Project Brief

giga

foraus
Forum Aussenpolitik
Forum de politique étrangère
Forum di politica estera
Swiss Forum on Foreign Policy

Project: Giga Knowledge Spark

January 2026

Giga Knowledge Spark

Incentives towards achieving meaningful connectivity

Hana Ahmed Gamal Kamal ElAkhras, Gevorg Barseghyan, Salma Bourichi, Naa Lamiorkor Boye, Elise Coquoz, Simon Derleth, Jakob Frerichs, Manthan Gadhia, Gion-Andra Gianelli, Anja Ihle, Klára Kolářová, Naga Priyanka Kuruganti, Nicola Lo Russo, Beatriz Movido, Fadwa Mugahid, Enkhchimeg Munkhsaikhan, Patrick Navia, Andrea Amarayo San Martin, Dmitrii Shevchuk, Natalie Sprenger, François Tameza, Miguel Vitali, Abin Wang, Miao Yu, Han Zhou

Edited by: Anja Kölbig, Maximilian Rau, Sabrina Ritz

Executive summary

As the world moves deeper into the digital age, access to meaningful, sustainable, and affordable internet connectivity has become a prerequisite for quality education. Yet millions of children continue to attend school that remain disconnected, reinforcing educational inequalities and limiting future economic and social opportunities. School connectivity is not merely a technical challenge but a structural, financial, and political one.

This Project Brief explores pathways toward universal, equitable, and sustainable school connectivity by 2045. The policy recommendations presented are the outcomes of a pilot edition with a two-day collaborative workshop held in October 2025 at its heart, organised in partnership with Giga, a joint initiative of the International Telecommunication Union (ITU) and UNICEF, supporting governments to connect schools to the internet. Through structured exchanges with professionals from the international digital and education policy ecosystem and a collective policy-writing process, this project sought to strengthen participants' hard skills (policy analysis and drafting), soft skills (public speaking, collaborative work), and professional network, while providing youth-informed inputs to key multilateral policy discussions. By combining evidence-based analysis with forward-looking policy imagination, this Project Brief aims to contribute to global efforts to close the digital divide.

1. Introduction

Authors: Andrea Aramayo San Martin & Abin Wang

The challenge of school connectivity

Today's digital landscape reflects deep structural inequalities: 2.2 billion people remain unconnected, with today's digital divides marked by differences in speed, reliability, affordability, and skills (ITU, 2025a). Two-thirds of school-age children worldwide, around 1.3 billion, do not have internet access at home, making the digital divide a pressing global priority (UNICEF, 2022).

This lack of access reinforces social and economic disparities, limiting children's ability to learn, develop, and participate in an increasingly digital world. At the household level, 58% of children from the richest households have home internet access, compared with just 16% of children from the poorest households. At the country level, fewer than one in twenty school-age children in low-income countries are connected at home, versus nearly nine in ten in high-income countries (UNICEF, 2022). Evidence shows that countries with higher levels of school connectivity also tend to have stronger student performance on standardised tests (WEF, 2021), yet children from the poorest households are falling further behind (UNICEF, 2022).

Schools are more than learning spaces : they are central pillars of social and economic life. They host community events, support crisis response, and often double as sites for essential services such as health campaigns or elections.

Once schools get connected they can strengthen digital skills and literacy within the wider population (WEF, 2021). Schools can also act as entry points for connecting entire communities, fostering entrepreneurship, financial inclusion and digital public services (The Economist, 2021).

School connectivity produces measurable economic impact. Countries with higher levels of school connectivity exhibit higher national internet penetration, stronger economic performance, and greater productivity. A multi-country time-series analysis by the Economist Intelligence Unit (EIU) found that a 1% increase in school connectivity is associated with a 0.06% rise in average years of schooling and a 0.11% increase in GDP per capita (The Economist, 2021).

Connecting schools is thus a powerful lever reducing educational inequality and addressing structural drivers of the digital divide. Early access to digital tools and skills generates lifelong benefits, with positive spillovers for households, communities, and national economies (WEF, 2021).

African context on school connectivity

Across Africa, school connectivity remains critically low where around nine in ten school-age children lack internet access at home, making the region the most affected globally (Statista, 2021). In West and Central Africa, 95%, or 194 million children, are unconnected, while in East and Southern Africa, 88%, or 191 million face the same barrier (The Economist, 2021) although they are a population group (15-24) which would be more likely to use the internet (ITU, 2025a). This digital divide is even more pronounced in landlocked African regions, where the absence of nearby undersea cable landings results in weaker infrastructure and higher connectivity costs (ITU,2025a).

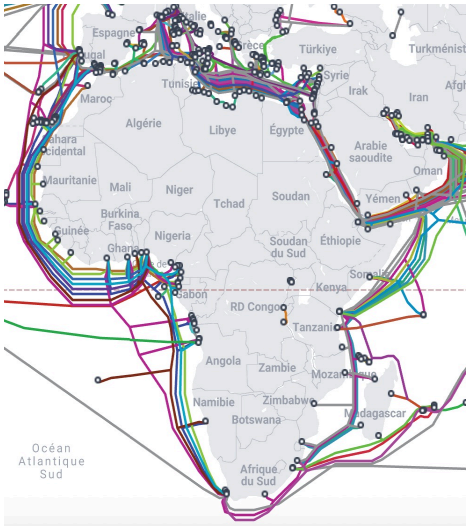

Fig.1 Map of active undersea cables around Africa (TeleGeography, 2025)

The change needed

With the goal of supporting governments to connect every school to the internet, the United Nations Children's Fund (UNICEF) and the International Telecommunications Union (ITU) launched Giga in 2019. This initiative provides governments with technical assistance across four core areas: school mapping, infrastructure modelling and cost analysis, financing, and contracting, all underpinned by capacity development. Through this integrated approach, Giga delivers evidence-based insights to inform national connectivity investment plans, identify sustainable funding sources, and design transparent and attractive procurement processes. As a result of these targeted actions, Giga has partnered with governments in 48 countries and territories and mapped more than 2.2 million schools, positioning education as a gateway to information, opportunity, and choice (Giga, 2025a).

Achieving universal school connectivity requires a coordinated, systemic approach built on multilateral cooperation and robust public policy reform. Because connectivity gaps stem from overlapping regulatory, financial, and infrastructural barriers, governments and the private sector must collaborate to design holistic, affordable, and sustainable strategies.

The ideal solution goes beyond simple access: it ensures that connectivity is reliable, sustainable, affordable, and paired with devices, relevant digital content, and support for teachers and students so that technology is meaningfully integrated into learning. When these elements align, digital infrastructure can unlock transformative opportunities, enabling hybrid and blended learning models, expanding access to high-quality education in remote areas, and giving students greater flexibility in how they learn (WEF, 2021). Strengthening school connectivity also empowers policymakers through improved data systems such as EMIS (Education Management Information Systems), enabling more agile and evidence-based decision-making (The Economist, 2021). In this way, multilateral collaboration, effective regulation, and inclusive digital policies form the foundation for leveraging connectivity to improve learning outcomes and generate long-term socio-economic gains. A priority reflected across national agendas, as shown by the recent OECD Policy Survey on School Education in the Digital Age covering 37 jurisdictions (OECD, 2025).

To explore the pressing global challenge of ensuring every student, everywhere can access and benefit from meaningful connectivity foraus, in collaboration with Giga, piloted the "Giga Knowledge Spark" between October and December 2025, bringing together more than 25 young thinkers from different fields with the aim of generating innovative policy pathways for the future of school connectivity.

At the heart of this process was a two-day workshop, held on 16 and 17 of October 2025, at the Giga Connectivity Centre in Geneva, Switzerland, which brought students together to explore incentives for achieving meaningful, affordable, and sustainable school connectivity, particularly in underserved regions of Africa.

Divided into four groups and guided by facilitators, participants engaged in expert-led visioning sessions in a World Café format, examining barriers such as fragmented regulation, heavy taxation, limited economies of scale, and investment risk. Building on these insights, participants conducted a structured backcasting exercise, working from a 2045 vision back to 2025, to develop actionable policy, regulatory, and financing strategies. Drawing on the outcomes of the workshop, each working group then co-authored a chapter of this Project Brief.

In the first chapter, **Naa Lamiorkor Boye, Jakob Frerichs, Gion-Andrea Gianelli, Klára Kolářová, Patrick Navia, Dmitrii Shevchuk, and Miguel Vitali** examine how fragmented governance structures and inconsistent regulatory processes hinder the expansion of school connectivity across many African countries, and propose a solution in form of a centralised platform that offers increased transparency, streamlines procurement processes, and reduces administrative burdens.

Next, **Hana Ahmed Gamal Kamal ElAkhras, Gevorg Barseghyan, Simon Derleth, Manthan Gadhia, and Priyanka Kuruganti** explore how taxation regimes shape the affordability and viability of school connectivity, particularly in underserved regions. They then propose targeted tax reforms and smarter fiscal frameworks that lower costs, attract investment, and accelerate school connectivity efforts, especially in contexts where high taxation acts as a major structural barrier.

In the third chapter, **Elise Coquoz, Nicola Lo Russo, Beatriz Movido,**

Fadwa Mugahid, and Enkhchimeg Munkhsaikhan take a close look at the structural challenges that limit economies of scale in expanding school connectivity, especially in rural and difficult to reach areas. As a solution, they offer an idea how leveraging economies of scale at national and regional levels can provide more solid grounds for competition , accelerate deployment, and support more equitable access to digital connectivity.

Finally, **Salma Bourichi, Anja Ihle, Natalie Sprenger, François Tameza, Miao Yu, and Han Zhou** analyse how innovative financing mechanisms can unlock progress in connecting schools, particularly in remote and rural areas where traditional market incentives fall short. To overcome these constraints, they propose a central role for governments in shaping blended finance solutions, thereby strengthening investment policies, mobilising public resources, and reducing risks to attract private participation.

2. Four visions for 2045

2.1. Vision 1: Multisectoral collaborative or whole-of-government regulatory approach

Authors: Naa Lamiorkor Boye, Jakob Frerichs, Gion-Andrea Gianelli, Klára Kolářová, Patrick Navia, Dmitrii Shevchuk, Miguel Vitali

Introduction

Despite substantial progress in connectivity, with approximately 240 million people gaining internet access in 2025, an estimated 2.2 billion people still lacked access (ITU, 2025a). This is a particular issue for children's education. In 2020, two thirds of the world's school-age children or 1.3 billion children aged 3 to 17 years old do not have internet connection in their homes (UNICEF, 2020). These figures underscore persistent digital divides that continue to constrain social and economic participation. According to ITU estimates, achieving universal meaningful connectivity will require 2.6 to 2.8 trillion USD in infrastructure investment and thus a procurement process of similar scale (ITU, 2025e).

Research by the OECD shows that limited transparency and excessive administrative burdens are major barriers preventing small and medium-sized enterprises from participating in public tenders (OECD, 2023). In developing countries, where corruption and nepotism tend to be more prevalent, a lack of transparency further increases the risk of misallocation of public resources (OECD, 2016).

From a policy perspective, strengthening transparency in procurement can yield several benefits: lowering entry barriers for smaller firms, reducing corruption-related losses, and improving donor confidence in the integrity of public spending. Emerging technologies such as blockchain can support these goals. When properly designed

and managed, blockchain-based systems may help improve transparency in procurement by making records harder to alter and by facilitating the review and verification of potential misconduct. Technology-driven transparency can open new avenues for development funding (Fabian, 2025).

The following sections will further explore how transparency, competition, and technology can converge to promote more equitable and efficient public procurement systems.

Vision for 2045

By 2045, African Union (AU) member states operate a centralised, interoperable procurement platform dedicated to digital connectivity and related infrastructure.

Through this platform, governments can post standardised *Requests for Proposals* (RFPs) that make their connectivity gaps visible, while suppliers can easily see, compare, and respond to these requests. Because demand is visible and aggregated, the platform can create bidding packages that pair high-return urban connections with lower-return rural or remote sites, making universal service more commercially feasible. Countries with higher deployment costs, such as landlocked states, also benefit from pooled, multi-country investment programmes that spread risk and attract larger players.

The platform further increases transparency by providing reference prices and facilitating knowledge exchange among governments and suppliers. Competition is strengthened through subsidy bidding, which encourages providers to offer better value for public funds (OECD, 2019). Having a single platform for the entire AU streamlines processes for investors, removing obstacles such as the need to research and navigate dozens of separate national markets. Every transaction and procedure is recorded on a blockchain, with records that can be made available to courts and oversight bodies, thereby further enhancing transparency and accountability across the system.

Action Planning

(2045) All African Union States Rollout: Impact

- All African Union states use a single interoperable platform for standardised RFPs, supplier comparison, and aggregated bidding packages.
- Pooled tenders cut costs for landlocked and otherwise higher-cost-bearing countries.
- Transparent reference prices and blockchain logs deter corruption.
- Competitive subsidy bidding and streamlined investor entry will help connect at least 1.5 million schools.

(2040) Scaling Regionally: Ecosystem Leadership by AUC

- Informed by Brazil's Connected North and India's 4G Saturation Project (OECD, 2019), the platform scales regionally.
- The platform adds a knowledge-sharing module.
- Via the platform, the AU Commission (AUC) provides innovation ecosystem leadership, enabling knowledge mobility and ecosystem stability, fostering the ecosystem's ability to sense and seize innovation opportunities (Dhanaraj; Parkhe, 2006 & Foss; Schmidt; Teece, 2023).

(2035) Pilots: Connecting Humanity Principles

- Pilot deployments are planned in volunteer countries across Southern Africa and beyond to test cross-border tenders, subsidy bidding, and bundled urban-rural projects. Countries already engaged with Giga are of particular interest, from Kenya to Senegal, from South Africa to Niger.
- Multistakeholder and public-private partnerships structure these pilots, drawing from cases such as the Healthcare Electrification and Communications Alliance (GCA, 2026) and the Digital Transformation Centres Initiative (ITU, 2025d).
- Pilots follow ITU Connecting Humanity principles: align value propositions, engage only essential partners and plan for sustainability.

(2030) Shaping Architecture: Southern Africa Primary Focus

- Primary focus on the Southern African region cases (e.g. Angola and Mozambique): one of the continent's largest remaining connectivity gaps (Giga, 2025b).
- States appoint national points of contact and adopt shared Terms of Reference and a dispute-settlement mechanism, drawing on Crasa's regional harmonisation model (Crasa, 2025).
- Technical bodies and open-source communities co-design core modules: standard RFPs, reference-price dashboards and a blockchain procurement ledger for oversight and courts.

(2025) Laying the groundwork: WIPO's Madrid e-Filing analogy

- AUC and ITU launch a design study for an AU-wide digital connectivity procurement platform, inspired by international one-stop systems like WIPO's Madrid e-Filing.
- Takeaways from Giga's pilot programmes in Kenya (Kizito, 2025) and Rwanda (Nyandwi, 2025) (cost reductions of up to 60% and 55%, respectively) will be incorporated into the analysis.
- Country teams within the AUC map connectivity gaps, procurement rules, and price levels; workshops surface barriers for Small and Medium-sized Enterprises (SMEs), landlocked states, and civil-society groups.
- Development institutions provide initial funding aligned with the Connecting Humanity Action Blueprint. Development institutions include multilateral development banks (e.g., African Development Bank, World Bank), United Nations agencies (e.g., UNDP, ITU), regional bodies (e.g., NEPAD, SADC, ECOWAS), and philanthropic initiatives (e.g., Bill & Melinda Gates Foundation).

Policy Recommendations

To connect 1.5 million schools by 2045, a centralised, interoperable procurement platform for digital connectivity and related infrastructure should be developed at the African Union level to enable coordinated, efficient, and scalable deployment across member states.

1. National regulatory authorities as well as Ministries of Education and ICT should promote open contracting by replacing fragmented bidding with standardised requests for interest. This approach can reduce the "nepotism premium" (higher costs and lower quality resulting from contracts awarded based on personal connections) and build trust with international donors and investors. Digital tools, including blockchain, can support this effort when well governed, providing auditable procurement records for oversight and judicial review.
2. Frameworks and incentives should be established to ensure that all relevant stakeholders, including the AU, national ministries, regulatory authorities, regional economic communities, ISPs and backhaul providers, multilateral development banks, donors, Giga, UNICEF, and ITU, publish accurate and up-to-date price-performance data on a public dashboard. Transparency will enable evidence-based decision-making, promote competition, and support fair procurement.
3. The AU should launch a centralised connectivity procurement platform, modeled on WIPO's Madrid e-Filing system, and harmonise national and AU-level ICT legal and regulatory frameworks, drawing on CRASA's approach.
4. Bundled tendering should be implemented to pair high-return urban connections with lower-return rural sites, making service deployment commercially viable. Regulatory frameworks should ensure that countries with structurally higher deployment costs, such as landlocked states, can leverage transparency and collective bargaining to secure fair, reliable access to submarine-cable gateways.

2.2. Vision 2: Taxation policies

Authors: Hana Ahmed Gamal Kamal ElAkhras, Gevorg Barseghyan, Simon Derleth, Manthan Gadhia, Naga Priyanka Kuruganti

Introduction

The enduring challenge of global digital connectivity lies less in technical capability, and more in policy. While rapid growth in the global IT sector has brought unprecedented internet access, large communities, especially in the Global South, remain isolated. We argue that a major barriers the absence of economic policies that incentivise sustainable, meaningful access for all. This chapter focuses on Sub-Saharan Africa (SSA), where high connectivity costs continue to be an obstacle, and proposes tax policy interventions as a pathway towards universal connectivity. The consequences of limited or missing connectivity are far-reaching. They include reduced access to education and healthcare, diminished business opportunities, and limited social and civic participation.

Recent ITU data show that African regions face the highest average spectrum usage fees value-added tax (VAT) rates, and corporate income taxes in the global telecommunications and ICT sector (ITU, 2025c). Though these elevated taxes contribute to high internet costs, they make sense in context. Given the informal nature of much of the region‘s economic activity, IT-sector products and services are more accessible to government taxation.

India and South Africa offer practical examples of effective reform. In India, reductions in spectrum usage charges and improvements to auction design have lowered internet service provider (ISP) costs and expanded access. Similarly, South Africa has implemented streamlined spectrum allocation and simplified licensing, which have boosted competition and lowered connectivity prices (Access Partnership, 2024). Sub-Saharan African countries can adopt these strategies by reducing high spectrum fees, improving auction transparency, and easing regulatory burdens. These changes would reduce providers‘ operational costs, attract new market entrants, and accelerate progress toward universal, affordable digital connectivity (Department of Telecommunications of India, 2023).

Vision for 2045

By 2045, Uganda is the 5th Sub-Saharan African country to adopt the Affordable Connectivity through Taxation (ACT) toolkit, a new policy model that encourages school connectivity. In Sub-Saharan Africa (SSA), widespread community-based initiatives will be undertaken to expand access and strengthen digital inclusion. ACT introduces a mechanism for corporations and digital service providers that profit from connectivity, offering a revenue-based tax exemption in return for providing infrastructure to knowledge centres. As a result, every school is equipped with reliable broadband and serves as a community hotspot. This allows people living around schools to access affordable internet without needing private data plans, expanding digital access. By 2045, ACT will be fully operational in five SSA countries, demonstrating how fair taxation policies can make universal digital access achievable.

Details of the vision

What is ACT?

The ACT toolkit uses taxation as a lever to encourage network expansion. Operators receive tax benefits only if they connect schools (or other community spaces), creating private incentives to maximise social welfare. Reduced acquisition costs for lower-frequency spectrum (which offer wider coverage and lower infrastructure requirements, especially in rural areas) further support easier network entry (GSMA, 2022). This model strengthens community support around a school-based infrastructure, ensuring that public investments benefit nearby areas. The toolkit also provides governments with performance metrics to guide and monitor improved digital access.

Why ACT?

ACT lowers telecom tax burdens, expands school-centred connectivity, and aligns private sector efforts with public digital inclusion goals.

Research indicates that a 10% rise in broadband penetration is associated with a boost of 0.8% to 2.46% in GDP growth (UNECA, 2025). This implies that even if telecom tax reforms lead to a small

short-term dip in revenue, the long-term fiscal gains, through greater economic growth and increased tax revenue, are significantly larger. Over time, this growth also leads to a greater formalisation of the economy, as seen in India's case.

Action Plan

(2045) Programme Expansion

Objective: End of the first 10-year plan and expansion of the successful programme to five new countries that commit to full connectivity through the ACT toolkit.

Action:

- End of the timeline for the implementation of the ACT toolkit. Giga and the pilot countries share the positive impact of implementing the toolkit to encourage the participation of other SSA countries.
- Five more SSA countries commit to implementing the toolkit.

(2040) Programme Refinement

Objective: Giga and pilot countries use the metrics of the current programme to refine the ACT.

Action:

- Midway point of the programme: Giga sets policy-relevant metrics to assess the toolkit's efficiency and identify potential areas for improvement in both pilot countries.
- These metrics could include, for example:
  - Fiscal efficiency metrics, such as changes in telecom tax revenues,
  - Connectivity outputs, including the number of newly schools connected and the bandwidth offered per school,
  - Regulatory metrics,uch as the time required from policy drafting to implementation and the number of regulatory changes achieved.

(2035) Timeline Development & Pilot Countries programme Embarkation

Objective: Two pilot countries forecast a 10-year timeline for imple menting policies with Giga.

Action:

- Giga develops a timeline for the pilot countries, outlining all required governmental approval processes, including approval of the new tax policy , selection of telecom providers, and finalisation of financing agreements.
- The government's approval process could take between 10 to 12 months, including the stages of internal government consultation, high-level approval, legal review, and implementation planning.
- The *India-UN Development Partnership Fund* provides financing to help in technical modelling, tax-impact assessments, and legislative preparation.
- The African Development Bank (AfDB) offers favourable, low-interest financing tied to the implementation of the toolkit to support digital school infrastructure.

(2030) Toolkit finalisation & regional outreach

Objective: Complete development of the ACT toolkit and outreach to potential pilot countries.

Action: India, South Africa and Giga co-author the ACT toolkit.

- India shares its expertise in implementing the Universal Service Obligation Fund (USOF), which is funded by a levy on telecom operators to expand networks in remote, less-commercially viable areas.
- South Africa offers contextual knowledge on African market realities, VAT exemptions for educational technologies, and ways to link Universal Service Fund (USF) allocations to school connectivity for the ACT toolkit design.
- Giga markets the ACT toolkit through workshops that highlight the quantified benefits of a reduction in broadband costs per school and an increase in the number of schools connected.
- Two pilot countries are selected based on clear criteria, including their political willingness to undertake reforms, availability of data, and their potential for measurable fiscal and broadband impacts.
- Kenya stands out as strong pilot-country candidate due to its clear telecom tax burdens, cooperative operators, and a stable enough fiscal environment for producing regionally replicaable insights. Senegal is another strong candidate, with moderate market

complexity (three operators), and sufficient data availability.

(2025) Groundwork & policy architecture
Objective: Develop the early framework of the ACT Toolkit.
Action:

- Giga presents the current taxation landscape in the SSA region to the Indian & South African governments, encouraging them to collaborate with the ITU in developing the ACT toolkit.
- Giga seeks financing for the project through the United Nations Office for South–South Cooperation's India–UN Development Partnership Fund, valued at USD 150 million.

Key actors: Giga, ITU, United Nations Office for South-South Cooperation, Telecom Regulatory Authority of India, Department of Communications and Digital Technologies (DCDT) of South Africa, The Indian Department of Telecommunications and Ministry of Finance, South Africa's National Treasury, African Development Bank (AfDB), Departments of Telecommunications and Ministries of Finance of pilot countries, two SSA pilot countries, five SSA nations.

Policy Recommendations

Reduce end-user internet costs and increase overall access by strategically leveraging tax incentives to transform community-level public spaces (like primary or secondary schools, libraries, etc.) into connectivity hotspots.

1. Adopt performance-based tax incentives for telecom companies and ISPs that install community-level infrastructure (e.g., schools) for internet connectivity through towers or fibre connections.
2. Include "end-user cost plan" requirement when auctioning spectrum licenses to telecom companies.
3. Waive spectrum license costs for new infrastructure for the first decade of operation to encourage long-term investments.
4. Cap the maximum price for 1GB of data at 2% of the median income of the lowest tax bracket to ensure affordable access.

Examples from India and South Africa's demonstrate that financial incentives delivered through tax instruments can encourage connectivity growth. For Sub-Saharan African nations, the main priority is to reduce the cost of access for citizens and to encourage long-term infrastructure development.

To support this transition, institutions like Giga need to play a coordinating role in promoting the meaningful adoption of the ACT Toolkit in SSA governments. Transforming tax incentives into tools that drive positive economic activity is highly achievable, and Giga is well-positioned to help countries implement the Toolkit by adapting it to local contexts.

2.3. Vision 3: Economies of scale

Authors: Elise Coquoz, Nicola Lo Russo, Beatriz Movido, Fadwa Mugahid, Enkhchimeg Munkhsaikhan

Introduction

In Sub-Saharan Africa many schools are still offline, not simply because networks have never been built, but because existing infrastructure is to operate and maintain. Several broadband assessments by the ITU (ITU & UNESCO, 2025) , the Broadband Commission, and Smart Africa (Smart Africa, 2026) highlight the same issue: limited maintenance capacity is a substantial bottleneck.

Between 2017 and 2020, Tanzania's national ICT broadband backbone (NICTBB) experienced 682 failures, with long restoration times due to difficult terrain, limited transport, shortages of technicians, and weak maintenance systems (Chingumbe & Mahabi, 2024). Similar challenges are common across rural areas worldwide,where keeping networks operational involves costly transport and field interventions, which often exceed the cost of installing them in the first place (M. A. D. Souza et al., 2021).

The impact on schools is enormous: recent data from the ITU (ITU, 2025a) indicates that, as of 2025, 2.2 billion people worldwide remain offline, with the largest share concentrated in low-income countries and Sub-Saharan Africa. Children and youth are disproportionately affected: UNICEF estimated that an estimated two-third of the school-aged children do not have internet access (UNICEF, 2025). UNESCO reports that only about 40% of primary schools in Africa have an internet connection (UNESCO, 2024), with even lower coverage in the Sub-Saharan region. Without strong maintenance systems, new deployments simply add to the backlog of infrastructure that cannot be sustained.

In this chapter, we start from a simple idea: school connectivity maintenance cannot depend only on national efforts. We look at how cooperation and economies of scale can reduce operational costs, and how common standards and shared systems can create more affordable solutions. Our goal is to propose a realistic path toward low-cost, efficient maintenance models that ensure meaningful connectivity over time, paving the way for every school in Sub-Saharan Africa to be connected by 2045.

Vision for 2045

In 2045, all schools in Sub-Saharan Africa will have access to universal and meaningful connectivity (ITU, 2026). One way to achieve this goal is to reduce network failures and service interruptions by addressing the lack of maintenance capacity for ICT infrastructure in schools.

The idea is to establish the Systems Infrastructure & Maintenance for Broad Africa organisation (SIMBA), dedicated specifically to the maintenance and repair of ICT infrastructure in schools across Sub-Saharan Africa. Through SIMBA, member countries will be able to share knowledge and resources, benefiting from cross-border cooperation and economies of scale.

Member countries will have a platform to identify synergies around shared school connectivity challenges and to collaborate on finding technical, regulatory, and financial solutions. SIMBA will also sponsor workshops and technician training programmes to support knowledge exchange and skills development among participating countries. In addition, tools, equipment, and spare parts can be procured in bulk, allowing members to benefit from cost reductions.

Ideally, ICT infrastructure among schools in member countries will be standardised so that guidelines and protocols can be uniformly applied throughout the region. These regional standards would also make monitoring and evaluation far more efficient, with a single unit delegated to conduct this work. The deployment of certified network technicians along with their training and certification would also be streamlined if infrastructure were consistent among member countries.

Action Planning

(2045) Universal, Sustainable Maintenance

- Full maintenance coverage for all connected schools under harmonised service level agreements.
- Continuously improve *Mean Time To Repair* (MTTR), availability, and power resilience.

Funding: Fully domestic, membership fees from the participating countries stemming from national education and ICT budgets, operators, and public facilities. Donors, such as Mozilla Foundation, GSMA Foundation, NetHope, support only the poorest or conflict-affected countries.

(2040) Full Standardisation & Efficiency

- Standardised infrastructure for school networks and power systems; negotiation of regional vendor framework contracts.
- Maintain a continuous technician pipeline (recertification and succession planning) in partnership with projects such as Smart Africa.
- Operate a regional performance dashboard (availability, MTTR, preventive maintenance).
- All schools automatically enrol in SIMBA through a binding government agreement.

(2035) Institutionalisation & Regional Scaling

- Create a Regional Maintenance Coordination Unit and a Network Observation Centre (NOC). Inspired by the NICTBB, the NOC monitors system performance, reports breakdown issues immediately, tracks outage minutes, and calculates MTTR and availability for all NICTBB infrastructures.

- Scale from pilots to national coverage and onboard new countries and connectivity programmes.

Funding: Shift to mixed models with progressively increasing domestic contributions,coordinated by SIMBA).

(2030) Pilot Implementation

- Co-design a Regional Maintenance Framework with 2–3 early-adopter countries, such as Tanzania (through its National Fibre Optic Cable network) (NICTBB, 2025); Zambia (through its National Digital Transformation Strategy (Republic of Zambia, 2023), or Mozambique (via its Ministry of Communications and Digital Transformation) (UNDP, 2025).
- Establish an initial Standard Operating Procedure (SOP) for incident response and MTTR tracking.
- Deploy a monitoring platform with monthly availability reporting.
- Launch regional technician training and certification (e.g. in partnership with Smart Africa).

Funding (coordinated by SIMBA): Grants from agencies and philanthropic organisations (e.g. World Bank, UN agencies, and foundations like Gates or Mastercard).

(2025) Foundations

- Establish SIMBA through Smart Africa Alliance and African Union (AU) to oversee the project.
- Regional diagnostics on outages, MTTR, availability, failure modes, and connected-school mapping.
- Identify existing maintenance solutions and institutional partners in the area.

Policy Recommendations

1. Establishment of Systems Infrastructure & Maintenance for Broad Africa (SIMBA)

In 2025, Smart Africa along with the African Union (AU) create an institution that will maintain connectivity throughout Sub-Saharan Africa, utilising funding donations from different donor agencies and ISPs The institution will identify the regional standards for the development of connectivity, coordinate the purchase of equipment through bulk procurement, provide training programmes for technicians, and subsequently operate a newly formed Sub-Saharan Network of Certified School-Connectivity Technicians.

2. Make maintenance a mandatory part of all school connectivity policies and budget

African Union and Smart Africa should promote the adoption of mandatory connectivity maintenance requirements in member countries by 2030. Members would allocate a minimum of approximately20% of their national ICT budgets to SIMBA every year. This allocation would be linked to performance indicators — such as school connect-time — to ensure proper use of the allocated funds.

3. Mobilisation of technical and financial support for SIMBA

The ITU will establish technical and cybersecurity standards for school networks, while UNICEF (Giga) will provide mapping tools and dashboards to support school-network maintenance by 2030. Beginning in 2035, major donors (World Bank, Gates, Mastercard) should provide financial support for regional training hubs and spare-parts systems.This will help reduce costs for all Member States through pooled procurement.

2.4 Vision 4: Innovative finance to address inadequate infrastructure

Authors: Salma Bourichi, Anja Ihle, Natalie Sprenger, François Tameza, Miao Yu, Han Zhou

Introduction

Across Africa, millions of students still lack reliable internet access in schools, limiting their ability to participate in digital learning and develop skills needed for the future economy. Despite the rapid expansion of mobile broadband and fibre networks, coverage remains uneven, especially in low-income and rural areas where infrastructure is costly to build and revenue prospects are low. In some underserved regions, notably Western and Central Africa, less than 5% of schools have both computers and internet access (UNESCO Institute for Statistics, 2025). Today, the main challenge is no longer technological feasibility, but how to ensure sustainable financing for connectivity, alongside strengthening national skills and capacity to plan, deploy, and operate these investments effectively (UNICEF Innocenti, 2024).

Sustainable financing streams are required to bridge Africa's digital divide in schools, particularly as the continent is home to one-third of the global youth population seeking quality education. Despite numerous international initiatives and national efforts, a substantial financing gap persists. Structural barriers to investable opportunities continue to exist, including fragmented demand and perceived business-risk (EIB, 2021; ITU & UNESCO, 2025). Traditional funding channels and domestic resources remain limited, whereas blended financing and other innovative financing approaches that combine public and private capital offer promising alternatives. These mechanisms can reduce project risks, mobilise larger volumes of funding, attract a wider range of investors, and focus on impact creation (WEF, 2025; G20, 2025).

However, this raises an urgent policy question: How can diverse financing streams be structured and coordinated to drive meaningful school connectivity investments across Africa? This policy brief outlines a proposal for a new mechanism:he Fusion Finance 2045 Initiative. The initiative brings together financial and non-financial approaches through a shared digital platform that matches projects with a suitable mix of funding, maximises collaborations, reduces inefficiencies, and accelerates school connectivity at scale.

Vision for 2045

By 2045, the Fusion Finance 2045 Initiative aims to achieve universal school connectivity across Africa through a fundamental shift in how digital infrastructure is financed and delivered. It combines financial and non-financial expertise, bringing together public and private actors on a shared digital platform. It draws on tools such as Giga's school connectivity measurements (Giga, 2025a), connectivity credits (Giga, 2025c) and the future development of a Smart AI Procurement tool, while leveraging enablers such as the digital infrastructure Investment Initiative (DIII) (ITU, 2025d) to guide investment decisions and optimise project design.

This initiative turns school connectivity from a high-risk challenge into a scalable and investable asset that drives inclusive digital development. Its de-risking strategy is built on project bundling; hybrid fund structures that combine philanthropic, public, institutional and private capital; real-time monitoring impact-linked metrics; community engagement, and a strong framework for implementation and operational execution.

Action Planning

(2045) 100% connectivity is sustainably financed and governed at the sovereign level, supported by national digital capacities

- **Strategic Shift:** Move from financing infrastructure to **enabling meaningful use** (supporting local digital content, teacher training, and community services).
- **Financial & Operational Transition:** Systematically transition the primary role of investor and operator to **African institutions**, including national budgets and telecom companies, completing the initiative's catalytic mission.
- **2045 Outcome:** Achieve the goal of universal **school connectivity in partner countries**, sustained by local capacity and financing, ultimatelyclosing the digital divide.

(2035-2040) Regional Scaling & Fund Mobilisation. This phase achieves financial and operational scale across regions.

- Establish a **regional blended finance fund** to pool capital and finance multiple national portfolios simultaneously.
- Secure **long-term funding commitments (10-15 years)** from governments, international financial institutions, and institutional investors, ensuring predictable capital flow.
- The initiative reaches **full operational capacity**, with real-time monitoring of a growing project portfolio.

(2030-2035) Validation & Initial Replication. This phase leverages the lessons from the first pilot to refine and expand the model.

- The focus shifts to **disseminating knowledge and securing scale-up funding**.
- Key activity: Showcase the results and lessons from the first pilot at the **DIII 2035 event**, turning proven experience into a replicable blueprint.
- Goal: **Replicate the model in 2-3 additional countries**, adapting the framework to new national contexts.

(2025-2030) Pilot Launch & Framework Establishment. This phase focuses on building the operational foundation and proving the model in one country.

- **2026:** Officially launch the **Fusion Finance 2045 Initiative** as a dedicated track within the DIII platform.
- **2026:** Roll out a five-year operational plan and activate the digital coordination platform. A key deliverable is a development of **Smart Procurement AI Tool** to administer the end-to-end bidding and contracting processes.
- **2026-2030: Execute the first national pilot** using our four-layer de-risking framework:
  - **Portfolio Bundling:** Bundle schools into standardised, investable assets to spread risk.
  - **Hybrid Fund Creation:** Co-design with Swiss financial partners a fund where concessional capital (e.g., from the philanthropic sector, international financial institutions) absorbs first loss, making the portfolio bankable for private investors.
  - **Impact-linked metrics:** Integrate the **Giga Meter App** (Giga, 2026) and **Connectivity Credits** (Giga, 2025c) to ensure payments are triggered only by verified, real-time connectivity data.
  - **Community Engagement:** Onboard governments, operators, and developers onto the shared platform for coordination and capacity building.

Policy Recommendations

The successful implementation of the Fusion Finance 2045 Initiative requires coordinated policy action from all stakeholders. We propose an integrated set of recommendations to support each phase of the action plan.

1. **For National Governments**, the priority is to turn digital infrastructure into a bankable capital asset. This involves providing sovereign guarantees to cover first-loss risk and formally integrating school connectivity operational costs into national education budgets to bridge the gap of long-term sustainability in low-demand markets. Adopting technology-neutral regulations and endorsing transparent procurement tools are essential to reduce costs and attract private capital.
2. **Multilateral Development Banks and International Financial Institutions** must act as catalytic anchor investors in the regional blended-finance fund, providing the concessional capital needed to crowd in commercial investment at scale. Additionally, expanding tailored technical assistance and political-risk insurance products for connectivity projects in fragile markets is crucial to unlock initial deployments.
3. **The DIII Catalyser Platform and UN Agencies** should institutionalise this initiative as a flagship component of their programming. A key action is to champion the “Connectivity Credits” framework as a universal standard for outcomes-based financing, while leveraging DIII events to share knowledge, identify pipeline projects and accelerate replication across countries.
4. **The Private and Philanthropic Sector**, has an essential strategic role to play. Operators and tech firms should participate in procurement and

planning, viewing schools as anchors for network expansion. Philanthropies should allocate catalytic, first-loss capital, while institutional investors develop mandates to invest in the de-risked, long-term yield profile of school connectivity portfolios. Through aligned action across these sectors, the vision of sustainably connected schools across Africa can be realised.

3. Conclusion

Digital connectivity is increasingly shaping how societies learn, work, access services, and participate in civic life, yet access to these opportunities remains profoundly unequal. Across Africa, the lack of reliable connectivity reflects deeper structural challenges. Addressing connectivity therefore requires wider social and economic interventions. It demands a systematic rethinking of how digital infrastructure is governed, financed, and sustained.

The four visions developed respond directly to these structural barriers and, taken together, outline a coherent pathway toward universal, meaningful, and sustainable school connectivity by 2045.

Vision 1

Centralised and transparent procurement mechanisms can reduce inefficiencies, lower costs, and restore trust in connectivity markets.

Vision 2

Strategic tax reforms can make internet access more affordable for end users while aligning private-sector incentives with public policy objectives

Vision 3

Regional approaches to infrastructure maintenance can ensure that connectivity, once deployed, remains reliable and operational over time

Vision 4

Innovative and blended financing models can unlock the scale of investment required by transforming school connectivity into a bankable, impact-driven asset capable of attracting long-term capital

Crucially, these approaches are mutually reinforcing. Implemented in parallel, and supported by collaboration between governments, regional institutions, multilateral development banks, UN agencies, the private sector, and initiatives such as Giga, they provide a credible framework for moving from pilots to system-wide impact.

Reframing school connectivity as a foundation for inclusive digital development opens a powerful pathway forward. When schools are reliably connected, they become gateways to opportunities that extend far beyond the classroom, strengthening communities, supporting economic participation, and building resilience in face of future challenges. The visions and recommendations outlined offer a concrete starting point for this transformation, helping ensure that by 2045, connectivity serves as a shared public good rather than a persistent source of inequality.

4. Endnotes

Introduction

International Telecommunication Union. A. (2025). Facts and Figures 2025: Measuring digital development. https://www.itu.int/itu-d/reports/statistics/facts-figures-2025/index/

Giga. (2025a). Connecting every school to the internet. Giga. https://giga.global

OECD. (2025). Policies for the digital transformation of school education: Evidence from the Policy Survey on School Education in the Digital Age. https://doi.org/10.1787/464dab4d-en

Statistica. (n.d). Internet usage in Africa. https://www.statista.com/topics/9813/internet-usage-in-africa/#topicOverview

TeleGeography. (2025). Submarine Cable Map. https://www.submarinecablemap.com/

UNICEF & International Telecommunication Union. (2021). Two Thirds of the world's school-age children have no internet access at home. https://www.unicef.org/press-releases/two-thirds-worlds-school-age-children-have-no-internet-access-home-new-unicef-itu

World Economic Forum. (2020). We need to connect every school to the internet. Here's How. https://www.weforum.org/stories/2021/12/covid-19-education-digital-divide/

World Bank. (2021). Feasibility study to connect all African higher education institutions to high-speed internet. https://documents1.worldbank.org/curated/en/320071626434508906/pdf/Feasibility-Study-to-Connect-all-African-Higher-Education-Institutions-to-High-Speed-Internet.pdf

Chapter 1

Communications Regulators' Association of Southern Africa. (2025). About CRASA. https://www.crasa.org/

Dhanaraj, C., & Parkhe, A. (2006). Orchestrating innovation networks. Academy of Management Review, 31(3), 659-669. https://journals.aom.org/doi/10.5465/amr.2006.21318923

Fabian, C. (2025, September). Open-source financing: Where technology and the United Nations system can shine. Financing the UN Development System. https://financingun.report/essay/open-source-financing-where-technology-and-united-nations-system-can-shine

Foss, N.J., Schmidt, J., & Teece, D.J. (2023). Ecosystem leadership as a dynamic capability. Long Range Planning, 56(1), 102211. https://doi.org/10.1016/j.lrp.2022.102211 Global Communications Alliance (2026). Global Communications Alliance. https://globalcommsalliance.com/

International Telecommunications Union. (2025d). Digital Transformation Centres Initiatives. ITU Academy. https://academy.itu.int/itu-d/projects-activities/digital-transformation-centres-initiative

International Telecommunication Union. (2025b). Connecting humanity action blueprint: Advancing sustainable, affordable and innovative solutions. https://www.itu.int/pub/S-GEN-INVEST.CON-2025

International Telecommunication Union. (2022). Internet use surge slows, leaving 2.7 billion people offline in 2022. https://www.itu.int/en/mediacentre/Pages/PR-2022-09-16-Internet-surge-slows.aspx

Kizito, P. (2025, December 18). School internet costs drop after procurement reforms. Capital Business. https://www.capitalfm.co.ke/business/2025/12/school-internet-costs-drop-after-procurement-reforms

Nyandwi, C. (2025, November 26). New Study shows how Rwandan schools can cut internet costs. The New Times. https://www.newtimes.co.rw/article/31539/news/education/new-study-shows-how-rwandan-schools-can-cut-internet-costs?

OECD. (2016). Preventing corruption in public procurement. https://baselgovernance.org/sites/default/files/2020-03/oecd_preventing_corruption_in_public_procurement_2016.pdf?

OECD. (2018). SMEs in public procurement. https://www.oecd.org/content/dam/oecd/en/publications/reports/2018/10/smes-in-public-procurement_g1g98d8f/9789264307476-en.pdf?

OECD. (2019). Reforming public procurement: Progress in implementing the 2015 OECD Recommendation. https://doi.org/10.1787/1de41738-en

Giga. (2025b). Giga school connectivity map. https://maps.giga.global/map

World Intellectual Property Organization. (n.d.). Madrid e-Filing: Apply for international trademark protection online. https://www.wipo.int/en/web/madrid-system/madrid-e-filing-apply-for-international-trademark-protection-online?

Chapter 2

Access Partnership. (2024, March 8). Access Alert: South Africa's next generation spectrum policy - paving the way to enhanced connectivity. https://accesspartnership.com/opinion/south-africas-next-generation-spectrum-policy/

Department of Telecommunications. (2023). Telecom at a glance 2023. Government of India. https://dot.gov.in/sites/default/files/Telecom%20at%20a%20Glance%202023%20as%20on%2018-01-2023.pdf

GSMA. (2022). GSMA annual report 2022. https://media.gsma.com/assets/2022/annual_report.pdf

International Telecommunication Union.(2025c). An overview of digital services taxation. https://www.itu.int/hub/publication/d-pref-dig.01-2025/

Pankaj D. (2025, March 24). Relief to telcos: Govt set to waive spectrum usage fee. The Times of India. https://timesofindia.indiatimes.com/business/india-business/relief-to-telcos-govt-set-to-waive-spectrum-usage-fee/articleshow/119390874.cms

United Nations. (2024). Taxing for tomorrow: Aligning fiscal policies with the Sustainable Development Goals. https://www.un.org/sites/un2.un.org/files/2024/08/unen_policy_brief_july_2024_1.pdf

United Nations Economic Commission for Africa. (2025, March 24). Unpacking the ICT tax conundrum. https://www.uneca.org/eca-events/stories/unpacking-ict-tax-conundrum

United Nations Office for South-South Cooperation. (n.d.). India-UN Development Partnership Fund. https://unsouthsouth.org/indiaunfund/

Chapter 3

Broadband Commission for Sustainable Development. (2025). The state of broadband in Africa 2025. International Telecommunication Union & United Nations Educational, Scientific and Cultural Organization. https://www.broadbandcommission.org/wp-content/uploads/dlm_uploads/2025/09/The-State-of-Broadband-in-Africa.pdf?

National ICT Broadband Backbone. (n.d.). NICTBB overview. http://www.nictbb.co.tz/

Republic of Zambia. (2023). National Digital Transformation Strategy. https://www.mots.gov.zm/wp-content/uploads/2023/10/National-Digital-Transformation-Strategy.pdf

Souza, M.A.D., et al. (2021). A techno-economic framework for installing broadband networks in rural and remote areas. IEEE Access, 9. https://doi.org/10.1109/ACCESS.2021.3071919

United Nations Development Programme. (2025). Accelerating Mozambique's digital transformation through partnership and innovation. UNDP Mozambique. https://www.undp.org/mozambique/news/accelerating-mozambiques-digital-transformation-through-partnership-and-innovation

Republic of Zambia. (2023). National Digital Transformation Strategy. https://www.mots.gov.zm/wp-content/uploads/2023/10/National-Digital-Transformation-Strategy.pdf

Chapter 4

European Investment Bank. (2024). Unlocking digital connectivity in Africa. https://www.eib.org/files/publications/unlocking_digital_connectivity_in_africa_en.pdf

G20. (2025). Africa's G20 moment to fast-track digital transformation. https://g20.org/track-news/africas-g20-moment-to-fast-track-digital-transformation/

Giga.(2025c). Why the idea of connectivity credits is gaining momentum. https://giga.global/why-the-idea-of-connectivity-credits-is-gaining-momentum/

Giga. (2026). Giga meter. https://meter.giga.global/

International Telecommunication Union. (2025d). Digital Infrastructure Investment Initiative white paper. https://www.itu.int/hub/publication/s-dii-diii-whitepaper-2025/

International Telecommunication Union, UNESCO. (2025). Broadband policies for Africa. https://www.itu.int/dms_pub/itu-s/opb/pol/S-POL-BROADBAND.32-2025-PDF-E.pdf

Our World in Data. (n.d.). Primary schools with access to the internet. https://ourworldindata.org/grapher/primary-schools-with-access-to-internet

UNICEF Innocenti. (2024). Investing to harness the potential of African education. https://www.unicef.org/innocenti/media/10226/file/UNICEF-Innocenti-Invest-Harnessing-potential-in-African-education-2024.pdf

World Economic Forum. (2025, April). How shared digital infrastructure can bridge the gap in Africa. https://www.weforum.org/stories/2025/04/how-shared-digital-infrastructure-can-bridge-the-gap-in-africa/

5. Authors and contributors

Editors

Anja Kölbig: Anja works at foraus as an Innovation and Communication intern. She is currently completing her Master in International Relations and Comparative Politics at the University of Geneva.

Maximilian Rau: Max is the Head of Innovation at foraus. He is responsible for the Think Tank's numerous projects and ensures that they follow an innovative methodological approach.

Sabrina Ritz: Sabrina works at foraus as a legal intern as part of the Law Clinic on Digitalization and Society. She is currently completing her Master in law at the University of Fribourg (CH).

Authors

Hana Ahmed Gamal Kamal ElAkhras is a master's student in Economics at University of Geneva, and she holds her bachelor's degree in Economics from the American University in Cairo. Currently, she is completing her master thesis on the impact of AI adoption on exports' composition. Her interests lie at the intersection of economic policy, sustainability, and real-world decision making, with a focus on turning complex analysis into practical insights.

Gevorg Barseghyan is a master's student in Responsible Management at the University of Geneva. He holds a Bachelor's degree in International Business Administration from Tilburg University, where he focused on management and marketing. His academic interests include responsible business practices, sustainability, and the integration of ethical considerations into business strategy.

Salma Bourichi is currently pursuing MAS in International Law and Economics MILE at World Trade institute, Universität Bern, with previous experience in finance.

Naa Lamiorkor Boye is a Ghanaian currently pursuing her master's in IT, Digitalization & Sustainability at the Lucerne University of Applied Sciences and Arts (HSLU), Switzerland. She is passionate about using technology to achieve the UN's Sustainable Development Goals for all countries.

Elise Coquoz is a Master's student at the University of Zurich studying Internet & Society in the school of Media & Communications, exploring how society and the fast-changing digital environment influence one another in economic, social, cultural, and political areas. Simon Derleth is a master's student in Statistics at the University of Geneva with a particular interest in addressing socio-economic challenges.

Jakob Frerichs is a student at ETH in Science Technology and Policy. He holds a bachelor degree in Industrial Engineering from the University of Technology of Hamburg and is interested in how to improve policies in technical fields and consequently get these policies passed.

Manthan Gadhia is a master's student in Science, Technology, and Policy at ETH Zurich, minoring in Computer Science, and with a bachelor's degree in Artificial Intelligence and a long-standing interest in the social impacts of digital communication- and information-technologies on educational and economic outcomes.

Gion-Andrea Gianelli is currently pursuing a Master's degree in Political Science at the University of Bern passionate about international cooperation and development.

Anja Ihle is currently pursuing a Master's degree in Political Science, with a minor in Media and Communication Studies at the Universities of Bern and Fribourg. She has completed an internship with the Engagement Team at foraus and gained experience at a research and consulting firm. Before completing her studies, she will spend next semester abroad at Aarhus University in Denmark.

Klára Kolářová is currently pursuing a Master's degree in Science, Technology and Public Policy at ETH Zurich. She holds a bachelor's degree in Computer Science and focuses on human-centered artificial intelligence and the alignment of technological innovation with societal needs.

Naga Priyanka Kuruganti recently completed a master's degree in economics at the University of Geneva and is interested in development economics, public policy, and environmental economics, with a particular focus on South Asia.

Nicola Lo Russo is a Master's student at ETH Zurich studying Computational Science & Technology Policy, focusing on the intersection of computer science, mathematics, and society.

Beatriz Movido is completing her Master's degree in Science, Technology and Policy at ETH Zurich. Her research interests lie in international development and climate finance, particularly for low- and middle-income countries.

Fadwa Mugahid is currently a master student in the Science of Economics at UNIGE. She is interested in understanding how education can reduce inequalities and foster economic and social growth. She is particularly motivated by the role that public policies play in shaping education systems and, more broadly, in influencing how societies develop.

Enkhchimeg Munkhsaikhan is a Master's student at the University of Geneva studying Economics and has professional experience in the financial sector, focusing on financial risk management and evaluation. Patrick Navia is a master's student in Management at the University of Lausanne. He holds a bachelor's degree in Economics from the Universidad Católica Boliviana and is interested in economic development and the promotion of equal opportunities in peri-urban and rural areas.

Patrick Navia is a master's student in Management at the University of Lausanne. He holds a bachelor's degree in Economics from the Universidad Católica Boliviana and is interested in economic development and the promotion of equal opportunities in peri-urban and rural areas.

Andrea Aramayo San Martin is a Master's student in Responsible Management at the University of Geneva and an intern at the International Trade Centre (ITC). She has practical experience leading and supporting projects focused on education, business development, and social innovation in her home country, Bolivia, and the Americas region.

Dmitrii Shevchuk is a master's student in Digital Society at the University of Fribourg. He is interested in how society shapes technological development.

Natalie Sprenger is a Master's student in Science, Technology and Policy at ETH Zurich, with a minor in Life Science and Health. She holds a Bachelor's degree in Biochemistry and is now exploring the intersection between environmental policy and biotechnological innovation, particularly the development of new technologies for species and biodiversity conservation

François Tameza is completing a Master's degree in Economics at the University of Geneva. His academic interests focus on economic growth theory and development dynamics. Prior to his master's studies, he earned a BSc in Economic Engineering and Finance.

Miguel Vitali is a master's student in Science, Technology, and Policy at ETH Zurich. With experience at UNEP, DHI, and Eawag, he focuses on sustainable infrastructure, environmental governance, and bridging the gap between technical science and policymaking.

Abin Wang is a Master's student in Law at the University of Geneva specialising in international law, with a particular interest in connecting the legal and technological spheres to develop innovations that serve and empower people on a broad scale.

Miao Yu is a Master's student in Computational Linguistics at the University of Zurich. Her interests include AI for language and speech, digital and learning accessibility, with focus on how technology can help reduce barriers to access in education and online environments. Han Zhou is a master's student in Comparative Linguistics at the Uni versity of Zurich, with a minor in Digital Linguistics. Her interests include digital literacy and educational equity, with a focus on how unequal access to digital resources shapes educational opportunities and future cross-linguistic interactions.

Foresight workshop experts

Tanya Accone, Senior Adviser (Geneva Programme and Management), UNICEF
Paul Demba, Project Manager, Future Network & Spectrum Management division, ITU's Telecommunication Development Bureau (BDT)
Sergio Estupiñán, Co-founder & Co-CEO of Beekee
Irene Kaggwa, Giga Programme Manager, ITU
Youlia Lozanova, Senior Programme Officer, Regulatory & Market Environment Division, ITU's Telecommunication Development Bureau (BDT)
Walid Mathlouthi, Head of Infrastructure, Future Network & Spectrum Management division, ITU's Telecommunication Development Bureau (BDT)
Sonja Novikov-Bruderhofer, Giga Programme Officer, UNICEF
Nancy Sundberg, Senior Programme Officer, Regulatory & Market Environment Division, ITU's Telecommunication Development Bureau (BDT)
Carmen Prado Wagner, Senior Programme Officer, Regulatory & Market Environment Division, ITU's Telecommunication Development Bureau (BDT)

Facilitators & Workshop Team

Maria Duran de Bernardo, Yannick Heiniger, Marie Hürlimann, Anja Kölbig, Sarah Maunder, Braden Phillips, Maximilian Rau, Sabrina Ritz, Andrea Aramayo San Martin, Abin Wang

Participants

We would like to thank all participants for their active contribution to the content of this brief during and after the workshop.

Sponsors

We would like to extend our sincere thanks to the Senior ITU team who supported this pilot project, and shared their valuable insights, in particular:

Marco Obiso, Digital Networks & Environment Department, ITU's Telecommunication Development Bureau (BDT)
Sofie Maddens, Chief, Digital Knowledge Society Department, ITU's Telecommunication Development Bureau (BDT)
Ahmed Elraghy, Head of the Regulatory & Market Environment Division, ITU's Telecommunication Development Bureau (BDT)
Alex Wong, Senior Advisor, Strategic Engagement & Initiatives, ITU's Office of the Secretary General
Irene Kaggwa, Giga Programme Manager, ITU's Office of the Secretary General

Layout

Prachi Saxena

To find out more on Giga, visit https://giga.global/ . Find out Giga's latest news and insights around school connectivity, sign up to receive our Giga Report Newsletter.

Citation
Koelbig, A., Rau, M., Ritz, S. (Eds.) (2026). Giga Knowledge Spark - Incentives towards achieving meaningful connectivity

Disclaimer
Project briefs bring forward relevant ideas, expertise and policy recommendations produced through participatory projects run by foraus. The content of this publication reflects the personal opinion of the authors and not necessarily of foraus, ITU, UNICEF, Giga, or the workshop experts. Project briefs differ from foraus' official publications, which are subject to the complete foraus review process.

In unseren Project Briefs werden relevante Ideen, Expertise und politische Handlungsempfehlungen diskutiert, die im Rahmen der von foraus durchgeführten partizipativen Projekte entstanden sind. Der Inhalt dieser Publikation gibt die persönliche Meinung der Autor:innen wieder und nicht unbedingt die von foraus, ITU, UNICEF, Giga, oder den Workshop-Expert:innen. Die Project Briefs unterscheiden sich von den offiziellen Publikationen von foraus, die dem vollständigen foraus-Review-Prozess unterliegen.

Nos Project Briefs mettent en avant les idées, l'expertise et les recommandations politiques pertinentes issues des projets participatifs menés par foraus. Le contenu de cette publication reflète l'opinion personnelle des auteur·e·s et pas nécessairement celle de foraus, ITU, UNICEF, Giga, ou les expert·e·s de l'échange. Les Project Briefs diffèrent des publications officielles de foraus, qui sont soumises au processus de révision de foraus.

www.foraus.ch

foraus – Forum Aussenpolitik | Marktgasse 36 | 3011 Bern
office@foraus.ch | +41 44 501 68 65

foraus – Forum de politique étrangère | c/o Impact Hub
Rue Fendt 1 | 1201 Genève
office@foraus.ch | +41 77 532 44 64

IBAN: CH06 0900 0000 6017 6892 9

Engage

Become a member.

foraus.ch

Giga Knowledge Spark

The Giga Knowledge Spark program seeks to provide new and innovative policy perspectives to Giga as it seeks to help government connect schools to the internet by 2030. As a pilot conducted in 2025, it aims to connect Master students from Switzerland with the International Geneva ecosystem, to foster innovative policy ideas around the global issue of school connectivity. Through an exchange with professionals and by co-writing a Project Brief, the Giga Knowledge Spark strives to strengthen students' set of hard skills (e.g. policy writing), soft skills (e.g. public speaking), and personal networks, while providing key multilateral fora with youth's inputs