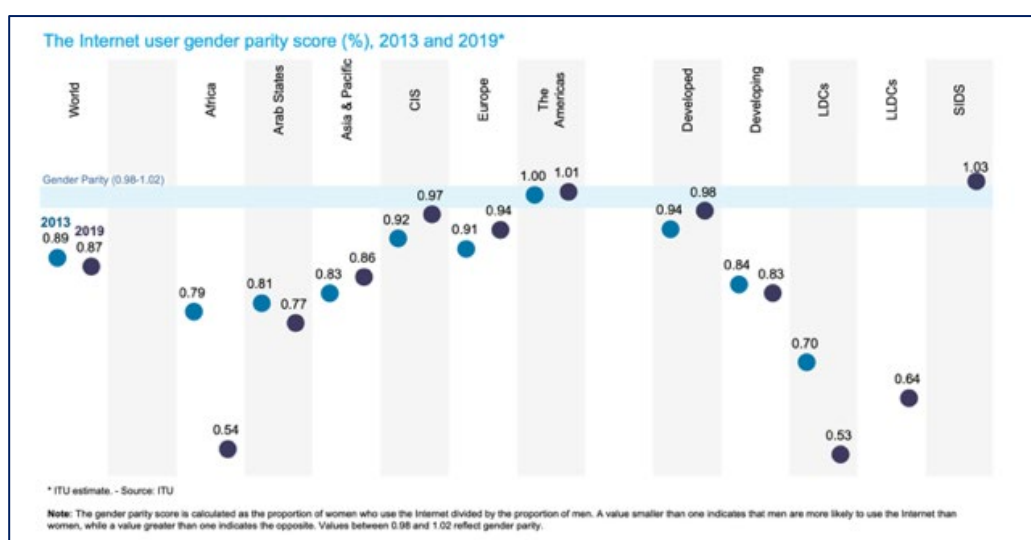


Figure 12: The Internet User Gender Parity Score 2013 and 2019

9.6 New Mandates and Toles for USAFs

While infrastructure deployment remains key, increasingly digitally-focused funds will need to be considered in markets that are reforming their Funds. As discussed in the Prioritisation section (Part A, [section 3](#)), Funds will need to continue facilitate the bridging of the digital divide but will additionally facilitate the digitalization of the economy by prioritising the funding of .

- a) **Connectivity, digital networks and access** – this includes extension of networks to rural and underserved areas, but additionally ensuring a ‘step change’ and supporting projects that have an impact through new investments or additional functionality.

- b) **Digital adoption through facilitating demand side investment.** This requires that the founding legislation allows Funds to spend money on digital inclusion and on demand stimulation projects – currently about 70 percent of operational Funds’ legislation does not provide for this according to the ITU.⁵⁹ USAF2.0 should be mandated to finance:
- i) **Providing individual and strategic public institution support.** The focus is on investing in digital literacy, promoting uptake and usage.
 - ii) **Digitising and supporting industry and in particular local SMEs** to ensure that businesses, SMEs, digital and non-tech industries can benefit from digital innovations to create a higher value chain and to scale up.
 - iii) Supporting digital literacy, skills development and local and relevant content development to support adoption and usage, which in turn will spur infrastructure investment.
- c) **Research and Development (R&D) and Innovation** to facilitate the development of innovative (and local) digital applications and technologies which have a developmental impact and are aligned with the SDGs.
- d) **Mainstreaming digital inclusion** by making the addressing of the needs of marginalised and vulnerable communities a condition of funding.
- e) **The development of tools that will facilitate investment.** This includes key tools like research, baseline data, infrastructure maps (to identify ducts, fibre, etc that can be shared – the ITU broadband and Giga real time maps that are central to achieving school connectivity are good examples).

With the multitude of institutions involved in the financing of the digital space, the USAF as we know it will have to differentiate itself to remain relevant. It can do this by adding an advisory or facilitating role to their funding role given their unique positioning amongst ICT sector funders. This could entail:

- a) Convening various funders and financiers interested in digital infrastructure, innovation and adoption, as well as digital inclusion;
- b) Filling knowledge gaps between financiers with no specific knowledge or understanding of the ICT and digital sectors and USAF2.0 which is able to design and develop concepts and terms of reference for successful broadband and digital transformation projects that consider connectivity, access and use across the economy;
- c) Coordinating the pooling of government resources in line with a whole of government approach. The Korean Fund of Funds case shows that government can pool monies from different departments and agencies dealing with one theme (e.g. SMEs) and use it to increase the size of the Fund. If this approach is taken, it can coordinate government funded initiatives, as well as complement or replace the mandatory levies depending on the funding gap in a country; and

⁵⁹ ITU Eye, 2019

- d) Using the UASF projects as a model for national scale projects – in this way it can collaborate and align with the regulatory regime (e.g. sandboxes) and private initiatives (e.g. accelerators) to make a meaningful impact. Basically it should evolve its thinking about “pilots” and invest in scalable pilots.

Adopt a catalytic mindset and shifting its focus from implementing projects to *leveraging investment in* projects. While leveraging investment, theoretically has always been their role given that Funds aimed to fill coverage and affordability gaps through subsidies that were to be given on a sustainable basis, this has not always been the case. USAF2.0 should work with other actors in the ICT and digital funding space to achieve the objectives of leveraging funds to achieve sustainability.

9.7 Sources of Funding

As the Fund is increasingly forced to consider expanding its scope to include supporting the delivery of broadband and digital services, so too must it reconsider its funding mechanisms. Currently, most Funds get the bulk of their money from mandatory contributions made by licensees in the sector. Fifty-five percent of Funds require all operators to contribute to the Fund; 20 percent require fixed line operators (with or without SMP) and 30 percent require mobile operators (with or without SMP). Only 7 percent of Funds require ISPs to contribute to the Fund, and yet ISPs are key beneficiaries of the increase in universal broadband access. Fundamentally, the bulk of the responsibility for financing the Fund has historically been placed on mobile and fixed operators who were delivering the voice services that needed to be extended. In a modern scenario, many funds have not changed who contributes, but they have increased the scope of who may benefit including potentially unlicensed entities in the digital value chain such as digital platforms and data centres.

To that end, key proposals for sourcing funds include:

- a) The contributions received from industry should be used as ‘anchor funds’ and should mobilise investment in the Fund from other parties. Legislation has to enable the Fund to collect money from other sources like donations, donor organisations, institutional investors and NGOs, amongst others; it also has to allow the Fund to pool public sector resources (Korea) or co-invest with such parties in some cases (New Zealand). In addition to legislative permission to do this, Funds will need to have evidence of performance in order to attract other funding.
- b) In reviewing sources of funding, it is imperative that Funds reconsider the level of USAF levies which currently range from 0.5 percent to 6 percent. In most countries despite changes in the revenues of the operators and their profitability, the introduction of new players and changes in the size of the market, the levies have not changed since inception. This creates the impression that the levies bear no relation to the sector need. One argument that has been raised in order to address this is that Funds should be funded by a government appropriation – they should have a budget issued to them by the government. Ironically, despite collecting levies, in some countries the levies collected are sent to the general government budget and then allocated to the Fund on an annual basis. In these countries, the challenge can be defined as over-collection and also misallocation – funds intended for ICT sector development are used for funding other government priorities in another sector. The effect of this is that the levy risks

being considered at tax, no different from VAT or excise duty – collected and used for the general budget. This position is made more untenable by the fact that this tax gets passed on to consumers and effectively increases the cost of communication.

USAF2.0 has to ensure that moneys collected are sent straight to the Fund and are used for the purposes for which they are intended, and that there are no unintended policy consequences such as the pass through to consumers. This might require the creation of ‘virtual funds’ which are effectively an entry in the books for operators to pay, but collection occurs only once the money that has already been collected is disbursed. This approach can be implemented easily (even for Fund that have already collected and not disbursed) and will incentivize expenditure while ensuring that excess money is not collected. This would require an amendment to the founding legislation in order to add the condition that collection follows spending.

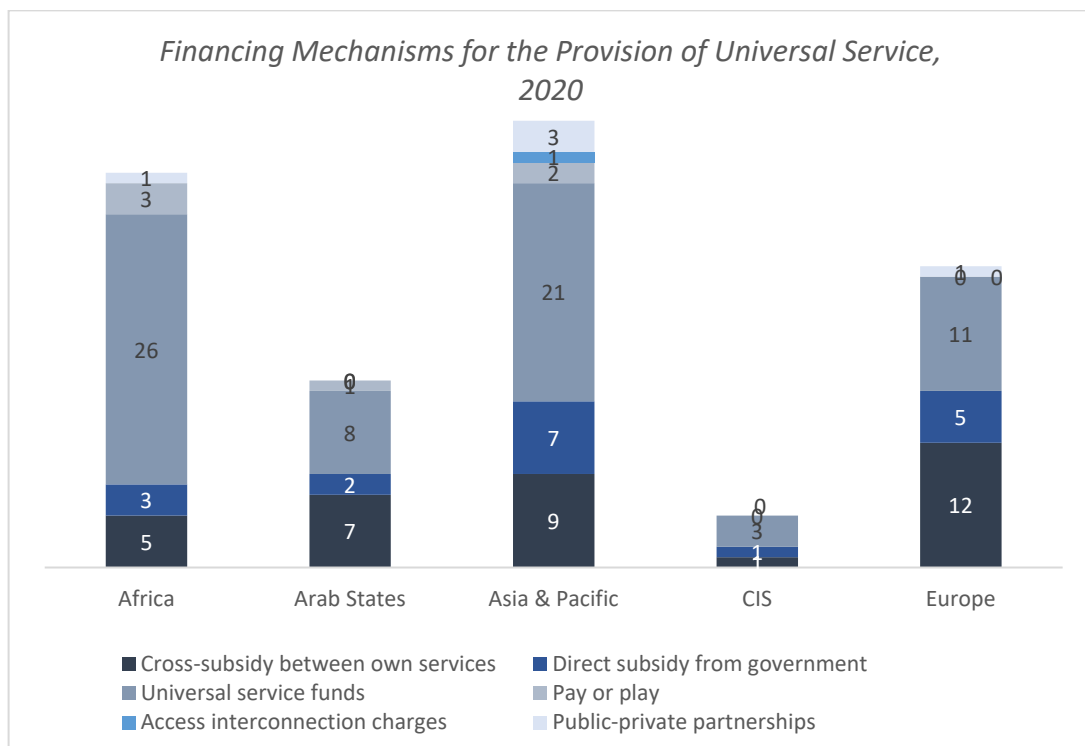


Figure 13: Financing Mechanisms for the Provision of Universal Service, 2020

9.8 Beneficiaries

The beneficiaries of the funds distributed by USAFs have primarily been operators and equipment vendors (through least cost subsidies and competitive bidding processes), low income users and projects that support the Fund mandates, e.g. telecentre projects. With a broader scope, the eligible beneficiaries may need to be widened. Beneficiaries refers to direct beneficiaries, i.e. recipient of money from the Fund, as opposed to the people who broadly benefit from a project.

If the Fund continues to be limited to monies received from mandatory contributions by a select group of operators, then it is difficult to argue for the broadening of the scope of beneficiaries. It might then make sense to prioritise the financing of the parties that have contributed to the Fund to the extent that they obtain the funding on a

competitively neutral basis. In this case, pooling resources and extending its sources of funds, may be the reformed Funds' only option to reaching more beneficiaries.

9.9 Approaches to Funding

9.9.1 Using Blended Finance Principles

Given that USAF2.0 should have as a principal goal the promotion of private sector investment, all spend should be geared at getting the most 'bang for its buck' and thus leveraging its funds by pooling resources or co-investing with other investors with similar or complementary economic development objectives through the use of financial instruments that will mitigate risks that are keeping private capital at bay; and will contribute to assuring the sustainability of the projects. In blended financing arrangement, the Fund can focus on combining the use of grants and/or financial instruments from the USAF2.0 budget with private capital (via a loan, debt, equity or any other repayable form of support).

Legislation may need to be amended to adapt the Funds' mandates to enable it to be a facilitator of investment in addition to a funder.

9.9.2 Imposing Developmental Conditions on Funding

An important tool that the Fund has at its disposal, which differs from other actors in the financing space is its positioning in the ICT policy, regulatory and institutional framework. The Fund can use its monies to achieve broader policy and regulatory objectives, due to its position in the ICT institutional framework. USAF2.0 has to be strategic in its allocation of funds and in so doing use the financial support:

- a) To fund projects and initiatives that will assist to promote UA;
- b) To achieve non-financial goals that will ultimately reduce the cost of rollout for private investors; and
- c) To demonstrate additionality, i.e. to bring private capital, while supporting for development.

Simply put, the Fund should attach conditions to its funding that align with the regulatory conditions being promoted, e.g. funded infrastructure should be made available on an open access basis, should be rolled out using 'dig once' or 'dig smart' approaches, and infrastructure sharing should be mandatory on publicly funded infrastructure (see [Part C, section 10](#)). Demand side and innovation projects financed by USAF2.0 should demonstrate alignment with SDGs – for example should the Fund finance innovation via SMEs or accelerators they should ensure that they focus on technology and digital projects that specifically respond to an identified developmental or community challenge, close an identified digital gap, or address digital developmental in general. Additionally, in the same way the ExACs are framed in the EU, Funds should ensure that all funded projects align with the broader policy and regulatory framework and advance the nation vision.

This concept is not novel. Some first generation Funds have put conditions on the funding such as that related to infrastructure sharing and open access (Pakistan), however globally this has not been an intrinsic part of the Fund management and

administration framework in many developing countries. Another set of conditions that should be linked to all USAF2.0 funding is the addressing of digital inclusion.

At all times, projects should address the needs of women, persons with disabilities, the youth and the elderly as part and parcel of the funding decision.

9.10 Fund administration

Globally, Fund management and administration is approached either through **the Ministry** (Colombia), a division of the regulator (Uganda, Eswatini, Lesotho, Mauritius), a separate agency (Nigeria, Peru, Tanzania) or an independently run third party (United States). Any of these models is acceptable if the right governance and institutional framework is in place consisting of:

- a) A qualified Fund manager and a management team that includes technical, project management, legal and financial expertise;
- b) An objective board – Ghana and Pakistan’s Funds are amongst the 26 Funds globally where the Board includes operators⁶⁰ and in Eswatini is includes representatives of Ministries other than the Ministry responsible of ICT. This promotes a whole of government approach to financing projects and initiatives;
- c) A separate bank account and audited financials;
- d) Published application procedures, often captured in a Fund manual; or
- e) Requirements for periodic reporting, also audited.

What has plagued many Funds is that although the rules are known, they are not followed in all cases. Given the amount of money that is collected, the sources of funding and the objectives of the Funds, it is critical that there is transparency on the spending of the money. It is furthermore important that the Fund, wherever it is housed, is accountable for all collections and expenditure.

Tools to Improve Transparency and Accountability

USAF’s today suffer from lack of trust. This arises from many funds not being transparent and accountable with respect to the use of the monies received. Funds should:

- a) Adopt a clear timebound strategy with an associated budget which informs the public of the direction the Fund intends taking with respect to spending;
- b) Use technology to promote transparency and to make their initiatives more effective;
- c) Make use of open data policies and platforms to allow stakeholders, including contributors to the Funds to track progress on disbursement; and
- d) Use open data to coordinate projects and collaborate across funders and beneficiaries.

⁶⁰ ITU Eye, 2019

9.11 Programmes that Do Good and Facilitate Investment

USAF2.0's programmes should be broadly defined, and project types should not be prescribed in too much detail in legislation given the fast pace of change and the innovation in the sector. The programmes should match a country's policy priorities and reflect the broadband and digital ecosystems. The Fund should be able to disburse for supply side and demand side projects meeting the above which should be broadly defined so as not to restrict implementation.

9.11.1 Infrastructure: Improve Connectivity, Digital Networks and Access (Supply Side)

Any financing of USAF2.0 infrastructure projects, and public infrastructure projects in the ICT sector in general, should be premised on the following key principles:

- a) **Complementary and competitively neutral** – To that end, it should only be used to optimise the total available funding and in so doing complement market reform measures. Public funding should not compete directly with or replace current or planned investments of market players. Any public intervention should try to limit the risk of crowding out private investments, of altering commercial investment incentives and ultimately of distorting competition⁶¹.
- b) **Technologically neutral** – Government should allow the use of all technologies and leave technology decisions to the operator and equipment partners, as long as they have the appropriate physical attributes to meet clearly defined broadband and universal access goals and targets.
- c) **Wholesale open access** – Third parties should be allowed to use the subsidised network to provide their own services thus ensuring that maximum utility is derived from the network and that costly duplication is avoided. Access must be effective, transparent and non-discriminatory.
- d) **Targeted and impactful** – The publicly funded broadband intervention must make a tangible difference. It should therefore either extend the network where there is none, or have a significant impact providing a substantial improvement over the existing network. In terms of the EU State Aid Guidelines, the latter is described as a “step change.”
- e) **Scalable** – the interventions should at the same time be locally relevant, but capable of being able to be applied in other similar markets. This requires good documentation of processes and outcomes, standardisation and harmonisation.
- f) **Spur local development** – funding should be locally oriented and meet the needs of the community in terms of creating decent jobs and other opportunities.
- g) **Encourage Digital inclusion** – all projects that are funded with public monies must meet minimum digital inclusion criteria in relation to the number of jobs they create for marginalised communities, the amount of procurement they outsource to them, the levels of training provided and the participation of persons with disabilities, women, and the elderly, as appropriate in the projects.

⁶¹ State Aid Rules, 2013

STEP CHANGE – IMPACTFUL INTERVENTIONS

The EU State Aid guidelines provide two (2) criteria for 'step change:'

- (1) New Investment - the public infrastructure project should make significant new investments in the broadband network. The mere upgrade of the active components of an existing network infrastructure would not constitute a step change.
- (2) New capabilities - the subsidised infrastructure brings significant new capabilities to the market in terms of broadband service availability and capacity, speeds and competition. An upgrade from a basic network (e.g., ADSL) to an NGN with speeds of 100 Mbps would be a step change.

<https://ec.europa.eu/digital-single-market/en/state-aid>

CHECKLIST FOR USAF2.0 FUNDING: MOBILISING AND CROWDING IN

To avoid crowding out funding, recipients of USAF2.0 support should be required to confirm the following:

- a) Has the objective of the project been clearly defined? Is it linked to national targets and SDGs?
- b) Does contributing USAF2.0 funding serve to mobilise additional investment by the private sector and other funding actors?
- c) Would the project undertaken with USAF2.0 have been executed under the beneficiary's existing business plans?
- d) Has a collaborative approach been taken? Has USAF2.0 funding been pooled with other funders and financiers where the projects supports the use of ICTs in that sector?
- e) Has the funding been allocated transparently and objectively, e.g., through competitive tendering or least cost subsidies?
- f) Has a monitoring and evaluation framework been set up with clear responsibility given to an independent party to monitor the implementation of the project objectives?

9.11.2 Uptake and Usage: Support Adoption (Demand Side)

Some key principles that ensure the success of USAF2.0 funded demand side projects and programmes include:

- a) **Aligned with SDGs and national policy** – they should be linked to broader national and international policy goals.
- b) **Digital inclusion** – all projects that are funded with public monies must meet minimum digital inclusion criteria (See section 9.11.3).
- c) **Demand aggregation** – the projects should address demand risk for ICT infrastructure
- d) **Stimulate revenue growth for operators** – in order to ensure that projects are sustainable and that a win-win is created for industry and consumers, there is a need to ensure that all initiatives enable operators to make sufficient return on

investment to be viable and to invest further in network infrastructure and encouraging adoption.

- e) **Sustainability** – the projects should be able to stand on their own after a specified amount of time which should be agreed upfront. They should also achieve sustainability by ensuring that before projects start, the proper groundwork is done – this includes checking for key readiness factors, i.e. research and feasibility studies, availability of electricity, and demand analysis amongst others.
- f) **Innovative partnerships** – the different cost components of expanding access and adoption should be borne by various stakeholders – the public and private sectors, donors, civil society and even consumers. Partnerships that allow these investments to be coordinated and that bridge the gaps between the available funds and the investment required can shift the burden as appropriate to the different stakeholders.⁶²
- g) **Collaborative approaches** – no single skillset is required to deliver any of the solutions to demand adoption, and all of the solutions are complementary. As such, collaboration across stakeholders and the formation of coalitions is key to deliver access and the training that will encourage communities and individuals to use the content, services and applications available, as well as to develop their own.
- h) **Targeted and impactful** – the projects must make a tangible difference on job creation, innovation, digital literacy and local content development. They should always have clearly specified digital inclusion targets linked to them.
- i) **Scalable** – the interventions should at the same time be locally relevant, but capable of being able to be applied in other similar markets. This requires good documentation of processes and outcomes, standardisation and harmonisation.
- j) **Spur local development** – funding should be locally oriented and meet the needs of the community in terms of creating decent jobs and other opportunities.

⁶² Internet for All

9.11.3 Digital Inclusion

Digital inclusion requires that deliberate and targeted strategies and investments be pursued which will reduce and eventually eliminate institutional and structural barriers to the access and use of technology. As such, it not a 'nice to have', but must be central to the funding decision. As such, all supply and demand side projects and initiatives that are funded with public monies, whether infrastructure or adoption focused, must meet minimum digital inclusion criteria in relation to:

- a) The number of jobs they create for marginalised communities, entrepreneurs and SMEs;
- b) The amount of procurement they outsource to them marginalised communities and SMEs; and
- c) The value and amount of training and skills development provided the participation of persons with disabilities, women, and the elderly, as appropriate in the projects.

Programmes and projects are discussed in [Part E](#).

PART C: NON-FINANCE MECHANISMS: REGULATORY INCENTIVES TO LOWER RISK AND REDUCE COSTS

10. BACKGROUND

Regulators have long realised that market development regulations are central to creating an investor and investment friendly environment for broadband and digital transformation. Regulations on licensing, spectrum management, universal access and service, various aspects of technical regulation, competition and consumer protection which underpinned second and third generation regulation are still the building blocks of good regulation. However, in order to lead the next level of change and use more collaborative regulation (G4 and G5 generations of regulation⁶³), to support UA investment:

- a) **The right mindset has to be adapted by the regulator** - G4 regulation represents a shift in the *approach* taken by regulators to implement the frameworks that they created over the last two decades – the move is towards a more principle and outcomes-based approach which facilitates investment and innovation; and
- b) **In some cases, the content of regulation has to change or be updated**, i.e., key areas of regulation that create an enabling regulatory environment and did not previously take centre stage but are now recognised as important for digitalization and supporting the digital investment should be made.

Part C addresses non-financial incentives. It considers the way in which regulators can use the regulatory environment to create stability, reduce risk and lower implementation costs for both supply side projects related to infrastructure rollout, and demand side programmes to spur adoption and usage. In some cases, appropriate implementation of these measures will be sufficient to reduce risk and costs to spur investment; in other case they can be used to complement the application of financial incentives. This can be done through imposing obligations or adding them as conditions for financing. As an example, infrastructure sharing obligations can be included when towers are funded by USAF2.0.

⁶³ The concept of 'generations of regulation' is an important framework which assists in analysing the maturity of modern regulatory regimes. It is based on a view of collaboration, high-level principles and focus as illustrated by indicators set out in ITU's G5 regulatory toolbox. In summary, according to ITU: (1) Collaboration is the dominant element – the very watermark of G5 regulation. It measures the breadth and depth of cross-sector collaboration between the ICT regulator and her/his peers; (2) As regulation shifts from rules to principles, the design of frameworks and what keeps them together have acquired especial importance. While rules will not disappear soon, principles are better suited for finding balanced, sound solutions, especially in complex areas. (3) New consumer needs, business models and market dynamics call for retooling regulatory inventory and the development of coherent, outcome-oriented policy instruments as set out in the G5 Regulatory Toolbox.

11. CONNECTIVITY, NETWORK, AND ACCESS INCENTIVES

The focus of this section is on regulatory measures that can attract investment and improve digital infrastructure financiers' returns by helping to reduce or mitigate some of the political and regulatory risks set, as discussed earlier in [Section 2](#). Some of the key incentives that form part of effective next generation regulatory regimes are:

- a) **Waiving taxes, fees, costs and other payments** which would otherwise have to be paid by an infrastructure provider to government departments, agencies and regulators. The ICT sector in many countries is taxed on multiple fronts – general taxes (Valued Added Tax ,corporate tax, customs and excise duties). Measures to lower their costs and increase investment could include tax holidays or license fee exemptions for spectrum licenses and airtime taxes which directly increase consumer prices and reduce affordability, import taxes and customs and duties on network equipment, hardware and devices, especially handsets through which many are accessing the internet. Lowering taxes can play a role in reducing the device access and affordability gap.

Tax incentives include those applying to software development services, ICT related services and call centre services as implemented in Belize, Djibouti, India and the Philippines.⁶⁴ Additionally, tax exemption regimes can be used to attract investment for example through Special Economic Zones (“SEZ”) and Science Parks that provide tax incentives and other incentives such as access to land, high quality infrastructure and streamline processes for new ICT businesses, and Real Estate Investment Trusts (“REITs”) that incentivise investment in infrastructure such as towers and data centres.

Special Economic Zone Frameworks	
Rwanda	Rwanda’s SEZ program is designed to address some of the domestic private sector constraints such as availability of industrial and commercial land, availability and the cost of energy, limited transport linkages, market access and reduced bureaucracy and availability of skills. Designated, serviced land is provided for small and large scale industrial development, as well as reliable, quality infrastructure, competitive fiscal and non-fiscal regulations and streamlined administration procedures. ⁶⁵
China	Businesses operating in EDZs can expect, among other incentives, a higher level of autonomy over their operations, a variety of tax exemptions, land and building subsidies, and preferential employment policies. China had established 156 high-tech development zones (HTDZs) by the end of 2017. In 2017, the 156 HTDZs contributed \$1.42 trillion to China’s GDP, or 11.5 percent of the economy. In these zones, the ratio of research and development (R&D) expenditures to total production value was 6.5 percent, three times the average in the national economy. Patents granted to enterprises in the zones account for 46 percent of all business patents granted nationwide. ⁶⁶

⁶⁴ https://www.wto.org/english/res_e/booksp_e/wtr20_e/wtr20-2_e.pdf

⁶⁵ https://unctad.org/system/files/official-document/WIR2019_CH4.pdf

⁶⁶ <https://www.china-briefing.com/news/wp-content/uploads/2019/03/Types-of-Economic-Development-Zones-in-China-UPDATED.jpg>, and https://unctad.org/system/files/official-document/WIR2019_CH4.pdf

Special Economic Zone Frameworks	
Turkey	Technology Development Zones (TDZ) are areas designed to support R&D activities and attract investments in high-technology fields. There are 84 TDZs, of which 63 are operational and 21 have been approved and are currently under construction. Until December 2023 (1) Profits derived from software development, R&D, and design activities are exempt from income and corporate taxes (2) Sales of application software produced exclusively in TDZs are exempt from VAT (3) 50 percent of the employer's share of the social security premium will be paid by the government ⁶⁷

- b) **Streamlining processes, procedures and approval processes**, including those for Environmental Impact Assessments (“EIA”) and permits to access rights of way for national, municipal, and local sites, and permissions for towers with an antenna to be deemed to have complied with EIA requirements for additional collocations.
- c) **Promoting open access and infrastructure sharing** at national and local levels, as well as across sectors. A key principle should be the reduction of duplication which will in turn reduce costs. This can be done non-discriminatory open access regimes that recognise the initial investment in networks can significantly reduce investment costs. It can also be achieved through the sharing of passive infrastructure such as ducts, masts and towers. Sharing should not be limited to the telecommunications sector – cases like the Balkans Digital Highway Initiative show that cross sector infrastructure sharing⁶⁸ also presents opportunities. The Balkans Digital Highway Initiative focusses on regional interconnectivity in the Western Balkans and seeks to increase access to the Internet by establishing a regional broadband internet infrastructure over transmission grids of state-owned energy companies. Alternatively, on a national and regional level, ISPs can benefit from infrastructure sharing activities through access to more fibre optic capacity; and electricity companies which do not use all of their capacity – often less than half of it – can add new revenue streams while lowering costs for the ICT sector.⁶⁹
- d) **Rights of way and ‘dig once’ and ‘dig smart’ open trench notification policies and processes**. “Dig once” policies applicable to network providers, transport and construction companies and municipalities which play a role in network expansion. They lower the rollout costs by requiring that they notify other parties of trenching and conduit installation. “Dig once” and “Dig smart” policies should be applicable to municipalities and local governments who can be encouraged to install relatively low cost conduits – narrow pipes with no actual fibre optic cable housed within – during local construction projects while upgrading, maintaining or repairing pipes, roads and other relevant infrastructure.
- In terms of ‘dig smart’ policies conduit installation is mandatory for anyone installing infrastructure in a public right of way, and the government must pay for

⁶⁷ <https://www.invest.gov.tr/en/investmentguide/pages/investment-zones.aspx>

⁶⁸ <https://pubdocs.worldbank.org/en/307251492818674685/Cross-Sector-Infrastructure-Sharing-Toolkit-final-170228.pdf>

⁶⁹ <https://pubdocs.worldbank.org/en/307251492818674685/Cross-Sector-Infrastructure-Sharing-Toolkit-final-170228.pdf>

the incremental costs of laying down the conduit, with the government retaining ownership of the installed conduit – in the longer term these conduits can be leased out as a means of the municipality / local government earning revenue. These policies link directly to policies that encourage GIS mapping and improve access to information so that other providers *know* where conduits are available, and they can install fibre at a lower cost.

- e) **Assign radio spectrum for next generation networks under investment-friendly conditions** as set out in the ITU GSR 20 best practice guidelines, amongst others⁷⁰. The guidelines provide that spectrum should be made available for wireless applications timeously and as easily as possible, giving spectrum users and innovators at national and, where possible community levels, the flexibility to provide services that will deliver the greatest long terms benefits to society. Governments should weigh the long term value that can be achieve from spectrum assignments, against the potential short term revenues that may be received from spectrum fees or spectrum auction proceeds. The GSR 20 Guidelines further promote “(a)n agile and flexible authorization framework, using technology- and service neutral approaches may enable spectrum users to deploy equipment quickly and smoothly and evolve their networks.” This will drive innovation and investment in a range of technologies that can complement and support networks and expand broadband access at low cost both at a national and community level, where appropriate.⁷¹
- f) **Run consumer education and awareness campaigns** to address the public’s concerns about the health and environmental impacts of infrastructure deployment. For years, the link between mobile infrastructure and health has been questioned. It is important that communication about relevant standards, such as ICNIRP, is disseminated, especially as investment models become more localised and community based, and as the focus on adoption increases.
- g) **Introduce industrial policy and regulatory measures** like Singapore’s Smart Nation Plan, Mexico’s Industry 4.0 Roadmap, Philippines I-cubed (Inclusive, Innovation-led Industrial) Policy and Rwanda’s made in Rwanda Policy, can be put in place to promote research and development, local innovation and manufacturing to support business models such as those offering low-cost devices on the market.⁷² Despite an increasingly interconnected world, consideration of ICT industrial policy, i.e. its impact on productivity, jobs and growth, will enable countries to:
 - i) Better grow their local manufacturing sectors and compete in the global market; and
 - ii) Invest to turn R& D into commercial success with a developmental impact.

This understanding will influence the types of projects to which finance is channelled the core underlying business models that will stimulate local research

⁷⁰ European Commission Recommendation on a common Union toolbox for reducing the cost of deploying very high capacity networks and ensuring timely and investment-friendly access to 5G radio spectrum: <https://ec.europa.eu/digital-single-market/en/news/commission-recommendation-common-union-toolbox-reducing-cost-deploying-very-high-capacity>

⁷¹ https://www.itu.int/en/ITU-D/Conferences/GSR/2020/Documents/GSR-20_Best-Practice-Guidelines_E.pdf

⁷² https://www.wto.org/english/res_e/booksp_e/wtr20_e/wtr20-2_e.pdf

and development, and innovation. Low cost devices, accelerators and local incubation hubs and local IP and patents will be encouraged.⁷³

- h) **Infrastructure mapping and improving access to information.** The public sector, at national, regional and local levels should generate and provide market research or other studies or data, including GIS maps, surveys and other geographic information, that it has compiled in the ordinary course (e.g. location of schools, hospitals, police stations, levels of connectivity, households, etc) will help providers make strategic deployment decisions. This information is important to encourage investment and also to facilitate infrastructure sharing, open access, “dig once” and other policies. Information is a key aspect of these policies. Timely information about the location of fibre and rights-of-way access facilities and the procedures to facilitate sharing can cause action that will significantly reduce costs. This type of mapping is a core part of Giga which provides a visual representation of school connectivity⁷⁴. It maps the location of a learning institution and the level of internet connectivity available to better identify priority areas and finance them.
- i) **Improving collaboration and cooperation between the regulators across sectors** to accelerate the deployment of ICT driven and digital solutions, including in terms of regulations that will lower taxes. This could be applied in the finance, energy, transport, health and education sectors, for example.
- j) **Demand aggregation to guarantee traffic for operators**, which is not often the case in the case of UASF end user subsidies. This can be done through subsidising the costs of low income, marginalised and vulnerable users, aggregating demand and facilitating ‘smart’ procurement by government; making government a public anchor institution (See [section 12](#) on Adoption and Inclusion Incentives)

Case Study: California Municipality

In Santa Cruz, California, the county’s initiatives were crafted into a comprehensive set of policies:

- a) A dig-once process that requires the county to notify broadband companies and provide opportunities to lay fibre whenever a street is open;
- c) Development of master lease agreements to simplify access to county facilities; and
- d) Inclusion of conduit as part of public works projects, new developments and land divisions.

Source : <http://www.bbpmag.com/MuniPortal/EditorsChoice/0516editorschoice.php>

⁷³ <https://www.enisa.europa.eu/publications/enisa-position-papers-and-opinions/eu-ict-industry-consultation-paper>

⁷⁴ <https://gigaconnect.org/category/map/>

12. ADOPTION AND INCLUSION INCENTIVES

12.1 Consumer Protection, Privacy and Data Protection Policies, Laws and Regulations

This suite of laws and regulations build consumer and business trust and confidence in using the Internet for personal and potentially sensitive matters such as digital payments, government applications and any other e-services that require the sharing of personal information. These policies can reduce investor risk by influencing user uptake and usage (and therefore expand the market for potential investors). They can also protect businesses and consumers. Some key legal and policy instruments include:

- a) **Privacy regulation instruments** such as the EU’s General Data Protection regulation (“GDPR”)⁷⁵ passed in 2016 and effective from mid-2018, and South Africa’s Protection of Personal Information Act (“PoPIA”)⁷⁶, Brazil’s Lei General de Proteção de Dados (“LGPD”) and Thailand’s Personal Data Protection Act (“PDPA”)⁷⁷, all of which came into effect in 2020 and 2021.
- b) **Electronic transaction, cybersecurity and consumer protection frameworks** that are a pre-requisite for transacting on the internet and support investment in e-commerce. Electronic transaction laws have been adopted by 158 countries (81 percent), of which 68 are developing or transition economies and 30 are Least Developing Countries.⁷⁸ It is further noted that according to UNCTAD, 154 countries (79 percent) have enacted cybercrime legislation, the pattern varies by region: Europe has the highest adoption rate (93 percent) and Asia and the Pacific the lowest (55 percent).⁷⁹
- c) **Intellectual property and copyright protection rules** will affect investors’ decision to put money into content and platform services.

⁷⁵ <https://gdpr.eu>

⁷⁶ <https://popia.co.za>

⁷⁷ <https://thainetizen.org/wp-content/uploads/2019/11/thailand-personal-data-protection-act-2019-en.pdf>

⁷⁸ <https://unctad.org/page/e-transactions-legislation-worldwide>

⁷⁹ <https://unctad.org/page/e-transactions-legislation-worldwide>

12.2 Investment Enabling Regulation

In addition to legislation and policy that protect consumers and encourage them to use the internet, there is a need for legislation that protects the providers of digital services. This includes recognition of ISP association take down notices and legislation such as:

- a) Section 230 of the Communications Decency Act (United States) which protects ISPs, website owners, social media networks, and other sites and online services provides that **"(n)o provider or user of an interactive computer service shall be treated as the publisher or speaker of any information provided by another information content provider."** This promotes user-generated content (which as an important form of local content) and also protects service providers or intermediaries from lawsuits for the posting of illegal content – there are however exceptions for copyright violations, sex work-related material, and violations of federal criminal law.⁸⁰
- b) The updated EU Directive on Copyright in the Digital Single Market (Directive 2019/790). Article 17 which deals with the **use of protected content by online content-sharing service providers** makes providers liable if they fail to take "effective and proportionate measures" to prevent users from uploading certain copyright violations and do not respond immediately to takedown requests.⁸¹

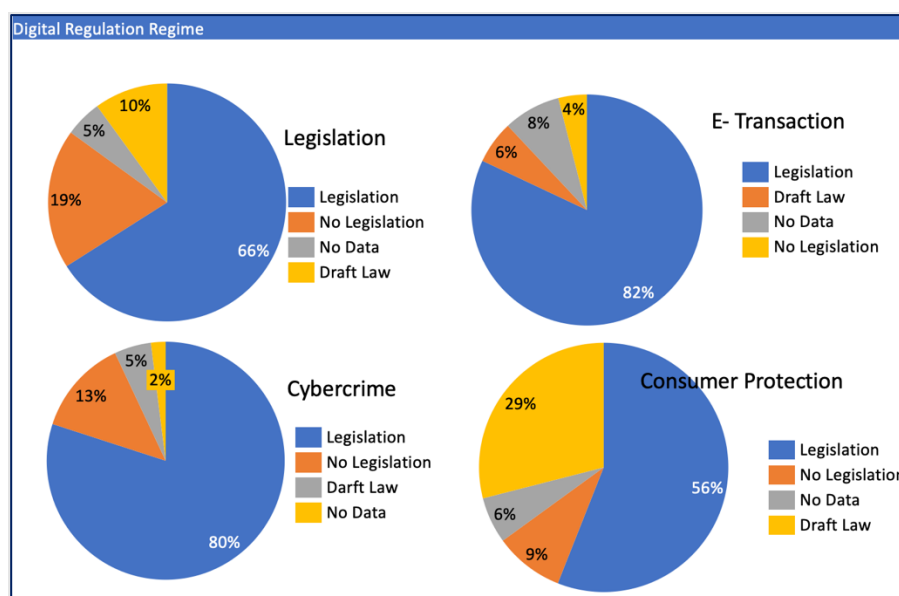


Figure 14: Digital Regimes, UNCTAD

⁸⁰ <https://www.eff.org/issues/cda230>

⁸¹ <https://eur-lex.europa.eu/legal-content/en/TXT/HTML/?uri=CELEX:32019L0790>

13. SANDBOXES: SPURRING INNOVATION AND DEVELOPMENT INCENTIVES

A regulatory sandbox is essentially an innovation safe space or “test and learn” environment which enables both start-up and established businesses to develop new concepts and products in a controlled environment. The regulatory requirements in a sandbox are relaxed to facilitate innovation – this significantly reduced the regulatory risk. Initially most sandboxes were intended to develop fintech concepts, such as the recently launched “Controlled Tests Environment for Financial and Payment Innovations” in Brazil and the CSA Regulatory Sandbox, established by Canadian Securities Administrators (CSA), as well as in Colombia and Thailand.

- a) In Canada, if the fintech firm seeks to operate in multiple Canadian jurisdictions, registration under the CSA Regulatory Sandbox can be made under the “passport regime”, giving the fintech firm access to capital markets in multiple jurisdictions.⁸²
- b) In May 2020, Colombia’s Regulation Communications Commission (CRC) adopted a resolution introducing a regulatory sandbox as an alternative regulatory mechanism that allows testing of new products, services, and solutions in any aspect of the ICT sector. The maximum 12-month licenses allow for tests to be conducted within specified geographic areas under flexible regulation or with regulatory exemptions. Telecommunications network and service providers – whether multinational or community-based entities – may participate.⁸³
- c) In Thailand, the National Broadcasting and Telecommunications Commission established a sandbox regime to facilitate technology testing for businesses and in preparation for the adoption of 5G technologies. The Notification re: The Criteria for Permitting Frequency Use for Innovation Development and Testing in a Sandbox Area allows sandbox participants to use certain frequencies and conduct frequency testing, within a limited sandbox area subject to obtaining a sandbox license.⁸⁴

Regulatory sandboxes are important for encouraging innovation and the local development of solutions. However, similar to entrepreneurs and start-ups, often products, technologies and solutions developed and tested in sandboxes face challenges in terms of being able to get sufficient funding in order to scale them. In Rwanda, the companies that have benefited from regulatory sandboxes providing the space to innovate have been international firms with sufficient funding, but no market in which to conduct trials. Thus, the sandbox solves this challenge. What it does not address is the funding that small firms and local companies require to scale their projects – this is funding that is most likely available through accelerators, hubs and venture capitalists.

Using regulatory protection provided by sandboxes along with funding provided by other Funds, will increase research and development, innovation, job creation and local content development through supporting incubators and accelerators. It will also

⁸² https://www.securities-administrators.ca/industry_resources.aspx?id=1588

⁸³ [Case Study: Regulatory Sandbox Framework in Colombia | Digital Regulation Platform: https://digitalregulation.org/case-study-regulatory-sandbox-framework-in-colombia/](https://digitalregulation.org/case-study-regulatory-sandbox-framework-in-colombia/)

⁸⁴ <https://www.bakermckenzie.com/en/insight/publications/2019/09/thailands-nbtc-introduces-regulatory-sandbox>

provide a practical way to test the efficacy of regulatory measures. The emerging technologies like high altitude platforms systems (HAPS)⁸⁵ currently being deployed without proven business models can highly benefit to be mandated within the regulatory sandboxes for broadband access in rural areas.

14. TOOLS TO IMPLEMENT INCENTIVES

Importantly, these measures are not stand-alone issues to be crafted into ‘command and control’ style regulations. In line with the holistic and outcomes-based approach to collaborative regulation, these measures may be implemented via:

- a) **Public funding conditions**, for example ‘dig once’ and ‘dig smart’ policies and processes for publicly funded municipal networks⁸⁶;
- b) **Guidelines and Memoranda of Understanding**, or vertical regulation for cross cutting issues like EIA applications and ‘rapid deployment’ rules;
- c) **USOs**, where they are applicable, e.g. open access requirements for broadband spectrum licensees; and
- d) **Informal practices** such as municipalities and communities allowing broadband providers access to lines of sight such as roofs of government buildings, water towers and other tall structures to install transmitters, antennas and other networking equipment can result in broadband deployment with lower costs, promoting expansion.⁸⁷

15. REGULATORY FORBEARANCE

In addition, to making effective regulations to create and enabling environment, regulators should avoid onerous or counterproductive regulation that fails to maximise market and consumer outcomes. Regulators and governments should be cautious that frameworks that have recently been put in place to cater for local needs and protect local markets, are carefully balanced against their potentially negative impact on the investment climate. For example:

- a) **Data centre / data localisation requirements** in terms of which governments oblige companies to store and process local data within a country may have the unintended consequence of increasing operational costs (e.g., cloud computing costs), especially in smaller markets where the traffic is insufficient to justify building a data centre.
- b) **Online content rules** may have the unintended consequence of restricting content for subjective reasons related to politics or religion, for example and those which place restrictions on freedom of expression, however it is defined in a particular country context, may inhibit investments in local content. They may also inhibit the usage and uptake of internet. Furthermore, the application of the laws, which once created have to be enforced, often through requests to

⁸⁵ <https://www.itu.int/en/mediacentre/backgrounders/Pages/High-altitude-platform-systems.aspx>

⁸⁶ Appendix A: FTTH Council America’s DIG SMART: Best Practices for Cities and States Adopting Dig Once Policies

<https://www.ncbroadband.gov/media/50/download?attachment>

⁸⁷ <https://www.ncbroadband.gov/technical-assistance/playbook/policy-broadband/building-structure>

operators to take down content, switch of certain services or limit internet access for consumers – negatively impacts the investment climate.

Importantly today more than ever, regulators have to look beyond their core mandates to understand the impact of regulations on investment. While the focus on considering the impact of regulation that is made in sectors that intersect with the ICT sector is clearly understood, it is also important for regulators to be aware of the broader national, regional and international regulatory frameworks. Often, newly adjacent or vertical sectors such as transport and financial services may have rules on issues such as e-hailing or fintech respectively, may have rules that deter investment in these sectors, and will affect digital investment broadly.

16. PLAY POLICIES: IN-KIND CONTRIBUTIONS

16.1 Measured ‘play’ strategies

Initial universal access and service strategies were based on first and second generation ‘command and control’ approaches to regulation. For example, it was not uncommon to have license obligations to connect a targeted number of schools or hospitals by a certain deadline, without reference to a particular operator’s size, coverage or budget – often the only difference would be technology based with one set of obligations for fixed line operators, another for mobile and yet another for ISPs. As licensing frameworks have become more unified or converged over time, the imposition of license obligations on certain licensees, most often incumbent and mobile operators, without proper regard to national needs, or operator’s ability to perform is problematic in that it increases investment costs and impacts the value of licenses whether issued via beauty contest or auction as is increasingly the case for spectrum assignments. It also lays the ground for an adversarial relationship between the operator and the regulator, particularly as the regulator tries to enforce these obligations.

Exhibit: Mobile network coverage requirements in select OECS countries⁸⁸

Country	Coverage requirements attached to MNO licenses
Anguilla	Not applicable
British Virgin Islands	95 percent coverage of the population
Dominica	Island wide coverage
Grenada	92 percent coverage within three (3) years of establishment
Montserrat	None
St Kitts and Nevis	Typically, 92 percent island wide, and 95 percent at each cell site
Saint Lucia	80 percent

⁸⁸ ITU Giga Report, 2021

by issuing an invitation to tender for the reallocation of 900 MHz, 1800 MHz and 2.1 GHz band frequencies, which are currently being used by 2G, 3G and 4G mobile networks and whose licences are set to expire between 2021 and 2024. ARCEP also codified the commitments that operators made for 2018 to 2021 into their current spectrum licences, to make them legally binding. The new obligations will be written into future licences and will make it possible in particular to:

- Increase the pace of targeted coverage improvement programmes through the creation of a "mobile" window, requiring every operator to deploy 5,000 new 4G cell sites, some of which will be shared, in those areas identified by the Minister responsible for electronic communications;
- Improve reception quality nationwide, and particularly in rural areas. The new baseline standard applied to operators' obligations will be that of "good coverage";
- Upgrade all existing 2G and 3G sites to 4G, which will mean bringing 4G to more than a million additional people in 10,000 municipalities in France;
- Accelerate the pace of 4G rollouts along 55,000 km of roadways;
- Achieve ubiquitous indoor coverage, notably by requiring the operators who committed to do so to provide their customers with a voice over Wi-Fi service.⁹⁰

Spectrum for COVID-19

In response to COVID-19 being declared a "National Disaster" in South Africa, the regulator prescribed minimum standards that licensees had to adhere to enable the sector to meet increased demand for ICT services during this period. A critical measure introduced by the regulations is the temporary release of high demand IMT spectrum in the 700MHz, 800MHz, 2300MHz, 2600MHz and 3500MHz bands for the duration of the national state of disaster in order to ease network congestion, maintain good quality of broadband services, and enable licensees to lower cost of access to consumers.

A spectrum auction had been envisaged in 2020, and the regulator commented that "...the emergency release of this spectrum does not, in any way whatsoever, negate the processes that are currently underway for permanent assignment of spectrum through an auction."

Source: Independent Communications Authority of South Africa

⁹⁰ARCEP website: https://archives.arcep.fr/index.php?id=8571&no_cache=1&L=1&tx_gsactualite_pi1_percent_255Buid_percent_255D=2160&tx_gsactualite_pi1_percent_255Bannee_percent_255D=&tx_gsactualite_pi1_percent_255Btheme_percent_255D=&tx_gsactualite_pi1_percent_255Bmotscle_percent_255D=&tx_gsactualite_pi1_percent_255BbackID_percent_255D=26&cHash=1c6543c915ed03e42982c7b134d62b52

Obligations: Selected Play Measures			
Country, Year	Target	Key Aspects	Provider
Argentina, 2014 ⁹¹	National coverage, including underserved areas	The auction of 700 MHz, 1700 MHz/2100 MHz spectrum included coverage obligations requiring licensees to rollout 4G services to all localities with more than 500 inhabitants	All successful licensees
United Kingdom, 2020 ⁹²	Connection that can deliver 1 Mbps download speed and 1 Mbps upload speed (along with other defined quality parameters). Ofcom defined an affordable connection as one that costs less than £45 per month.	USO provides a legal right to request a decent broadband connection, up to a cost threshold of £3,400. USO providers must provide service across their infrastructures for anyone that asks for it in their coverage area (with reasonable notice). Other operators and interested parties pay into a fund to compensate the incumbents.	BT and Kingston Communications
Switzerland ^{93,94}	Switzerland's Federal Communications Commission (ComCom) requires affordable and available services in all regions, and In 2020, the minimum speed requirement for the broadband service tripled to 10/1 Mbps. From 2018 to 2022, existing analogue and legacy digital connections, such as ISDN, need to be replaced by multifunctional connections based on IP standards	Universal services are only provided by one service provider. Other providers are not subject to the specific regulations in this respect. Swisscom has not asked for compensation for providing universal services.	Swisscom, chosen in a public tender process (next one in 2022)

16.2 Key Considerations: Play Obligations

⁹¹ GSMA, https://www.gsma.com/spectrum/wp-content/uploads/2016/11/spec_best_practice_ENG.pdf

⁹² <https://commonslibrary.parliament.uk/research-briefings/cbp-8146/>

⁹³ <https://www.bakom.admin.ch/bakom/en/homepage/telecommunication/the-universal-service-with-regard-to-telecommunications.html>

⁹⁴ <https://www.ses.com/case-study/swisscom>

USO's are not a progressive approach to financing UA. In general, USOs should only be imposed for operators with access to high demand scarce resources such as spectrum. If license obligations are to be imposed as part of a spectrum licensing process, they should be as relevant and manageable as possible, and their impact should already be predicted through research and Regulatory Impact Analysis. Some good practice and principles include:

- a) Map the national priorities as set out in the broadband policy, digital agenda and any relevant vertical digital policies. For example if school connectivity is a national priority.
- b) Estimate the costs of compliance with the obligation and see if it can be offset against any other fees that are charged. This recognises that the USO is not a tax but is being imposed on an operator with the resources (technical, project management and spectrum) to deliver on the universal access goal.
- c) Only impose obligations after considering the potential market impact – ensure that they do not distort the market or discourage applications for spectrum. Refer to the public infrastructure funding principles in [section 8](#).
- d) Ensure that progress is measured periodically and that there is certainty around the obligations.
- e) Define USOs upfront at the beginning of a spectrum licensing process to enable proper planning and to promote certainty before the operator makes an investment.
- f) Ensure that any USOs are imposed only after public consultation including with the recipients of the intended benefits of the obligations (e.g. schools, communities) and the licensees on whom they will be imposed to ensure that they are appropriate and achievable.

PART D – PROGRAMMES, PROJECTS AND PRACTICES

This section discusses the design of publicly funded ICT and digital programmes and projects which may include funding from the many actors described in the previous sections, including USAF2.0, local or municipal government, donors or other sources, in combination with private sector resources. Projects should be tailored to the country specific requirements as determined through an analysis of the policy context, the existing and future infrastructure plans, the service requirements and demand by the population. The right financial mechanisms should be applied to a project to ensure that it is developed in a sustainable manner which de-risks the project and encourages further investment in it. Badly designed projects and programmes will result in ineffective project implementation, and in some cases a waste of resources.

	Pros	Cons	Public Funding Instrument
Public Private Partnership	<p>Can be supported by many financial mechanisms.</p> <p>Can encourage the financial markets to lend into projects.</p> <p>Partnerships can access the broad range of skills, expertise and resources needed to successfully execute broadband infrastructure projects.</p>	<p>High funding requirement</p> <p>High transaction / execution costs due to the multiple parties involved</p>	<p>Direct and indirect or contingent support</p> <p>in kind support (such as provision of land or equipment)</p> <p>Loans</p> <p>Guarantees</p>
Design Build Operate (private)	<p>Low levels of risk for public sector</p> <p>Potential high value asset for private operator once network is operational.</p> <p>If there is sufficient public funding and risk mitigation, private investment can be mobilised</p>	<p>High funding requirement - sufficient funding has to be available to attract interest from private operators, as significant investment may be required to make a viable business case, especially in rural areas.</p>	<p>Grants, against obligations (open access, infrastructure sharing, etc.)</p>
Design Build Operator (public)	<p>Catalyst effect - public sector retains ownership and control of the network and can facilitate further investment.</p> <p>using it (wholesale open access network).</p>	<p>High risk for public sector</p> <p>High funding requirement – network will have to be reliable, high speed and high quality to attract other investment.</p> <p>Often lack of public sector commercial and technical expertise – requiring an operator/vendor partner through out</p> <p>does not exploit the economies of scale and scope that private-sector operators can bring.</p>	<p>Fiscal funding</p>
Community	<p>Communities/ Investors play the role of generating and aggregating demand in the</p>	<p>Lack of access to financing by communities, particularly those in rural and underserved areas.</p>	<p>Government guarantees</p>

	Pros	Cons	Public Funding Instrument
	area, government and donors can co-finance the projects.	Lack of technical experience of communities requires higher cost turnkey solutions. Long term sustainability is a challenge. No scalability Project does not benefit from economies of scale and scope	Underwriting loans grants, however, a plan needs to be in place for long term sustainability.

17. INFRASTRUCTURE BUSINESS MODELS

17.1 State Ownership: Direct Investment/ Equity

In terms of this model, all aspects of the deployment and operation of the network are managed and financed by the public sector. Government gives a capital contribution without receiving any guarantee or repayment and in so doing acquires ownership of a project. The government has an equity stake and is directly involve in network deployment. This approach responds to the high cost of broadband deployments in rural areas and other underserved areas and seeks to make sure that the goal of no one being left behind is achieved. The infrastructure funding principles recommended for USAF2.0 and described in [section 8](#) should inform this model in order to mitigate the main risk of this financing approach which is that it has a low leverage effect and does not necessarily serve to mobilise other investment – in fact, it risks crowding out investment. It also does not explicitly create incentives for delivery.

National broadband networks such as those rolled out in Australia, Tanzania, Malaysia and South Africa were a common feature of Broadband Policies and Strategies after the 2008 Global Financial Crisis. By mid-2018, over 60 percent of all Australian premises could access NBN services, with the project due for implementation in 2020. The Australian NBN investigated the social and economic impacts of the network rollout and found that access to the NBN helped drive an estimated USD 1.2 billion in additional economic activity in 2017 and had helped create up to 5,400 businesses and 9,700 new jobs. The same research estimates that the benefits to Australia once the NBN rollout is complete include up to USD 10.4 billion of additional annual Gross Domestic Product (GDP) as well as the creation of up to 80,000 new businesses and up to 148,000 additional digital jobs by 2021.⁹⁵

⁹⁵ <https://www.industry.gov.au/data-and-publications/australias-tech-future/digital-infrastructure/what-is-the-government-doing-in-digital-infrastructure>

Not all state-owned broadband networks have had the same impact. Many have struggled to compete with other broadband operators in the market – this is due to the fact that they do not necessarily address a market gap and do not constitute effective investment.

17.2 Public Private Partnerships (PPPs)

The World Bank defines a PPP as “a long-term contract between a private party and a government entity, for providing a public asset or service, in which the private party bears significant risk and management responsibility and remuneration is linked to performance.”⁹⁶ The intention is not to discuss PPP’s as there is significant literature on the pros and cons of such structures.⁹⁷ However, it is interesting to note that certain structure and features of PPP’s, namely availability of payments and offtake agreements, can be applied to mitigate risk in funding universal access and service.

The form of governments’ involvement in PPPs, may range from financial support to indirect or contingent support, to in kind support (such as provision of land or equipment), to broader financial mechanisms that can support the specific PPP rollout program or encourage the financial markets to lend into projects.⁹⁸ In the broadband sector there is always some element of public funding in broadband PPPs. The mode of financing among the partners determines the framework of risk sharing and the roles of each of the partners in the PPP.

Concessional PPP Model	Operator PPP Model	Cooperation PPP Model
<ul style="list-style-type: none"> • Partners share the funding • Low risk projects • Over a period of time that aligns with amortisation period of private investment 	<ul style="list-style-type: none"> • 100 percent public funding • High risk projects • Example: National Broadband Networks 	<ul style="list-style-type: none"> • Shared funding & 100 percent public funding • Example: Undersea cable projects

Figure 15: The Broadband PPP Models

There are three main broadband PPP models: (1) concession model, (2) operator model, (3) cooperation model.⁹⁹

- a) Concession models are used in lower risk projects. In this model, the public and private sector partners agree to share the funding of the PPP project. Concessions for the private partner are usually assigned over a time period, which corresponds with the period of amortization of the private investment;

⁹⁶ <https://pppknowledgelab.org/guide/sections/3-what-is-a-ppp-defining-public-private-partnership>

⁹⁷ See: Developing Successful Public-Private (ITU, 2013) <https://www.itu.int/ITU-D/treg/publications/SuccessfulPPPs.pdf>

⁹⁸ <https://ppp.worldbank.org/public-private-partnership/government-support-financing-ppps>

⁹⁹ Financial funding and organisational models in Public Private Partnerships for broadband projects in Europe

- b) Operator models are applied where there is 100 percent public funding. This model tends to apply to very high risk projects where market demand is very low – rural, remote and low population areas would meet these criteria; and
- c) Cooperation models are applicable for both shared and a 100 percent public funding which have a medium to high risk level. These projects may have low market demand, but potential for demand aggregation, for example under sea cable projects.

These partnerships, recognise the need for a broad range of skills, expertise and resources to successfully execute broadband infrastructure projects. In their most basic form PPPs may include network operators and government; however, many successful PPPs also include equipment suppliers, vendors, manufacturers, and communities, in recognition that in many underserved areas bottom-up approaches to project development and implementation are key. Increasingly, PPPs are taking on a more holistic approach and also involve digital platforms that are intent on ensuring increased connectivity in order for their business models to be successful.

17.3 Privately-owned Municipal, Local Government and Regional PPP Models

This privately-owned and run model involves a private sector organisation receiving some level of public funding (often a grant, sometimes through USAFs, other Structural Funds or State Aid) to assist in its deployment of a new network offering open wholesale access. Open access, infrastructure sharing and other relevant obligations that promote competition and lower the costs of investment for future competitors can be imposed on publicly funded local PPPs in exchange for the funding. The public sector can provide funding as well as commitment to procure (e.g. offtake agreements) thus guaranteeing a certain level of capacity from the locality from individuals, schools and municipal departments, and local businesses. On the back of this, open access network deployment and the competitive provision of services is more attractive for investors.

While some level of funding is provided in this model, it is not strong on risk mitigation. The same risks that a national operator would be faced with will apply to the local operator, albeit on a smaller scale. The local operator risks being the first entrant in the underserved market and developing a market, which may be cannibalised by national or other local operators in future once demand has been confirmed. An example is South Africa's Underserved Area Licenses (USALS) which were licensed in underserved regions and received subsidies from the Fund. The USAL model was unsuccessful because, amongst other reasons, although subsidised by the Fund, the USAL had to enter into commercial agreements to lease infrastructure from and interconnect with mobile operators with whom they competed in the markets for which they were licensed. The infrastructure costs were high since the licensees had to procure high cost turnkey solutions from vendors, and some elected to roam on mobile networks to provide services, but in the absence of open access regimes this did not enable them to create sustainable businesses. The burden on the Fund and government was low, but the local entrepreneurs carried the risk.

Case study: Privately Owned Municipal, Local Government and Regional PPP Models

In the United States, the New Hampshire Fibre Network Consortium (NHFNC), a public private partnership established by the University System of New Hampshire, together with the Community Development Finance Authority in New Hampshire and a fibre build out entity known as FastRoads New Hampshire, applied for broadband stimulus grant funding together with two or more private sector providers of fibre network capacity who would provide private matching funding for the federal grant. NHFNC intend to be structured like a “fibre condominium”. The public participants will each be allocated a block of fibre strands and will have an equity stake, the size of which is yet to be determined, along with private participants in NHFNC, who will be assigned a block of fibre to offer to users on a commercial basis.

The new fibre infrastructure will be designed with off-ramps for anchor institutions as well as nodes for town-by-town Last Mile fibre connections that would be made available on a wholesale basis by FastRoads New Hampshire and others to retail service providers in return for payment for use of the local infrastructure.¹⁰⁰

17.4 Publicly-Owned Regional and Municipal Networks (Design, Build, Operate)

Smaller scale municipal or local state-owned entities own, operate and maintain a wholesale open access network over which competing service providers can deliver their retail services.

The local authority benefits from the fact that the operator or vendor takes the investment risk and makes the investment, in exchange for retaining all of the revenue. At the end of the contract, the network infrastructure remains with the public authority, however, a major risk, is that once the agreed contract period is over, they are unlikely to be able to run the network independently, and they will not have taken any actions to introduce any further competition, making this an unsustainable long term solution.

Case Study: Romania’s Public Design, Build Operate Model¹⁰¹

In Romania, RO-NET has been funded under a ‘design, build, operate’ model, to develop backhaul and local access networks bringing Internet closer to around 400 000 people in almost 130 000 households, as well as 8 500 business and 2 800 public institutions, primarily in rural areas. This has increased broadband coverage in Romania by 1.9 percent, which means that by the end of 2020, broadband internet was available for 99.2 percent of the country’s population. The network is rolled out mainly in “white” areas with no broadband infrastructure. Romania’s Ministry of Communications and Information Society owns the infrastructure which is built and managed by a number of operators that have been selected via an open call for tender. The operators pay a concession fee and are responsible for managing and operating the network for the entire contractual period, as well as for all costs arising from the

¹⁰⁰ <https://ppp.worldbank.org/public-private-partnership/sector/telecom/telecom-laws/case-studies-telecommunications>

¹⁰¹ <https://business-review.eu/news/ro-net-internet-broadband-project-completed-in-over-200-white-areas-111478>

operations. They also have the right to keep revenue from the network, although a mechanism is in place to prevent them from making excessive profits.

The network is provided to ISPs and other operators on an open access basis. RO-NET was rolled out in two phases, the first was during 2014-15 (approximately EUR 15 million.) and phase two took place during 2015-16. The budget for the second phase was approximately EUR 66.7 million, with around EUR 45.7 million provided through EU co-financing.

17.5 Community Ownership

This grassroots, bottom-up model is reminiscent of cooperative models which saw the local community (residents and/or businesses) take control of the delivery of fixed and wireless broadband to their neighbourhoods¹⁰². Community anchors, including local governments, agricultural cooperatives, schools and clinics, create a sustainable case where there was previously a universal access gap through aggregating demand and also actively taking steps to increase local adoption. In the digital era, the most strategic role communities can play is to (1) provide key data to attract investors (See *Good Practice: Data Mapping by Communities* below), (2) aggregate demand to increase traffic and mobilise investment; and (3) they can extend existing networks and promote public shared use, for example through Wi-Fi in their localities or through building dynamic wireless community networks.¹⁰³

Community based models have been found to face challenges relating to:

- a) Lack of technical knowhow of the communities to lead the deployment of networks, and sometimes even to manage the appointed contractors;
- b) Lack of access to financing by communities, particularly those in rural and underserved areas. Where there is some level of local finance available, the government and donors can co-finance the projects through grants, loans and guarantees, however a plan needs to be in place for long term sustainability;
- c) If the project is end-user funded, securing upfront funding for high cost infrastructure projects, even on a small scale will be difficult; and
- d) In fact, the project may be more expensive in that it does not benefit from economies of scale and bulk procurement discounts that large operators would get. The public sector and Funds can provide guarantees and subsidies to support these projects but must have a long term view on them.

Overall, the fibre bottom-up model is most appropriate for targeting localised areas in developed markets and for gaining the most benefit from small amounts of funding. It is highly unlikely that end users in unserved or underserved locations in emerging markets would be able to finance any such project without substantial support from the public sector (central or local government). In these situations the public DBO model is more appropriate.¹⁰⁴

¹⁰² The ITU/ISOC Community Networking Manual – How to Build a Network Yourself. https://www.intgovforum.org/multilingual/filedepot_download/4391/2376

¹⁰³ <https://www.itu.int/en/ITU-D/Technology/Pages/LMC/LMC-Home.aspx>

¹⁰⁴ The ITU Last Mile Connectivity Solutions Guide. <https://www.itu.int/ITU-D/treg/publications/SuccessfulPPPs.pdf>

Emerging markets tend to be better suited to wireless community network models – some models rely on wireless mesh networks, others, rely on community members sharing unused bandwidth amongst each other. The latter model can be made sustainable through partnerships between the ISPs and the community who can enter into a revenue sharing arrangement with customers who sell their unused bandwidth.

Good Practice: Data Mapping by Communities

The community promotor can work directly with community institutions – government and public service agencies, places of worship, libraries, schools, local businesses– to increase both participation and awareness in the community. A data map that shows potential demand and identifies underserved areas within a community provides a powerful tool. With demand and needs accurately mapped a community gives potential broadband providers:

- a) A ready-made map of potential customers and therefore an indication of demand;
- b) A map that presents opportunities to use existing community and municipal and or local infrastructure to expand broadband internet services, especially fixed wireless broadband;
- c) The locations of important anchor tenants (schools, colleges, libraries, non-profits, government offices, healthcare organisations, local business centres, known future development projects and work-ready sites); and
- d) The beginnings of a strategic, phased expansion of broadband internet service.

Some important information on community infrastructure that can attract broadband investors and investments:

- a) Locations of electricity infrastructure that is key for broadband infrastructure; in some cases the infrastructure may be capable if being shared in order to reduce costs and speed up rollout. Absence of electricity is a key stumbling block for rollout and significantly increases costs;
- b) Locations of locally/community-owned water towers, silos, telecoms towers, high sites, and tall buildings that can be used by broadband providers at low- or no-cost leases;
- c) Rights of way for easier and less expensive access for deploying fibre optic cable;
- d) Capital projects, either current or planned, such as road construction or installing or upgrading water pipes or other infrastructure, can be used as an opportunity to lay new fibre optic conduit for future activation;
- e) Locations of community-owned infrastructure that can be used at reduced costs or even free of charge by telecommunications companies to expand broadband networks; and
- f) Details of community-owned land that can be leased at reduced costs

Adapted from <https://www.ncbroadband.gov/technical-assistance/playbook/assets-needs>

18. FINANCING ADOPTION, USAGE, INNOVATION AND INCLUSION

18.1 Overview

Demand side projects that promote local content, digital inclusion and digital literacy or support the development of digital entrepreneurs and SMEs tend to be innovative and often first of their kind, making them difficult for traditional funders to evaluate. The lack of precedent of similar business models at times, for example in the case of digital platform services such as Uber, Facebook or Airbnb, would make it difficult for banks to assess potential values and risks using existing frameworks, and thus make it challenging for them to be financed. This lack of knowledge and expertise within banks puts digital projects at a disadvantage compared to other kinds of projects and therefore requires creative approaches to funding digital innovation.

The main challenges inhibiting usage and uptake are (1) affordability, or rather lack thereof; (2) lack of relevant applications and content; and (3) inability to use the internet. In response to these challenges, USAF's and other funders and collaborators have considered strategies to make connectivity – the service as well as the devices - affordable and accessible for individuals from low income and vulnerable groups and strategic institutional users (e.g. schools, hospitals). They have also put in place digital literacy strategies. All of these strategies stimulate demand and service two purposes:

- a) Get people online where networks exists; and
- b) Encourage the extension of networks to what would otherwise have been low traffic and low affordability

18.2 Adoption, Usage, Inclusion and Innovation Models

There are a number of ways in which government finances universal access projects that serve to stimulate demand. These differ based on the type of project, the locality, region or country and the market. Two key themes for demand side and adoption strategies are that the most effective ones are local and bottom up; and that they embrace collaboration at all levels – from design to funding to execution. This collaboration is between communities, donor agencies, the public sector at regional and municipal levels, the private sector, often as corporate social investment (“CSI”), and Universal Service and Access Funds. The involvement of Funds in demand side projects has increased over the years and according to the ITU, only about 30 percent of Funds currently have measures in place in their Fund structures to stimulate demand of services among low-income users or target groups, e.g., youth, students, elderly. This means that only in limited number of Funds are capacitated to fund adoption related projects – however they can consider partnerships and in-kind contributions to complement other parties funding efforts.

This section considers the following types of initiatives that stimulate demand within the broad funding priority areas discussed in [section 3](#):

Initiatives	Public Connectivity	Affordability	Adoption - Usage and Uptake	Innovation & SME development	Digital Inclusion
Public access centres and Wi-Fi	X	X	X		X
Low-cost broadband for individuals		X	X		X
Low cost connectivity for Strategic Public Institutions	X	X	X		X
SME Connectivity	X		X	X	X
Digital Literacy programmes			X	X	X
Local content and relevance			X		X
Accelerators and incubators				X	X
SME Development	X		X	X	X
Research	X	X	X	X	X
Mapping	X	X	X	X	X

The above-mentioned projects and initiatives are funded in a myriad of ways – from private sector to universal service and access funds to donor organisations. A key aspect that contributes to their successful collaboration – given that connectivity of communities has so many touchpoints – the school, the ISP, the UASF as an example – it is critical that stakeholders that may not usually engage or interact, do so.

In this section, initiative types set out above will be explored and consideration will be given to how they are conceptualised, funded and executed. In addition case studies will be provided as appropriate. This section highlights the role of Funds, if any, in each of these types of projects to inform the recommendations with regard to the modernisation of Funds.

18.3 Project and Initiative selection

Broadband adoption programs differ significantly across countries and communities given the location specific characteristics, needs, opportunities, and challenges. However, in general, before selecting any of the models described in this section, communities and municipalities should go through (1) needs assessment; (2) stakeholder engagement; (3) initiative and programme planning and (4) monitoring and evaluation.

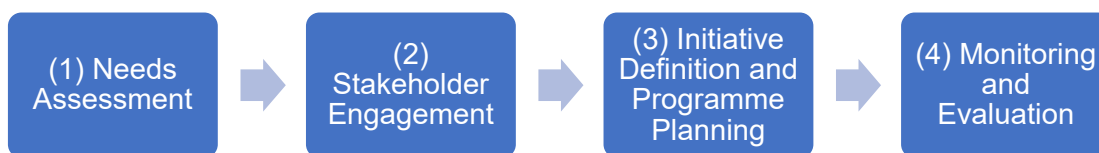


Figure 16: Project and Initiative Selection Process

- (1) **Needs Assessment:** Because adoption projects are ultimately about people, it is important that financiers have a clear understanding of the needs and opportunities in the community or region to be addressed, and how broadband adoption will address them, this includes the technical, financial and human resources needs to match the broadband adoption;
- (2) **Stakeholder engagement:** It has long been established that no community based projects should be implemented without community buy in. It is therefore critical that the Fund maps all of the relevant stakeholders, and engages them on all aspects of the initiative;
- (3) **Initiative definition and program planning:** It is necessary to align the programme with policy and regulatory objectives, and develop a plan that is outcomes based and includes measurable targets through the project implementation cycle to ensure an adequate return on social and financial investment;
- (4) **Monitoring and evaluation** is a core aspect of the project implementation and should involve ongoing assessment, data collection and analysis, information sharing and programme improvements.

Through the needs assessment the initiatives will be tailored to specific technical, financial and resource needs of the community being addressed. This will also ensure that the right type of support is provided for the desired outcomes. The models are not mutually exclusive. It might be that several initiatives may need to be implemented in parallel or in a complementary manner to achieve the desired objectives.

18.4 Supporting Tools: Research and Mapping

Data is key to closing the digital divide. It is used by governments at national, regional and local level, to decide where to target public funds. It is therefore important that attaining data is considered a “universal access project” of sorts and adequately funded either a stand-alone project or as part of the initial feasibility and pilot phases of all projects; and later at the implementation and evaluation stages.

Research includes market gap analysis discussed earlier in this paper, on progress in attaining UA goals and targets, on the efficacy of funding models, and project trends and improvements, amongst others. This will ensure that the policy and funding frameworks and the USAF strategy are evidence based. It will also facilitate the monitoring and evaluation of projects and will support the achievement of outcomes-based funding.

Mapping is a critical data input for effective UA projects. This is discussed later in the context of the Giga project that addresses school connectivity. Mapping assists to derive the correct data which in turn enables countries to prepare appropriate budgets to close the broadband and other gaps.

18.5 Public Connectivity

18.5.1 Public Wi-Fi

Public access today can learn from the lessons of yesterday. With respect to Wi-Fi models, these tend to be either (1) government-led through direct funding from the state (Philippines), (2) operator / ISP led, or (3) development partner led, depending on the primary source of financing, and then community supported. There are also successful Fund led models sponsored by the USAFs (Botswana). The most effective models involve collaboration across actors and the value chain, i.e. with community, public and private (technical) cooperation.

- a) Facebook's Express Wi-Fi is a collaborative model through which it collaborates with other private sector players including Cisco, mobile operators and local entrepreneurs in specific countries to finance public access. Express Wi-Fi is a software platform offered free of charge to MNOs and ISPs, allowing them to deploy, operate, and monetise Wi-Fi services, according to Analysys Mason. Express Wi-Fi is monetised either as paid data bundles or via advertising. Usually the sale of Express Wi-Fi data bundles is done via local entrepreneurs offering the Express Wi-Fi hotspot service.¹⁰⁵
- b) In the Philippines, the Department of ICT is responsible for the implementation of the "Free Public Wi-Fi for All" programme which provide free public Wi-Fi in parks, plazas, public universities and colleges, public hospitals and health centres and airports, amongst others. The Department of ICT procures the services of various providers through bidding processes which are documented on its website and also lists all areas and live sites that have been covered by the programme. The Free Wi-Fi for All Programme as part of its disaster relief efforts, recently installed emergency free Wi-Fi services via Very Small Aperture Terminal (VSAT) in affected areas after the typhoons in November 2020. As of April 2020, over 3700 sites were operational.¹⁰⁶

18.5.2 Public access centres

Funds also maintain public access computing facilities that allow residents to access technology in places in which they feel comfortable and supported. These spaces also complement the digital literacy classes that are often offered in the same location and can complement Wi-Fi projects. Low-income individuals and families value public access computing centres because they are often in convenient locations and have helpful staff that provide them with one-on-one support with computers and broadband Internet access.

¹⁰⁵ It provides low cost access, as long as users have a device that can connect to the network; boosts service usage by capturing new users within already covered areas and increasing their data consumption due to improved service quality and affordability; and allows operators to offload their mobile traffic, in urban and semi-urban areas, onto the Wi-Fi network.

¹⁰⁶ <https://freepublicwifi.gov.ph> and <https://www.itu.int/en/myitu/Publications/2020/08/31/09/09/Digital-Regulation-Handbook>

The most successful public access centre models are bottom up community based models that are financed in partnership with private sector. Funds have significant experience delivering this model – with early models being telecentres in Latin America which quickly spread throughout developing countries. Many lessons were learned from telecentre and multi-purpose community centre models – one lesson was that bottom-up models with community ownership and buy in work best; the other was that the whole ecosystem needs to be considered – device, service and training. In addition a key lesson was that sustainability is critical. Many telecentres failed because they were not able to develop sustainable business models.

18.6 Adoption: Uptake and Usage

18.6.1 Low-cost Connectivity for Individuals

As discussed earlier, meaningful connectivity can only be achieved if there is Internet connectivity with an appropriate device, increasingly a smart device, that enables the use of apps; appropriate also means that the devices must be designed in line with universal design or design for all principles. Nearly 2.5 billion people live in countries where the cost of the cheapest available smartphone is a quarter or more of the average monthly income.¹⁰⁷ subsidised low-cost or free smartphones, tablets and computers are therefore central to enabling active participation on the internet. Some Funds and community-based projects also provide ongoing technical support to residents who need the social and technical assistance to keep their computers up and running—and connected online—over time. In addition, funding for the development of low-cost devices to address the device affordability barrier can be considered in line with broader industrial policy incentives discussed later in this section.

Case Study: Italy's voucher scheme for low income families ¹⁰⁸

In Italy, a 200m Euro voucher scheme has been developed that supports low-income families by providing vouchers to purchase broadband services with download speeds of at least 30 Megabits per second (Mbps), with a preference for the highest speed available to the extent several suitable infrastructures are present in the relevant area. The vouchers will also cover the provision of the necessary equipment, such as a tablet or a personal computer.

The measure aims at enabling eligible families to telework and access educational and other services provided online by schools, universities, public services providers and businesses. The families can select their providers and equipment from the eligible providers – hence there is competitiveness and technology neutrality in the programme.

18.6.2 Low-Cost Connectivity for Strategic Public Institutions

¹⁰⁷ <https://webfoundation.org/2020/08/mobile-devices-are-too-expensive-for-billions-of-people-and-its-keeping-them-offline/>

¹⁰⁸https://ec.europa.eu/commission/presscorner/detail/en/IP_20_1445

Most broadband plans and digital agendas recognise the importance of connecting critical public institutions such as schools, hospitals and police stations, as a means of increasing usage and uptake, as well as promoting efficient delivery of services in line with e-governance strategies. The challenge lies in the fact that in many cases, municipal or national budgets do not cater sufficiently for them or their users to the Internet.

An “e-rate” is a funding mechanism for school connectivity. Similar schemes can be applied to other public institutions that are considered strategic such as universities, clinics, hospitals and police stations. The institutions are given discounts on ICT services such as voice and broadband, and the service provider either pays the difference as part of an e-rate obligation (South Africa) or is reimbursed to the level of the discount from the Universal Service Fund (United States). Schools typically still have to pay for the remaining part of the fee. A challenge that has been experienced is that in many countries Funds are not capacitated to manage end user subsidies. Five out of the nine Organisation of Eastern Caribbean States (“OECS”) countries Funds and based on the frameworks for those USAFs, the support available is primarily for network- or infrastructure-related capital projects, such as the expansion of networks into underserved areas. Additionally, the Fund frameworks do not appear to readily contemplate use in subsidy arrangements.¹⁰⁹

Another model used in many developing countries is the National Research and Education Network (“NREN”) model. An NREN is a specialized ICT service provider that exists in a country to provide internet and advanced ICT services to research and education institutions on a non-profit basis. In Zambia and Morocco, ZAMREN and MARWAN4 have expanded over the years and now offer Eduroam, a service that allows users from participating institutions to gain secure access to wireless network using their standard username (email format)/ and password credentials as they do at their home institution for wireless access. It is based on a federated authentication model where usernames and passwords are validated at their home institution and enables access to authorized network services that are controlled by the visited institution.¹¹⁰

¹⁰⁹Giga School Connectivity Report

¹¹⁰ <https://ubuntunet.net/2015/04/zamren-growing-eduroam-service/>

ZAMREN (Zambian NREN)	Marwan 4 (Moroccan NREN)
<p>In addition to donor funding, ZAMREN members provide the income of ZAMREN to pay for the operational expenditures of ZAMREN, there is no direct government financing. The government does however support ZAMREN indirectly:</p> <ul style="list-style-type: none"> a) The national electricity provider (ZESCO) provides a national Gigabit backbone free of cost during the start-up phase and has announced that in the future ZAMREN will have a special tariff for the national backbone. b) The Zambian regulator provides additional funds to ZAMREN to connect members to the nearest ZAMREN PoP; there are budget limitations to the number of members that can be connected per year. 	<p>MARWAN is funded by the Ministry of Higher Education and Scientific Research. The Ministry pays for the internet link, whilst each institute pays for its link to the MARWAN network.</p> <ul style="list-style-type: none"> a) More than 200 connected institutions over 80 links covering cities b) Offered bandwidth ranges from 100 Mbps to 5Gbps c) Total bandwidth currently 35Gbps connected to the Internet via 2 links of 10Gbps each in Rabat and Casablanca d) IPv6 is deployed natively in dual stack e) IP multicast support f) Multiple classes of services offered to ensure quality of service for critical applications for the Ministry and Universities
<i>Source: ZAMREN</i>	<i>Source: MARWAN 4</i>

18.6.3 SME Connectivity

In addition to productivity gains, small businesses and entrepreneurs that invest in and adopt ICT and digital products/services can gain access to new markets. They can therefore exploit efficiency gains in conjunction with promoting job creation. In addition to generating additional revenues for operators, connecting SME's will facilitate adoption by a new segment of users by making new applications and use cases available.¹¹¹

Connecting SME's offers an opportunity for Funds and other financiers in blended arrangements to focus on digital inclusion targets in relation to women and persons with disabilities, for example in relation to requirement for participating SMEs to employ and or train a certain number of people from marginalised communities. Innovative approaches to SME connectivity include a digital adoption fund in Singapore called "SMEs Go Digital", which offers grants covering over two thirds of what small businesses from all sectors spend on digital technology. The Info COMM Media Development Agency oversees this fund.

¹¹¹ <https://www.bcg.com/publications/2020/plan-to-bring-high-speed-internet-access-to-two-billion-people>

The rationale for the grants issued is that if the costs of adopting technology can be funded, then the application of these technologies will make them more productive. Given that small and medium enterprises employ two thirds of Singapore's workforce and contribute nearly half of Singapore's GDP, this is an important and targeted intervention to grow the economy. With digital technology transforming every sector of Singapore's economy the government seeks to ensure that SMEs make the most of digital technologies to improve operations and generate new revenue.¹¹²

A New Kind of Fund: Singapore, focussing on innovation and SME demand

SMEs Go Digital

Launched in April 2017, the 'SMEs Go Digital' programme hosted by the Info COMM Media Development Authority ("IMDA") aims to make going digital simple for SMEs. More than 63,000 SMEs have adopted digital solutions from the programme. To make it easy for SMEs to adopt digital solutions recommended in the IDPs, IMDA provides a list of pre-approved solutions assessed to be market-proven, cost-effective and supported by reliable vendors. SMEs interested in adopting these solutions can start by visiting Go Business Gov Assist and applying for the Productivity Solutions Grant ("PSG") through the Business Grants Portal. PSG can help to offset up to 80 percent of the costs of adopting these solutions.

Start Digital

Together with Enterprise Singapore (ESG), IMDA launched the Start Digital initiative in January 2019. Start Digital helps newly incorporated SMEs and those that have yet to digitalise, to get started with foundational digital solutions through their natural touchpoints – banks and telcos.

5G Innovation programme

To strengthen Singapore's competitiveness enabled by a robust and advanced connectivity backbone, IMDA's 5G Innovation Programme will be supporting and encouraging enterprises and industries to adopt and implement new 5G applications in live operating environment. The programme will also be supporting solution providers and technology developers commercialising 5G solutions, by making the benefits of 5G more accessible to companies, focusing on:

- a) Domain areas (i.e., Robotics & IoT, AI & Data, AR/VR); and
- b) Commercialisation and deployment of 5G solutions.

¹¹² https://www.imda.gov.sg/-/media/Imda/Files/Programme/SMEs-Go-Digital/Media-Factsheet_SMEs-Go-Digital_1-Apr-2021.pdf?la=en

18.6.4 School Connectivity

The lack of connectivity among the most marginalised populations – children and young people from poor households and rural areas – places them at an extreme disadvantage and reduces their prospects of participating effectively in the modern economy. This was exacerbated by the COVID-19 pandemic which led 190 countries to close schools for a period of time, forcing learners to learn remotely. It shed light on the goal of universal service to internet (in the household) , while in many countries universal access in schools has not even been achieved. The challenge, in many developing countries, is that (2) the schools have a school connectivity plan, but the plan has not been mapped, to achieve efficiencies derived from a holistic view and approach. Mapping is the first pillar of the ITU/UNICEF Giga project¹¹³; (2) some of the hygiene factors, i.e. electricity, infrastructure, teachers are not digitally literate; furthermore, there is no digital literacy in the curriculum – thus preventing schools from being able to connect. Thus, in order to advance to connecting the schools, it is important that the school connectivity goal is properly considered, and that:

- a) There is collaboration with other authorities (local government authorities. Energy companies, education authorities etc) to ensure that the school is ready for digitalization; and
- b) Prioritise schools that are ready, so that no time is lost.

Thereafter finance can be sought from, amongst others, communities, local governments, USAF's and multilateral and bilateral agencies.

In Rwanda, Giga has found that USD11 million of Capex funding and USD5 million of annual Opex funding will enable Rwanda to connect 1,796 schools. This investment will bring 1.3 million students and teachers online and connect 2 million community members who live locally, potentially enabling up to \$400m USD in GDP growth. This budget was derived from a thorough analysis of the school connectivity gap which is premised on mapping. Mapping is instrumental in getting an understanding of the true gaps - Giga mapping shows that nearly all Rwandan schools are within 30km of the fibre network and covered by mobile broadband, but 1,796 schools (43%) remain without internet. Electrification and ICT resources are major barriers. ¹¹⁴

¹¹³ <https://gigaconnect.org>

¹¹⁴ <https://gigaconnect.org/wp-content/uploads/2021/03/Rwanda-Opportunity-Brief.pdf>

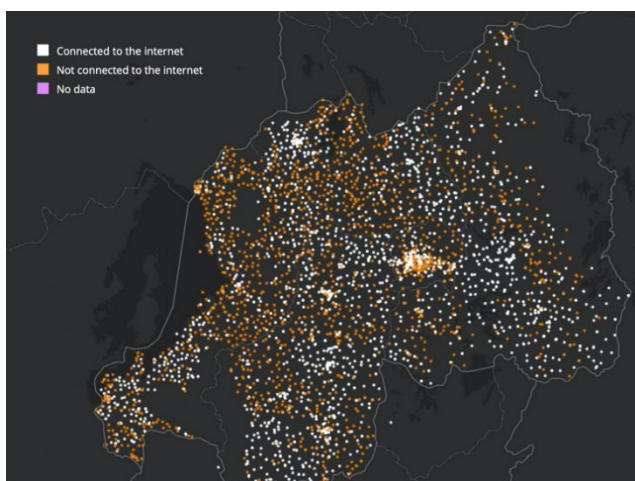


Figure 17: Rwanda, Giga Mapping¹¹⁵

Partnerships Across Sectors and Funders

Launched by UNICEF and ITU in 2019, Giga sets the goal of connecting every school to the internet, and every young person to information, opportunity, and choice. Giga serves as a platform to create the infrastructure necessary to provide digital connectivity to an entire country, for every community, and for every citizen. It is about using schools to identify demand for connectivity, as well as using schools as an analogy for learning and connecting where the community can come together and support its next generation in a world where we are all increasingly digital, where the skills that are required are not formal ones, necessarily, and where learning happens continuously.

The 'GIGA' initiative comprises four pillars:

- a) Map connectivity of every school and use it to show where connectivity demand is, and use new technologies like artificial intelligence (AI) to create a real-time map of school locations and their connectivity level.
- b) Finance working with governments and advise them on building affordable and sustainable country specific models for finance and delivery, subsidising market creation costs and incentivizing private sector investment.
- c) Connect every school to the Internet and create a monitoring system to oversee the level and quality of connectivity this includes determining the best possible solutions for last mile connectivity.
- d) Empower young people with skills by investing in, and scaling, open source solutions that – with connectivity – will be available to children, teachers, and administrators.

Source: <https://gigaconnect.org/>

¹¹⁵ <https://gigaconnect.org/wp-content/uploads/2021/03/Rwanda-Opportunity-Brief.pdf>

Table 2: School Prioritisation Scorecard
Source: Author

School Prioritisation Criteria	
Level	10
Secondary	10
Primary	5
Type	7
Private	3
Public	7
Learner/Teacher Ratio	5
Learner: Teacher Ratio > 30:1	3
Learner: Teacher Ratio <30:1	5
Location	6
Rural	6
Peri-Urban	5
Urban	3
Infrastructure	2
On National Grid	2
Off National Grid	1
On Fibre Route	2
Off Fibre Route	1
Training	4
2 – 5 teachers trained in ICT/ 50 students	2
>5 teachers trained in ICT/50 students	4
Curriculum	4
ICT in curriculum for > 50 percent of students/year	4
ICT in curriculum for 10 percent - 49 percent of students/year	2
Additional Points	
Willingness to Partner with Primary School	6
Willingness to be Community Centre	6
School for Persons With Disabilities	8

- **Prioritise**
 - Government Secondary (based on country strategy)
 - On Grid / On Fibre
 - Learner/Teacher Ratio
 - ICT Trained teachers at school
 - ICT in curriculum
- **Extra Points**
 - Partnering with Primary
 - Community Access
 - PWD

Successful school connectivity projects have been undertaken globally. The most successful models are those that consider the school as a central element to understanding the demand in a community. The school can be considered an entry point into connecting a community as well as the centre of the community, however all equipment and devices need to be secured and students' security should not be put at risk due to the vandalism and security risks sometimes associated with the presence of new technology.

Rwanda is considered a flagship school connectivity programme. Some other successful school connectivity projects include:

- a) The Communications Authority of Kenya ("CA") led a project that connected over 890 public secondary schools to the Internet. Following a tender process, the CA appointed two service providers in 2016 and reportedly approximately 94 percent of the schools that were identified for connection are online. The KES 837mn (USD 8.3mn) project received financing from the Universal Service Fund which receives 0.5 percent of its annual revenue from operators. In July 2020, the CA collected Sh5.3 billion (USD 52.3mn) for the Fund, with KES 2.1 billion (USD 20.7mn) distributed to projects by the end of the year.¹¹⁶

¹¹⁶ <https://www.businesschief.eu/technology/communications-authority-connect-896-schools-internet>

- b) In Jamaica, the Fund fully finances the “Tablets in Schools” programme, through which devices are distributed to students at the pre-primary, primary, and secondary levels, as well as at select teachers’ colleges and special education institutions. Students at the University of the West Indies, the University of Technology and the Edna Manley College for the Visual and Performing Arts enjoy free campus-wide Wi-Fi courtesy of the USAF. We have also upgraded the ICT infrastructure at the College of Agriculture Science and Education (“CASE”), the Mico University College and the Caribbean Maritime University. In 2018/19, the Fund spent 60 percent of what was budgeted. e-Learning Jamaica Limited, an NGO, received the full amount that was budgeted for the financial year 2018/2019 towards the Tablets in School (“TIS”) project. The expansion of the island-wide broadband network accounted for 28 percent of the Fund’s total projects expenditure.¹¹⁷

18.6.5 Digital Literacy

Digital literacy is a cross cutting issue in that literacy is required for participation in the working world as well as across all aspects of society. Thus funding for digital literacy tends to be housed in a number of places and supported by a number of actors – the whole public sector is concerned about digital literacy. In addition, there is a broad range of funders in the form of private sector, philanthropists, foundations and donor organisations. As such, in one country there may be multiple digital literacy funds or programmes outside of the Ministry responsible for education or ICT. And these programmes may be national or local.

The diversity in approaches demonstrates the number of touchpoints the digital literacy has, and ultimately makes the case for collaboration. Several funds with similar objectives in a single country can pool resources to leverage private sector finance. They can also work together to ensure that there is coordination in approaches and outcomes. USAF2.0 can play a key role in coordinating these initiatives to ensure consistency, create a minimum standard for digital literacy, and to ensure adequate and efficient investment.

Cross sectoral funds that can collaborate with ICT Funds to leverage school connectivity funding	
Country & Type	Description
Australia: National Innovation and Science Agenda (Education Sector)	<p>Australia, the National Innovation and Science Agenda intended to invest USD 50.6 million over four years (1 July 2016 – 30 June 2020) to support all Australian teachers and students in embracing the digital age and in implementing the Australian Curriculum: Digital Technologies. This funding provides support for:</p> <ul style="list-style-type: none"> a) Grants to school principals and ICT leaders for projects to implement the Australian Curriculum: Digital Technologies through a whole of school approach; b) Online professional development courses for teachers; c) Online computing challenges for all Year 5 and Year 7 students;

¹¹⁷ https://usf.gov.jm/wp-content/uploads/2020/08/USF_Annual_Report_2018_2019.pdf

Cross sectoral funds that can collaborate with ICT Funds to leverage school connectivity funding	
Country & Type	Description
	<p>d) ICT summer schools to engage Year 9 and 10 students, with a focus on those from disadvantaged backgrounds, to increase their participation in digital technologies and STEM studies in school, post-secondary school and the workforce;</p> <p>e) Cracking the Code - a series of fun and engaging computing and coding challenges and activities for school students, to be held in National Literacy and Numeracy Week;</p> <p>f) Teacher support for digital technologies to provide in-class support and/or telepresence support and follow-up to schools in the early stages of implementing the Australian Curriculum: Digital Technologies; and</p> <p>g) Developing effective partnerships between STEM professionals and schools to build teachers' and students' understanding of STEM applied in the real world.</p> <p>The focus is on tackling the digital divide to ensure that students most at risk of falling behind in the digital age are given opportunities to participate and engage in digital literacy and STEM in both primary and secondary school settings.</p> <p>www.education.gov.au/inspiring-all-australians-digital-literacy-and-stem.</p>
<p>Canada: Digital Strategy Fund (Council for the Arts) (Vertical Sector: Arts and Culture)</p>	<p>The Digital Literacy and Intelligence component of the Digital Strategy Fund , which sits under the Canada Council for the Arts supports the arts sector in building digital knowledge, skills and capacity. It supports Canadian artists, groups and arts organisations in their efforts to: (1) respond more effectively to the challenges, issues and opportunities of the digital era; (2) develop and broaden their strategic digital thinking; and (3) strengthen their ability to translate that thinking into sustainable, concrete actions.</p> <p>Applicants may request a grant for a single-phase initiative for which the objectives, timelines and expected results are clearly set out. Eligible activities include, but are not limited to, initiatives that:</p> <p>a) Build strategic digital knowledge and capacity in identifying and understanding the challenges, issues and opportunities of the digital environment. Examples: group learning on strategic issues, workshops, webinars, hackathons, collaborative digital needs/maturity assessments and digital strategic plans that are not for single organisations, etc.;</p> <p>b) Gather and connect with people within or beyond the arts sector to explore digital challenges, issues and opportunities, and to foster collaboration and digital knowledge sharing. Examples: organising symposia, forums, conferences, communities of practice, etc.;</p> <p>c) Research and experiment with collaborative approaches to problem solving, and to build strategic digital knowledge and capacity. Examples: design thinking activities, coaching approaches, conducting studies and strategic foresight, etc.</p>

Cross sectoral funds that can collaborate with ICT Funds to leverage school connectivity funding	
Country & Type	Description
	<p>Activities addressing digital challenges, issues and opportunities related to artistic practice are eligible if the focus is not on the creation and production of artistic work.</p> <p>https://canadacouncil.ca/funding/strategic-funds/digital-strategy-fund</p>
Nigeria (Local) (Multistakeholder)	<p>As part of the efforts to empower vulnerable groups in rural clusters in Northern Nigeria with the digital skill set required for the future of work and advanced learnings for the 21st century in Nigeria, Technology for Social Change and Development Initiative (Tech4Dev) and the Foreign Commonwealth and Development Office (FCDO) have signed a resilience training agreement to carry out the Basic Digital Literacy for Rural Clusters in Northern Nigeria.</p> <p>The programme is inclusive and targets 50% vulnerable women and girls (aged 8-18; 45-65), 30% Persons with Disabilities (PWDs) and 20% individuals of other vulnerable groups.</p> <p>By investing in digital literacy for vulnerable people living in rural clusters in Northern Nigeria, allows for the reduction in the poverty index by increasing the employability of the beneficiaries and closing the digital skills gap needed in the digital economy.</p> <p>The initiative is designed to directly impact 1,000 beneficiaries, in ten rural clusters, across ten states in Northern Nigeria; Zamfara, Kaduna, Kwara, Kogi, Benue, Sokoto, Jigawa, Nasarawa, Niger and Plateau states.¹¹⁸</p>

18.7 Innovation and SME Development

18.7.1 Incubators and Accelerators

A decade ago, ICT sector tech hubs and incubators and accelerators, designed to support start-up businesses and technology-oriented entrepreneurs, were at their infancy. Through their support for innovation, many of these hubs and accelerators have produce globally and locally relevant solutions that are scalable.

There are four main types of hubs and incubators, which focus mainly on the provision of collaborative working space and infrastructure for entrepreneurs and start-ups: (1) Academic institution-led, (2) civil society-led, (3) government-led, and (4) hybrid-led. The operating type informs a hub's funding.

Accelerators, tend to be privately led, or government led, and are slightly more sophisticated than incubators in that in addition to shared space and opportunities for co-creation, investors receive expert mentoring, exposure to investors and cash investment. In exchange for this, the entrepreneur gives a portion of his or her company's equity to the partners of the program and for this reason is often called a "seed" or "venture" accelerator. Private and NGO led accelerators face funding

¹¹⁸ <https://tech4dev.com/blog/blogCategories/pressRelease.html>

challenges. For example, Activespaces, founded in “Silicon Mountain” in Cameroon has been active for 10 years, and yet sustainability has been a major problem as it continues to search for a revenue model that will sustain it and ensure the smooth running of the space. Start Up Chile, on the other hand, is a government backed accelerator also launched in 2010 in what is dubbed “Chilecon Valley.” It is aligned with broader national policy - start-up entrepreneurialism in Chile a central part of government strategy. Corporación de Fomento de la Producción de Chile (CORFO) which is tasked with promoting economic growth in the country, including promoting small business development in rural areas, conceptualised the accelerator funding model. The accelerator’s twin mandate is to elevate Chile’s international profile and to build a local culture of entrepreneurship (see *Chilecon Valley – Accelerating Women’s Participation* case study below).

Funds could use accelerator models such as that use in the Start Up Chile case, Govtech Poland or the European Digital Innovation Hubs (See *Govtech Poland* case study below) and collaborate with partners to support accelerators that are focused on innovation and the design of local solutions –there is also a potential partnership opportunity with regulators that are creating sandboxes to finance the innovation developed. One of the challenges that has been noted for regulatory sandboxes is that they while they confirm the regulatory and technical feasibility of their innovations, they are not able to take them to scale due to finance constraints.

This is a potential area for Funds, regulators, donors and investors to explore collaboratively – perhaps through Fund of Funds models which use the technical skills of financial intermediaries . It is critical that USAF2.0 does not compete with venture capital funds, if they choose to finance innovation through accelerators, they should narrow the types of innovation that they are willing to finance to development oriented projects that are able to provide solutions to local challenges, or to close any of the identified digital gaps.

Chilecon Valley – Accelerating Women’s Participation (Start Up Chile)

The Corporación de Fomento de la Producción de Chile (“CORFO”) is tasked with promoting economic growth in the country and promoting innovation and small business development in some of Chile’s rural areas has been a priority. It established Start Up Chile as a public start up accelerator. Since 2010 it has had 1960 start-ups go through it; 54 percent of which are still active. Its valuation is USD 2,1b. Programmes include:

- a) S Factory: Pre-acceleration program for female-led start-ups in early concept stage. Successful applicants will receive 10m Chilean pesos (£12000).
- b) Seed: Acceleration program for companies with a functional product and early validation will receive 20m Chilean pesos (£24000).
- c) Scale: Top performing companies incorporated in Chile, looking to scale in Latin America and globally will receive 60m Chilean pesos (£72000).

Chile has also developed new programs to integrate women into the start-up ecosystem.

- a) 42 percent of women comprise the entrepreneurial activity in initial stages.
- b) Women lead 44 percent of established businesses in Chile.
- c) Creating awareness and encouraging women to start a career or boost their current one is something that organisations like Girls in Tech Chile is doing. Similarly, there are start-up programs specifically meant for female entrepreneurs.
- d) Access to the Start-Up Chile community includes up to USD 100 000 in perks such as Microsoft BizSpark, Facebook Start, Amazon Web Services and many more.

Source: <https://www.startupchile.org> and <https://contxto.com/en/chile/startup-hub-chilecon-valley/>

Govtech Poland (Hub-model)

One of the areas of UKE's activity is supporting Polish innovative solutions and enterprises on the market of telecommunications services. In 2019, UKE joined the Govtech Poland – Activate Ideas! programme, implemented under the auspices of the Prime Minister, which brings together public bodies, undertakings, start-ups, academic communities and citizens. By harnessing the competition formula, the programme invites stakeholders who want to use modern IT and technological solutions to come together and solve important challenges faced by society, improve living conditions of citizens or the effectiveness of the public sphere.

As part of the programme, UKE reported a challenge related to creating a publicly available platform showcasing investment attractiveness, especially in areas without the NGA standard infrastructure. UKE aims to ensure that in 2020 high-speed Internet will be available across Poland, and the measures undertaken by UKE are intended to promote and stimulate investment in the expansion of NGA networks.

Source: *Report_on_uke_activities_for__2019.pdf*

PART E: USING FUNDING TO MAINSTREAM THE INCLUSION OF WOMEN AND GIRLS

The digital gender gap is a major challenge. More men (58 percent) use the Internet than women (42 percent). In developing countries the mobile internet gap is starker and is 37 percent in Sub-Saharan Africa.¹¹⁹ In low and middle income countries, the GSMA has found that women are 8 percent less likely than men to own a mobile phone, and 20 percent less likely to use the internet on a mobile. Furthermore a key barrier is smartphone ownership, which is also 20 percent lower for women than for men.¹²⁰ As societies get more digitised and participation increasingly requires meaningful access to broadband networks and digital services, the cost of exclusion of women is going to increase.

On one hand the gender gap is not driven by technology but is rather exacerbated by it. Societal structures and biases which value women's work less, that underpay women (thus limiting their ability to afford), that limit their opportunities for education (thus reducing digital literacy) and compromise women's security (thus limiting their participation) only enhance the 'real world' divides. The same is true for the systemic biases against youth, the elderly and persons with disabilities. It is important to use the opportunity of financing to ensure that the response to these challenges is mainstreamed.

When assessing project proposals, Funds and other financiers can develop and apply selection criteria based on the digital inclusion framework (Figure 19) set out below. The analysis of the impact of projects on women and other marginalised communities:

- a) Is a process, not an event. The publication of a gender gap report, or research on an aspect of ICT and gender is important to identify and quantify gaps that need to be addressed, however it is not enough on its own;
- b) Has to form part of a broader national strategy and policy framework on inclusion to which USAF2.0 abides; and
- c) Must be implemented in a coherent manner, by first identifying gender gaps then designing and implementing appropriate measures (gender mainstreaming or specific measures) to address them.¹²¹

¹¹⁹ <https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2020/05/GSMA-The-Mobile-Gender-Gap-Report-2020.pdf>

¹²⁰ <https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2020/05/GSMA-The-Mobile-Gender-Gap-Report-2020.pdf>

¹²¹ <http://standard.gendercop.com/about-the-standard/why-a-standard-on-gender-mainstreaming/index.html>

Step 1. Analysis	Step 2. Objectives and indicators	Step 3. Theme specific competence	Step 5. Monitoring and evaluation
<ul style="list-style-type: none"> • Does the proposal include an inclusivity analysis of the intervention area (i.e. the analysis of differences in women's and men's situations and needs, the needs of immigrants, the needs of persons with disabilities – in their diversity – and the identification of relevant inequalities)? • Is qualitative and quantitative disaggregated data used to describe gender, PWD and other gaps and patterns? • Does the analysis refer to fund-specific, national and/or sub-national digital inclusion goals? 	<ul style="list-style-type: none"> • Are specific digital inclusion goals set for the project? Are they broken down into specific communities that are to be positively impacted (women, immigrants, PWDs, etc) • Are specific indicators set to facilitate the monitoring of objectives? Are general indicators related to individuals disaggregated by sex, type of disability, age, or other measures as appropriate in order to enable effective monitoring. • Are broader, cross cutting indicators that will assist in analysing socio-economic impact capture, e.g. age, socio-economic background, poverty, race, ethnicity, location (rural/urban), disability, sexual orientation (lesbian, gay, bisexual, transgender and others) and religion. 	<ul style="list-style-type: none"> • Does the project have access to internal gender/ PWD/ immigration/youth competence? If not, will external expertise be used? Does the project include a budget for such external expertise? • Is expertise and competence a requirement in training and evaluation procurements? 	<ul style="list-style-type: none"> • Does the proposal explain how the project will monitor and assess digital inclusion objectives/results/effects? • Does the proposal set out how the project will evaluate digital inclusion objectives/results/effects?

Figure 18: Digital Inclusion Framework

Source: Author adapted from <https://eige.europa.eu/gender-mainstreaming/toolkits/gender-budgeting/concrete-requirements-considering-gender-equality-within-eu-funds>

19. CONCLUSION

Throughout this paper the benefits of extending broadband access and increasing citizen demand through financing the rollout of networks and funding digital adoption, usage and digital inclusion are discussed in the context of finding ways to close the access gaps. The question is how does one do it? The answer is to collaborate, to pool, and to share. And one cannot stop there – the objective of pooling is not simply to have more available capital for UA, but rather to have more capital that can be leveraged to encourage private participation in the financing of universal access.

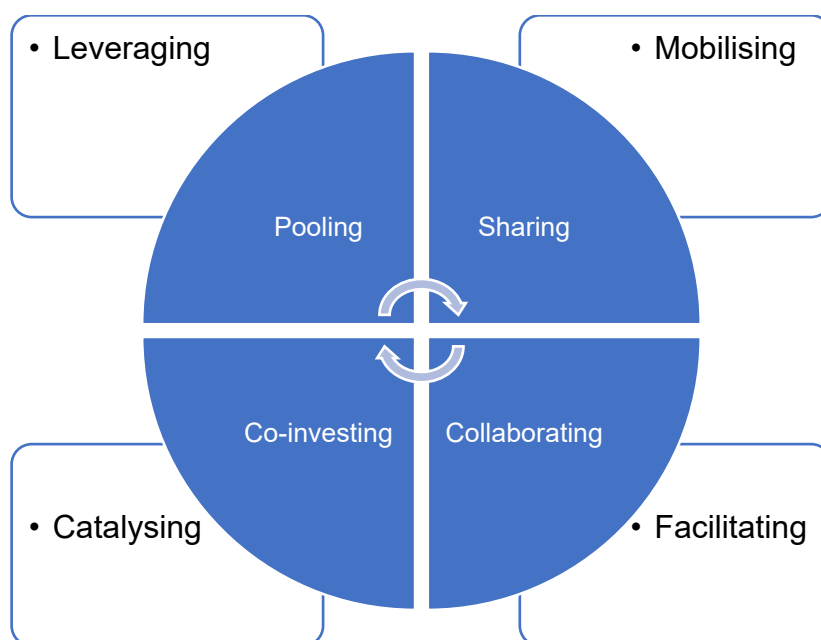


Figure 19: *Private Participation in the Financing of Universal Access*

There are a myriad of funders in the digital transformation arena – from private to philanthropic and development finance institutions to public funding as a last resort. Amongst those actors are structural funds which provide lessons for the reform of USAF2.0. The current USAF is not built for the purpose of digital connectivity – it therefore needs to be either reformed for effectiveness and relevance, or dissolved where Funds are not disbursing funds collected. Neither scenario is an absolute as the direction a Fund should take will depend on the country context. Furthermore, in all scenarios, Fund management should put in place mechanisms for periodic review of the Fund to ensure effectiveness – (1) annual financial and performance reports should be prepared and published; and (2) performance, institutional and strategic reviews should be held every 3-5 years at the time of the strategic review. These reviews are critical to ensure that the role and relevance of USAF2.0 are aligned with national, regional and community requirements.

This report provides an overview of key legal and institutional considerations that will support the reform process as well as guide periodic review processes in the future. It suggests that given the changed landscape, the new role and goals of the reformed USAF2.0 might include:

- a) Being a facilitator or an intermediary and consider pooling its funds with other DFI, donor and community funding and used in line with blended finance structural principles, to leverage private capital to the greatest extent possible;
- b) Targeting infrastructure that will have a significant impact on GDP growth as well as job creation across economic sectors;
- c) Targeting adoption and usage activities that have high potential for creating growth and jobs, with few adverse effects on competition that could reduce the growth and jobs potential of the rest of the economy;
- d) Facilitating innovation and SME development to benefit from economic and productivity gains as well as to encourage local innovation and R & D; and
- e) Always address digital inclusion as part and parcel of its investment strategy.

The report updates the thinking of UA financing but maintains that, as has always been the case, public funding should be complemented by non-financial interventions to close these gaps. It also argues that, borrowing from the blended finance framework, public funding should seek to demonstrate additionality – it should bring private capital that would otherwise not have been interested in developmental-oriented projects, to the table. This is part of a holistic approach to financing universal access to digital technologies and service, which bears in mind the following:

- a) **Broadband and digitalization have a huge potential to improve economic performance and create jobs.** The impact of a well conceptualised national digital agenda, with clear objectives and measurable targets, is a first step to defining UA objectives and will go a long way towards delivering a digital economy.
- b) **Collaboration is the name of the game.** The number of stakeholders in the digital ecosystem has grown. They include the pool of potential funders, and financiers have increased beyond the network providers, tower companies, and ISPs to reach other sectors and private investors. Universal Service Funds can collaborate with donor agencies, DFIs, and multilateral and bilateral agencies, amongst others to cover the geographic areas and people, as well as the innovative strategies, that the market is not able to reach. They must factor “additionality” into their collaboration with private sector funders and ensure that public and philanthropic funding is geared at catalysing private funding so as not to distort the market.
- c) **Financing infrastructure is critical as it is the foundation of digitalization.** However, even where there are networks, in some areas, people are not using them. Financing platforms, applications and content is imperative as they will increase the value of the network and the internet for users. Locally relevant content is a key driver of adoption as an application that resonates with users and is useful to them in their local contexts. These include financial services, transport and security applications, and content that is locally generated.

- d) **The availability of local, relevant, content and adequate end-user skills**, i.e. digital literacy, are critical for promoting digital inclusion and facilitating broadband adoption. Investments in skills and content may take the form of establishing tech hubs, local content ecosystems, or internet literacy training programs.
- e) **Regulation has to be flexible enough to enable universal access for all.** Prescriptive regulation and legislation will hold back the progress of the sector and constrain people's ability to make investment decisions.
- f) **Finally, people-centred financing is critical to facilitate user's access.** This includes making sure that users can afford to use the internet and that being online provides a meaningful experience.