COUNTRY ANALYSES AND PLANS

Sierra Leone

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$59M of upfront investment and $34M of ongoing annual service fee funding will enable Sierra Leone to connect 10,995 schools.

This investment will bring **2.1 million students and teachers** online and bring connectivity to **3 million community members** who live locally, potentially enabling $0.3 billion USD in GDP (2.2%) growth.

Source: Dalberg Analysis based on Giga mapping and modelling data, 2020

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“Access to connectivity, algorithms and open solutions are essential for driving our national vision of #DigitizationforAll and our principles of #MobileFirst.”

DAVID MOININA SENGEH
Minister of Education | Chief Innovation Officer

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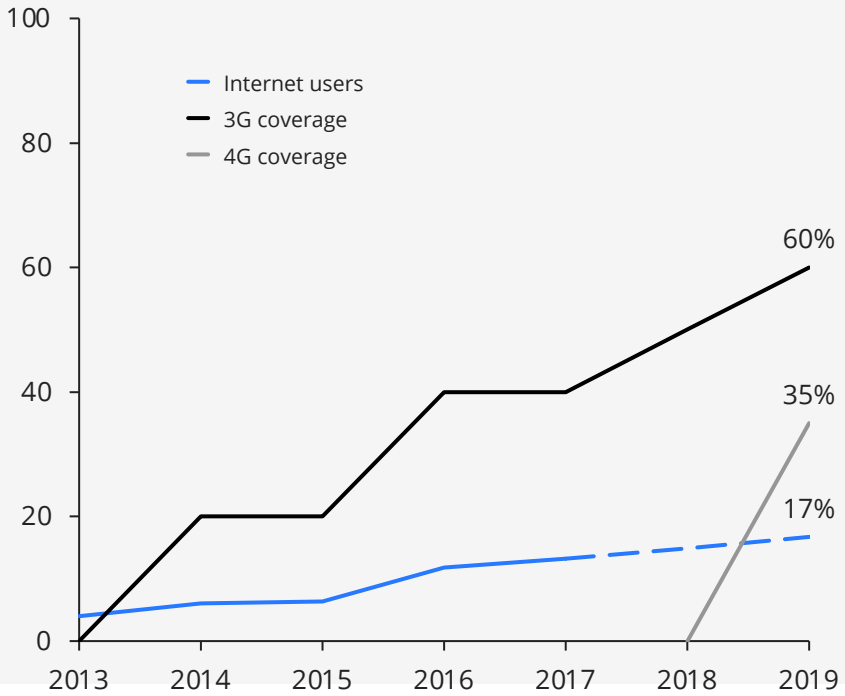
Sierra Leone has a strong focus on mobile coverage and aims to expand the covered population from 56% to 80% by 2024

Mobile connectivity has expanded from 2013, however internet use remains low at 17%

Broadband coverage and internet penetration, % of population (ITU, 2020)



The Government of Sierra Leone plans to expand broadband coverage to 30% of the population and mobile internet (at least 3G) to 80% by 2024 and create a digital economy[1]

Sierra Leone hopes to achieve this target through new national development plans and digitization strategies:

- Medium term National Development Plan 2019-2023: addresses government plans to expand national broadband penetration and increase mobile coverage, with a focus on upgrading infrastructure and increasing coverage and affordability, particularly in rural areas
- DSTI – National Innovation & Digital Strategy 2019-2029: articulates the "Digitization for all" strategy that underpins DSTI's mandate to use science, technology and innovation to help the government deliver on its Medium Term National Development Plan (MTNDP) and to establish Sierra Leone as an 'Innovation Nation'. The strategy outlines the need for connectivity in schools and an ecosystem approach to address content provision, the local start-up ecosystem, and accessible and distributed energy (among others) that are necessary for full connectivity
- MBSSE National Curriculum Framework & Guidelines For Basic Education: aims to cultivate talents, nurturing a problem-solving, and includes technology and ICT literacy in basic education with a focus on empowering learners with foundational competencies and ICT skills that are applicable in various contexts such as business, engineering, and education

Source: 1) Medium term National Development Plan 2019-2023; ITU (2020) World Telecommunication/ICT Indicators database; NATOM Sector Statistics, Medium term National Development Plan 2019-2023, National Innovation & Digital Strategy 2019-2029, Universal Access Development Fund Strategy 2020-2024

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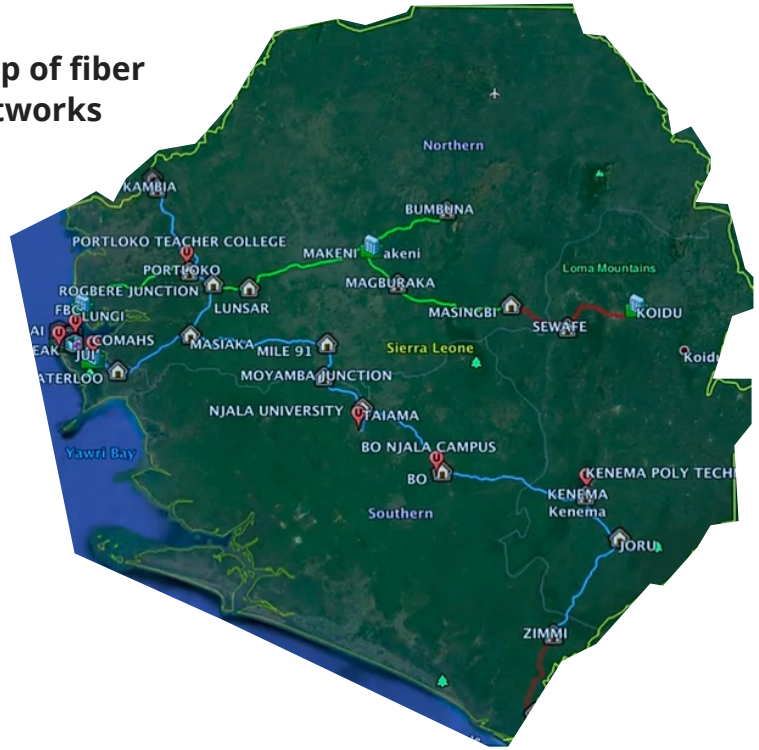
Map of fiber networks



	Mobile	Fixed
Subscriptions per 100 inhabitants	15	<1
5-year CAGR	+5%	<1%

The Goal: National Coverage and Connectivity

Through SALCAB, Sierra Leone continues to invest in a national fiber network that primarily supports a growing user base of mobile based service provision

Sources: ITU (2020) World Telecommunication/ICT Indicators database; SALCAB (2020)

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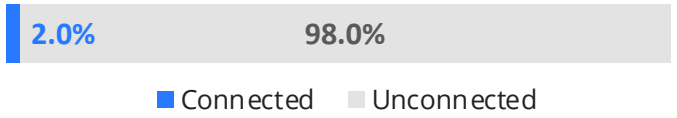
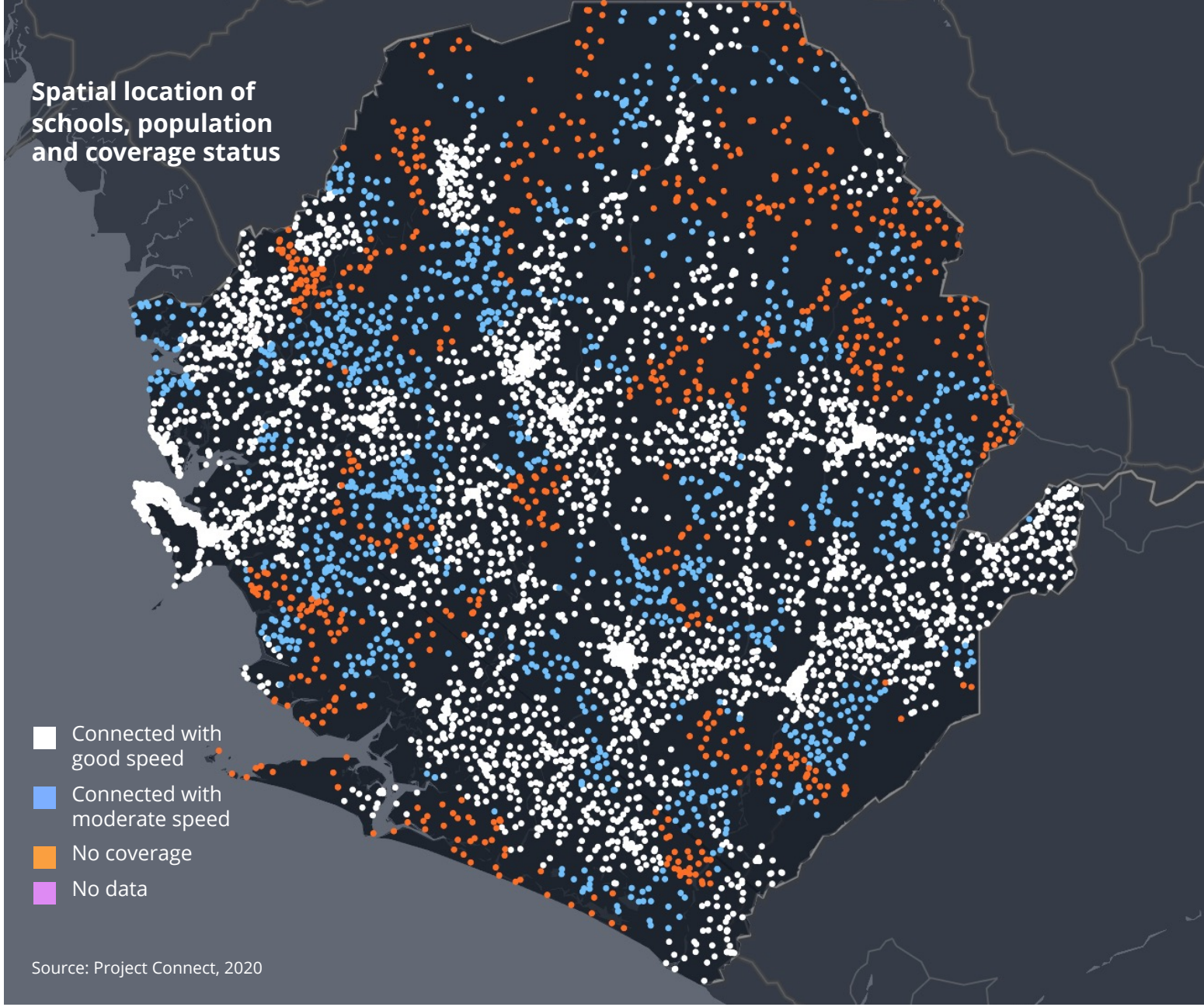
School Coverage and Connectivity

Total schools: 11,200



While 80% of Sierra Leone's 11,200 schools are within 3G or 4G coverage, only 205 schools are connected.



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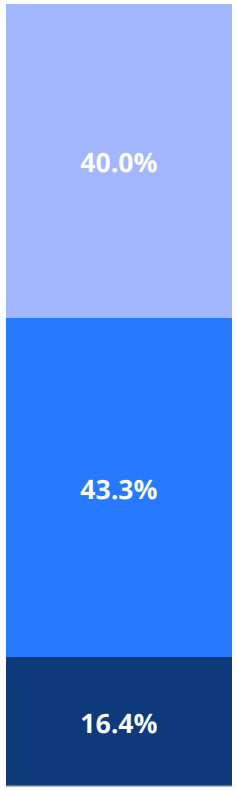
40% of Sierra Leoneans lack coverage and addressing the 43.3% usage gap is key to bridging the digital divide

THE MOBILE INTERNET COVERAGE AND USAGE GAP



CONNECTIVITY ACCESS		NEEDS	GOALS
40.0%	COVERAGE GAP **No mobile internet**	Increase coverage	+3.1 million Sierra Leoneans covered
43.3%	USAGE GAP **Covered by 3G/4G but not connected**	Increase affordability Increase digital literacy Increase electrification	-$3.79/GB (-82%) Increase number of schools teaching digital literacy 60% electrification rate
16.4%	CONNECTED **Active mobile internet use**	Bridge the digital divide	+9.7% annual growth of mobile subscriptions and +1.9% annual growth of internet users

Notes: Prices based on ITU Data-only mobile broadband basket 1.5GB, pro-rated down to 1GB for comparison against the Broadband Commissions 2% recommended target
Sources: 1) DSTI education data hub; Dalberg analysis; Medium term National Development Plan 2019-2023 ; GSMA, Hjort and Poulsen, Internet in Africa, 2019

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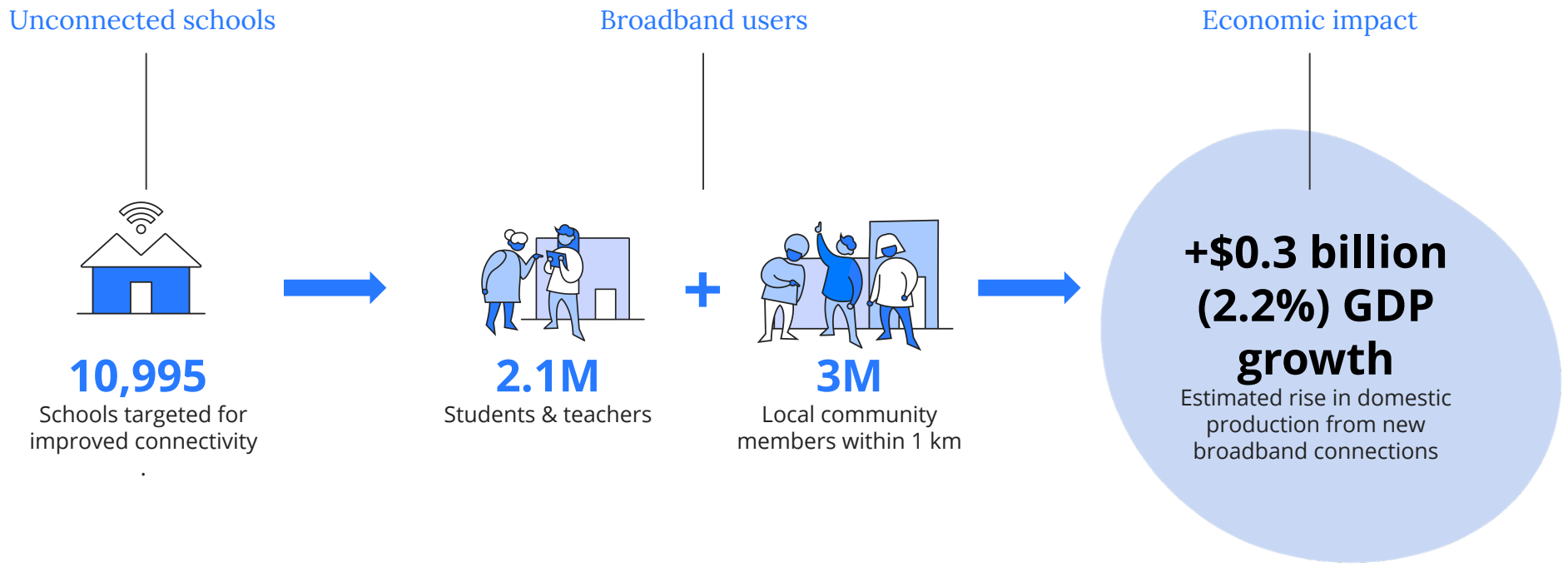
Targeted financing for connecting 10,995 schools can create GDP growth of over $0.3 billion

Universal expansion to all schools provides a gateway to community connectivity



Note: Economic impact calculation assumes that school connectivity is comparable to gaining access to a fixed line connection in a middle/lower income country in terms of reliability, bandwidth, use etc. Assumes middle income fixed broadband which is a conservative assumption when compared to low income mobile broadband
Source: Dalberg Analysis;; ITU (2020) World Telecommunication/ICT Indicators database; UNESCO UIS.Stat, 2018; World Bank (2020) World Development Indicators (WDI); ITU (2018) The Economic Contribution of Broadband

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School connectivity will require an estimated $59M of upfront capital expenditure and up to $34M of ongoing annual funding

Giga will help to mobilize investment and financing to bridge initial infrastructure gaps and provide mechanisms to supply longer-term financing to boost geographic reach and affordability through smart subsidies

(Schools to be connected: 10,995)

UPFRONT LAST-MILE INFRASTRUCTURE CAPITAL

Based on an initial technology assessment: 13% Fiber, 22% WISP, 18% 4G and 30% Satellite

$59M

Estimated total investment needed to reach 10,995 schools*

*This does not factor in potential volume discounts or other sources of funding

ONGOING ANNUAL FUNDING FOR REGULAR SERVICE FEES

Estimates based on an all-in service (72%), maintenance and technical support fee (28%):

$34M[a]

Potential service fees for 10,995 schools (Giga estimate)*

*This does not factor in potential volume discounts or other sources of funding

These high-level estimates can be further refined as the workflow progresses and more mapping and specific cost data is established

A) Pre-feasibility preliminary estimates based on Giga's ACTUAL model school bandwidth requirements and annual service fee estimates in Kenya, adjusting for country costs based on 'Fixed-broadband Internet 5GB' values and 'Data-only mobile broadband 1.5 GB' reported by each country in ITU's World Telecommunication/ICT Indicators database (2020)

Source: Dalberg Analysis based on Giga mapping and modelling data, 2020

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Giga has already engaged significantly with the Government of Sierra Leone

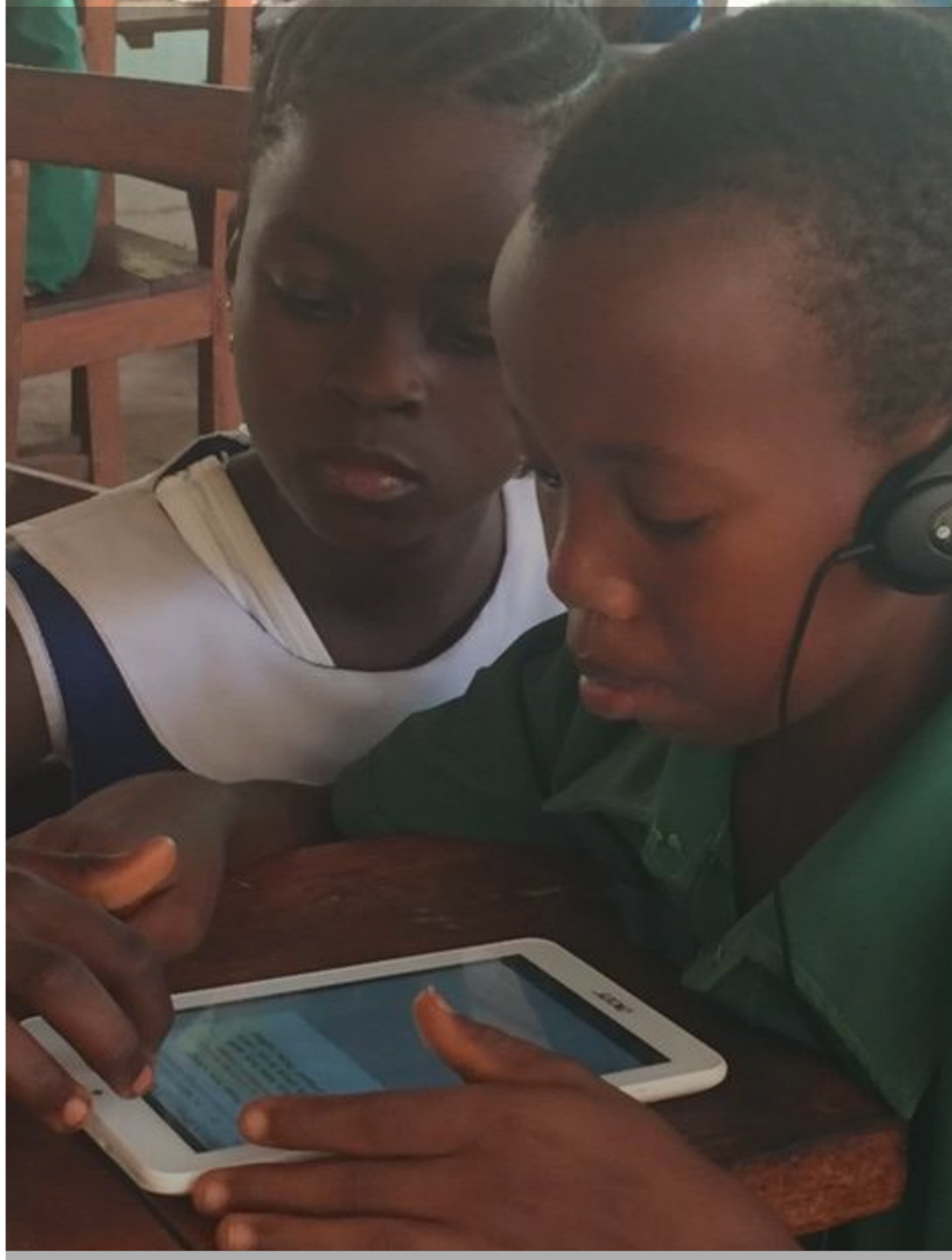
Key Stakeholders: Directorate of Science, Technology and Innovation, Ministry of Basic and Senior Secondary Education, Ministry of Finance

Giga engagement to date

- High level buy-in from the Directorate of Science, Technology and Innovation and a focal point established as Minister David Sengeh
- Sierra leone is one of the leading members of the Digital Public Goods Alliance
- Data sharing agreements and subsequent mapping analysis through Project Connect
- Completion of an upfront joint assessment to align on opportunities, constraints, priorities, and next steps

Giga actions to date

- Developed a proposed way forward on connecting 1,000 schools using a variety of connectivity technologies to achieve quick wins that extend connectivity during COVID-19, and test potential solutions for broader implementation
- Sought out financing opportunities to support Giga efforts
- Engaged with Sierra Leonean counterparts in the DPG Alliance to determine options for open source software across tele-education, tele-health, tele-work and financial services.



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In partnership with the GoSL, Giga has identified several activities to support the cost-effective connection of 10,995 schools

Augment Project Connect mapping to identify connectivity vs coverage in order to articulate needs and refine business cases that size the investment opportunity

Use Project Connect mapping to monitor real time connectivity, electrification, and map vulnerability

Work with partners to take advantage of potential regulatory opportunities (particularly around child online protection, intellectual property and data protection laws) to boost competitiveness

Survey the landscape of implementation options – ISPs, MNOs, to identify appropriate and innovative technologies for middle- and last-mile connectivity cases

Mobilize funding to connect 10,995 schools that currently lack connectivity

Work with SALCAB to pilot Project One Access and extend implementation to 1,000 schools

Provide technical assistance to UADF Committee on best practices for efficient, cost-effective deployment of funds toward school connectivity

Work with existing accelerator programmes and ecosystem actors including DSTI to build capacity around DPGs

Leverage Sierra Leone's co-chair role on the DPG Alliance to elevate country as a regional DPG leader; strengthen capacity in DSTI as a best practice for other countries in the region

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Rapid Regulatory Scan

Policies

Sector strategies:[1]	
Digital transformation/broadband strategy	No
Planned e-government roll out	No
Digital education in strategy	No
Child Online Protection:[2]	
National strategy/policy?	Partial
Responsible agency?	No
Non-discriminatory inclusive use policy?	No
Data Sharing:[2]	
Data protection policy?	Partial
Privacy and data protection laws	No

ICT Regulatory Tracker[3]

Sector strategies:	
Generation of ICT Regulation	G2
Overall	56/100
C1: Regulatory Authority	16/20
C2: Regulatory Mandate	19/22
C3: Regulatory Regime	14/30
C4: Competition Framework	7/28

Regulation

Regulatory structure[1]	
Public/private sector consultation	No
Regulatory autonomy from the government	Partial
Clear planning and licensing process?	Partial
Procurement or competition agency?	No

Competition

Regulatory structure[1]	
SMP in national anti-trust/competition law	No
Spectrum technology neutrality in place	No
No foreign investment restrictions?	Yes
Infrastructure sharing?	No
Wireless Operators Market HHI[4]	
Fixed Broadband Operator Market HHI[4]	

Taxation

Services	
VAT[5]	15%
Sector specific tax on internet services[5]	0%
ITA Participant[6]	No
ICT Equipment import duties[7]	0-20%
Ongoing regulatory/license fees[1]	Tbc

Universal Access

Services[8]	
Is school broadband a universal service?	Yes
Operational Universal Service Fund (USF)?	Yes
Total amount allocated/disbursed so far	1.3M
Contributions as % of revenue/flat fee	$160k
Other public financing mechanisms?	No
Fully utilized currently?	No
Fully active in the last 5 years?	No

Strength
Neutral
Limitation

Notes: HHI – Hirschman Herfindahl Index (HHI) Score, > 4,000 Highly concentrated. Import duties based on a review of several Telecommunications, Electrical and Radio Transmission Equipment HS codes
Sources: 1) Latest ITU World Telecommunication/ICT Regulatory Survey 2019 2) ITU (2019) Global Cyber Security Index 3) ITU (2018) ICT Regulatory Tracker 4) EIU (2020) The Inclusive Internet Index 5) ITU (2019) Taxation Survey Country
6) World Trade Organization (2020) Information Technology Agreement Website 7) WITS (2020) World Integrated Trade Solution – Tariff Database 8) Latest ITU Global Report (2020) and, where available, the country's Universal Service Fund website

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