Connectivity, inclusion, and digital transformation for greater progress

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CAF DEVELOPMENT BANK OF LATIN AMERICA AND THE CARIBBEAN

Connectivity, inclusion, and digital transformation for greater progress

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Connectivity, inclusion, and digital transformation for greater progress

Today, the digital world is an integral part of everyday life and has transformed how we live and interact. Through internet access and technologies such as cell phones and computers, we can purchase products and services, study, work, communicate, and connect from virtually anywhere. Likewise, many technological solutions implemented by businesses and governments generate greater well-being—for example, by saving time and resources when completing administrative procedures.[a]

The expansion of internet access, increased computing and storage capacities, and the development of digital solutions—among other technological advances— are driving innovation, commerce, job creation, productivity improvements, enhanced well-being, and economic growth. They also promote inclusion and contribute to climate change mitigation, among other benefits.[1]

10% of households in LAC do not have fixed broadband Internet coverage, and the use and quality of Internet service in the region is much lower than in other more developed regions.

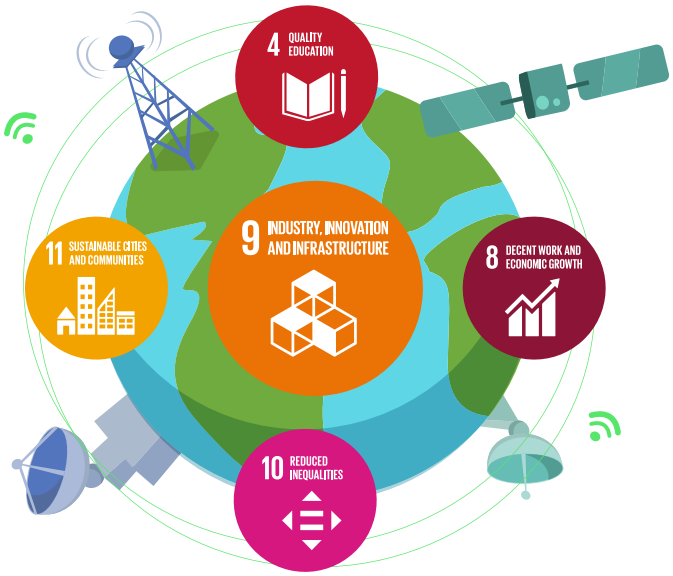
However, 10% of households in Latin America and the Caribbean (LAC) lack fixed broadband internet coverage. Additionally, the use and quality of internet services in the region remain significantly lower compared to more developed regions.[2] For the aforementioned benefits to reach all citizens in the region, it is essential to expand connectivity infrastructure—particularly in remote areas—to improve access and service quality. It is also necessary to advance digitalization[b] among businesses and governments.[3]

Over the past 6 years, CAF has allocated USD 2.79 billion to improve internet coverage and service quality in the region, promote digital inclusion, and drive digital transformation in businesses and governments.

a Administrative processes for citizens and businesses include various formal steps to complete official tasks or obtain public services, such as procedures, transactions, formalities, applications, and routine operational activities.

b The concept of *digitalization* (and *digital transformation*) used here refers to the implementation of digital solutions that can be adopted by both businesses and governments.

CAF's actions in digital infrastructure and transformation support the achievement of the Sustainable Development Goals (SDGs) outlined in the United Nations 2030 Agenda.[4]



Connectivity and digitalization challenges for households, businesses, and governments

In recent years, internet services have expanded significantly. Mobile internet (4G) coverage increased from 50% in 2015 to 94% of the population in LAC today. Similarly, fixed broadband coverage in the region now reaches 90% of households, a figure comparable to mobile coverage.[2]

Despite expanded coverage, only 80% of citizens use the internet, a rate that remains lower than in more developed regions.

Despite expanded coverage, only 80% of citizens use the internet, a rate that remains lower than in more developed regions, such as the Organisation for Economic Cooperation and Development (OECD), where usage reaches 93%. This gap reflects the lower internet penetration in LAC.[2,c]

Moreover, usage gaps widen further when analyzing accessibility among specific population groups:

- 42% of individuals over 65 years old,[5]
- 61% of citizens in the lowest income quintile,[5] and
- 63% of citizens living in rural areas.[2,d]

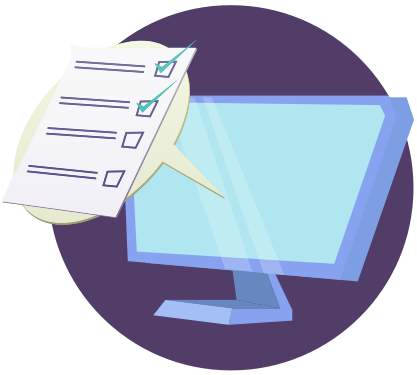
c Despite progress, significant disparities remain in the region. For example, in Guatemala and Haiti, less than 60% of citizens use the internet (CAF, 2024).

d Estimates based on available data. For instance, the average for the lowest income quintile was calculated using data from 6 countries in the region.

The most significant disparities emerge when assessing the quality of internet service.

However, the most significant disparities emerge when assessing the quality of internet service. The average download speed for fixed and mobile broadband in the OECD is 60% faster than in LAC.[2,e]

These usage and quality gaps limit the adoption of digital technologies in households. For instance, only 24% of citizens in LAC pay bills or shop online, compared to 65% in the OECD.[2,f] Internet usage and quality issues aside, this gap is also explained by the lack of digital skills among citizens. Only 37% of the population in LAC has sent an email with attachments in the past 3 months, compared to 79% in OECD countries.[6,g]



These gaps also hinder the digitalization of businesses and governments. In the case of businesses, while internet usage is highly widespread in LAC, reaching 91%, only 55% of businesses in the region have a website, compared to 77% in OECD countries. Moreover, this lag is even more pronounced when considering more advanced digital adoption indicators, such as the development of data center infrastructure and businesses' ability to track shipments.[2]

For governments, an indicator of digitalization is the ability to complete procedures online. One example is business registration: while 45% of LAC countries allow this procedure to be completed online, the figure rises to 88% in OECD countries.[7] This gap is also evident when analyzing the availability of public procurement portals, digital identity services, and various indices, such as CAF's State Digitalization Index, among others.[8]

e There is also a gap in other quality measures, such as latency and international bandwidth per capita, as well as in critical infrastructure development and download speeds, which are factored into the quality indicator associated with CAF's Digital Ecosystem Development Index (IDED) (CAF, 2024).

f Regarding digital payments, 59% of the LAC population sent or received a digital payment, compared to over 90% in high-income countries (World Bank, 2024). Additionally, comprehensive indices on household digitalization, such as the index by CAF (2024), also indicate that the region lags behind OECD countries.

g Calculations based on available data. The LAC average includes data from 8 countries between 2022 and 2023. Notably, there is a positive relationship between digital skills and individuals' education levels (Alves et al., forthcoming at www.caf.com).

Benefits of connectivity and digital transformation for businesses and governments

To fully harness the benefits of digital technologies, it is crucial not only to expand internet coverage and improve service quality in LAC, but also to encourage the adoption of digital solutions by businesses and governments.

To fully harness the benefits of digital technologies, it is essential not only to expand internet coverage—particularly in rural areas—and improve service quality in LAC but also to promote the adoption of digital solutions by businesses and governments. Examples include implementing artificial intelligence in businesses and digitalizing public services.[9]

Evidence shows that these actions have positive impacts on economic growth,[h] leading to increased productivity, production, and exports for businesses; improved access to and quality of goods and services provided by governments; greater employment benefits and improved well-being for individuals.

Impacts on businesses

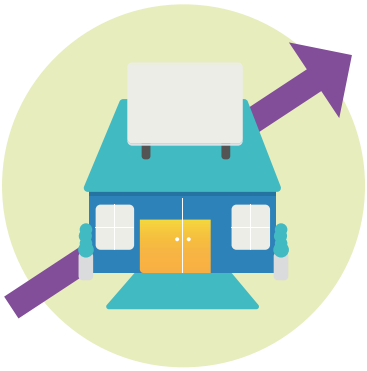
Access to the internet improves business **productivity** by 3% to 9%.[10,i] This is explained by the fact that digital connectivity enhances access to information and reduces various costs, such as production costs and job vacancy search costs (as it allows individuals to find jobs that match their skills), thereby improving efficiency in production and management.[11] Additionally, it fosters the generation and distribution of information and ideas, as well as the use of new digital technologies, which stimulates **innovation** in processes and products.[j] Furthermore, improvements in the quality of internet service—understood as the transition from a basic service to a high-speed service—generate an additional 1.2% impact on firms' productivity.[12]

h Although establishing a causal relationship between internet access and economic growth is methodologically challenging, evidence suggests that adopting internet services can boost GDP growth (Briglauer y Gugler, 2019; Czernich et al., 2011; Koutroumpis, 2009; Goldbeck & Lindlancher, 2023; Katz et al., 2020; Edquist et al., 2018; Bahia et al., 2024). Furthermore, it is not only internet access that could positively impact growth but also improvements in service quality: increasing average internet download speeds by 1 Mbit/s can lead to a 0.18% increase in municipal GDP (Briglauer et al., 2021).

i Total Factor Productivity (TFP) is measured. It is important to note that, while most evidence shows positive effects on business productivity, some studies do not find significant results (Haller y Lyons, 2015 and De Stefano et al., 2018).

j Evidence also shows that digital connectivity increases the number of patents by 6%, driven by higher recruitment of research and development (R&D) personnel and improved access to financing (Zhu, 2023; Yang et al., 2022).

Investing in quality internet infrastructure facilitates the adoption of digital solutions by companies, leading to increased production, revenues, and international trade.



High-quality internet infrastructure also facilitates the adoption of digital solutions by businesses, such as artificial intelligence (AI) and machine learning, leading to further gains. These investments drive the hiring of skilled workers, foster innovation, and improve value-added production.[13] Integrating AI can also directly improve worker productivity.[14] For instance, tools like ChatGPT and GitHub Copilot for writing and programming tasks[k] reduce production time by 40% to 56% and increase output quality by 18%.[15]

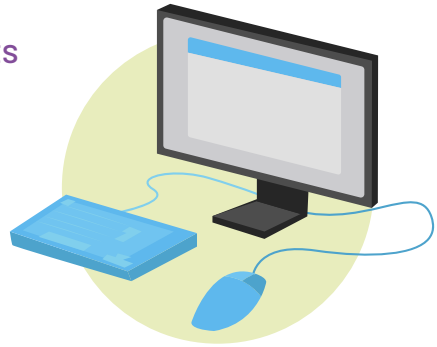
Enhancements in production processes and improved access to information can boost **output levels** and **revenues**. For example, studies show that internet access increases total agricultural production by 7% through more efficient fertilizer use[16] and leads to an approximate 15% rise in incomes.[17] Similarly, adopting digital solutions positively impacts sales. Implementing cloud services raises sales by 7%, with the effect persisting in the long term.[18] AI adoption—specifically, a standard deviation increase in AI investments—results in a 32% increase in sales and a 36% rise in share prices, driven by reduced product innovation costs.[19]

Investing in digital connectivity infrastructure also boosts **international trade** by improving access to information and facilitating client communication. By reducing search, transaction, and monitoring costs, businesses can increase commercial efficiency, overcome geographic barriers, access new markets, and expand trade volumes at both national and international levels.[20] Evidence shows that better internet access can increase exports by 7% to 19% and foster greater export activity among manufacturing firms.[21]

k For example, when professionals write a sensitive email (Noy y Zhang, 2023), or implement an HTTP server in JavaScript (Peng et al., 2023).

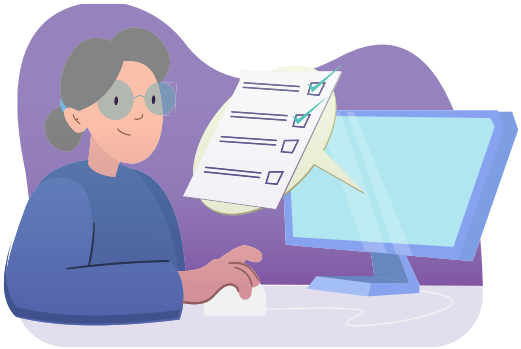
High-quality internet infrastructure facilitates the adoption of digital solutions by governments, enabling reductions in the time and costs citizens and businesses spend on administrative procedures.

Impacts on governments



High-quality internet infrastructure facilitates the adoption of digital solutions by governments, enabling reductions in the time and costs citizens and businesses spend on administrative procedures. Digitalizing procedures and public policy-related transactions, along with incorporating technology into internal administration, improves access to and the quality of public goods and services while also reducing public expenditures. The benefits of these technologies are significant for all levels of government and, in some cases, even more pronounced for local governments, which deliver numerous services directly to citizens and manage territories at a more immediate level.[22]

Digital solutions to improve service provision for citizens



The **digitalization of public procedures** enhances efficiency by reducing the time and costs required for citizens and businesses to complete administrative processes. It also improves transparency and minimizes errors in procedures, providing greater certainty to users.[23] This is particularly relevant for remote and disadvantaged populations, who face significant challenges in accessing services.[24]

Digitalization is even more critical in LAC, where completing an administrative procedure takes an average of 5.4 hours, and one in four processes requires 3 or more interactions to be resolved.[25] Avoiding physical travel between cities optimizes the time dedicated to these processes and contributes to reducing carbon dioxide (CO_2) emissions.

Evidence of positive impacts of digitalizing public administrative procedures:

» **Identity Documentation:** Digitalization reduced the time needed to complete this process by 40% and increased the percentage of successful completions by 23 percentage points.[26]

» **Land Registry:** Digitalizing property registration can increase rental transactions by 27%,[27] improve access to credit by 11%, and raise the number of registered mortgages.[28] This is due to increased reliability and verifiability of property rights by third parties, such as mortgage lenders, as well as reduced costs for updating information in the records.[29]

» **Business Registration:** The digitalization of business registration processes can boost the formalization of microenterprises by 30%,[30] driven by lower procedure costs and reduced regulatory burdens, thus improving the business environment.

» **Customs administrative procedures:** In Colombia, digitalizing customs procedures—such as electronic import declarations—led to increased imports and reduced smuggling and underreporting. While clearance times did not significantly decrease, they became more predictable due to reduced discretion among customs agents.[l] Additionally, by facilitating trade, digitalization positively impacted business dimensions such as value-added, employment, productivity, and the likelihood of exporting, with small and medium-sized enterprises (SMEs) benefiting the most.[31]

Digital infrastructure also enables the **digitalization of public services**[m], leading to improved service quality, timely delivery, and better quality of life for citizens.[32]

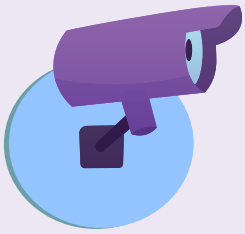
l Customs offices are often vulnerable to corruption because customs agents wield significant discretionary power, making decisions that greatly impact the economic interests of businesses and can lead to improper benefits at their expense (Laajaj et al., 2023).

m For more information on digitalization experiences in public services, see Cont et al., (2021).

There is evidence of the positive impact of public service digitalization across various sectors:

» In **healthcare**, telemedicine[n] can improve both access to and the quality of services provided, while also enhancing patient health outcomes. Evidence shows that telemedicine is effective in treating conditions such as diabetes, cardiovascular diseases, chronic obstructive pulmonary disease (COPD), and mental health disorders.[33,o] It also reduces the burden on healthcare infrastructure by decreasing emergency room visits, hospitalization durations, and unnecessary testing.[34,p] Additionally, telemedicine enhances access to medical care for vulnerable populations, particularly those in rural areas or individuals facing mobility challenges.[35,q] However, several obstacles hinder the effective implementation of telemedicine, including the need for adequate physical infrastructure to facilitate consultations, access to high-quality internet, and the proper functioning of devices. Other challenges include language barriers, patients' age and education levels, digital literacy, and unfamiliarity with new technologies. These issues are compounded by concerns about data confidentiality and privacy.[36]

» In **public safety**, the deployment of video surveillance systems, monitored by law enforcement, can deter criminal activity by increasing the perceived likelihood of detection and punishment. Evidence shows that video surveillance reduces crime, particularly property crimes.[37]



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n Defined as the use of information and communication technologies to provide remote medical care.

o However, some studies have not found conclusive evidence regarding the effectiveness of telemedicine for certain conditions, such as wound care and ophthalmological and dermatological diseases (Ekeland et al., 2010; Martínez et al., 2018).

p Telemedicine could also reduce the carbon footprint of healthcare, primarily by cutting emissions related to transportation (Purohit et al., 2021).

q It is important to ensure that in-person medical care remains available, as relying exclusively on telemedicine could increase inequalities in healthcare access, particularly for individuals lacking internet access or devices.

Studies in Colombia and Uruguay report a 20% reduction in crime without significant displacement of criminal activity to areas outside surveillance coverage.[38,r] Integrating surveillance systems with police patrols is essential to ensure their effectiveness.[39]

» In **education**, as outlined in ImpactoCAF – Education, technology in education—such as improving school connectivity or providing computers, tablets, and other devices—has a positive impact when paired with guidelines for use, educational programs aligned with curricula,[40] or remote learning technologies.[41] Such interventions have the potential to improve academic performance by 2% or increase learning-adjusted schooling by 35% of a school year.[42] These effects are stronger when supported by adequate infrastructure, such as internet access, equipment, and electricity; when technologies are tailored to students' needs; and when teachers receive training to use these tools effectively.[43]

» Digital solutions can enhance the quality and reliability of **electricity** services. While evidence remains limited, one study on a smart grid system assessing its response to a storm estimated that digitalization prevents outages in affected areas and enables faster service restoration.[44]

r While this type of intervention is expected to have a deterrent effect on crime, evidence from the implementation of surveillance cameras in Stockholm's metro system shows that some crimes were displaced to surrounding areas (Priks, 2015).

Digital identity

Digital identity is a mechanism that, within the context of the digital economy, makes it possible to verify whether the person on the other end of an electronic device is real and to confirm, using virtual means, that they are who they claim to be.

Identification is established by comparing biometric data—such as a fingerprint—with a recorded profile that links this data to a name, identification number, and biographical information. These technologies are commonly used in tools like electronic passports.[45]

These developments have facilitated and modernized administrative procedures, processes, and economic transactions, in part thanks to the centralized management of information. Implementing a digital identity system enables the delivery of public services to legitimate beneficiaries, thereby reducing corruption, improving access to public services, and fostering the inclusion of the most vulnerable populations.[46]

Evidence from the deployment of biometric identification cards within a cash transfer program suggests that misallocated funds were reduced by approximately 40%, which in turn increased the benefits received by households by 24%.[47,s]

Lastly, high-quality internet infrastructure also facilitates the adoption of **AI solutions** by governments. A notable example is the implementation of virtual assistants (chatbots) aimed at improving administrative efficiency—both at national and subnational levels[48]—and enhancing citizen services.

Evidence shows that chatbots are effective in improving mental health indicators for women, such as reducing anxiety and depression.[49] Additionally, virtual assistants can help women identify domestic violence situations and contribute to a 7-percentage-point reduction in intimate partner violence.[50]

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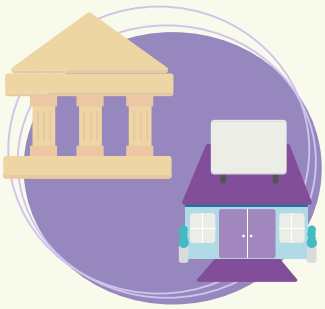
s Since the delivery of transfers depends on confirming individuals' identities, special care must be taken to avoid unintended consequences, such as excluding legitimate beneficiaries due to the introduction of stricter biometric requirements (Muralidharan et al., 2023; Santiso & Cetina, 2022).

Incorporating technology into public administration

Digital connectivity also facilitates the use of data and technology to modernize internal state administration, such as **digital public procurement systems**. These systems aim to prevent collusion between public officials and companies, reduce public spending, and improve the quality of procured goods and services.

GovTech



Solutions have emerged through collaborations between the public and private sectors, where governments partner with startups and innovative companies to tackle public challenges using data analytics and advanced technologies. **GovTech** can be defined as an ecosystem in which governments work with startups, scaleups, and MSMEs that leverage data intelligence, digital technologies, and innovative methodologies to deliver products and services addressing public issues.This system accelerates the digital transformation of public administrations and services by implementing solutions that enhance and streamline the provision of services such as healthcare, education, public safety, mobility, waste management, and emergency response. It also enables more efficient management of internal processes of public administration.[51]

The implementation of digital solutions improves public procurement systems by promoting greater dissemination of information among stakeholders and making collusion between public officials and companies more difficult.

Public procurement is critical for delivering public services, representing approximately 30% of government budgets in Latin America. However, procurement and contracting processes pose significant risks: closed and discretionary processes tend to exhibit more irregularities than open processes. This risk can be mitigated by implementing digital solutions that improve procurement systems, promote greater information dissemination among stakeholders, and make collusion between officials and businesses more difficult. By reducing irregularities in procurement, public spending decreases, and the quality of acquired goods and services improves.[52]

In this regard, evidence suggests that the digitalization of public procurement improves the quality of projects and can reduce the prices paid for goods. [53,t]

Citizen monitoring

Digital technologies can also improve the dissemination of public information and facilitate citizen monitoring, which serves as a crucial mechanism for reducing corruption and, consequently, enhancing the quality of public spending.[54]

Evidence shows that sharing information about investment projects allows citizens to access relevant data, verify progress, and make inquiries. This transparency positively impacts project performance, reflected in greater physical and financial progress.[55]

Impacts on people

Internet access can have positive effects on labor outcomes, such as employment and income.

Access to the internet and the adoption of digital solutions by businesses and governments have numerous positive effects on people's lives. Beyond facilitating communication, access to information, and entertainment, they also generate improvements in employment and well-being indicators.

Recent studies in developing countries show that internet access can positively impact labor outcomes, such as employment[56] and income.[57] For example, access to the internet in Africa increased employment rates by between 7% and 13%.[58,u]

These effects are driven by increased access to job opportunities through telework (also known as remote work),[59] improved productivity and exports among businesses, and greater market entry, particularly in technology-intensive sectors.[58]

t In Lewis-Faupel et al., (2016) an increase of 10 to 20 percentage points was observed in the quality ratings of completed works, while no significant effect on contract prices was identified. Conversely, De Michele & Pierri (2020) reported a 4% reduction in prices.

u It is important to note that there is literature indicating that internet access, like other technological innovations focused on specific skills, may primarily benefit workers with higher levels of education, potentially displacing workers depending on their skill level (Acemoglu & Autor, 2011; Autor, 2015; Álvarez et al., 2020). However, these studies have mainly focused on wealthy countries (Bahia, 2024).

Internet access in rural areas improves employment opportunities and contributes to reducing economic gaps between urban and rural areas.

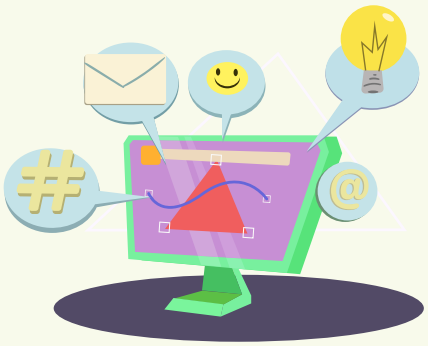
The expansion of internet access also enhances reemployment rates for the unemployed, as it increases online job searches and the number of applications submitted, resulting in a 4% rise in reemployment rates after 4 months of unemployment.[60]

Internet expansion is especially critical in remote areas, such as rural regions, where it can boost employment rates by 3% to 5% and increase labor income by 15% to 22%, as seen in Ecuador.[61] This underscores the value of connectivity in rural areas, where internet access expands job opportunities and helps narrow economic gaps between urban and rural zones.

Furthermore, internet access increases women's participation in the labor force, driven by opportunities for remote work. This enables time savings for household tasks and can translate into lower marriage and fertility rates.[62]

Digital skills to reduce inequality

To fully leverage the opportunities presented by digital technologies and ensure that existing inequalities are not exacerbated,[v] it is essential to invest in complementary digital skills.[20]



While evidence remains mixed, training women in technical skills for freelance work—such as graphic design and digital marketing—can increase their likelihood of finding employment by 19% and boost their income by 40%.[63]

It is important to note that the effectiveness of such programs depends on high completion rates for training. Furthermore, these programs may not be as effective when targeting individuals who initially perform poorly in their first job contracts.[64]

v Additionally, other risks must be addressed, such as excessive energy consumption, job displacement, market concentration, cybersecurity threats, and the vulnerability of private information, among others (OECD et al., 2020; World Bank, 2023; World Bank, 2024)).

Ultimately, as these benefits materialize—such as improved employment and income—internet access can also contribute to poverty reduction and improved well-being in the region. For instance, evidence from Nigeria indicates a 10% increase in food consumption and a corresponding 9 percentage point reduction in extreme poverty.[65]

CAF's action

CAF supports countries by improving internet coverage and quality in the region, fostering digital inclusion, and promoting the digitalization of businesses and governments.

Between 2019 and 2024, CAF financed operations with connectivity and digital transformation components for a total of USD 2.79 billion, including 41 credit operations for USD 2.77 billion[w] and 85 technical cooperation operations for USD 17 million. This action benefited 16 countries: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Mexico, Panama, Paraguay, Peru, Spain, Trinidad and Tobago, Uruguay, and Venezuela.

CAF'S ACTION IN THE LAST 6 YEARS (2019-2024)

$2.79 billion dollars

with connectivity and digital transformation components

- **$2.77 billion dollars** in 41 credit operations
- **$17 million dollars** in 85 technical cooperation operations

16 countries benefited

Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Mexico, Panama, Paraguay, Peru, Spain, Trinidad and Tobago, Uruguay, and Venezuela

w The total amount of these operations, including components unrelated to digital transformation, amounts to nearly USD 4.737 billion.

75.8 million people benefite

through internet service expansion, training programs, technological equipment, and the digitalization of public services

231 public institutions supported

through GovTech solutions, digitalized public services, and streamlined administrative processes, among others

9 equity investments in private companies

Connectivity and digital inclusion

In the past 6 years, CAF has financed 13 credit operations and 30 technical cooperation initiatives aimed at enhancing connectivity and digital inclusion in the region. Additionally, the development bank mobilized USD 11.4 million from third parties to conduct feasibility studies and boost world-class infrastructure for data transmission, storage, and processing.

These operations include funding for physical infrastructure to expand internet access and telecommunications services, particularly in remote areas, and improving service quality. Notable projects include the deployment of a submarine fiber-optic cable in El Salvador and the ARSAT satellite system in Argentina.

CAF finances credit and technical cooperation operations aimed at improving connectivity and digital inclusion in the region.

CAF has also supported initiatives to ensure citizens' effective access to digital services by financing the development of digital competencies and investments in devices, such as modems, computers, and tablets, for both domestic use and educational environments. The bank also promotes digital technology adoption among citizens.

Technical cooperation operations financed feasibility and pre-feasibility studies for connectivity projects, studies aimed at bridging the digital divide in Latin America, technical assistance for defining strategies for digital inclusion and transformation, and support for the creation of online payment ecosystems.

CAF's action in these areas has reached 12 countries: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, El Salvador, Mexico, Panama, Paraguay, Peru, and Trinidad and Tobago.

CAF'S ACTION IN THE LAST 6 YEARS (2019-2024) IN CONNECTIVITY AND DIGITAL INCLUSION

13 operations
with connectivity and digital inclusion components

- **10.5 million people**
  benefited by connectivity improvements, especially in remote areas
- **116,000 new jobs**
  due to improved connectivity[w]
- **35,000 people**
  lifted out of extreme poverty[w]

6 operations
aimed at boosting technology access and use in education

4 operations
focused on developing digital competencies

117,000 individuals trained

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x Authors' estimates based on evidence and official statistical sources on employment and poverty, derived from the financing of 3 projects totaling USD 489 million (Galperin et al., 2022; World Bank, 2023; CEDLAS & World Bank, 2024; ILO, 2024).

CAF and its support of digital inclusion and connectivity

CAF supported the Santa Fe + Conectada program in Argentina's Santa Fe province, aiming to expand the fiber-optic network by 3,400 kilometers. The project is expected to provide high-quality internet access to nearly 3.4 million people—approximately 95% of the province's population—and modernize the provincial education system. Efforts include building and equipping schools, launching a new educational platform, updating curricula, and training teachers and administrators in digital tools.

In Peru, CAF invested USD 15.5 million in equity in 2018, alongside Telefónica, Facebook, and IDB Invest, to support the creation of Internet para Todos. This initiative provides sustainable 4G mobile internet access to rural and geographically complex areas. Over 5 years of operations, Internet para Todos benefited 3.7 million people in 20,000 rural localities across Peru.

Digitalization of governments

CAF is promoting initiatives to make governments more agile, transparent, and innovative through the adoption of new technologies, with the goal of improving the quality of public services offered to citizens in Latin America and the Caribbean.

Over the past 6 years, CAF has financed 33 credit operations and 45 technical cooperation projects focused on state digitalization. These initiatives have benefited 14 countries: Argentina, Brazil, Chile, Colombia, Ecuador, El Salvador, Mexico, Panama, Paraguay, Peru, Spain, Trinidad and Tobago, Uruguay, and Venezuela.

CAF is promoting initiatives to make governments more agile, transparent, and innovative through the adoption of new technologies, with the goal of improving the quality of public services offered to citizens in Latin America and the Caribbean.

CAF'S ACTION IN THE LAST 6 YEARS (2019-2024) IN SUPPORT OF THE DIGITALIZATION OF GOVERNMENTS

34 operations
included components for national and subnational government digitalization

25 operations
focused on digitalizing public services

→ **64.5 million people**
benefited by digitalized public services

7 operations
targeted the digitalization of administrative procedures

→ **128,000 hours**
in annual savings[x]

→ **67,000 additional people**
able to access services[x]

6 operations
with digitalization components within state administration

9 operations
supported GovTech companies

10 operations
backed regulatory reforms and strategic digital transformation efforts

7 operations
with training components for public officials in digital skills

public officials
trained

y Authors' estimates based on the financing of one project totaling USD 75 million, using evidence and statistics on administrative procedures and births (Chong et al, 2022; Roseth et al., 2018; Latinobarómetro, 2017; United Nations, 2024).

This action includes:

1. **Digitalization of public services:** Efforts included digitalizing electricity services (management systems), transportation (public and air transport monitoring), healthcare (telemedicine and medical monitoring), education (digital learning platforms), waste management (digital platforms), and security (video surveillance), all aimed at improving service quality and delivery.

Healthcare digitalization:
A case of telemedicine in El Salvador

In 2023, CAF approved funding for the implementation of an innovative telemedicine system in El Salvador. The initiative aims to improve access to healthcare services and reduce waiting times for medical attention. The project is expected to benefit approximately 4.5 million citizens, representing nearly 70% of the country's total population.

2. **Digitalization of administrative procedures:** Aimed at increasing efficiency in service delivery by reducing the time and costs incurred by citizens and businesses, this effort can minimize corruption, streamline public procedures, and improve the quality of government services.

3. **Digitalization of state administration:** Supported the strategic use of data and digital technologies to strengthen and modernize internal administration. For instance, digital public procurement systems can help reduce public spending, improve the quality of goods and services, and prevent collusion between public officials and companies. During the COVID-19 pandemic, CAF launched an initiative in partnership with Open Contracting Partnership to digitalize and open emergency procurement data in Colombia, Ecuador, Panama, and Paraguay.

4. **GovTech development support:** Supported the development of GovTech companies to digitalize public procedures and services, such as creating a digital platform for managing urban municipal services.

Smart cities and greentech

Over the past 6 years, CAF has financed 13 credit operations promoting the development of smart cities—those that leverage digital infrastructure, data, and innovation to deliver more efficient public services, improve quality of life, and enhance territorial sustainability.

In Salvador, Brazil, CAF financed the development of a Smart City and Technology Master Plan in 2018. In 2024, CAF supported the creation of a digital government plan and the implementation of a Smart Neighborhood project, which includes upgrading the city's technological infrastructure and building the Salvador Observatory, an integrated operations and control center serving as a platform for the city's integrated management. The project envisions partnerships with the private sector and the development of GovTech solutions, offering significant opportunities to promote these innovations.

CAF also supports the use of technologies to mitigate and reverse the negative effects of human activity on the environment (greentech). For instance, in Santo André, Brazil, a flood prediction model is being developed with the support of artificial intelligence.

5. **Support for strategies and regulatory reforms:** Encouraged ecosystem development, streamlined administrative procedures, and advanced areas like cybersecurity, artificial intelligence for policymaking, and government's adoption of digital solutions.

Trinidad and Tobago's digital transformation and inclusion strategy

Through a USD 120 million loan, CAF supports the implementation of Trinidad and Tobago's digital transformation and inclusion strategy, contributing to the creation of an institutional framework and public policies for the digitalization of the State. This includes the development of a cybersecurity strategy, digital identification, a cloud

for the public sector, and the implementation of an interoperability ecosystem among government entities.

Additionally, the initiative promotes the use of technologies to strengthen climate resilience, advance digital literacy, and provide training in marginalized communities.

6. **Training for public officials:** Provided training to develop digital skills, particularly in implementing digitalized administrative processes and public services.

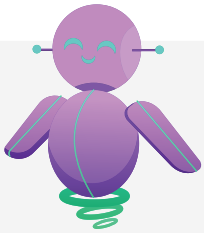
Public integrity

CAF supports governments in the region in improving their procurement processes, particularly in areas related to integrity and digital solutions aimed at increasing transparency. Over the past 6 years, CAF has financed 4 operations with such components, including the modernization of the transparency portal in Ribeirão Preto (Brazil).

Additionally, in partnership with the Inter-American Network on Government Procurement, CAF funded the development of an early-warning algorithm to detect corruption risks in public procurement.

CAF also supported the development of CosT platforms for Jalisco (Mexico) and Bogotá (Colombia), which publish infrastructure project information to ensure transparency and accountability.[66]

Finally, CAF backed the implementation of the Inter-American Open Data Program in Colombia, Costa Rica, Ecuador, Panama, and the Dominican Republic. This initiative facilitated the creation of more than 30 government-use datasets, contributing to transparency and interoperability among public entities.



Artificial intelligence

CAF has spearheaded nearly 30 initiatives for the development and adoption of AI across countries in LAC. These efforts focus on public policy and regulation, institutional frameworks, high-performance computing capabilities, talent development, data infrastructure and interoperability, and the creation of AI centers and laboratories to transform public administrations.

Additionally, CAF and UNESCO foster the ethical development of AI by institutionalizing the High-Level AI Authorities Summit in the region. This initiative aims to build a regionally focused work agenda, foster international cooperation, and help countries develop initiatives aligned with their priorities and regulations. Significant achievements include the Santiago Declaration, the Montevideo Declaration, and a Regional Roadmap approved by ministers. This roadmap covers issues such as AI governance and regulation, the protection of vulnerable groups, environmental sustainability and climate change, talent development and the future of work, as well as infrastructure and high-performance computing.

Digitalization of businesses

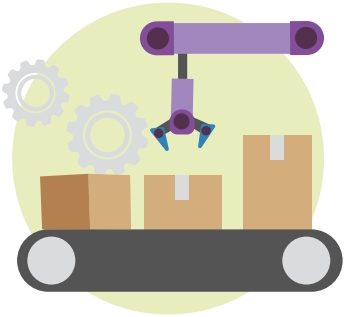
To drive the digital transformation of businesses, CAF not only finances digital connectivity infrastructure but also promotes the implementation of digital services and solutions across various value chains.[z]

Over the past 6 years, CAF has approved 8 credit operations and 10 technical cooperation projects aimed at advancing the digital transformation of enterprises in 9 countries: Colombia, Costa Rica, Ecuador, El Salvador, Mexico, Panama, Paraguay, Peru, and Trinidad and Tobago.

With the goal of improving business productivity, CAF's support includes the adoption of digital technologies in production processes—such as supply chain, production, and distribution—as well as solutions involving artificial intelligence (AI), the Internet of Things (IoT), data intelligence, and blockchain,

z While GovTech development can also be considered part of the digital industry, as it involves private sector companies developing digital solutions, this action has been categorized under State Digitalization.

among others. One concrete example is the monitoring of crops using smart sensors through the Climate-Smart Initiatives for Climate Change Adaptation and Sustainability in Prioritized Agro-Productive Systems (CSICAP, by its Spanish acronym) project in Colombia.



CAF's efforts also encompass initiatives that foster the development of digital industries—businesses that rely heavily on technology for their operations, such as software, hardware, and telecommunications companies—promote the integration of businesses into e-commerce, and support the growth of fintech companies, which use technology to deliver financial products and services.

CAF'S ACTION IN THE LAST 6 YEARS (2019-2024) IN BUSINESS DIGITALIZATION

18 operations
aimed at boosting the digital transformation of companies

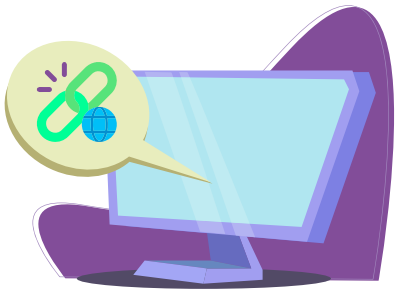
- **8 credit operations**
- **10 technical cooperations**

9 beneficiary countries
Colombia, Costa Rica, Ecuador, El Salvador, Mexico, Panama, Paraguay, Peru, and Trinidad and Tobago

Other contributions

Over the past 6 years, CAF has published nearly 100 knowledge-sharing documents related to connectivity, inclusion, and the digital transformation of businesses and governments. These include policy summaries implemented in the region and successful cases of solutions led by GovTech startups, such as Dasigno and Datasketch in Colombia and MuniDigital® in Argentina, aimed at spreading best practices and supporting decision-making processes.

Other notable initiatives promoted by CAF include:



» GovTech Observatory: Designed to identify and map GovTech startups in Ibero-America—highlighting who they are, where they operate, and the solutions they develop—to foster collaboration in leveraging data and digital technology to solve public challenges.

» Financial Inclusion Lab (LIF): Focused on supporting highly innovative projects that incorporate technology to improve access to financial services and promote greater financial inclusion in the region.

» GovTech and the Future of Government MOOC: A free theoretical and practical course that provides key concepts for identifying relevant stakeholders and selecting the best tools to develop and consolidate GovTech ecosystems to improve public management.

» Digital Ecosystem Development Index (IDED) 2023: Featuring over 150 country-level indicators, this index offers a comprehensive view of the digital ecosystem, including infrastructure, public policies and regulation, human capital and workforce, household digitalization, digitalization of governments, the digital economy, and the green digital economy.

» CAF and the OECD developed two key publications on digital transformation in public administration: "The Strategic and Responsible Use of Artificial Intelligence in the Public Sector of Latin America and the Caribbean" and "Digital Government Review of Latin America and the Caribbean: Building Inclusive and Responsive Public Services."

» Humboldt Cable: Through a USD 3 million technical cooperation, CAF funded feasibility studies for the *Submarine Cable Integration Project: "Asia-South America Digital Gateway."* This pioneering connectivity and integration project aims to digitally connect South America with Asia via a submarine fiber-optic cable, enhancing international capacity and positively impacting the quality of life for millions of people in the region.

In summary

Despite significant progress in expanding internet coverage in the region, only 78% of citizens use the service. Usage gaps widen when examining specific groups such as older adults, low-income populations, and rural residents.

Additionally, for those who do use the service, internet quality is far below that of more developed regions. These disparities in internet usage and quality, combined with a lack of digital skills among citizens, hinder the adoption of digital technologies by households and constrain the digitalization of businesses and governments.

Over the past 6 years, CAF has allocated USD 2.79 billion in credit and technical cooperation operations to enhance internet coverage and quality, promote digital inclusion, and support the digital transformation of businesses and governments in the region.

These initiatives have a positive impact on economic growth, resulting in greater productivity, increased production and exports for businesses; improved access to and quality of goods and services provided by governments; and significant benefits for people in employment and personal well-being. For example, access to quality internet could boost business productivity by 3% to 9%, raise employment rates by 3% to 13%—equivalent to 116,000 new jobs in the countries supported by CAF—and increase labor income by 15% to 22%. Lastly, digitalizing identity document procedures could cut processing time by 40%.

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