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Investigating the Caribbean ICT Landscape

RESEARCH PROJECT REPORT

by

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Abstract

This project, Investigating the Caribbean ICT Landscape, sets out to contribute to the planning and provisioning of adequate and accessible telecommunications and internet infrastructure and services in the Caribbean. Its focus is evidence-based insights, with particular emphasis on underserved communities.

Both primary and secondary research methods (desk research, interviews and surveys) were used to ascertain the data needs of ICT policymakers and regulators for policy and planning in three sample Caribbean Community (CARICOM) countries¹. Data deemed necessary was grouped into different categories to create country-specific profiles on the state of ICT, which were then assessed by the originally surveyed stakeholders.

The findings of this investigation indicate that there is a dearth of publicly available data necessary to assess meaningful connectivity and other key access metrics in such a way as to inform evidence-driven policy-making. In particular, considerable gaps exist in data on the regularity of internet use, access to appropriate devices and adequate data, and connection speed; as well as data disaggregation by geography, demography, socioeconomic status, and other key factors. The investigation also revealed the rolling need for current data as well as the need for standardized definitions of terms such as affordability, broadband and coverage to facilitate benchmarking and policy harmonization among CARICOM countries.

¹ All CARICOM countries are classified as developing countries. They are all relatively small in terms of population and size, and diverse in terms of geography and population, culture and levels of economic and social development. The fifteen member states and five associate members may be found at <https://caricom.org/member-states-and-associate-members/>.

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List of Abbreviations

A4AI	Alliance for Affordable Internet
CARICOM	Caribbean Community
CSO	Central Statistical Office
DAI	Digital Access Index
DOI	Digital Opportunity Index
GNI	Gross National Income
ICT	Information and Communications Technology
IDI	ICT Development Index
ITU	International Telecommunication Union
LACNIC	Latin American and Caribbean Internet Addresses Registry
LDCs	Least Developed Countries
NTRC	National Telecommunications Regulatory Commission
PUC	Public Utilities Commission
SIDS	Small Island Developing States
TATT	Telecommunications Authority of Trinidad and Tobago
UN	United Nations

1 Introduction

The Coronavirus (COVID-19) pandemic has highlighted the significance of Information and Communications Technology (ICT) in sustaining economies and societies globally (Zhao 2020²). As countries try to mitigate the effects of this pandemic, Caribbean territories, most of which are classified as small island developing states (SIDS) by the United Nations (UN), were hit particularly hard on account of a range of preexisting geographic and socio-economic vulnerabilities. As a result, digitally marginalized communities have been impacted adversely (Robinson et al 2020)³.

This study, Investigating the Caribbean ICT Landscape, seeks to contribute to the planning and provisioning of adequate and accessible telecommunications and internet infrastructure, and services in the Caribbean. Its focus is on determining the minimum information stakeholders deem necessary for ICT policy and planning in the region, particularly in underserved communities, with the intent of revealing data gaps and inconsistencies.

The methodology comprised 2 streams: data collection, and data processing and analysis. Baseline ICT data and statistics, and their standard formats, were sourced through desk research, and classified according to its openness and provenance. Consultations were held with policymakers and regulators to supplement the baseline findings and explore perceptions of how such data should be presented for use in policy and planning.

Collated data was aggregated and utilized to generate country-specific ICT profiles of the enabling environment, infrastructure, service availability and existing data gaps. Visualizations, including graphs and tables, served as focal points for original stakeholder respondents to assess the usefulness of envisioned data products.

Project outputs, including country profiles, are available on a stand-alone website⁴.

² <https://unctad.org/news/heres-how-we-are-accelerating-digital-development-all>

³ <https://www.cogitatiopress.com/socialinclusion/article/view/2632/2632>

⁴ <https://cirp-lideres-project.web.app>

1.1 Project Objectives

1. To gather baseline ICT data and statistics for the countries under study
2. To determine the minimum set of data needed for effective and efficient planning, policymaking, and regulation, and appropriate formats for presentation
3. To collate, pre-process, and aggregate the relevant ICT data and statistics gathered
4. To create country-specific-profiles for each country under study, utilizing rich visualizations (e.g., charts, and tables)
5. To perform a gap analysis on publicly available ICT data for the countries under study

1.2 Scope

The geographic scope of the study comprised three (3) sample countries: Guyana, St. Vincent and the Grenadines and Trinidad and Tobago, with extensibility to all CARICOM countries encouraged following project execution. The organizational scope for data gathering purposes comprised policymakers and regulators in the telecommunications sector.

2 Literature Review

2.1 *The Global Digital Divide*

Although mobile broadband is available to more than 90% of the population in most regions globally (ITU 2020b⁵), and to a lesser extent fixed broadband, many persons are not using the internet. It is evident that divides exist across countries of different socioeconomic status, geographical locations within countries, and different demographic groups. For example, developed countries generally have greater network coverage than less developed countries, particularly so for rural communities. More than 86% of the rural population in developed countries is covered by mobile broadband whereas only 64% and 66% of the population in rural areas are covered in LDC's and SIDS respectively (ITU 2020b⁵). Internet adoption by youth is considerably higher, at 87%, in developed countries than it is in developing countries where it sits at 66% (ITU 2020b⁵). While there is gender parity in ICT use in developed countries, a digital gender divide exists in developing countries where only 40% of women use the internet compared to 49% of men (ITU 2020b⁵).

Even though there are statistics on people using the internet as per ITU's definition⁶, these may not be enough to measure the true digital divide. Meaningful connectivity, as introduced by the Alliance for Affordable Internet (A4AI 2020⁷), comprises:

- regular internet use (minimum: daily)
- access to an appropriate device (minimum: a smartphone)
- access to adequate data (minimum: an unlimited broadband connection at home or a place of work or study)
- fast connection (minimum: 4G mobile connection)

⁵ <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2020.pdf>

⁶ Percentage of persons who have used the Internet (from any location) in the last 3 months

⁷ <https://docs.google.com/document/d/1qydsMTY4hln3pP4dWJbCSRfNa8SfDYAtGfacKYwhVk8/edit>

The percentage of the population that is meaningfully connected is represented by averaging the percentages of all 4 parameters. Taking these factors into consideration, fewer persons are deemed to be connected. For example, in Colombia the percentage of people who were connected in 2020 based on ITU's definition of connectivity was 84.1% compared to 50.9% when using A4AI's definition of meaningful connectivity (A4AI 2020⁷). This may be the case in other countries where many appear to be connected but are not *meaningfully* connected.

2.2 Policy and Regulation for Bridging the Access Gap

ITU (2020c)⁸ states that the overall policy and regulatory environment for connectivity in a country can either greatly contribute to enabling and encouraging new service deployment for unconnected communities or act as a barrier. Three steps are outlined to identify potential constraints to connectivity:

1. Identifying the country's overall ICT regulatory environment
2. Identifying the country's policy on universal access and coverage
3. Researching existing policy options for:
 - new entities to deliver new service to underserved areas
 - existing operators to expand service to underserved areas
 - compelling either new or existing telecommunications operators to establish service in underserved areas.

Policies and regulations should also incorporate targets that are measurable, evidence-based and relevant. Following broad stakeholder consultation, A4AI (2020⁷) offers recommendations similar to that of the ITU. In particular, they recommend reviewing the existing policy and regulatory environment to assess the state of connectivity policy and targets. A4AI (2020⁷) emphasizes the importance of the measurement of these targets and recommends the building and strengthening of statistical organizations to effectively gather disaggregated data, particularly by gender, to measure progress towards the targets set in policies and regulations.

⁸ https://www.itu.int/dms_pub/itu-d/opb/tnd/D-TND-01-2020-PDF-E.pdf

Recognizing that globally, rural communities are less connected than urban communities, A4AI (2021)⁹ developed the Rural Broadband Policy Framework which includes the following policy recommendations:

- Harnessing market competition while addressing market failures – e.g. facilitation of infrastructure sharing
- Streamlining regulatory processes – e.g. streamlining regulations with respect to market entry in rural communities and processes with respect to obtaining access to rights-of-way (ROWs)
- Public access and universal service and access funds – e.g. investment in public access solutions
- Effectively managing spectrum resources – e.g. increasing spectrum allocation for access projects, encouraging spectrum sharing where appropriate and facilitation of spectrum reallocation
- Leveraging innovative technologies, architectures, and business models – e.g. non-restrictive use of innovative technologies by operators to provide broadband in rural communities
- Adopting appropriate tax and fee structures – e.g. reduction or removal of taxes and fees in rural areas, ensuring tax regimes are competitively and technologically neutral and do not cause broadband services to be unaffordable in rural areas, and ensuring that broadband in rural areas is taxed similarly or less than other services
- Stimulating demand for broadband services – e.g. building digital literacy in rural areas through targeted programmes, promoting practices for data protection, safety and privacy when using the internet, facilitation of local content creation and provision of e-government services
- Monitoring and accountability – e.g. multistakeholder data collection and documentation on policy performance, and analysis to make future recommendations

The final recommendation reiterates the importance of data collection to monitor and keep track of the performance of policies to address the divide and using these to inform future decisions.

⁹ <https://1e8q3q16vyc81g8l3h3md6q5f5e-wpengine.netdna-ssl.com/wp-content/uploads/2020/09/UPDATED-Rural-Broadband-Policy-Framework-Report-09-2020-web-ready.pdf>

2.3 Existing ICT Policies & Regulations in Caribbean Countries

CARICOM has set ICT for development as one of its priorities and has proposed a CARICOM Single ICT Space with regionally harmonized ICT policies, legislation, regulations, technical standards, best practices, networks and services (CARICOM 2017¹⁰). It aims to foster socioeconomic and cultural integration in an ICT-enabled borderless space. In fact, some of the envisioned outcomes for the Single ICT Space are “equitable, affordable access to broadband information and communication technologies, which are secure, ubiquitous and reliable; and which facilitate rapid acquisition, processing and dissemination of information” and “the use of ICTs to gather information and knowledge, manipulate and disseminate it effectively for citizens’ social and economic progress”.

Table 1 shows the intended outcomes specified in ICT policy documents from the 3 countries under study.

Table 1 Summary of intended policy outcomes from policy documents in the 3 countries under study

Country	Policy Document	Policy Outcomes
Guyana	Guyana’s Low Carbon Development Strategy 2030 ¹¹	<ul style="list-style-type: none"> ○ Expansion of the existing 4G LTE network infrastructure ○ Expansion of the fibre optic network ○ Service-oriented government programmes (portal for e-Government services, electronic identification, etc.)
St. Vincent and the Grenadines	National Broadband Plan 2015-2020 ¹²	<ul style="list-style-type: none"> ○ Provision of basic broadband service of 70Mbps download and 30Mbps upload speeds ○ Availability of high-speed broadband services of minimum 500Mbps download and upload speeds to all upon request ○ Cost reduction of broadband services ○ Access to a minimum of 1Gbps download and 50Mbps upload internet speeds to all schools, health centres, community centres and government buildings.

¹⁰https://caricom.org/documents/15510-vision_and_roadmap_for_a_single_ict_space_-_final_version_updated.pdf

¹¹<https://lcds.gov.gy/wp-content/uploads/2021/10/LCDS-2030-Final-DRAFT-for-consultation-min.pdf>

¹²http://carcip.gov.vc/carcip/images/PDF/PROCUREMENTDOCUMENTS/National_Broadband_Plan_draft.pdf

Country	Policy Document	Policy Outcomes
		<ul style="list-style-type: none"> ○ Expansion of digital literacy to all and guaranteed digital privacy, personal data protection and freedom of opinion and expression. ○ Availability of 4G LTE Advanced mobile wireless connection of minimum 50Mbps download speed island wide. ○ Adoption of measures allowing for more abundant, attainable and affordable internet-enabled electronic devices
Trinidad and Tobago	National ICT Blueprint 2018-2022 ¹³	<ul style="list-style-type: none"> ○ Enhancement of ICT infrastructure – availability of Next Generation Networks providing fibre optic connectivity to the home and business, Long Term Evolution (LTE), etc. ○ Modernisation of the legal and regulatory framework to establish an enabling environment for ICT ○ Strengthening ICT safety, security and resilience ○ Development of ICT human capital ○ Improving access to ICT human capital ○ Promotion of digital inclusion ○ End-to-end government services ○ Promotion of adoption of government e-services ○ Increase in government efficiency through use of ICTs ○ Promotion of open government ○ Advancement of e-commerce ○ Diversification of the economy through ICT sector development ○ Advancement of digital content production ○ Promotion of Green ICT

In Guyana, with respect to ICTs in the Low Carbon Development Strategy 2030, the focus is on access to the underserved through infrastructure expansion. Of particular importance is the ICT Access and E-services for Hinterland, Poor, and Remote Communities project which aims to “provide the necessary infrastructure, equipment, hardware, and software necessary to enable access to high-quality ICT, training and e-services in all parts of Guyana, with particular attention given to vulnerable groups and remote communities who might otherwise be excluded.” In St. Vincent and the Grenadines’ National Broadband Plan 2015-2020, particular attention is placed on public access, especially with respect to quality of service, service and

¹³ <https://mpadt.gov.tt/publications/NICT%20Plan%202018-2022>

device affordability, digital literacy, and data security and privacy. In Trinidad and Tobago's National ICT Blueprint 2018-2022, the desired policy outcomes include improvement in existing infrastructure, provision and promotion of e-government and e-government services, modernisation of the legal and regulatory framework to foster an enabling environment for ICTs and building digital skills and human capital.

Table 2 outlines some regulatory provisions in each country with respect to universal access.

Table 2 Countries' legislation with respect to Universal Access

Country	Regulatory Document	Regulatory Provisions for:
Guyana	Guyana Act No. 18 of 2016 Telecommunications Act 2016 ¹⁴	<ul style="list-style-type: none"> the Minister in consultation with the Agency to determine the public telecommunications networks and public telecommunications services for which universal access and universal service apply taking into account factors such as affordability and needs of the public universal access to a high-quality public telephone service 24/7 free access to emergency telecommunications special arrangements for blind or differently abled persons Universality Fund
St. Vincent and the Grenadines	St. Vincent and the Grenadines Telecommunications Act 2001 ¹⁵	<ul style="list-style-type: none"> including requirement in telecommunications operators' licenses to provide universal service, in a transparent, non-discriminatory and competitively neutral manner a telecommunications provider to provide universal service, if included in its licence, to such price and with the quality of service specified by the licence Universal Service Fund
Trinidad and Tobago	Telecommunications Act 2001 ¹⁶	<ul style="list-style-type: none"> the Authority to determine the public telecommunications services for which universal service shall apply which include at a minimum a quality public telephone service the Authority to periodically determine the manner in which a public telecommunications service or

¹⁴ [Telecommunications Act No 18 of 2016.pdf \(telecoms.gov.gy\)](https://telecoms.gov.gy/Telecommunications_Act_No_18_of_2016.pdf)

¹⁵ https://ntrc.vc/docs/legislations/telecom_act_2001_SRO_NO_11.pdf

¹⁶ [https://tatt.org.tt/Portals/0/documents/Telecommunications Act.pdf](https://tatt.org.tt/Portals/0/documents/Telecommunications_Act.pdf)

		<p>value added service shall be provided and funded in order to meet the requirements of universal service for that service, including the obligations, if any, of the providers and users of the service in accordance with the policy established by the Minister</p> <ul style="list-style-type: none">• Universal Service Fund
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3 Methodology

Research for this project was divided into 2 streams:

1. Data collection – desk research was utilized to gather publicly available ICT data and statistics for the 3 countries under study, and information on suitable data formats and presentations. Preliminary desk research was used to develop survey instruments which were employed to interview policymakers and regulators on their ICT data needs in different categories. The findings were used to supplement the data gathering process.

Following the development of ICT country profiles, the original respondents were surveyed to assess the effectiveness of sample data and presentations for policy and planning.

2. Data processing and analysis – The data gathered from desk research, and the initial interview and survey with stakeholders was used to create ICT profiles using various data visualizations. Interactive dashboards were created to facilitate data exploration. Analyses were also performed to identify the gaps that exist in key publicly available ICT data.

This process is illustrated in Figure 1.

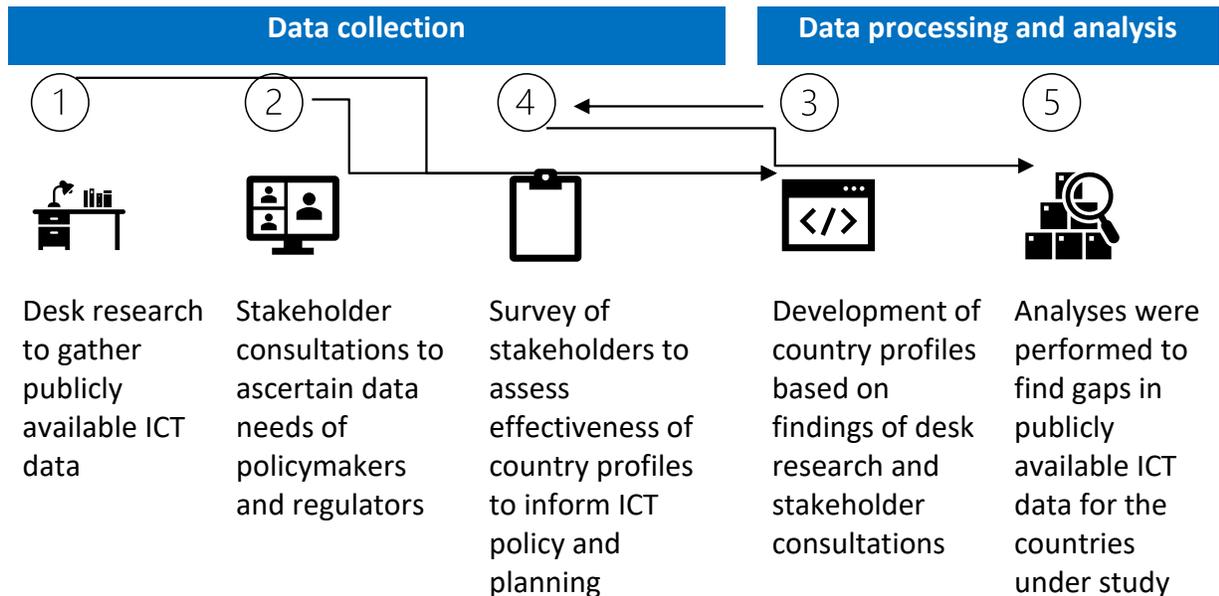


Figure 1 Summary of methodological streams of project

3.1 Desk Research

Desk research was first conducted to obtain publicly available baseline data related to the state of ICT to be used in the creation of ICT profiles for the 3 countries under study. Data for these profiles was organized in 4 main categories: Country Overview; Enabling Environment; ICT Infrastructure and Service Availability; and ICT Adoption and Usage.

These categories were selected based on trends gathered from desk research and from interviewing stakeholders. Generally, a range of 10 years (2011 – 2021) was used as a limiting factor for data collection. The categories are detailed as follows:

Country Overview

For this category, the geographic, demographic, and socio-economic data in Table 3 was used. This data, primarily sourced from the World Bank Indicators Database, was collected to provide context for the ICT indicators and statistics to be presented in the other dashboards. An additional statistic, the ICT Development Index (IDI) from the International Telecommunication Union (ITU) was also included in this category as a base level ICT indicator.

Table 3 Indicators, sources for Country Overview

Indicator	Source	License to use
Land area (sq. km)	The World Bank. “World Development Indicators Database.” Accessed September 2021. ¹⁷	Creative Commons Attribution 4.0 ¹⁸
Total population		
Population density		
Gross National Income (GNI) (current US \$)		
GNI per capita (current US \$)		
ICT Development Index (IDI)		

¹⁷ <https://databank.worldbank.org/source/world-development-indicators>

¹⁸ <https://datacatalog.worldbank.org/public-licenses#cc-by>

Indicator	Source	License to use
IDI Rank	ITU. “ICT Development Index” Accessed October 13 th , 2021. ¹⁹	

Enabling Environment

This category included information on the legal and institutional frameworks of each country’s ICT sector (see Table 4). This data was also supplemented with the ITU’s Global ICT Regulatory Tracker and affordability statistics from the ITU and the Alliance for Affordable Internet (A4AI).

Table 4 Indicators, sources for Enabling Environment

Indicator	Source
Legal Framework	Cabrera and Gabarro, 2017. “Telecommunications Governance Toward the Digital Economy.” ²⁰ Caribbean Community (CARICOM). 2007. “Assessment of the Telecommunication Services Sector in CARICOM.” ²¹
Public Policy Authority	
Regulating Authority	
Competition Authority	
National Digital/ICT/Telecommunications Strategy	
Market Access	
Global Regulatory Generation Tracker	ITU. “ICT Regulatory Tracker” Accessed October 21 st , 2021. ²²

¹⁹ <https://www.itu.int/net4/ITU-D/idi/2017/index.html>

²⁰ [Telecommunications Governance: Toward the Digital Economy | Publications \(iadb.org\)](https://publications.iadb.org/)

²¹ [https://caricom.org/documents/10091-telecoms_report_\(revised\).pdf](https://caricom.org/documents/10091-telecoms_report_(revised).pdf)

²² <https://gen5.digital/#/tracker-by-country/regulatory-tracker/2018>

Indicator	Source
ICT Price Baskets (GNIpc)	ITU and A4AI, "ITU ICT Price Baskets" Accessed October 13 th , 2021. ²³
Baseline Smartphone Affordability (% of GNIpc)	A4AI. "A4AI 2021 prices and affordability of smartphones and feature phones by country." Accessed October 13 th , 2021. ²⁴

ICT Infrastructure and Service Availability

Data for this category comprised two types: geolocation and statistics. These are listed in Table 5. The geolocation data included the latitude and longitude locations of fixed broadband infrastructure and cell tower locations where available. The statistics data included mobile network coverage, broadband download rates and people served per Internet Exchange Point (IXP) and per server.

Table 5 Indicators, sources for ICT Infrastructure and Service Availability

Indicator	Source
Submarine cable landing point locations	TeleGeography. "Submarine Cable Map." Accessed November 10th, 2021. ²⁵
Internet Exchange Points (IXPs) locations	Packet Clearing House. "Internet Exchange Directory." Accessed November 10th, 2021. ²⁶
Cell tower locations, Trinidad and Tobago	Telecommunications Authority of Trinidad and Tobago (TATT). "Mobile cell tower locations." Accessed October 16 th , 2021.

²³ <https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>

²⁴ <https://docs.google.com/spreadsheets/d/1ArxeZ2r2Kwh9eEDf6qsDbbZV1iVSnF2lg3xNFRCLifE/edit#gid=46210019>

²⁵ <https://www.submarinecablemap.com/>

²⁶ <https://www.pch.net/ixp/dir>

Indicator	Source
ICT Indicators for Trinidad by municipality: IDI, Digital Opportunity Index (DOI), Digital Access Index (DAI)	Telecommunications Authority of Trinidad and Tobago (TATT). 2013. "Digital Divide Survey Trinidad and Tobago, 2013." ²⁷
2G coverage, indicator score	Global System for Mobile Communications (GSMA). "GSMA Mobile Connectivity Index." Accessed October 16 th , 2021. ²⁸
3G coverage, indicator score	
4G coverage, indicator score	
Servers per population, indicator score	
IXPs per population, indicator score	
Fixed broadband speeds (Mbps)	cable.co.uk. "Worldwide broadband speed league 2021" Accessed November 9 th , 2021. ²⁹

ICT Adoption and Usage

This final category of data, listed in Table 6, included telephony subscriptions, broadband penetration rates and international bandwidth utilization provided by the ITU. Both the telephony and broadband data are disaggregated into 2 categories: fixed and mobile.

Table 6 Indicators, sources for ICT Adoption and Usage

Indicator	Source
Fixed telephone subscriptions (per 100 inhabitants)	ITU. "Country ICT Data." Accessed October 13 th , 2021. ³⁰
Mobile cellular subscriptions (per 100 inhabitants)	

²⁷ [https://tatt.org.tt/Portals/0/documents/Digital Divide Survey2013_FINAL 17-01-2014-reduced.pdf](https://tatt.org.tt/Portals/0/documents/Digital%20Divide%20Survey2013_FINAL_17-01-2014-reduced.pdf)

²⁸ <https://www.mobileconnectivityindex.com/>

²⁹ <https://www.cable.co.uk/broadband/speed/worldwide-speed-league/#speed>

³⁰ <https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>

Indicator	Source
Percentage of individuals using the internet (%)	
Fixed broadband subscriptions (per 100 inhabitants)	
Mobile broadband subscriptions (per 100 inhabitants)	
International bandwidth (Mbps)	ITU. “International Bandwidth in Mbps” Accessed October 20 th , 2021
International bandwidth per person (bps)	

3.2 Stakeholder Consultations to Identify Data Needs

A qualitative and a quantitative survey in the form of an interview and a questionnaire were respectively used to:

- gather a list of data required to:
 1. understand the gaps in service to the underserved
 2. plan and deploy emergency and regular internet service to underserved communities.
- identify data formats and presentations styles that are deemed most effective to guide policymaking and regulation for accessible internet services, and sustainable infrastructure in the countries under study.

A representative from a telecommunications policymaker and another from the regulator in each of the 3 countries under study participated in the stakeholder consultations. A mock consultation was conducted on October 1, 2021 with Mr. Yacine Khelladi, A4AI’s then Regional Coordinator for Latin America and the Caribbean (see Appendix A for stakeholder profiles). Table 7 shows the schedule for the survey activities undertaken to identify the data needs to address the access gap.

Table 7 Schedule of survey activities

Activity	Mode	Description	Estimated Time (mins)	Target Schedule
Interview	Synchronous	Perspectives on data necessary for policy and planning, required formats, and envisioned application to policy & planning	40	October 4 – 8, 2021
Questionnaire	Asynchronous		20	

The interview instrument was formulated by referencing ICT- related documents, listed in the Literature Review, to address policymaking and regulation for the 3 countries under study. Eight general questions were prepared as detailed in Table 8 (see Appendix A for general interview instrument).

Table 8 General interview questions

#	Question	Purpose
1	What does your organization define as the digital divide? How, if at all, does your organization differentiate the divide into its various aspects?	To identify if the digital divide is defined and/or disaggregated by policymakers and regulators. This will help identify by which parameters data should be disaggregated as well as to identify gaps
2	How is the access gap measured in your country, and what data is utilized in its measurement?	To identify how the access gap is measured in the countries under study and what data is used
3	I understand that your country has implemented initiatives to reduce the access gap. Can you provide specific examples of <i>additional</i> initiatives that can be employed?	To identify measures that can be put in place to address the access gap as well as identify data that can be used
4	What, if any, is the additional data that is needed to address national access targets?	To identify the data gaps for addressing national access targets in each country
5	How does your organization specify and quantify/measure affordability?	To identify how organizations define and measure affordability. This will be used as a basis of comparison among different approaches
6	What data is required to assess affordability? What of this, if any, is not publicly available?	To gather a list of data required to assess affordability and identify to what extent this data is publicly available. This will be used to inform the data used in country profile generation and assess data gaps

#	Question	Purpose
7	Please identify data gaps that inhibit your organization from addressing other priorities, outside of access.	To identify other data that is needed by policymakers and regulators to address their priorities other than access
8	Please describe the data presentation formats that would most assist your organization address the access gap.	To identify data presentations preferred by policymakers and regulators to be used in country profile generation and assess data gaps

All questions were then tailored specifically to the country and organization of each interviewee. The interviews were conducted using the video-conferencing software Microsoft Teams and in some instances, answers were communicated via email (see Appendix C for interview schedules). The findings gathered from the interview were used to guide the formulation of the follow-up survey instrument to get more in-depth information or any information that was missed. For the quantitative survey, data needs were put into 5 categories, based on desk research:

1. ICT Infrastructure
2. Service Availability
3. ICT Affordability
4. ICT Use
5. ICT Usage

Respondents were given a list of data under each category from which they chose what they deemed most necessary. Table D1 and Table D2 in Appendix D detail the contents of the questionnaire. The instrument was implemented using Microsoft Forms³¹ and was distributed to stakeholders via email.

3.3 Implementation of Country Profiles

Following accumulation of data for the 4 categories as outlined in section 3.1 (viz. Country Overview; Enabling Environment; ICT Infrastructure and Services Availability; and ICT Adoption and Usage), interactive dashboards were created for each category using Microsoft Excel. This was determined to be the most suitable way to visually display the data to obtain

³¹ <https://forms.office.com/r/q5PEsbi6hP>

evidence-based insights. These dashboards are available in the stand-alone site³² created for the presentation of this project's findings. Since all data was not conducive to being represented in a dashboard, additional sections were included in the report site to give a more comprehensive view of each country's ICT landscape.

3.4 Country Profile Assessment

A questionnaire was developed to structure the process of assessing the effectiveness of the country profiles implemented. Table 9 shows the survey design.

Table 9 Questions to assess effectiveness of data and data presentations in country profiles for policymaking and regulation

#	Question	Purpose	Format
1	Please state your name	To identify respondent	Short answer question
2	Is the data made available on the profile for your country adequate to make informed policies or regulations, particularly for serving the underserved?	To assess the adequacy of data that is publicly available	Multiple choice: Yes/No
3	If the response to the question above was "Yes", please provide examples of critical data that is missing.	To identify critical data gaps	Long answer question
4	What improvements, if any, can be made to the country profile for your country?	To identify improvements that can be made to the country profiles to inform ICT policymaking and regulation	Long answer question
5	On a scale of 1 to 5, with 1 being not useful and 5 being very useful, how would you rate the effectiveness of the data presentation for effective policymaking and regulation?	To assess the effectiveness of the profiles for policymakers and regulators numerically	5-point scale rating

The questionnaire was implemented using Microsoft Forms³³ and was distributed via email to stakeholders with whom prior consultations were held.

³² <https://cirp-lideres-project.web.app>

³³ <https://forms.office.com/r/EnrMrhsYFK>

4 Results

This section presents the results from stakeholder consultations and the implementation of country profiles.

4.1 Stakeholder Data Needs

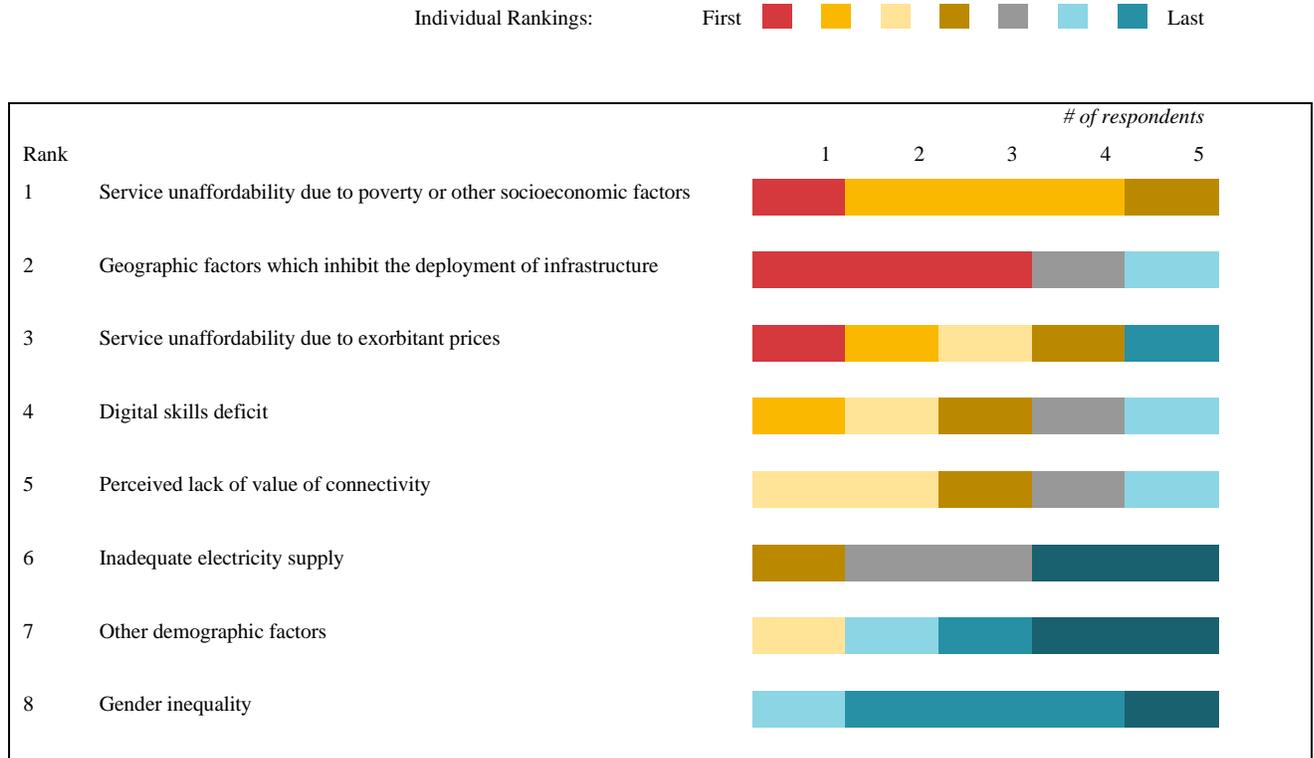


Figure 2 Ranking of the factors that affect the digital divide by stakeholders surveyed

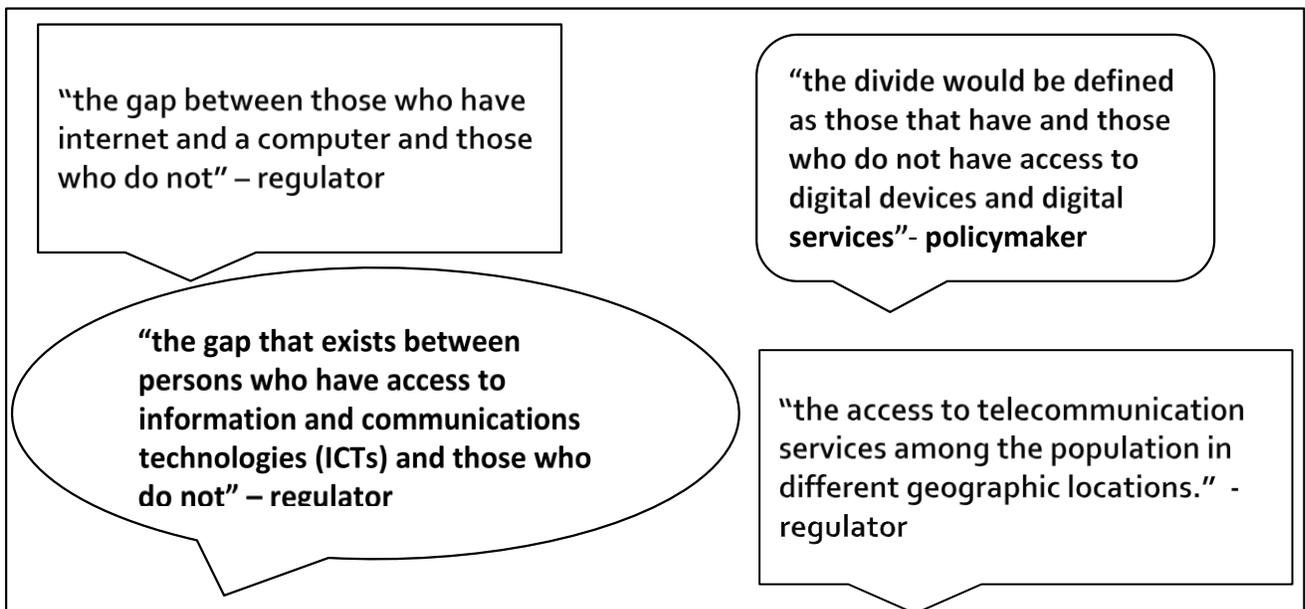


Figure 3 Digital divide definitions used by organisations interviewed

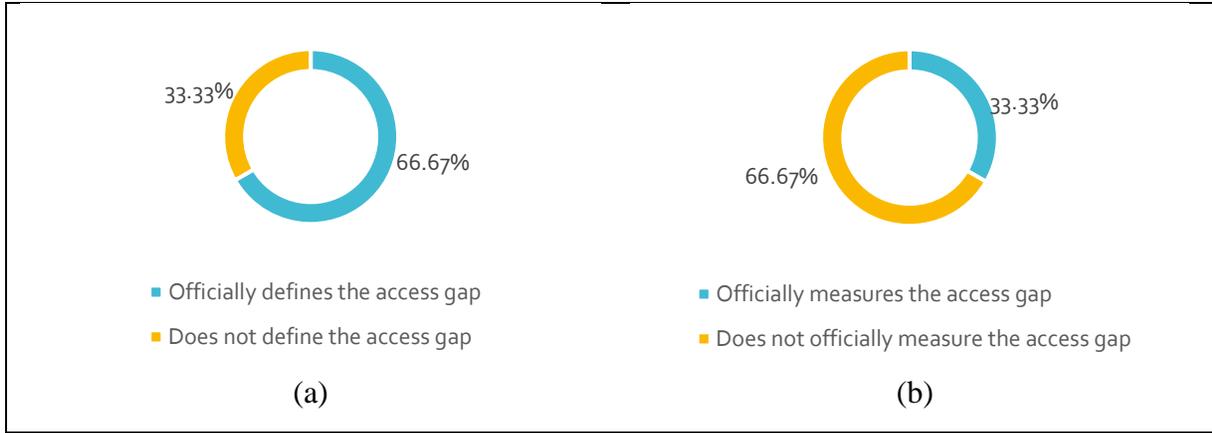


Figure 4(a) Organizations who officially define the access gap (b) Organizations who indicated that the access gap is measured in their country.

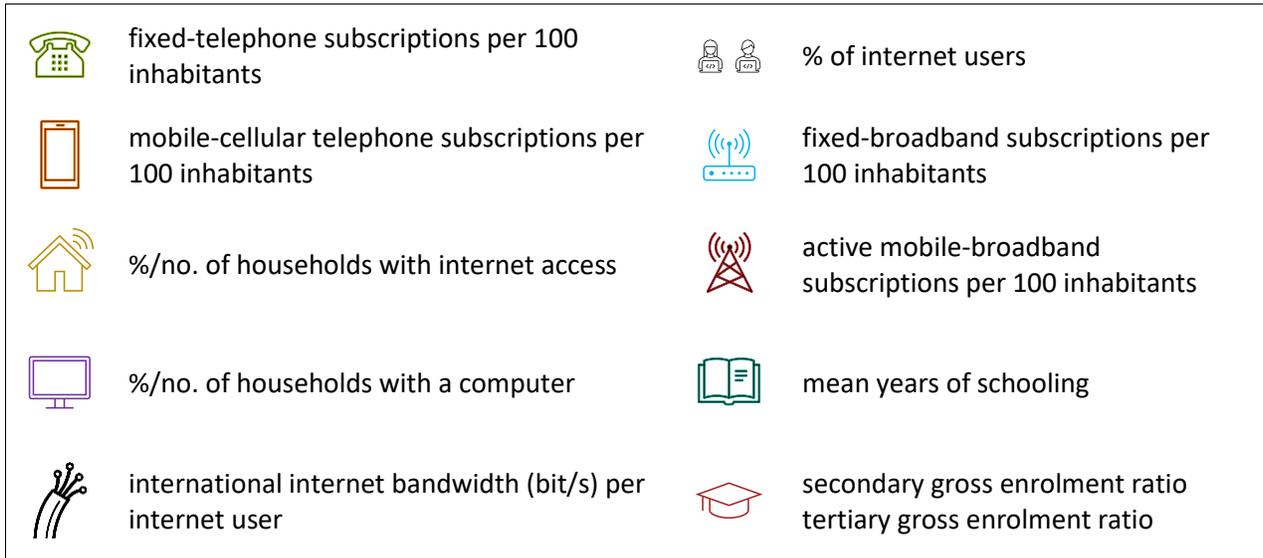


Figure 5 Examples of data used to measure the access gap in Trinidad and Tobago

<p>①</p> <p>Geospatial Maps</p>  <p>“GIS mapping” – regulator</p> <p>“Picture formats are easier to decipher than textual information for e.g. the cell sites on the map is useful.” – policymaker</p> <p>“Geospatial.....good representation for infrastructure to identify infrastructural gaps” – regulator</p>	<p>③</p> <p>Presentations suited to the audience</p>  <p>“Any form of presentation, once the information is clear and usable and applicable to the audience for their purpose” – regulator</p> <p>“With other formats, presentation is dependent on the audience ...their technical background, knowledge on what is being presented” – policymaker</p>
<p>②</p> <p>Graphs</p>  <p>“dashboard”- policymaker</p> <p>“time-series” - regulator</p>	<p>④</p> <p>Analytical Reports</p>  <p>“an analytical report” – policymaker</p>

Figure 6 Preferred data presentation formats by stakeholders interviewed

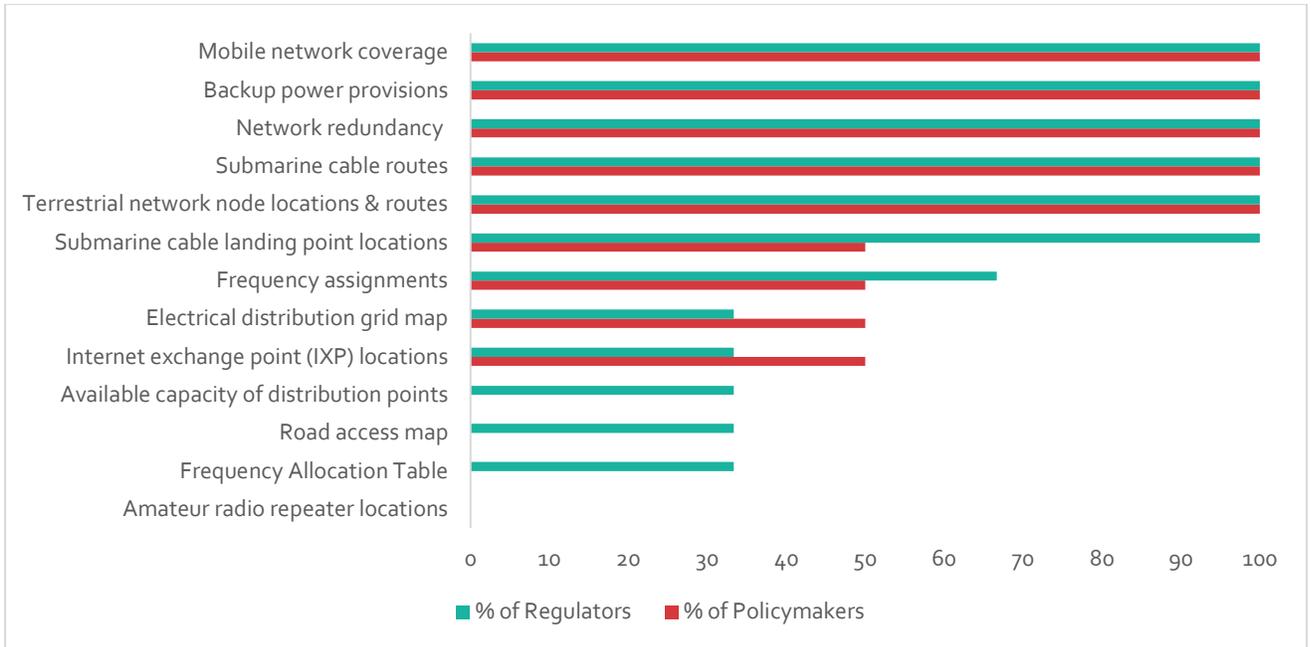


Figure 7 Data needs chosen by stakeholders to assess internet infrastructure availability

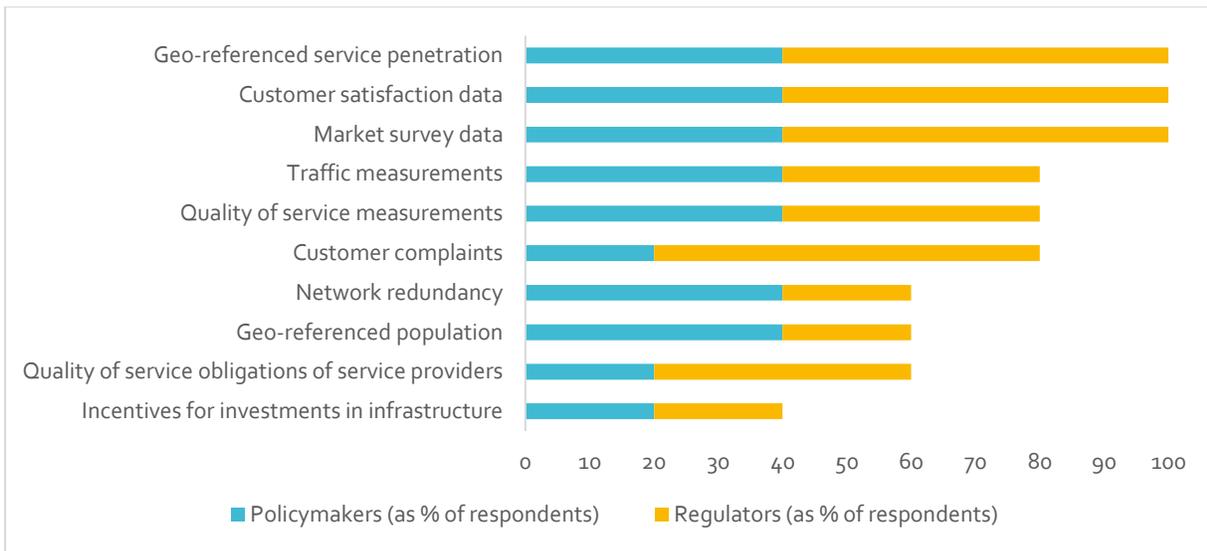


Figure 8 Data needs chosen by stakeholders to assess service availability

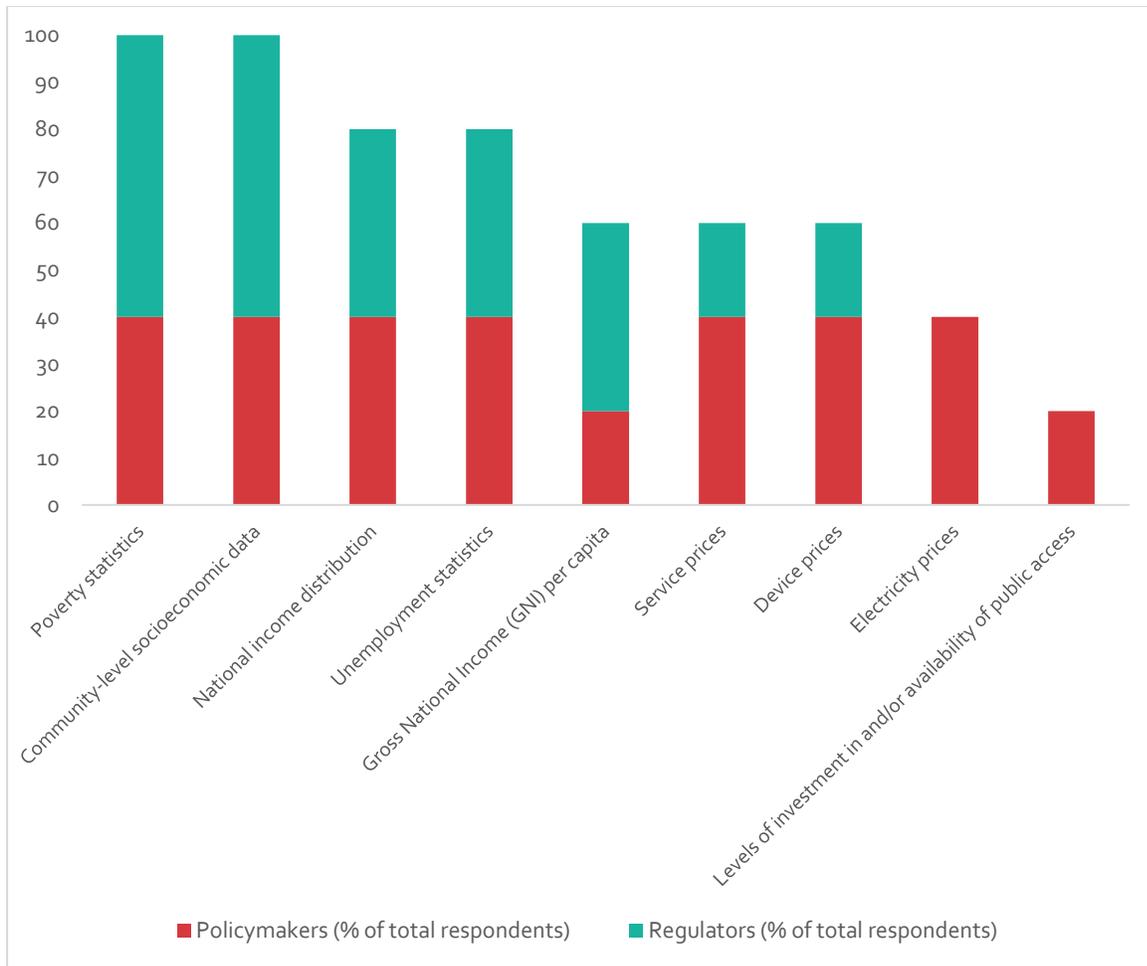


Figure 9 Data needs chosen by stakeholders to access service affordability

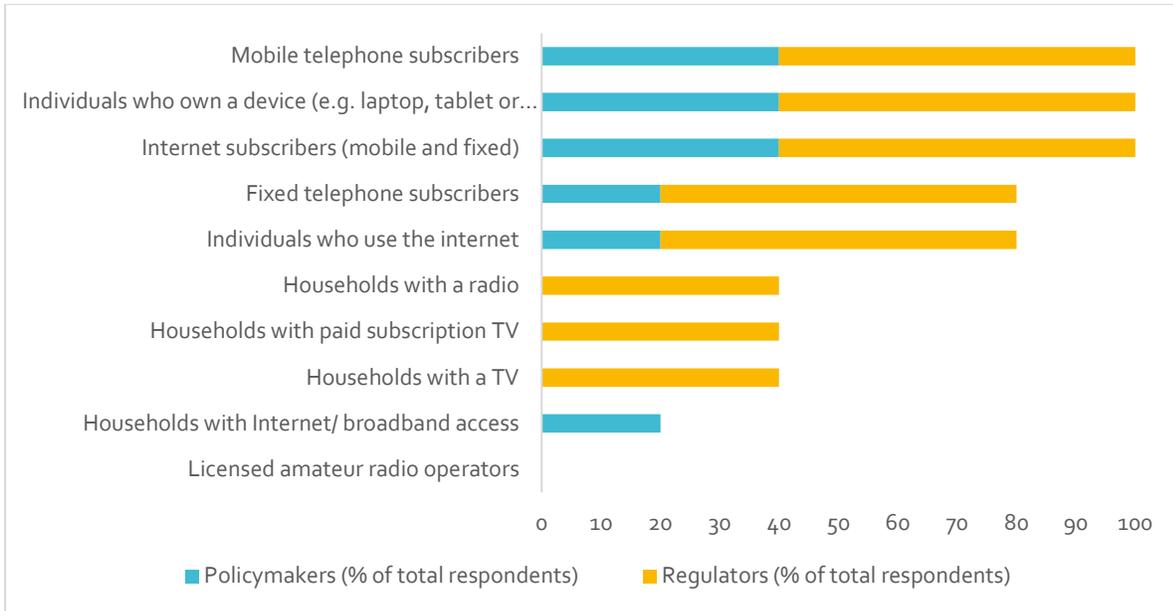


Figure 10 Data needs chosen by stakeholders to assess ICT use

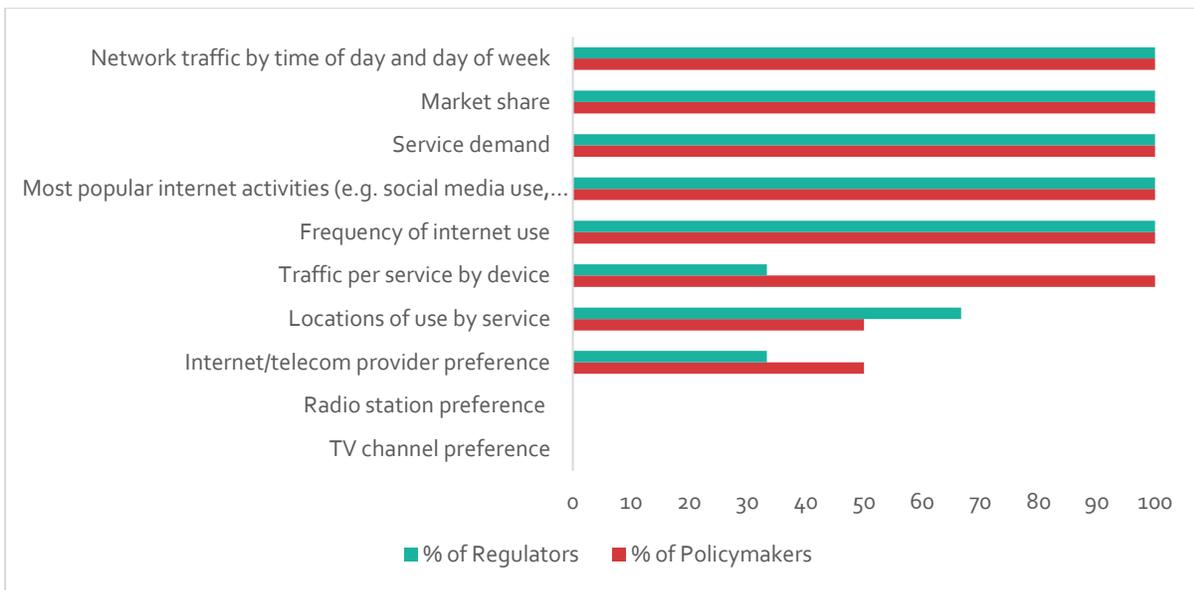


Figure 11 Data needs chosen by stakeholders to assess ICT usage

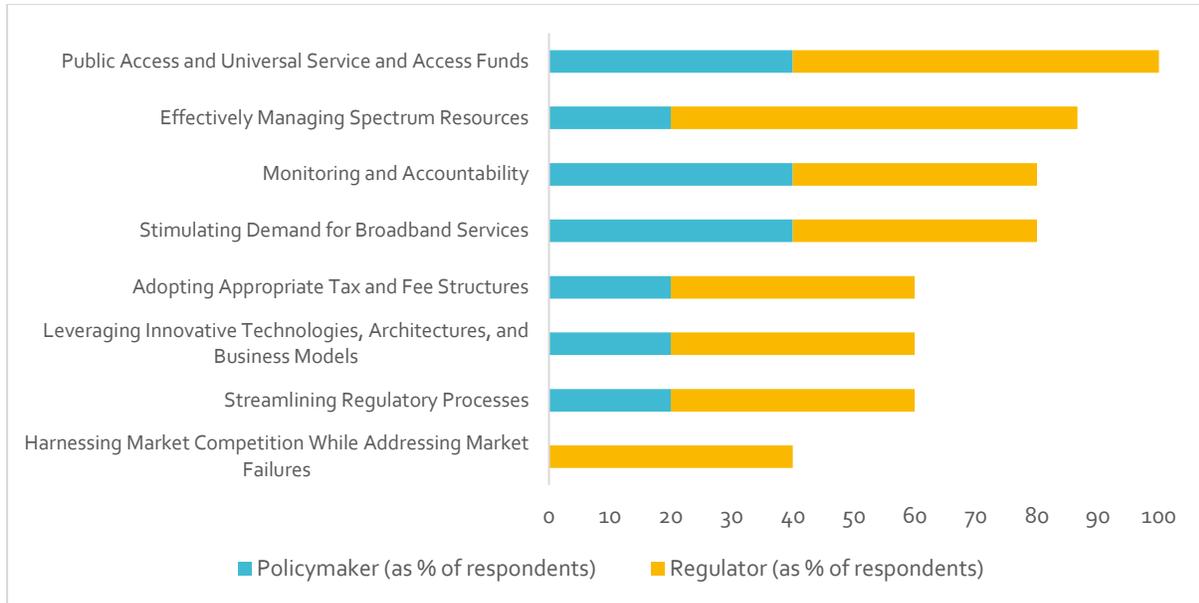


Figure 12 Incorporation of A4AI Rural Broadband Policies by organizations surveyed

4.2 Country Profiles³⁴

4.2.1 Country Overview

Geographic, demographic, and socio-economic data, primarily sourced from the World Bank's World Development Indicators Database as shown in Table 3, is used in this section (Figure 13). It provides context for the ICT indicators and statistics in subsequent dashboards. These include population numbers and density, GNI and GNI per capita, and the ITU's ICT development Index (IDI).



Figure 13 ICT Profiles for Country Overview

4.2.2 Enabling Environment

In this section, information on the legal and institutional frameworks of each country's ICT sector is displayed in tabular form (Figure 14) to provide context to the data in the Enabling Environment dashboard (Figure 15). This data includes ITU's Global ICT Regulatory Tracker data, ICT Price Baskets and smartphone affordability data as mentioned in Table 4.

³⁴ The country profiles can be found on the Repot Site here: <https://cirp-lideres-project.web.app/#profiles>

ICT Sector - Legal and Institutional Frameworks			
Category	GUY	TTO	VCT
Legal Framework	Telecommunications Act (2016)	Telecommunications Act (2001, amended in 2004)	Telecommunications Act (2001)
Public Policy Authority	Ministry of Public Telecommunications	Ministry of Digital Transformation (est. 2021) previously Ministry of Public Administration and Communications (MPUC)	Department of Telecommunications Science and Technology in the Ministry of Finance, Economic Planning and Information Technology
Regulating Authority	Public Utilities Commission (PUC)	Telecommunications Authority of Trinidad and Tobago (TAT)	National Telecommunications Regulatory Commission (NTRC), Eastern Caribbean Telecommunications Authority (ECTEL)
Competition Authority	Competition and Consumer Affairs Commission of Guyana (CCAC)	Fair Trading Commission (FTC)	National Competition Agency, Organisations of Eastern Caribbean States (OECS), competition bill is currently being reviewed
National Digital/ICT /Telecommunications Strategy	Guyana's Low Carbon Development Strategy 2030 (draft for consultation), previously National Development Strategy	National ICT Plan 2018 - 2022	National Broadband Plan 2015 - 2020
Market Access	Fully liberalised since October 2021	Fully liberalised since June 2004	Fully liberalised since March 2003

Figure 14 Legal and institutional frameworks for the ICT sector in the 3 countries under study (Enabling environment)



Figure 15 ICT profiles for enabling environment

4.2.3 Infrastructure and Service Availability

The Infrastructure and Service Availability profiles (Figure 16) include the number of submarine cable landing points and IXPs, mobile connectivity data and broadband download rates (Table 5). A subsection entitled “ICT Availability vs. Population Density Map” includes map visualizations (Figure 17 - Figure 20) with population densities, submarine cable landing

points and IXP locations where available. For Trinidad and Tobago, cell tower locations and ICT indicators (IDI, DOI and DAI) at the municipal level from TATT’s 2013 Digital Divide Survey (2013) is used.



Figure 16 ICT profiles for infrastructure and service availability

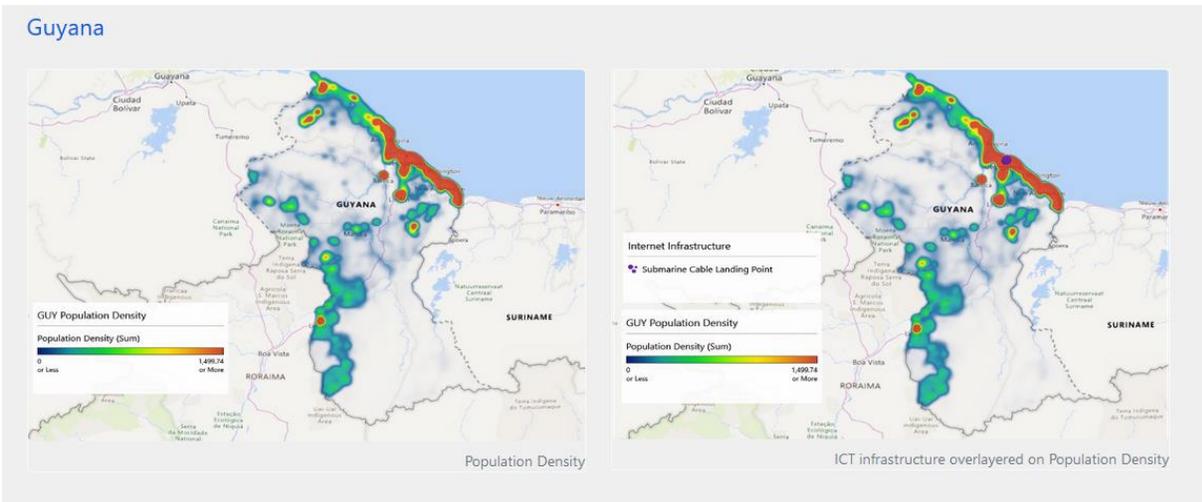


Figure 17 Maps of ICT infrastructure availability vs. population density for Guyana



Figure 18 Maps of ICT infrastructure availability vs. population density for Trinidad and Tobago

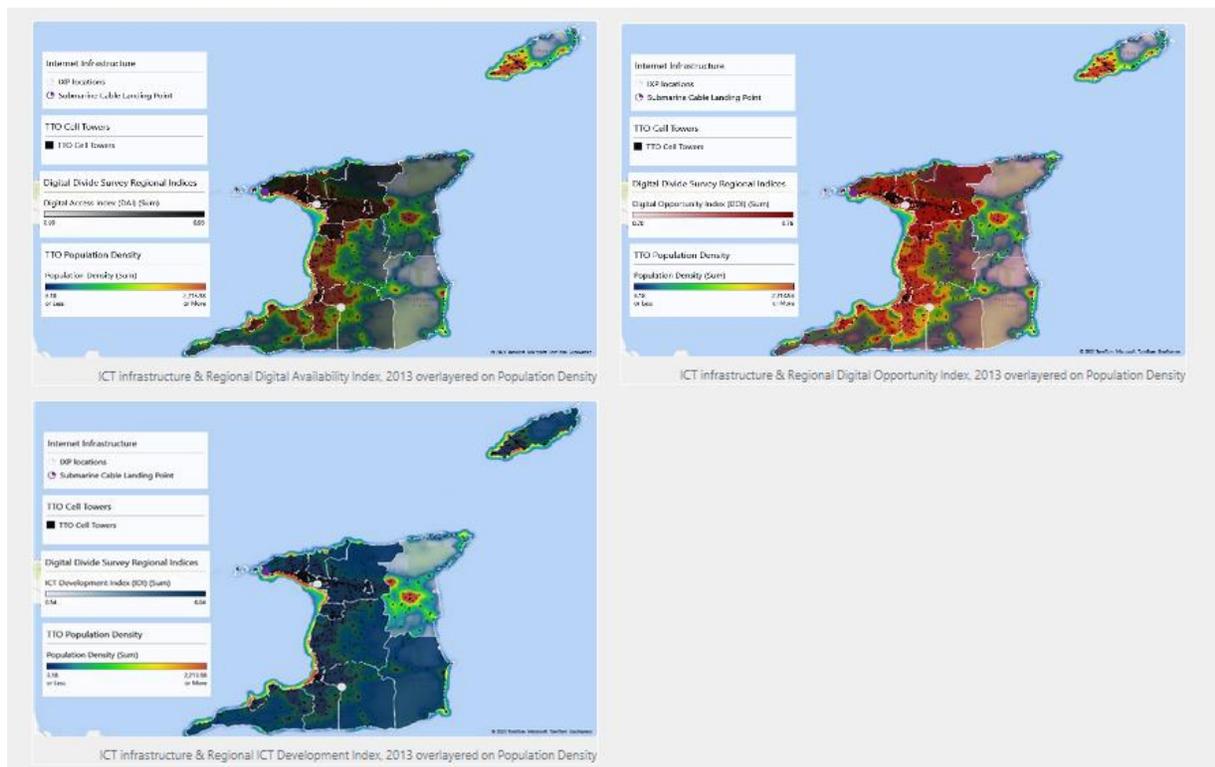


Figure 19 Maps of ICT infrastructure availability vs. population density, cell tower location and ICT indicators for municipalities in Trinidad and Tobago

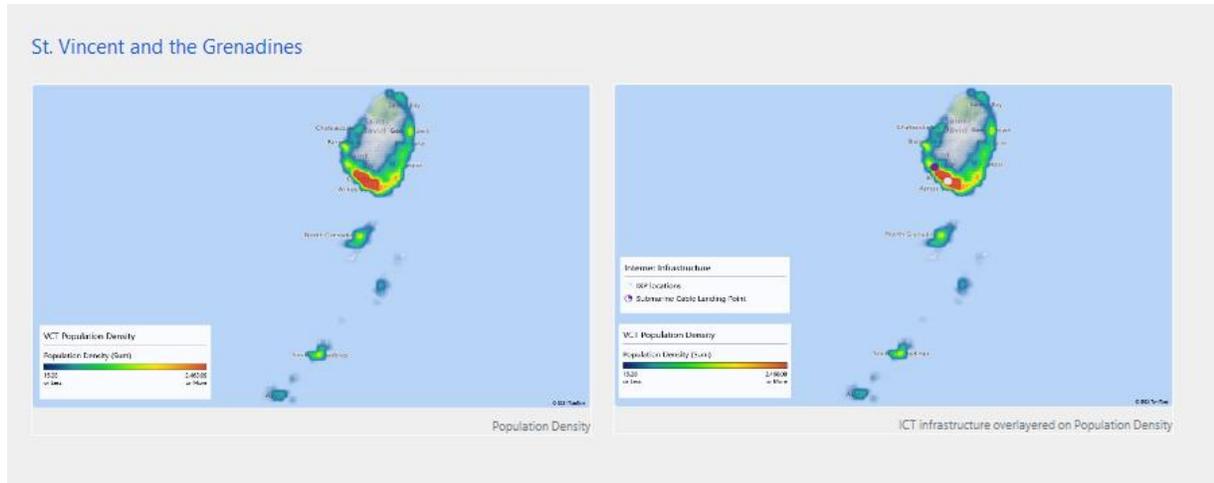


Figure 20 Maps of ICT infrastructure availability vs. population density for St, Vincent and the Grenadines

4.2.4 ICT Adoption and Usage

This section (Figure 21) uses data on adoption and usage, sourced from the ITU as mentioned in Table 6. These include telephony and broadband penetration rates (users and subscriptions), and international bandwidth rates.



Figure 21 ICT profiles for adoption and usage

4.3 ICT Profile Assessment

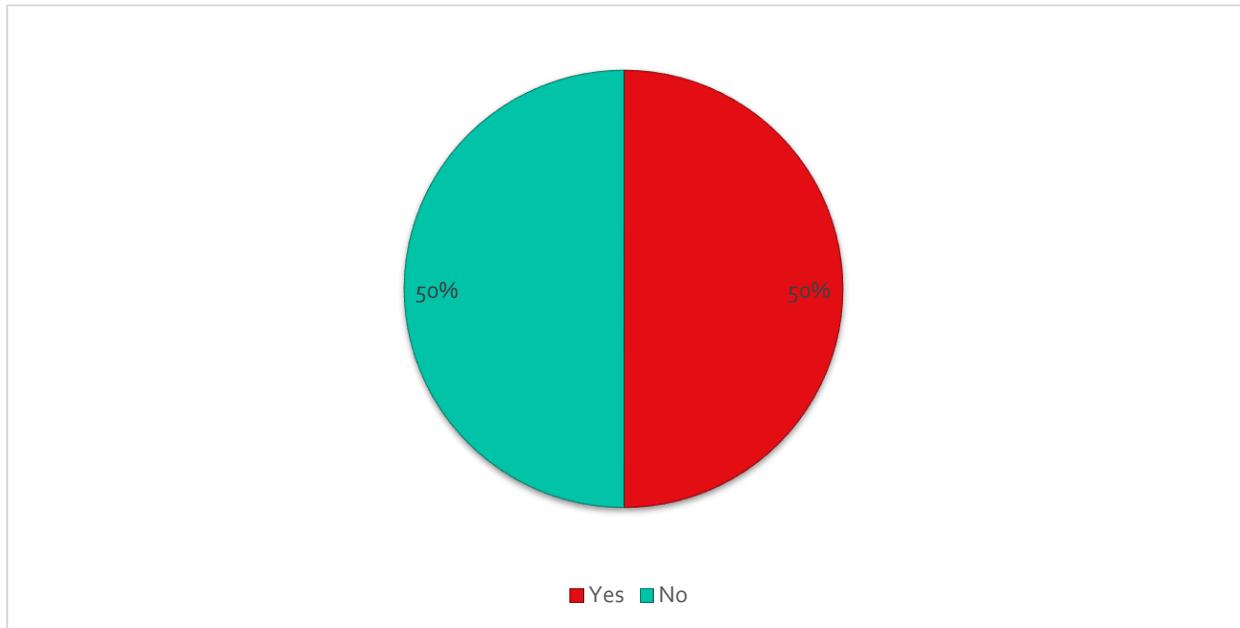


Figure 22 Response to data adequacy of ICT profiles

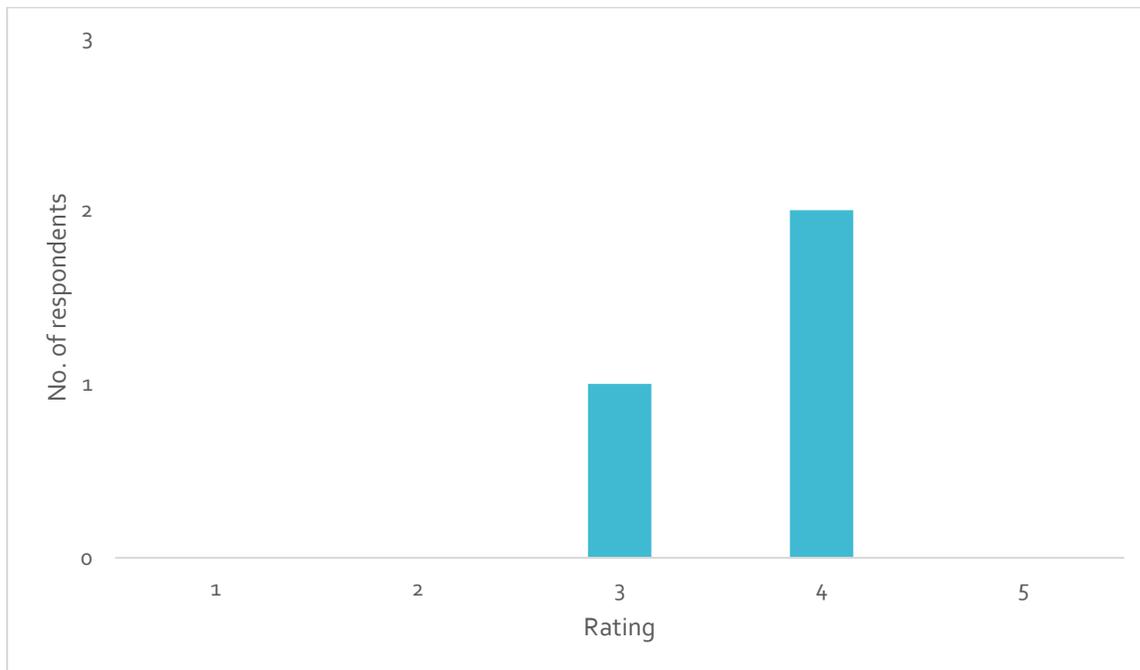


Figure 23 Respondents' rating (1 being not useful and 5 being very useful) of the effectiveness of data presentations on the ICT profiles for policy and planning

"Require data disaggregated by administrative region at a minimum. Require also specific definitions of coverage, affordability and minimum service offerings"- policymaker

"Consideration could be given to addressing the requisite legislationcritical in the context of an enabling environment. Admittedly, there is a need to update the referenced legislation and pursue their full proclamation for greater effectiveness." - regulator

Figure 24 Respondents' suggestions for improvement in data used in the ICT profiles

5 Discussion

5.1 Data Findings

Service unaffordability and geographic factors that inhibit infrastructure deployment were identified as the main causes of the digital divide by the stakeholders interviewed (Figure 2). The digital divide is officially defined by two thirds of the organizations interviewed (Figure 3 and Figure 4). The access gap was generally defined as the gap between those who have access to ICTs and those who do not. However, of those surveyed, only the Telecommunications Authority of Trinidad and Tobago (TATT) disaggregates the divide by geography (geographical classification of underserved areas) and by population groups (including but not limited to socioeconomic status, disabilities, age, group and gender). It has been acknowledged by A policymaker in Trinidad and Tobago acknowledges that the digital divide is not a single construct and is due to factors such as vulnerability, geographic factors (rural/urban), lack of finances, and lack of knowledge. Many of the stakeholders stated that the digital divide in one country may be different from that in another due to differences in geography and economies.

Of the 3 countries examined, the access gap is only measured formally in Trinidad and Tobago (Figure 4) through the 2007 and 2013³⁵ Digital Divide Surveys and the 2021 Digital Inclusion survey, by TATT. The 11 indicators of the ICT Development Index (IDI) are being used in this measurement (illustrated in Figure 5). Although the access gap is not officially measured in St. Vincent and the Grenadines, the National Telecommunications Regulatory Commission conducts ICT surveys for their own use, the last of which was done in 2019. Data is disaggregated by age and gender in these measurements. Some of these include frequency of internet use and mobile postpaid and prepaid data subscribers by age and gender, and number of devices owned and levels of computer literacy by age.

Most organizations do not have an official definition for service affordability. They do however use data such as disposable income, poverty rate, unemployment rates and number of people on social welfare to gauge service affordability. However, many respondents acknowledged the

³⁵ [Digital Divide Survey2013_FINAL 17-01-2014-reduced.pdf \(tatt.org.tt\)](#)

importance of defining affordability in such a way that it can be measured specific to their country's circumstances. The need for measurable definitions for terms such as broadband and coverage was also mentioned in interviews. Standardized definitions of terms such as these can facilitate benchmarking and policy harmonization among CARICOM countries as envisioned for the CARICOM Single ICT Space.

In terms of data formats, the stakeholders preferred graphical data in the form of maps and charts (Figure 6). It was also recommended that presentations should be clear and useful for the target audience. Figure - Figure 11 illustrate the data that policymakers and regulators deem necessary.

The need for disaggregation was further reinforced in the country profile assessments where 50% of respondents thought that the data provided is not enough for policy and planning (Figure 22), some citing the need for disaggregation (Figure 24). Three respondents gave an average score of 3.7 out of 5 for the data presentations in the country profiles (Figure 23). Although this is not a significant sample, this suggests that the formats are useful to the stakeholders.

5.2 Existing Data Gaps

The data deemed most necessary for policy and planning (as indicated by 80% or more of the survey respondents shown in Results in Figure 7 - Figure 11) and their degree of openness and disaggregation³⁶ are detailed in Table 10, according to the following key:

KEY

Public Availability

- publicly available and up to date
- publicly available but outdated
- unavailable or not measured
- available under license only/private

Disaggregation

-  demographic
- \$ socioeconomic
-  geographic

Table 10 Public availability of most needed data to assess different ICT categories

Category	Data	Public Availability		
		Guyana	St. Vincent and the Grenadines	Trinidad and Tobago
Infrastructure Availability	Terrestrial network node locations & routes	●	●	●
	Submarine cable routes	● 	● 	● 
	Network redundancy	●	●	●
	Backup power provisions	●	●	●
	Mobile network coverage	● 	● 	● 
	Submarine cable landing point locations	● 	● 	● 
	Market survey data	●	●	●

³⁶ Demographic – by age/gender, socioeconomic – by income, social class, employment status, Geographic – location-based

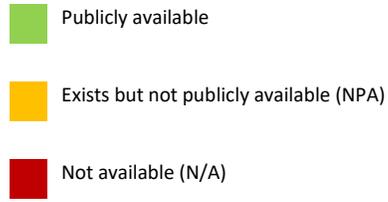
Category	Data	Public Availability		
		Guyana	St. Vincent and the Grenadines	Trinidad and Tobago
Service Availability	Customer satisfaction data			
	Geo-referenced service penetration			
	Customer complaints			
	Quality of service measurements			
	Traffic measurements			
Service Affordability	Poverty statistics			
	Community-level socioeconomic data			
	National income distribution			
	Unemployment statistics	 	 	 
ICT Use	Internet subscribers (mobile and fixed)			
	Individuals who own a device			
	Mobile telephone subscribers			
	Individuals who use the internet			
	Fixed telephone subscribers			
ICT Usage	Frequency of internet use		 	

Category	Data	Public Availability		
		Guyana	St. Vincent and the Grenadines	Trinidad and Tobago
Most popular internet activities		●	● ♂♀	●
Service demand		●	●	●
Market share		●	●	●
Network traffic by time of day and day of week		●	●	●

From Table 10, it is clear that there is a need for more open, up-to-date ICT data that is disaggregated by demography, socioeconomic status and geography for the 3 countries under study. Another gap appears to be in data granularity, particularly geographic, as evidenced from stakeholder interviews. Most data available is measured at macroscale (census divisions or municipalities) which facilitates less insight into priority communities. Data at the community level and even at the street level would be helpful to address the access gap. However, this data is challenging to obtain due to the overall cost of standard data collection methodologies. Interestingly, service prices were only identified by 60% of respondents as data required to assess affordability. This data is open and made available by the telecommunications operators in each country. In fact, TATT and St. Vincent and the Grenadines' NTRC compile service prices and feature them on their websites³⁷.

Figure 25 shows the data available in the 3 countries under study to assess meaningful connectivity according to A4AI's measure: regular internet use (minimum: daily), access to an appropriate device (minimum: a smartphone), adequate data (minimum: an unlimited broadband connection at home or a place of work or study) and fast connection (minimum: 4G mobile connection).

³⁷ TATT's quarterly price reports available here: <https://tatt.org.tt/ReportsPrices/Prices.aspx>, NTRC's compiled service prices available here: <https://www.ntrc.vc/consumer/tariffs/>



	Guyana	St. Vincent and the Grenadines	Trinidad and Tobago
<i>% of persons who have a 4G connection</i>	N/A	N/A	N/A
<i>% of persons who own or have access to a smartphone</i>	N/A	NPA	N/A
<i>% of persons who use the internet from an unlimited broadband connection at home or a place of work or study</i>	N/A	N/A	N/A
<i>% of persons who use the internet daily</i>	N/A	NPA	N/A
<i>% of persons who are meaningfully connected</i>	N/A	N/A	N/A

Figure 25 Data available in each of the 3 countries under study to assess meaningful connectivity

Figure 25 shows that the data required to assess meaningful connectivity is generally not available for the three countries under study. This was identified as an issue by some

stakeholders interviewed, one stating that accurate data on the household and individual level can only be collected through nationwide censuses. Table 11 shows the closest data available.

Table 11 Closest data available to those required to measure meaningful connectivity

	Most Similar Data Available		
	Guyana	St. Vincent and the Grenadines	Trinidad and Tobago
<i>% of persons who have a 4G connection</i>	Active mobile broadband subscriptions per 100 inhabitants 26.38 ³⁸ (2017)	Active mobile broadband subscriptions per 100 inhabitants 58.16 ³⁸ (2019)	Mobile internet penetration per 100 inhabitants 56 ³⁹ (2021)
<i>% of persons who own or have access to a smartphone</i>	Mobile-cellular telephone subscriptions per 100 inhabitants 83 ⁴⁰ (2017)	Number of devices owned by sex (includes smartphones) (Not publicly available)	Percentage of population who own a mobile phone 87.33 ⁴¹ (2011)
<i>% of persons who use the internet from an unlimited broadband connection at home or a place of work or study</i>	Fixed broadband subscriptions per 100 inhabitants 8.3 ⁴² (2017)	Fixed broadband subscriptions per 100 inhabitants 20.3 (2019)	Fixed broadband subscriptions per 100 inhabitants 24.3 (2019)
<i>% of persons who use the internet daily</i>	Internet users (%) 37.3 ⁴³ (2017)	Internet users (%) 60.6 ⁴⁴ (2019)	Internet users (%) 77.3 ⁴³ (2017)

³⁸ ITU. https://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2020/MobileBroadbandSubscriptions_2007-2019.xlsx

³⁹ https://tatt.org.tt/DesktopModules/Bring2mind/DMX/API/Entries/Download?Command=Core_Download&EntryId=1545&PortalId=0&TabId=222

⁴⁰ https://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2020/MobileCellularSubscriptions_2000-2019.xlsx

⁴¹ <https://cso.gov.tt/census/2011-census-data/>

⁴² https://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2020/FixedBroadbandSubscriptions_2000-2019.xlsx

⁴³ <https://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2021/July/PercentIndividualsUsingInternet.xlsx>

⁴⁴ https://www.ntrc.vc/statisticaldata_1/

Although all mobile data plans are 4G LTE and/or above for the countries under study, a single person may have multiple phones, hence multiple mobile subscriptions. There is a need to collect data for unique subscriptions, cross-referenced with those of multiple operators for accurate measures of persons who have access to, at minimum, a 4G connection. Mobile cellular subscriptions⁴⁵ may include phones that are not internet-enabled and fixed broadband subscriptions do not reflect the number of persons who have access to an unlimited broadband connection. It must be noted that an unlimited connection can be mobile or fixed but for the purpose of this comparison, the fixed internet subscriptions were chosen as most similar due to the higher likelihood of them being unlimited.

Data on the number of internet users as defined by the ITU (usage within the last 3 months) is available, however the A4AI standard calls for daily internet use. Countries may consider collecting and using this data to assess meaningful connectivity. Additionally, this data should be disaggregated by community, socioeconomic status, age, gender, disabilities and other parameters to formulate targeted policies to meaningfully connect the underserved.

With respect to addressing national ICT targets, data identified as necessary in stakeholder interviews was data on digital skills and digital skills forecasts, poverty rate and distribution and data at the household level (see Figure E2 in Appendix E). Though digital skills may not be readily quantifiable, ITU's Digital Skills Assessment Guidebook⁴⁶ is a useful guide to digital skills measurement.

5.3 How Data Can be Used in the Implementation of Initiatives

Stakeholders were asked to provide some example initiatives that can be implemented to address the access gap. These included broadband infrastructure projects, subsidized internet

⁴⁵ ITU Definition - the number of subscriptions to a public mobile-telephone service that provide access to the PSTN using cellular technology.

⁴⁶ <https://academy.itu.int/itu-d/projects-activities/research-publications/digital-skills-insights/digital-skills-assessment-guidebook>

programmes and programmes for free laptops and tablets for students (see Figure E1 in Appendix E). Table 12 shows how disaggregated data can help inform some initiatives.

Table 12 Ways in which data can be used to inform ICT initiatives

Example initiative	Data	Use
Broadband infrastructure projects	Terrestrial network node locations & routes	To locate existing infrastructure to which expansions can be made to provide access to the underserved
	Network redundancy (geographic)	To determine network resilience when part of the network or main power source is down. This can be used to add or improve the necessary infrastructure for resilience
	Backup power provisions (geographic)	To determine network resilience when part of the network or main power source is down. This can be used to add or improve the necessary infrastructure for resilience
	Mobile network coverage (geographic and topographic)	To find geographic gaps in mobile network access. This can be used to implement infrastructure or innovative low-cost solutions
	Customer satisfaction data (by location at community level)	To ascertain quality of internet and telecommunications services in different communities to see where improvements can be made to existing infrastructure
	Customer complaints (by location at community level)	
	Quality of service measurements	
	Geo-referenced service penetration	To find geographic gaps in different services. This can aid in identifying areas where there are infrastructure gaps
	Service demand (by location at community level)	To identify if it is feasible to deploy infrastructure in a community based on demand for service
Subsidized internet programmes	Poverty statistics	To aid in targeting subsidy programmes towards different communities and individuals
	Community-level socioeconomic data	
	National income distribution	
	Unemployment statistics	

5.4 Addressing the Digital Divide

In addition to the initiatives that can be implemented to address the access gap, stakeholders were surveyed on their organizations' implementation of strategies recommended by the A4AI

for Rural Broadband Policy. More than 50% of respondents identified seven out of eight of the policies that they use (Figure 12). Organizations may consider harnessing market competition and addressing market failures in their approach to bridging the access gap. Market data would be an integral part of adopting such policy measures. This may include encouraging infrastructure sharing, and cooperation of service providers as mentioned by a stakeholder during consultations (Figure E3 in Appendix E). In addition to data stakeholders identified the need for funding and financial resources, an integrated policy approach that takes into account the multiple divides, a policy plan and framework, inter-ministerial cooperation, capacity building, and poverty reduction.

6 Conclusion

This investigation set out to contribute to the planning and provisioning of adequate and accessible telecommunications and internet infrastructure and services in the Caribbean. Desk research and stakeholder consultations were used to determine the data deemed most necessary by policymakers and regulators to (i) understand the gaps in service to the underserved and (ii) plan and deploy emergency and regular internet service to underserved communities. Stakeholders' needs in terms of data formats and presentation were identified as well as their perceptions of how such data and insights would be used in policy and planning. Country-specific ICT profiles were created on a stand-alone website to show data that is available and sample possibilities for its presentation. Analyses were then performed to reveal the gaps in publicly available ICT data.

It became clear that there is a lack of up-to-date ICT data and minimal disaggregation into categories such as demography, geography and socioeconomic status. Key data is also not available to assess meaningful connectivity. Geographically granular data is also lacking at the community level for targeted policy and planning. Additionally, graphical data visualizations such as charts and maps were most preferred to facilitate insights for evidence-based policy and planning. Finally, terms such as affordability, broadband and coverage need to have contextual definitions based on a country's environment and needs; while at the same time enabling regional benchmarking

6.1 *Limitations*

1. Respondents for the primary data gathering exercises were limited to those in the three sample countries so findings cannot be assumed to apply generally across all jurisdictions
2. Limitations of Excel spreadsheets may motivate the use of alternate platforms for expanded country profiles

6.2 Recommendations for Future Work

This modest project comprised supply side as well as demand side studies. The supply side examinations revealed the basic state of publicly available ICT data for the 3 CARICOM countries under study. Demand side examinations revealed the needs, challenges and opportunities for data and analysis to inform policy and regulation to connect the unconnected in meaningful ways.

To progress the benchmarking and policy harmonization among CARICOM countries, it would be useful to expand the data gathering and analysis to all member states and associate members. Such a study would be best conducted with a larger number of respondents per country to ensure a robust assessment of cross-sectoral data needs for policy and planning.

Expansion of this supply and demand side examination would call for scalable dashboard interface with dynamic ICT profiles and a rich portfolio of data mashups and visualizations. These dashboards would be of particular profit to the Single ICT Space if accompanied by a suite of standardized data collection tools as well as agreed protocols for regular data sharing.

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⁴⁷ <https://databank.worldbank.org/source/world-development-indicators>

Appendix A – Stakeholder Profiles

Table A1 Stakeholder profile for mock interview

Interviewee	Organization	Organization Type	Role
Yacine Khelladi	Alliance for Affordable Internet	Policymaker	Regional Coordinator for Latin America and the Caribbean

Table A2 Stakeholder profile for official interviews

Country	Organization	Organization Type	Participant	Role
Guyana	Guyana Telecommunications Authority	Policymaker	Andre Griffith	Director of Telecommunications
	Public Utilities Commission	Regulator	Dela A. Britton	Chairperson
			Yogwattie Sookram	Financial Analyst
			Vidiahar Persaud	Secretary
St. Vincent and the Grenadines	Ministry of Finance	Policymaker	Anson Latchman	Assistant Project Coordinator (CARDTP)
	National Telecommunications Regulatory Commission	Regulator	Apollo Knights	Director
Trinidad and Tobago	Ministry of Digital Transformation	Policymaker	Shelley-Ann Clarke-Hinds	Senior Executive Manager, External ICT Relations
	Telecommunications Authority of Trinidad and Tobago	Regulator	Cynthia Reddock-Downes	Chief Executive Officer
			Kirk Sookram	Deputy Chief Executive Officer
			Annie Baldeo	Executive Officer, Economics

Appendix B – General Interview Brief



Data Needs to Address ICT Access Gaps

LIDERES 2.0: Investigating the Caribbean ICT Landscape
 Caribbean ICT Research Programme (CIRP)
 October 2021

Introduction

This survey, to be conducted via an interview, is a component of a LACNIC [Lideres 2.0](#) research project: *Investigating the Caribbean ICT Landscape*. It is being implemented by the Caribbean ICT Research Programme to explore the data needs for evidence-based policy and regulation to address the ICT access gap. The research is motivated by the considerable differential impact of the COVID-19 pandemic on various underserved and marginalized communities, relative to others.

The countries of interest, for the time being, are: Guyana, St. Vincent and the Grenadines and Trinidad and Tobago; and the executing team is the Caribbean ICT Research Programme (CIRP).

Intended Use of Data

Survey findings will be used to:

- identify the unsatisfied need for publicly accessible data required to address the access gap
- generate demonstrative access-centric country profiles as a focal point for the assessment of the data needs for evidence-based planning.

All findings will be published in a research report to be publicly available on a dedicated project website. Respondents' names, organizations and roles will be included in the report Appendix, however no attributions will be made to any responses unless with the explicit, written permission of the respondent.

The interview session will be recorded but will under no circumstances be made available to anyone outside of the research team at any time.

Declaration of Consent

I have read and understood the above description of the research study and the intended use of data from this interview. I voluntarily agree to partake in this study and give consent to record the interview session under the terms specified.

Name _____

Organization _____

Role _____

Signature _____

Date _____

Seeds for Discussion

1. What does your organization define as the digital divide? How, if at all, does your organization differentiate the divide into its various aspects?
2. How is the access gap measured in your country, and what data is utilized in its measurement?
3. I understand that your country has implemented initiatives to reduce the access gap. Can you provide specific examples of *additional* initiatives that can be employed?
4. What, if any, is the additional data that is needed to address national access targets?
5. How does your organization specify and measure affordability?
6. What data is required to assess affordability? What of this, if any, is not publicly available?
7. Please identify data gaps that inhibit your organization from addressing other priorities, outside of access.
8. Please describe the data presentation formats that would most assist your organization address the access gap.

Appendix C – Actual Stakeholder Interview Schedule

Table C1 Stakeholder interview dates and durations

Country	Organization	Interviewee (s)	Organization Type	Date	Time	Duration
Guyana	Guyana Telecommunications Authority	Andre Griffith	Policymaker	October 7, 2021	3:00 pm	40 min
	Public Utilities Commission	Dela A. Britton, Seema Sookram, Vidiahar Persaud	Regulator	Response received via email		
St. Vincent and the Grenadines	Ministry of Finance	Anson Latchman	Policymaker	Response received via email		
	National Telecommunications Regulatory Commission	Apollo Knights	Regulator	October 6, 2021	1:00 pm	53 min
Trinidad and Tobago	Ministry of Digital Transformation	Shelley-Ann Clarke-Hinds	Policymaker	October 18, 2021	2:00 pm	36 min
	Telecommunications Authority of Trinidad and Tobago	Cynthia Reddock-Downes, Kirk Sookram & Annie Baldeo	Regulator	October 12, 2021	2:00 pm	47 min

Appendix D – Questionnaire Design to Assess Stakeholder Data Needs

Table D1 User information for questionnaire to assess data needs to address the access gap

#	Field	Purpose	Format
1	Declaration of consent: I have read and understood the above description of the research study and the intended use of data from questionnaire. I voluntarily agree to participate	To ensure user agrees to the intended use of their responses before continuing to the rest of the questionnaire	Checkbox
2	Name	To identify respondent	Text field
3	Organization		Text field
4	Role		Text field

Table D2 Questions to assess data needs to address the access gap

#	Questions	Choices	Purpose	Format
5	Please state your organization's core priorities	None	To understand how the data needs of the organization align with their priorities	Long answer question
6	Digital Divide (DD) Please order these factors that may contribute to the DD: from most (top) to least (bottom) significant	<ul style="list-style-type: none"> ▪ Service unaffordability due to poverty or other socioeconomic factors ▪ Service unaffordability due to exorbitant prices ▪ Geographic factors which inhibit the deployment of infrastructure ▪ Inadequate electricity supply ▪ Perceived lack of value of connectivity ▪ Digital skills deficit ▪ Gender inequality ▪ Other demographic factors 	To use in analysis to compare the perception of policymakers/regulators with research findings	Ranking

#	Questions	Choices	Purpose	Format
7	<p>ICT infrastructure</p> <p>Please select all the data that you deem necessary to assess the adequacy of ICT infrastructure</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Terrestrial network node locations & routes <input type="checkbox"/> Submarine cable routes <input type="checkbox"/> Submarine cable landing point locations <input type="checkbox"/> Internet exchange point (IXP) locations <input type="checkbox"/> Amateur radio repeater locations <input type="checkbox"/> Network redundancy <input type="checkbox"/> Backup power provisions <input type="checkbox"/> Mobile network coverage <input type="checkbox"/> Frequency Allocation Table <input type="checkbox"/> Frequency assignments <input type="checkbox"/> Electrical distribution grid map <input type="checkbox"/> Road access map <input type="checkbox"/> Other _____ 	<p>To obtain a list of data required for assessing infrastructure adequacy. These will be considered in country profile generation and used to assess data gaps</p>	<p>Multiple-answer multiple choice</p>
8	<p>Service Availability</p> <p>Please select all the data that you deem necessary to assess ICT service availability</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Market survey data <input type="checkbox"/> Customer satisfaction data <input type="checkbox"/> Customer complaints <input type="checkbox"/> Geo-referenced service penetration <input type="checkbox"/> In-demand services <input type="checkbox"/> Internet service penetration <input type="checkbox"/> Quality of service obligations of service providers <input type="checkbox"/> Quality of service measurements <input type="checkbox"/> Traffic measurements <input type="checkbox"/> Incentives for investments in infrastructure <input type="checkbox"/> Geo-referenced population <input type="checkbox"/> Network redundancy <input type="checkbox"/> Other _____ 	<p>To obtain a list of data required for assessing service availability. These will be considered in country profile generation and used to assess data gaps</p>	<p>Multiple-answer multiple choice</p>
9	<p>Affordability</p> <p>Please select all the data that you deem</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Gross National Income (GNI) per capita <input type="checkbox"/> National income distribution 	<p>To obtain a list of data required for assessing affordability. These will be considered in</p>	<p>Multiple-answer multiple choice</p>

#	Questions	Choices	Purpose	Format
	necessary to assess ICT affordability	<input type="checkbox"/> Service prices <input type="checkbox"/> Device prices <input type="checkbox"/> Electricity prices <input type="checkbox"/> Unemployment statistics <input type="checkbox"/> Poverty statistics <input type="checkbox"/> Community-level socioeconomic data <input type="checkbox"/> Other _____	country profile generation and used to assess data gaps	
10	Use Please select all the data that you deem necessary to assess ICT use	The number of: <input type="checkbox"/> Internet subscribers (mobile and fixed) <input type="checkbox"/> Individuals who own a device (e.g. laptop, tablet or smartphone) <input type="checkbox"/> Individuals who use the internet <input type="checkbox"/> Fixed telephone subscribers <input type="checkbox"/> Mobile telephone subscribers <input type="checkbox"/> Households with a TV <input type="checkbox"/> Households with paid subscription TV <input type="checkbox"/> Households with a radio <input type="checkbox"/> Licensed amateur radio operators <input type="checkbox"/> Other _____	To obtain a list of data required for assessing ICT use. These will be considered in country profile generation and used to assess data gaps	Multiple-answer multiple choice
11	Patterns of Use Please select all the data that you deem necessary to assess ICT usage	<input type="checkbox"/> Frequency of internet use <input type="checkbox"/> Most popular internet activities (e.g. social media use, video streaming) <input type="checkbox"/> Service demand <input type="checkbox"/> Market share <input type="checkbox"/> Internet/telecom provider preference <input type="checkbox"/> TV channel preference <input type="checkbox"/> Radio station preference <input type="checkbox"/> Network traffic by time of day and day of week	To obtain a list of data required for assessing ICT usage. These will be considered in country profile generation and used to assess data gaps	Multiple-answer multiple choice

#	Questions	Choices	Purpose	Format
		<input type="checkbox"/> Traffic per service by device <input type="checkbox"/> Locations of use by service <input type="checkbox"/> Other _____		
12	Policy Which of the following A4AI ⁴⁸ Rural Broadband Policy elements is/are incorporated into your ICT policies?	<input type="checkbox"/> Harnessing Market Competition While Addressing Market Failures <input type="checkbox"/> Streamlining Regulatory Processes <input type="checkbox"/> Public Access and Universal Service and Access Funds <input type="checkbox"/> Effectively Managing Spectrum Resources <input type="checkbox"/> Leveraging Innovative Technologies, Architectures, and Business Models <input type="checkbox"/> Adopting Appropriate Tax and Fee Structures <input type="checkbox"/> Stimulating Demand for Broadband Services <input type="checkbox"/> Monitoring and Accountability	To identify the policy gaps with respect to A4AI's Rural broadband Policy Recommendations	Multiple-answer multiple choice
13	Addressing the Digital Divide Other than data, what are the key resources you deem necessary to address the access gap?	None	To identify other resources besides data that need to be considered to address the access gap	Long Answer

⁴⁸ Alliance for Affordable Internet. The Rural Broadband Policy Brief is available here: <https://1e8q3q16vyc81g813h3md6q5f5e-wpengine.netdna-ssl.com/wp-content/uploads/2020/09/UPDATED-Rural-Broadband-Policy-Framework-Report-09-2020-web-ready.pdf>

Appendix E – Additional Results of Stakeholder Consultations

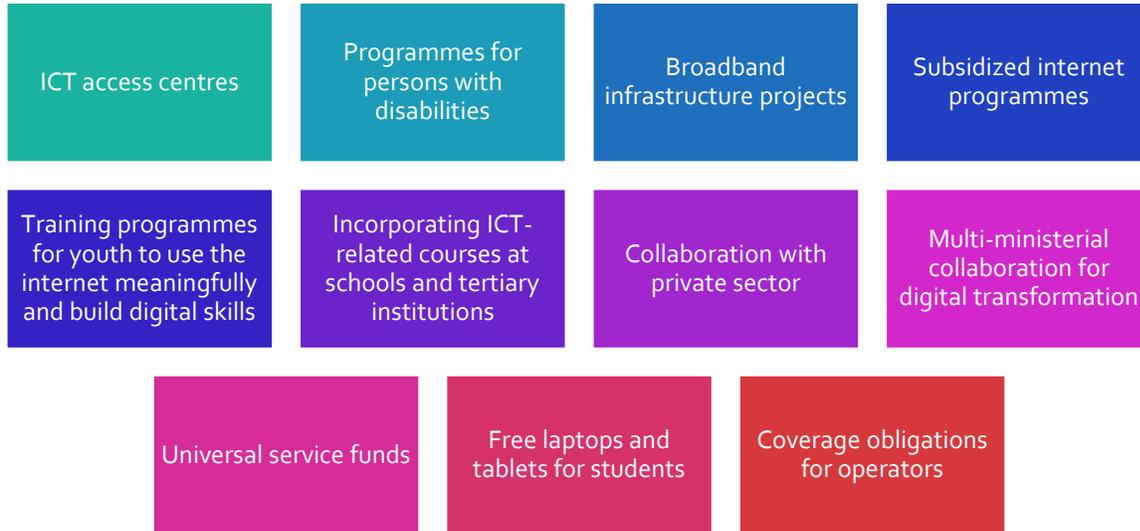


Figure E1 Initiatives to address the access gaps

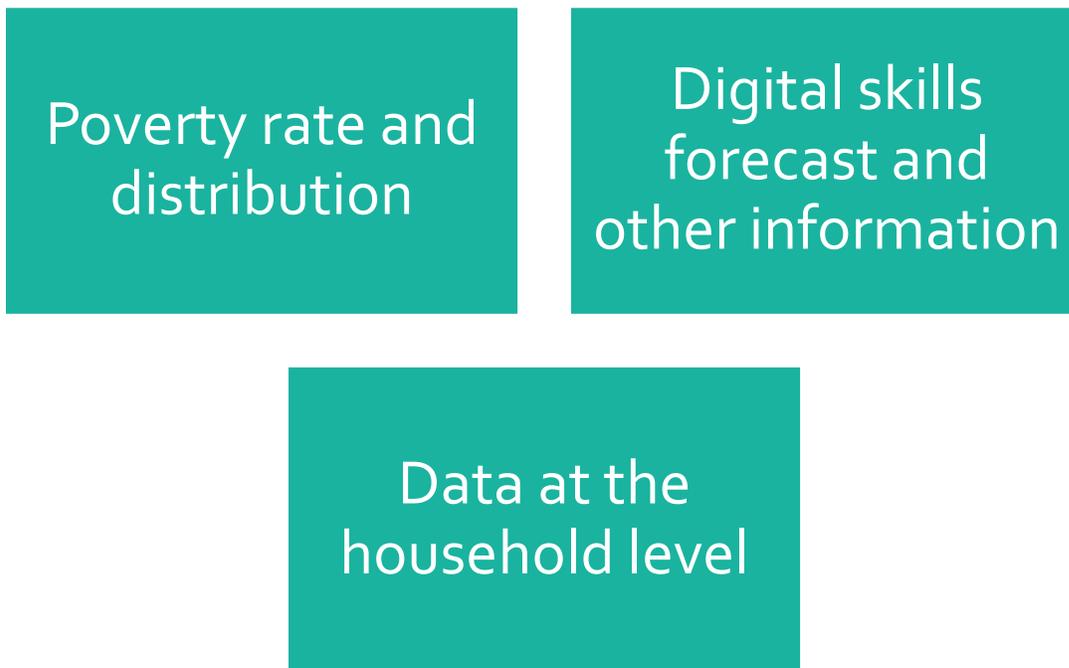


Figure E2 Data needed to address national access targets

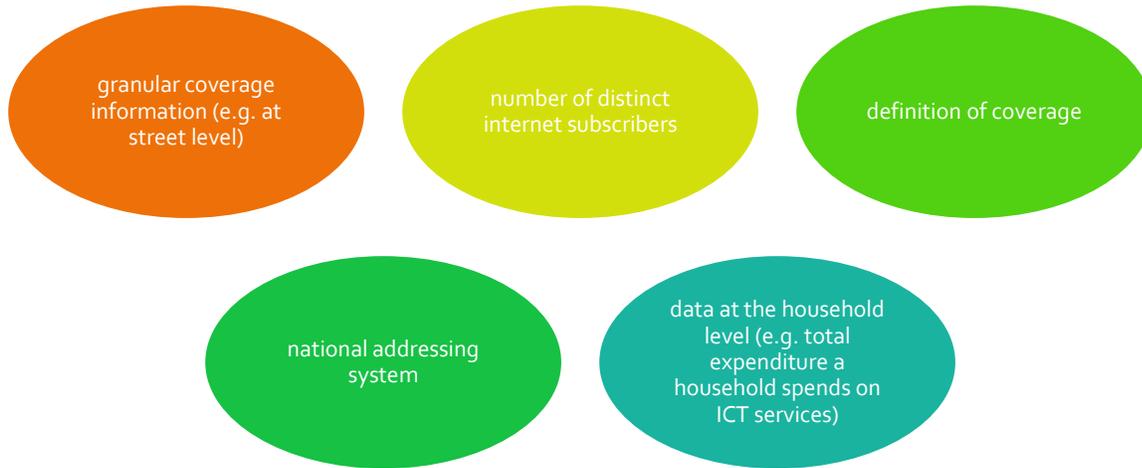


Figure E2 Data gaps that inhibit addressing other priorities

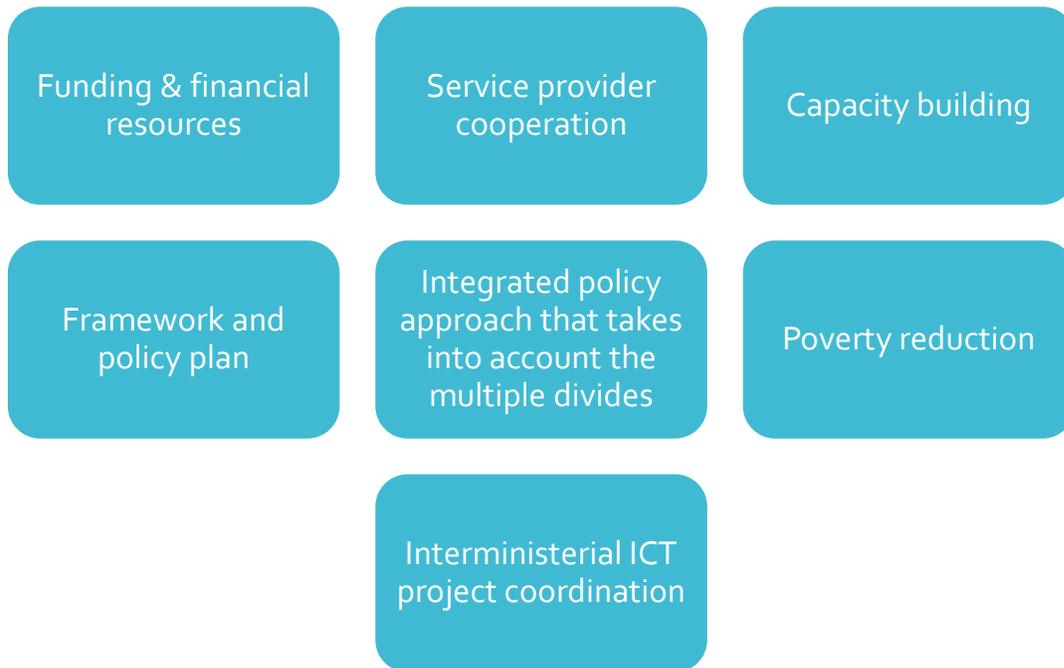


Figure E3 Factors other than data identified by stakeholders, that are necessary for addressing the digital divide