**Giga: Global Impact Stories**

**Giga overview**

[Giga](https://giga.global/) is a UNICEF-ITU global initiative to connect every school to the Internet and every young person to information, opportunity, and choice.  Giga provides three broad areas of support: it supports ***high-level engagement and governance*** around school connectivity; provides ***technical assistance*** to map schools’ internet access in real-time on Giga’s [Project Connect](https://projectconnect.unicef.org/map) map and helps identify optimal ways to connect unconnected schools through [infrastructure maps](https://bbmaps.itu.int/bbmaps/) and; supports governments with ***procurement processes and market access interventions***. Giga supports contracting for connectivity by helping design competitive and technically robust procurementprocesses to connect schools and helps design and implement interventions that improve market access, i.e. interventions that improve market information and transparency and ultimately help deliver affordable, sustainable and high-quality school connectivity. Examples of how Giga has generated an impact on the ground in each of these areas are described below.

**High-level engagement and governance**

***Brazil: Mobilizing capital for school connectivity in Brazil***

UNICEF Brazil with the support of Giga, successfully advocated for the use of the Universal Service Fund (USF) for connectivity. At least 18 percent of the USF has been specifically set aside for school connectivity.

In many countries, the Universal Service Fund (USF) is a tool used by the government to fund projects that increase access to telecommunication services in remote and underprivileged areas. These funds are often collected annually from contributions by telecommunications providers, which are typically computed based on their annual revenue. In August 2000, Brazil established its own USF named Fundo de Universalização do Serviço de Telecomunicações (FUST). However, after nearly twenty years, FUST had never disbursed any of the collected funds to support connectivity projects. The key hindrance was a restrictive law in which the funds could only be allocated to landlines or fixed telephony – a technology that has since become almost obsolete. The COVID-19 pandemic brought additional scrutiny to the FUST and, as a result, numerous stakeholders, including UNICEF Brazil and Giga, advocated for its restructuring.

The advocacy was successful, and in November 2020, the Senate approved a bill which reformed FUST to help ensure the collected funds are more effectively allocated and are appropriately used to expand telecommunications services in the country. The Bill also required 18% of the FUST’s annual collections to be set aside specifically for connecting public schools to the Internet, creating a sustainable solution for school connectivity. More information can be found in this [case study](https://giga.global/case-study-finding-sustainable-solutions-for-school-connectivity-in-brazil/).

***Kazakhstan: Increasing the minimum bandwidth requirement for schools***

In Kazakhstan, the Giga steering committee plays a pivotal role in bringing key national stakeholders together under a common agenda, which is school connectivity. The steering committee is set up as a platform for governance, which enables discussions of opportunities and challenges related to school connectivity in a country and discuss changes needed.

One of the challenges highlighted to the committee through Giga's data collection and through a feasibility study that Giga supported, was the low bandwidth available to schools. While many schools were connected to the internet in Kazakhstan, about 30 percent of schools were connected at less than 5 Mbps, and 56 percent were connected at less than 10 Mbps. The Minister of Digital Development, who is the chair of the Giga steering committee, based on this information and following Giga’s recommendations, made 20 Mbps the minimum bandwidth requirement to connect schools. The Steering Committee is continuing to actively guide other stakeholders on improving school connectivity based on insights from the study. The common platform plays an important role in getting tangible results for school connectivity.

**Technical assistance for mapping and monitoring**

Globally, Giga has mapped 2.1 million schools across 140 countries. Of these, schools in 85 countries have been mapped using Open Street Maps data, schools in 47 countries have been mapped using government provided data, and schools in an additional 8 countries have been mapped with data from other sources (e.g. NGOs, online portals etc.) have been used for other countries. Examples of how mapping has helped countries with their decision-making are below:

***Kyrgyzstan: Generating cost savings through mapping***

In Kyrgyzstan, Giga was able to help the government save about 40 percent (~$200k per year) of its education connectivity budget, through the transparency created by the mapping process alone. It was through school location and connectivity status mapping that the government realized that it was paying for the connectivity of many schools that were not really connected. These schools showed up as red (unconnected) on the Giga map, even though the government was paying for the connectivity of the schools. The government was able to use that information and was able to renegotiate a new contract with the suppliers to connect these schools with better internet speed and lower costs and save over 40 percent of its connectivity budget.

***OECS: Using school mapping for disaster response***

The Organization for Eastern Caribbean States, which includes 9 island countries that Giga is supporting, is exploring the potential for using school mapping for disaster response planning. This region is prone to natural disasters such as hurricanes. Access to the location and connectivity status information of schools will help decision makers plan disaster response activities and communication, as schools can be, and are often, used as centers for disaster response communication or distribution of essentials, etc.

***Multiple countries: Using Giga’s AI tool to improve school location data***

Giga has also provided support to several countries globally to map school location data using Artificial Intelligence (AI) in cases where that data was not accurate, unavailable or difficult to collect physically. Giga has used AI and high-resolution satellite imagery to add 23,000 unmapped schools to the map in Kenya, Sierra Leone, Rwanda, Niger, Honduras, Ghana, Kazakhstan and Uzbekistan and about 20,000 schools in Sudan.

***Benin and Zimbabwe : Identifying optimal ways to connect the unconnected through infrastructure maps***

In Benin, Giga supported an infrastructure/connectivity gaps analysis. Giga created a multilayered infrastructure map that displays school geolocations with infrastructure attributes such as distance to fiber nodes, towers and mobile coverage. This has provided evidence, visuals and proposals to the Government on the best technologies to connect specific schools. Further analysis is planned to provide cost scenarios based on a set of optimal connectivity technologies and will further support Government decisionmaking on where to develop ICT infrastructure and which areas/regions should be strategically prioritized while considering economies of scale and budgets. It is a powerful tool for building proposals and investment cases for donors, telecommunication companies and investors. A similar infrastructure analysis has been conducted in Zimbabwe, and it already includes some preliminary cost estimates to connect unconnected schools to the Internet. Giga is continuing to work with the Postal & Telecommunications Regulatory Authority of Zimbabwe (POTRAZ) to validate infrastructure cost data and refine the cost estimates.

***Multiple countries: monitoring the quality of internet service in schools***

Apart from mapping schools and their state of connectivity, Giga also helps monitor the quality of the internet connection in connected schools, almost in real time. Giga has developed an app called Daily Check app that can be installed in school devices. The app automatically measures internet speed twice a day and transmits results to a central server. This data is then visualized on our online map, Project Connect.

Internet QoS data visualized on Project Connect allows the tracking of progress and quality of connectivity of schools over time and improve accountability and transparency. Mr. Rustam Karimjonov, the Deputy Minister of Public Education in Uzbekistan, noted the importance of real-time monitoring of school connectivity when he said, “Giga’s real-time monitoring of schools’ Internet connectivity will help improve the efficiency of resource allocation for digital public goods and services and enhance accountability.” In Uzbekistan, currently more than 2000 schools transmit the daily quality of service data to project connect. Globally, 80,000 schools share real-time connectivity data across 19 countries[[1]](#footnote-2).

In the OECS, a sample of schools across 6 countries started testing Giga's Daily Check app in 2022. Although the number of schools actively sharing the data is relatively small, Mr. Germain Anthony, Technical Specialist at the OECS Commission, has observed that 'the data is already revealing that we have some significant quality of service issues at many schools'. The next step entails deploying the app to additional schools and ensuring that the data is effectively communicated to those who can take appropriate action.

Additionally, Giga is also working with Internet Service Providers (ISPs) who share their school connectivity network data. The combination of several measurements provides invaluable insights in how to best understand, represent and display school connectivity status.

An example of the value of this multi-pronged approach was recently experienced in Kenya. UNICEF and a contracted ISP used a combination of measurements in a school to identify that the main network router at the school premises had been disconnected from power, resulting in no connectivity. Here the ISP network data monitoring measurement showed that the school network was on, because it was receiving connectivity. However, the measuring device on the Local Area Network (LAN) which connects the computers was off. This led the ISP to call the school. The school then checked the network router and saw that it had been unplugged from the power source. The school representative plugged the router back in and the connection was re-established. Incidentally, power issues are one of the most common disruptions to networks. This example shows how having access to real-time connectivity data can lead to improved service, not just from a contractual perspective but also from a practice or usage perspective.

**Procurement support**

***Rwanda: Advanced Wireless Technology: Higher Speed at Lower Cost***

Since 2019, Giga has collaborated with the Government of Rwanda to improve internet connectivity in primary and secondary schools. While most schools are near a fiber network and mobile broadband, 43% lack internet access. In collaboration with the Government of Rwanda, Giga is implementing a prototype to reduce connectivity costs for schools and improve speed and quality of service. Giga aggregated the demand for connectivity across schools in the Eastern Province and supported the launch of a common bid to provide broadband internet to 63 schools. All the schools are now connected using an innovative fixed wireless solution.   This fixed wireless technology has unique capabilities to economize the number of towers and base stations, while providing speeds of up to 100 Mbps and a migration path to 500 Mbps to each customer. It is on this premise that Giga was able to secure minimum speeds of 25 Mbps and up to 150 Mbps per school — an improvement of 400% in connectivity speeds from the usual 5 Mbps that schools were connected through 4G technology. Giga was also able to secure a 30% to 55% reduction in the average price per Mbps paid by schools in the procurement process, from an average of $20 to between $9 and $14 per Mbps.  Internet service providers and international organizations have joined forces with Giga to connect up to 3000 more schools using this model, expanding its impact and scalability in bridging connectivity gaps in the region.

***Honduras: Schools as Connectivity Hubs in remote areas***

Honduras has a low connectivity rate, with less than 6% of its 16,445 schools currently connected. Coverage, affordability, and electricity continue to impede the expansion of connectivity. Giga estimates the need for USD 85 million of CapEx and USD 47 million of annual OpEx to connect all schools in Honduras. This requires a complex and sustainable financial solution, as grants alone will not be sufficient. Giga is partnering with the Government, ITU, and UNICEF Honduras to address this issue by providing technical support to connect 24 remote schools with hotspot technology, aiming to cover operating costs by extending connectivity to the surrounding communities. As of the end of 2022, 17 prototype schools have been successfully connected, and the knowledge gained will inform broader school connectivity efforts in the country.

***Botswana: Connect a Village – Connect all Facilities***

Giga is supporting the Government of Botswana's "connect a village – connect all facilities" multi-stakeholder initiative. Giga is helping create models to mobilize further resources and test solutions to connect the hard-to-connect schools in a sustainable manner. Giga plans to test schools as connectivity hubs model for sustainable school connectivity. This will also benefit the local communities who can use the school’s internet after school hours.

***Kyrgyzstan: Connecting the Hardest-to-Reach***

Kyrgyzstan, a mountainous country with remote and inaccessible villages, faces connectivity challenges, especially in southern areas like Zardaly, Kyzyl-Oi, and Enilchek. Giga is providing technical support to identify solutions to connect unconnected schools. This effort involves innovative technologies, ad-hoc network designs, and financing solutions to ensure affordable and sustainable internet access. Collaborating with the Kyrgyz Internet Society, Giga is developing a connectivity solutions playbook and business models to serve schools in these remote regions, with insights aimed at addressing similar challenges in other countries.

***El Salvador: Schools connected using TV White Space***

In El Salvador, less than 70% of schools are connected and with speeds below 10 Mbps. To address this, the government, in collaboration with Giga and UNICEF, initiated a pilot project connecting 35 remote coastal schools to the National Connectivity Network (NCN) using TV White Space, microwave point-to-point connections, and Wi-Fi. This effort not only provided high-speed connectivity but also laid the foundation for a digital ecosystem across the country. Additionally, it explored a business model reinvesting returns to extend connectivity to rural areas.

***Kazakhstan: Improving the Quality of Connectivity***

In collaboration with the Government of Kazakhstan and UNICEF Kazakhstan, Giga evaluated the feasibility of technical and financial solutions, as well as possible regulatory and policy measures for broadband upgrades of connectivity in Kazakh schools. Giga supported a feasibility study that identified areas of opportunity to improve connectivity speeds and recommended technical solutions for achieving the upgrade of school connectivity to broadband speeds in Kazakhstan, through a pilot of 38 schools. Further, with advocacy from Giga, local governments can now allocate resources for school connectivity (previously restricted to only the national government), helping creating a sustainable pathway to connectivity.

**Unlocking financing for connectivity**

***Unlocking IFI financing in Sierra Leone and Kenya***

Giga helped unlock financing from international financial institutions in Sierra Leone and Kenya. In Sierra Leone, USD 5 million have been mobilized from the Islamic Development Bank (IsDB) to accelerate school connectivity. Giga and UNICEF Sierra Leone provided support to the government in technical discussions with the donor, as well as, in preparing the technical proposal which was accepted. Giga and UNICEF Sierra Leone will continue to provide guidance to the government in the implementation of the funds to ensure affordable and quality connectivity for schools connected though them.

In Kenya, Giga helped in mobilizing USD 10.5 million from the EU for school connectivity and digital education. Giga supported UNICEF Kenya in technical discussions with the EU around the process of connectivity for schools, and also provided support to develop the successful technical proposal. Giga will continue to provide technical guidance on procurement of connectivity for the 1000 schools covered under this grant to UNICEF Kenya.

***Rwanda: Staking Ethereum to Finance School Connectivity***

To secure financing for universal school connectivity, Giga is exploring the nexus of blockchain, cryptocurrencies and connectivity to ensure transparency and accountability in the provision of connectivity by staking crypto and using the returns to finance school connectivity.  Giga, in collaboration with the Government, the Ethereum Foundation, and Launchnodes is currently prototyping a staking model in Rwanda. At start, the Ethereum Foundation donated 32 ETH for staking on an open-source cloud infrastructure. The node was launched in May 2022 and to date, 0.42799 ETH, equivalent to around USD 1,350 was generated. This alternative financing prototype also offers an opportunity to raise funds and make digital payments in a more transparent way. Giga aims to build and capitalize on these results, eventually prototyping the connectivity of schools through the rewards garnered through this model, as well as developing smart contracts for procuring school connectivity.

1. **Central Asia:** Kazakhstan, Uzbekistan; East Asia & Pacific: Mongolia; **Latin America and Caribbean:** Honduras, Brazil, Panama, Saint Lucia, Grenada, Saint Vincent and the Grenadines, British Virgin Islands, Anguilla, Saint Kitts and Nevis, Antigua and Barbuda, Trinidad and Tobago, Barbados; **Africa:** Kenya, Rwanda, Sierra Leone, Botswana [↑](#footnote-ref-2)