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Policy Brief
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Improving broadband quality and affordability in the Caribbean

Policies to advance digital inclusion in the subregion

Introduction

In this digitally transforming world, digital inclusion is becoming increasingly important to social inclusion and sustainable development. Affordable access to broadband is an essential precondition to digital inclusion. Internet quality, as measured by speed and other indicators, is also important, as digital inclusion is ultimately about ensuring equal access to the benefits and opportunities offered by digital technologies and the Internet. This policy brief provides insight into Internet speed and affordability across the Caribbean, and offers some recommendations for policymakers working with digital technologies and telecommunications.

As more human cultural, social and political events and processes are conducted online, the cost of exclusion from digital spaces increases, which can lead to inequality and marginalization. Digital and social inclusion are also inextricably linked, and the digitally excluded tend to be those that are the most marginalized in each society. For example, people with disabilities, who may be socially excluded and lack access to work and education, could greatly benefit from access to the Internet and accessible

Key recommendations

- **Develop a national broadband plan**
- **Define guidelines for infrastructure funding or subsidies**
- **Subsidize broadband access for underserved populations**
- **Promote free or low-cost public Internet access**
- **Promote subregional research on drivers of affordability**
- **Seek technical assistance, if needed**

digital technologies. However, as a consequence of their social exclusion, they may have low income and not be able to afford such access, barring them from accessing communication tools, information, services and entertainment, among others. This exclusion from the digital realm would then compound the marginalization they already experience in the physical world.

From 15 to 16 December 2022, ECLAC subregional headquarters for the Caribbean organized a virtual capacity-building seminar entitled “Measuring digital inclusion in the Caribbean”. During the seminar, information was presented regarding the speed divide in the Caribbean and the implications of this for digital inclusion were discussed. Participants expressed concern about the disparities that were observed and expressed their desire to understand the factors that might impact the Internet speed divide. It was proposed that affordability might be an important factor, and that the national income level of the country, or the purchasing power of the population might indirectly affect observed Internet speeds. In the discussion, the intersection of broadband speed and affordability was proposed as a possible research topic on the Caribbean. This policy brief will analyse some available data related to this topic, identify some possible drivers of affordability in the Caribbean and provide some recommendations to policymakers on what changes might have most significant impact.

The broadband speed divide

The average broadband speed in the Caribbean has increased dramatically in recent years. However, significant disparities of such speed remain among countries. There are also significant disparities among countries related to cost of access to fixed broadband. In most countries of the subregion, the cost of fixed broadband exceeds set international targets, in some cases significantly, raising concerns for entities responsible for digital inclusion.

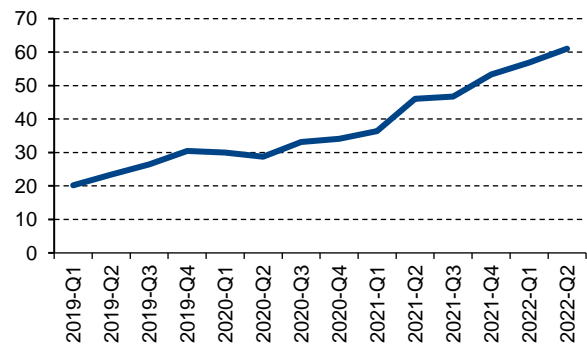
According to Cisco, video content is likely to account for 84 per cent of all Internet traffic in 2022. Since video content requires significantly higher Internet quality than text or audio-only content to be displayed correctly, Internet speed is important to be able to access most new online content. Many newer, resource intensive technologies, including cloud technologies, live video communication, high-definition streaming, and web-based software also have

minimum requirements in terms of Internet quality to function adequately. Improving Internet quality, including by increasing speed, is therefore important to ensure that people can fully benefit from Internet access, which is key to digital inclusion.

Internet quality can be measured in several ways, including upload speed, download speed and latency. These indicators are frequently measured by telecommunications companies but can also be measured by consumers via private entities. This analysis examines one such indicator, mean fixed broadband download speed, as measured by Ookla Speedtest, and its relationship to other relevant indicators.

Since the onset of the COVID-19 pandemic, the average fixed broadband download speed in the Caribbean subregion has tripled, from around 20 megabits per second (Mbps) in the first quarter of 2019 to over 60 Mbps in the second quarter of 2022 (figure 1).

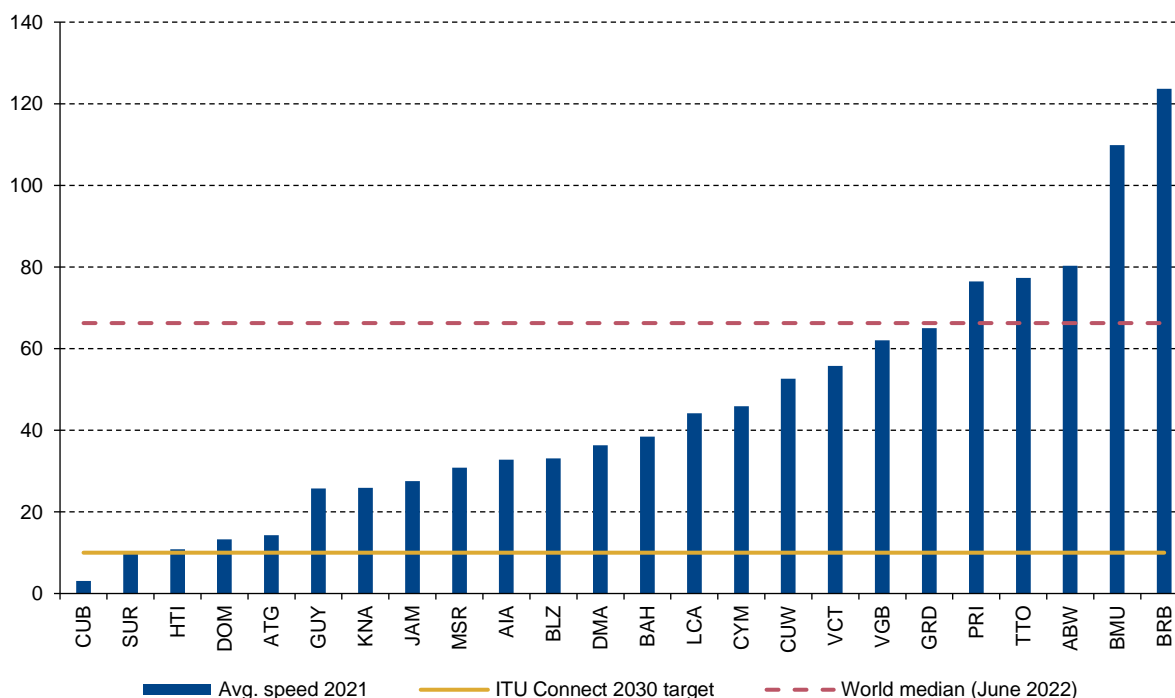
Figure 1: Average fixed broadband download speed¹



Source: Based on data from Ookla Speedtest.

¹ Average of 24 Caribbean countries and territories, see list after bibliography.

Figure 2: Average fixed broadband Internet speed (in Mbps) in 24 Caribbean countries, in 2021



Source: Ookla Speedtest, International Telecommunication Union (ITU).

However, significant broadband speed divides remain within and among Caribbean countries. User data derived from Ookla Speedtest shows that the average fixed broadband speed in various Caribbean countries in 2021 varied from around 3 Mbps in Cuba to over 123 Mbps in Barbados (figure 2). The benefits that Caribbean Internet users could derive from the Internet therefore depends strongly on where they are located. As figure 2 illustrates, Caribbean countries are fairly well-positioned in terms of speed. In 2021, on average, all countries except Cuba and Suriname² exceeded the target of 10 Mbps set by the International Telecommunication Union (ITU) in the Connect 2030 Agenda.

Average fixed broadband download speed exceeds the world median of 66.26 Mbps in five countries, in some cases significantly. In Barbados, for example, the average fixed broadband download speed was more than double the world median. However, the speed in most countries remains lower than the world

median, and 11 countries have speeds that are less than half of the world median speed.

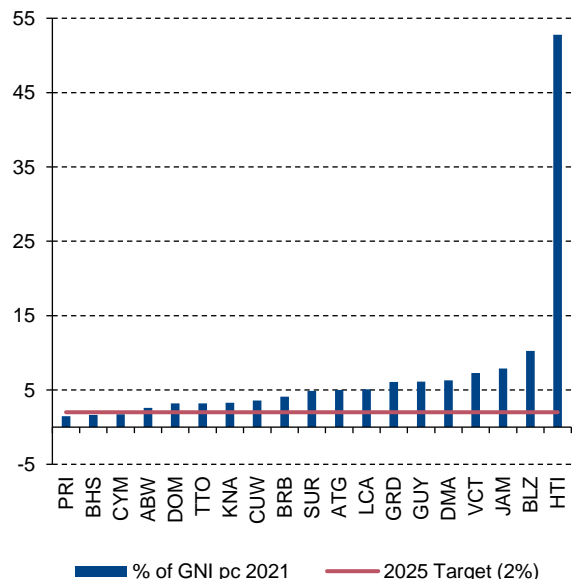
The broadband cost divide

The ITU is the specialized agency in the United Nations system responsible for information and communication technology (ICT). Part of its work consists of collecting, receiving, validating and harmonizing ICT data. One such data set, the ICT Price Basket (IPB), considers the affordability of ICT services around the world.³

² Suriname exceeded the target as of the third quarter of 2021.

³ ITU, ICT Price Basket.

Figure 3: Cost of fixed broadband Internet (5GB), as a percentage of gross national income per capita (GNI pc) in 2021



Source: ITU ICT Price Basket, Broadband Commission for Sustainable Development.

In a policy brief about the affordability of ICT services in 2021, the ITU noted that, after years of steady decline, the share of income spent on telecommunications increased globally in 2021. The ITU attributes this to the global economic downturn after the COVID-19 pandemic. It also noted that globally, there was an affordability gap between high-income economies and the rest of the world. Typically, the share of income required to purchase an entry-level fixed or mobile broadband basket is five or six times higher in low- and middle-income countries than in high-income countries.

As figure 3 illustrates, there is also a huge gap in affordability of fixed broadband among Caribbean countries. The cost of entry-level fixed broadband in Puerto Rico, the Bahamas and the Cayman Islands is below the affordability target of 2 per cent of gross national income (GNI) per capita set by the Broadband Commission for Sustainable Development for 2025. However, at the other end of the scale, the cost of such broadband would exceed 10 per cent of GNI per capita in Belize, which is nearly seven times as high as in Puerto Rico, and 52 per cent in Haiti. Such high costs would have a profound impact on

digital inclusion within societies, and maintain the digital divide among Caribbean countries.

The intersection of speed and cost

Another way of examining the affordability of Internet would be to look at its cost in international dollars, i.e. the cost in dollars as adjusted for living costs within each country. This is referred to as purchasing power parity (PPP).

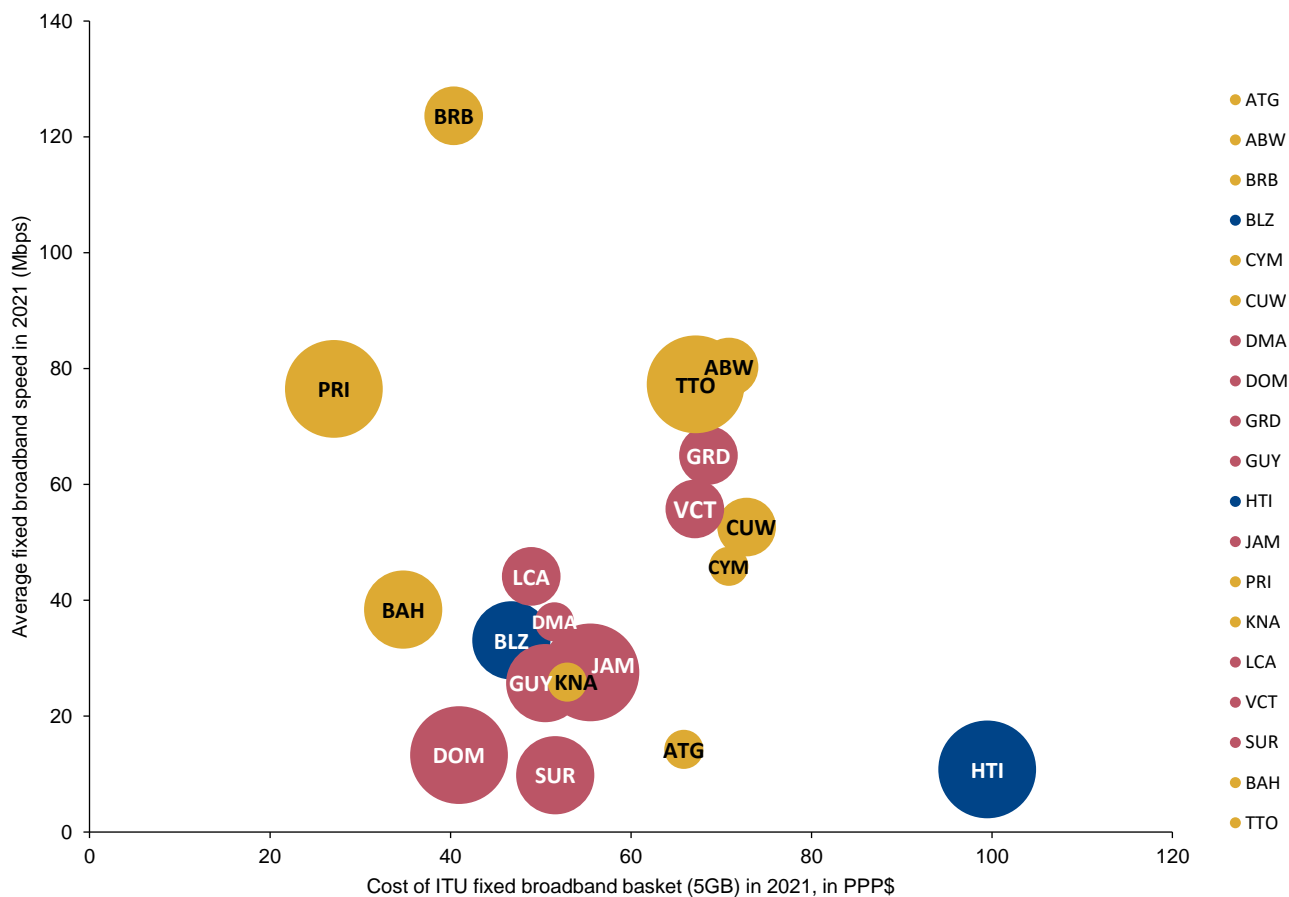
In 2021, the cost of an entry-level fixed broadband basket of 5 gigabytes (GB) in the Caribbean ranged from 27 international dollars (PPP\$) in Puerto Rico, to nearly 100 PPP\$ in Haiti. If we plot the average fixed broadband speed in each country against the cost of this basket, and account for population size and national income level (figure 4), we can make five key observations.

First, that among the four countries with the lowest speeds, where average speeds are under 20 Mbps (Antigua and Barbuda, the Dominican Republic, Haiti and Suriname, the relative cost of the basket varies greatly. Of the four countries, one is a high-income country (yellow), two are upper-middle income countries (red), and one is a lower-middle income country (blue).

Second, at the other end of the scale, the four countries that have the highest speeds (Aruba, Barbados, Puerto Rico and Trinidad and Tobago) are all classified as high-income countries. However, the cost varies greatly, with the relative cost in Aruba being nearly 2.5 times as high as in Puerto Rico.

Third, we can see two main clusters of countries in terms of cost and speed: one in which speeds are fairly low, ranging from around 20 to 40 Mbps, at a cost of between 40 and 60 PPP\$, and another cluster in which speeds are higher, ranging from around 40 to 80 Mbps, at a cost of between 60 and 80 PPP\$. Both clusters contain a mix of countries high-income countries and upper-middle income countries.

Figure 4: Average fixed broadband Internet speed (in Mbps) in 19 Caribbean countries, in 2021, plotted against the cost in 2021 of a fixed broadband basket of 5GB, in PPP\$



Source: Based on data from Ookla Speedtest, ITU ICT Price Basket, World Bank, World Population Prospects 2022.

The low-cost, low-speed cluster also contains Belize, which in 2021 was classified as a lower-middle income country, but in 2022 has been reclassified as an upper-middle income country.

Fourth, both clusters contain countries of varying population sizes (represented by the size of the bubbles). The five countries that have over 1 million people (the Dominican Republic, Haiti, Jamaica, Puerto Rico and Trinidad and Tobago) are spread all across the figure in terms of both speed and cost. Population size therefore does not appear to correlate with the speed or cost of this broadband basket.

Fifth, while there is an observed correlation between high-income countries and those enjoying the highest observed speeds, being classified a high-income country does not automatically ensure either high

speed or low relative cost. This is evident in the fact that high-income countries are spread all around figure 4.

With these observations in mind, based on this limited data, it appears that there is no direct relationship between national income level, population size, observable Internet speed, and the cost of an entry-level fixed broadband basket. While this analysis does not cover other types of ICT Price Basket, other measures of Internet quality or mobile broadband, and while it covers only a single year, it does suggest that there may be other relevant factors that should be examined.

Drivers of affordability

The Alliance for Affordable Internet (A4AI) is a coalition of governments, businesses and civil society organizations working to deliver the policies to make universal, affordable Internet a reality. The advocacy efforts of A4AI are guided by a set of policy and regulatory practices endorsed by its membership, and grounded in a set of guiding principles that relate to human rights, universal and meaningful access for all, affordability, gender-responsiveness, an open Internet where fundamental human rights are protected, and open and competitive markets. The Alliance also conducts research on the drivers of affordable broadband, and publishes the Affordability Drivers Index (ADI), which assesses how well a country's policy, regulatory and overall supply-side environment is working to lower industry costs and ultimately create more affordable broadband.

The 2021 edition of the ADI covers 72 low- and middle-income countries, of which four are located in the Caribbean: Belize, the Dominican Republic, Haiti and Jamaica. The countries assessed by the index are ranked based on their scores on a set of primary indicators, which are generally qualitative and relate to policies, and secondary indicators, which are generally quantitative and relate to infrastructure. Of the 72 countries, the Dominican Republic is ranked eleventh, Jamaica seventeenth, Belize sixty-eighth, and Haiti seventieth. It is noted that of this group, the Dominican Republic has the lowest fixed broadband basket cost, and Belize the highest average speed.

Because there is such variability in the scores, and two of the countries are ranked near the bottom, one approach to identify possible areas of improvement would be to identify the areas where variability is greatest, as it could indicate which policy areas the lower scoring countries may gain most from improving, and the areas where variability is lowest, as it may show where the high and low-scoring countries alike may have room for improvement. An examination of the primary data set, which consists of 14 questions, reveals that there are five questions

for which the difference between the highest and lowest score is 8 out of 10 possible points. These questions are:

- To what extent does the national broadband Internet plan (or in some cases the national ICT policy and plans) set clear, time-bound targets and interventions?
- To what extent has the government defined specific, limited and well-justified guidelines for public infrastructure funding or subsidies in telecommunications?
- To what extent are the government's plans for implementing more spectrum availability for broadband (both licensed and unlicensed) transparent, and are done through a competitive process via public auctions?
- To what extent have USF funds been used to subsidize broadband access for end users in underserved and underprivileged populations?
- Are there specific policies to promote free or low-cost public Internet access, such as budget allocations for Internet access in public libraries, schools and community centres, or provisions for spectrum use by community Wi-Fi options?

The question for which the highest and lowest score are most similar is:

- To what extent does the regulator and/or the competition commission enforce the country's ICT licensing requirements and regulations?

The above six questions all relate to planning and policy direction at the national level. The remaining eight questions primarily relate to the role of the telecommunications regulator in the country, licensing frameworks and infrastructure.

From this list of questions, five key policy-related drivers of affordability in the Caribbean can be identified:

- (i) A national broadband plan
- (ii) Funding or subsidies for telecommunications infrastructure
- (iii) Open and transparent spectrum allocation
- (iv) Policies to ensure affordable access, in particular for underserved populations
- (v) Enforcement by the regulator

While an in-depth assessment of the relevance of all these factors is not possible in this brief, the ICT Regulatory Tracker of the ITU (Tracker) could provide some insight into the characteristics of the policy environment of the Caribbean countries not assessed by A4AI. The Tracker records the existence and features of the regulatory frameworks in place but does not measure their quality. Based on the scores received on the Tracker's 50 indicators, countries are classified according to generations of regulation ranging from first generation (G1), defined by a command-and-control approach, to fifth generation (G5), defined by collaborative regulation, inclusive dialogue and a harmonized approach across sectors. At present, the G5 benchmark is aspirational.

As the Tracker, unlike the ADI, does not assess the quality of a regulatory framework, the insights derived from it are necessarily more limited. However, the data may still provide some insights that are useful to the discussion regarding broadband speed and affordability in the Caribbean. Where available, insights derived from Caribbean-focused studies relevant to the drivers is also provided.

Caribbean regulatory frameworks

For the Caribbean, the Tracker provides information on the regulatory frameworks of the 16 Member States of the United Nations. A review of the briefs for each of the countries identifies some data that is relevant to the five possible drivers of affordability identified above. These relate to the existence of a

national broadband plan, and the enforcement power of the telecommunications authority or ICT regulator.

a. National broadband plan

The data set shows that 7 out of the 16 countries do not have in place a national plan for broadband. This mirrors the findings of a recent digital inclusion study by ECLAC Caribbean, where of 11 countries reviewed, only three were found to have a general ICT plan in place (Alexander and others, 2022).

A review of the Tracker data on the existence of national broadband plans alongside the speed and cost data used above reveals some interesting patterns that warrant future investigation. For example, the data suggests that the existence of a national broadband plan does not have an impact on fixed broadband speed in the Caribbean. Of the eight countries with the highest speeds, only four have a national broadband plan in place. Similarly, of the eight countries with the lowest speed, five have a national broadband plan in place.

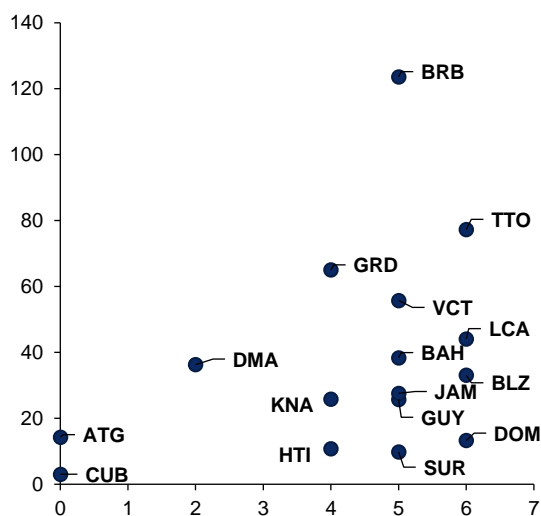
In relation to cost, the data set interestingly suggests that countries that do not have a national broadband plan tend to have lower relative costs of broadband. Five of the eight countries with the lowest costs for the fixed broadband basket do not have a national broadband plan, and five of the remaining seven countries⁴ with the highest costs do have a broadband plan. However, it is noted that the two countries with the highest relative costs (Grenada and Haiti) do not have a plan. A review of the cluster of seven countries with similar, relatively low costs (from around 45 to 55 PPP\$) shows the same diverse pattern, as three have a plan in place and four do not. As such, it appears that the mere existence of a broadband plan does not impact the cost of broadband. An assessment of the content or implementation of the plans, or of other policies or approaches used may reveal other relevant patterns, but that is beyond the scope of this brief.

⁴ No cost estimate is available for Cuba.

b. Enforcement power of the regulator

Regarding the enforcement power of the regulator, the Tracker asks several relevant questions regarding the existence, autonomy, enforcement power and sanction level of a separate telecommunications authority. The data set reveals that only 2 out of 16 countries do not have a separate telecommunications authority (Antigua and Barbuda and Cuba). It is noted that Cuba has the lowest speeds among all Caribbean countries, and Antigua and Barbuda the lowest speeds among the high-income countries of the Caribbean. However, the existence and enforcement power of a telecommunications regulator does not necessarily result in higher speeds. As illustrated by figure 5, while the countries with the highest speeds do tend to score highly in terms of the power of the regulator, some of the countries with the lowest speeds also score highly on that measure.

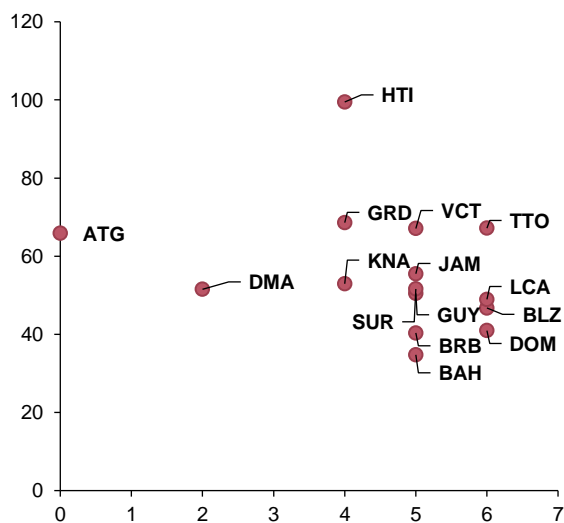
Figure 5: 2021 average fixed broadband speed, and author's estimate of the power of the regulator⁵



Source: Author's elaboration based on data from Ookla Speedtest and ITU ICT Regulatory Tracker.

A review of the relationship between the power of the regulator and the cost of the broadband basket also does not provide many clear answers. As figure 6 shows, countries with more powerful regulators tend to have similar relative price levels. However, price levels in Antigua and Barbuda, which does not have a separate telecommunications authority, and Dominica, whose regulator is estimated to have the least power, have similar price levels to those in several other countries where the regulator has more enforcement power. It may therefore be necessary to examine the extent to which the regulator exercises its power, the resources it has available or the methods it employs to provide more clarity.

Figure 6: Cost in 2021 of a fixed broadband basket of 5GB, in PPP\$, and author's estimate of the power of the regulator



Source: Author's elaboration based on data from ITU ICT Price Basket and ICT Regulatory Tracker.

Altogether, the review of the metrics from the Tracker revealed some interesting patterns but did not provide conclusive evidence to refute or validate the relevance of the affordability drivers identified above. One possible explanation for this is that the Tracker indicators, which are quantitative, are not sufficient, even when combined, to evaluate

⁵ Estimated power of telecommunications authority is based on existence of separate telecommunications authority (1 point), its level of autonomy (up to 2 points), whether it has enforcement

power (1 point) and the level of sanctions it can impose (up to 2 points), for a maximum total of 6 points.

the validity of the A4AI affordability drivers, which are qualitative. More qualitative research related to the affordability drivers for a broader set of Caribbean countries and territories could therefore be useful. Caribbean countries could also evaluate their own regulatory frameworks based on the 14 policy-related indicators contained in the ADI.

c. Universal Service Funds

The use of Universal Service Funds (USFs) to subsidize broadband access for underserved populations was another possible driver identified through the review of the ADI. A 2019 study by ECLAC Caribbean discusses the use of USFs to provide access to technology for persons with disabilities in the Caribbean (Bleeker, 2019). The study showed that USFs are underutilized in the region, as at least 10 countries had enacted relevant legislation, but without enacting the accompanying mechanism. The study also proposes some best practices and recommendations to increase the effectiveness of USFs, including updating relevant frameworks, increasing engagement with and the representation of persons with disabilities, setting specific targets for projects to be funded, and improving reporting, transparency and accountability.

Impact

The analysis above captures some of the factors that may have an impact on the affordability of broadband in the Caribbean. It also illustrates the complex relationships between policies, the regulatory environment, cost and speed, and the diversity of approaches and outcomes in the Caribbean. It demonstrates that policy interventions matter, even though there is no one-size-fits-all solution.

Which interventions to choose would depend on the existing policies and regulatory frameworks in each country. The G5 Accelerator site developed by the ITU to provide the concepts, practical guidance, examples of national approaches, and metrics to assist regulators may be useful to countries that wish to make quality broadband more affordable. The Accelerator contains 18 years of regulatory best

practice guidelines, adopted by experts in the field, case studies on various national approaches to regulation, and an ICT Policy Impact Lab that can estimate the impact of various policy variables on the telecommunications sector, mobile sector, and the overall economy, among others. Countries may also wish to seek technical assistance, where necessary, to identify relevant drivers of affordability applicable to their context, to develop appropriate policies and mechanisms to ensure their implementation.

Ultimately, the high cost and low speed of broadband in the Caribbean is a challenge to efforts to digitally transform the subregion, and to the digital inclusion needed to ensure that the digital transformation can benefit all segments of society and contribute to sustainable development. Caribbean policymakers must therefore address the speed and cost divides as a matter of priority.

Policy recommendations

Bearing in mind the importance of affordable, high-quality Internet to digital inclusion, the results of the Affordability Drivers Index, and the above analysis, six key policy recommendations are proposed below.

Develop a national broadband plan or ICT policy that sets clear, time-bound targets and interventions to ensure affordable access to broadband. While the mere existence of a broadband plan does not appear sufficient to ensure affordable, high-quality broadband, numerous examples of successful policy interventions and best practices are available to guide policymakers and regulators in their efforts to advance affordability for digital inclusion.

Define specific, limited and well-justified guidelines for telecommunications infrastructure funding or subsidies. Such funding and subsidies contribute to the affordability of broadband, and a set of clear guidelines could ensure that the priorities of governments related to digital inclusion are reflected in the infrastructural development efforts.

Use Universal Service Funds to subsidize broadband access for underserved and marginalized populations. The establishment of a USF funded by contributions from telecommunications operators could serve to fund access for underserved and marginalized persons and populations, without requiring additional funding from governments.

Promote free or low-cost public Internet access, including in public libraries, schools and community centres. Policies to this effect could promote digital inclusion even where reducing the cost of access to high-quality broadband for individuals proves challenging.

Promote further subregional research on drivers of affordability. The Caribbean as a diverse subregion of small island developing states has many unique challenges and circumstances, yet is rarely analysed as a unit. Given the complexities revealed above, and the limited data available, the promotion of further research on drivers of affordability in the Caribbean could ultimately result in concrete, comparable data that could be used by policymakers to develop tailored, evidence-based policies.

Seek technical assistance, and utilize available resources, when necessary. Addressing the drivers of affordability in each country and the speed and cost divides in the subregion is highly complex, and requires careful planning and coordination. However, learning resources, such as the G5 Accelerator, could be used to reduce this complexity, and United Nations system actors may be able to provide technical assistance to this process, upon request.

Conclusion

Digital inclusion is becoming increasingly important as the digital transformation of the world and the Caribbean subregion accelerates. Two of the elements that must be addressed for digital inclusion are access to high-quality broadband and affordability.

The development of effective, evidence-based policies, and their implementation and enforcement, are essential to tackle the drivers of affordability in the Caribbean. Further collaboration at the subregional level and targeted research is needed in order to identify which drivers are most relevant to the Caribbean context, and may lead to increased Internet quality and affordability in the shortest possible delay in all countries.

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Countries featured and country codes

The countries listed below were used to calculate the average fixed broadband download speed for the region in figure 1. This is the broadest set of Caribbean countries and territories for which data relevant to this policy brief was available in the sources listed. The three-letter country codes used in the figures are drawn from the ISO standard 3166-1. In figure 4, featured countries are also classified according to population size, which is split into four categories: Under 100,000 people; between 100,000 and 300,000, between 300,000 and 1 million people; and over 1 million people. Countries are also classified by income level, as defined by the World Bank based on gross national income per capita.

Country name	Code
Anguilla	AIA
Antigua and Barbuda	ATG
Aruba	ABW
Bahamas	BAH
Barbados	BRB
Belize	BLZ
Bermuda	BMU
British Virgin Islands	VGB
Cayman Islands	CYM
Cuba	CUB
Curaçao	CUW
Dominica	DMA
Dominican Republic	DOM
Grenada	GRD
Guyana	GUY
Haiti	HTI
Jamaica	JAM
Montserrat	MSR
Puerto Rico	PRI
Saint Kitts and Nevis	KNA
Saint Lucia	LCA
Saint Vincent and the Grenadines	VCT
Suriname	SUR
Trinidad and Tobago	TTO