

# DIGITAL DEVELOPMENT

GLOBAL PRACTICE







Digitalization is  
the **transformative**  
opportunity of our time

# Our Mission

Digital technologies are increasingly central to our economic and social lives. They have proven to be a powerful tool to help unlock economic growth and opportunity, tackle development challenges, ease access to services, and improve lives. In times of crises – from natural disasters to global pandemics – digital technologies have proven critical to supporting national resilience and keeping people, governments, and businesses connected. At the same time, they can exacerbate economic and social divides and create new privacy and security vulnerabilities. **Our aim is to maximize the benefits of digitalization – the digital dividends – for all, while mitigating the risks.**



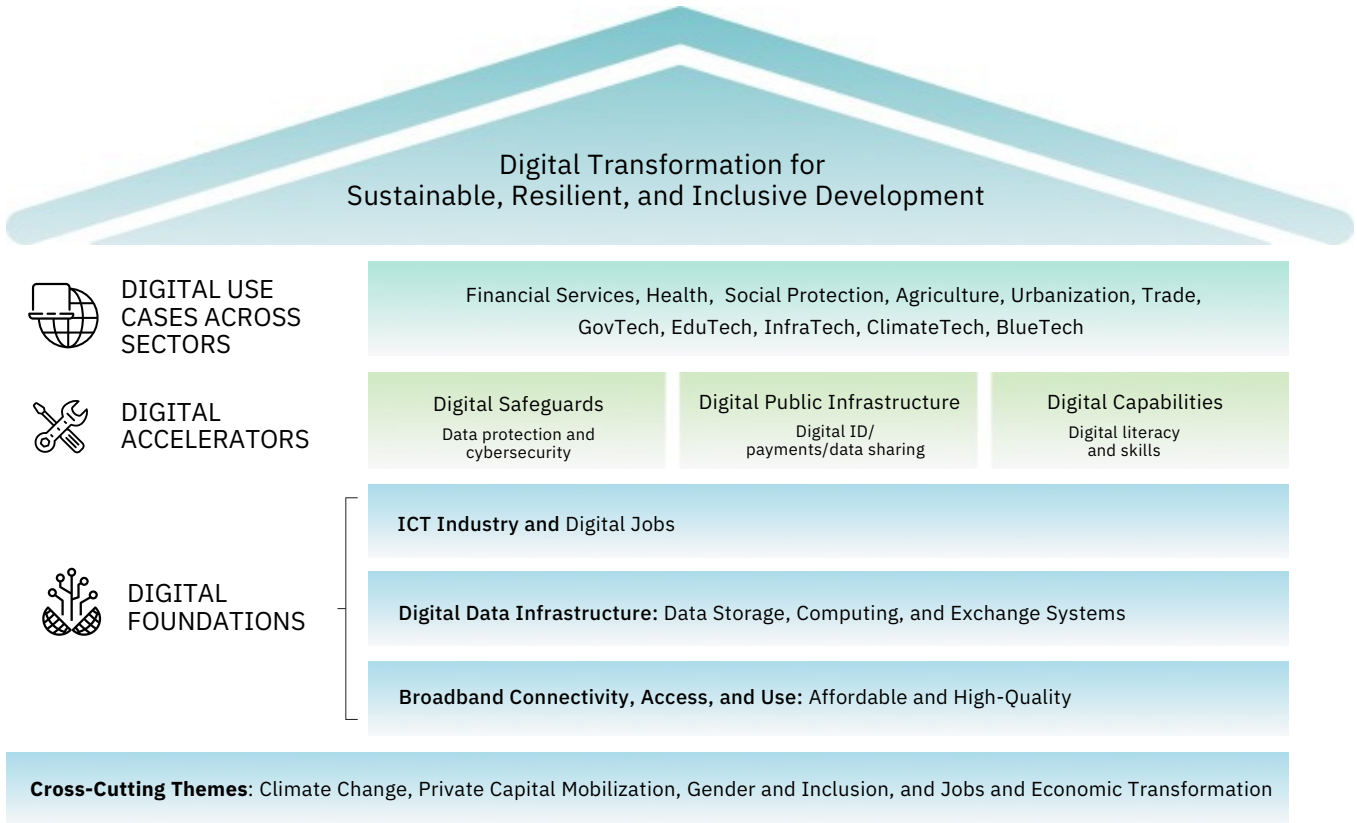
## What We Do

The **Digital Development Global Practice (DD)** works globally in more than 100 developing countries, including fragile and conflict states, to help create strong foundations for the digital economy to thrive. Working in collaboration with Global Practices (GPs) across the World Bank, the International Finance Corporation (IFC) and the Multilateral Investment Guarantee Agency (MIGA), we deploy a range of products, services, and partnerships to advance global knowledge around key digital development topics and to support countries to define and implement their vision for digital transformation through:

- **Financing** to governments in the form of grants, loans, guarantees, and risk management products to support digital investment projects and implement policy reforms
- **Advisory services** including targeted policy guidance, technical assistance, and capacity building
- **Knowledge products** including data and diagnostics to provide actionable insights at regional, country, and local levels, research and thought leadership to expand the global knowledge base, as well as thematic operational toolkits
- **Convening services** that bring together key stakeholders, from both public and private sectors as well as international and non-governmental organizations involved in advancing global digital development

## FRAMEWORK FOR DIGITAL DEVELOPMENT

Our framework for digital transformation supports sustainable, resilient, and inclusive development and is built around a set of digital foundations including broadband connectivity, digital data infrastructure, and establishment of local ICT industries and jobs, as illustrated in Figure 1. The digital development agenda can be further accelerated through establishment of digital safeguards to improve trust and security, development of digital public infrastructure to support digital public service delivery and access, and development of essential capabilities including digital literacy and skills. These foundations and accelerators can facilitate digital use cases across a range of sectors, to further drive social and economic development. The four cross-cutting development themes that help shape our approach to digital development and transformation include climate change, private capital mobilization, gender and inclusion, and jobs and economic transformation.



**Figure 1:** Framework for Digital Development



## Four cross-cutting themes help shape our approach to digital transformation:

### **Climate Change**

Supporting governments to plan, build, procure, and operate climate resilient infrastructure, helping governments reduce greenhouse gas (GHG) emissions from digital technologies, and manage e-waste. This also includes supporting governments to leverage digital technologies and data to accelerate climate change action.

### **Private Capital Mobilization (PCM)**

Mobilizing private investment in digital infrastructure and services at scale. This includes fostering policy, regulatory, and institutional reforms to enhance the enabling environment for private investments in the digital sector, as well as catalyzing the use of public financing and risk mitigation tools to close the viability gap for private digital investments.

### **Gender and Inclusion**

Narrowing the gender gap in access, adoption, and usage of digital technologies, data, and services, and supporting participation in the digital economy by all through broader access to markets, employment, and educational opportunities by focusing on affordability of devices, digital education, and cultural norms.

### **Jobs and Economic Transformation (JET)**

Supporting the development of the ICT industry, including the fostering of digital entrepreneurship to drive local innovation and development of digital platforms and applications. This also includes creating new jobs and mitigating potential negative impacts on labor markets created by digital technologies that facilitate wide-scale automation.



## Our Focus Areas

We work with governments, the private sector, NGOs, academia, and development partners across the globe to leverage digital technologies and data to accelerate sustainable, inclusive, and resilient social and economic development. Our work is organized around five interconnected business lines that form key digital foundations and accelerators for digital transformation and digital economy development. These business lines are reinforced and built upon through coordination and collaboration with our partner GPs, IFC, and MIGA under a digital economy framework.





## Broadband Connectivity, Access, and Use

Promoting universal access to inclusive, affordable, safe, and resilient broadband connectivity and supporting productive use through effective telecommunications policy and regulation, stimulating broadband infrastructure investment, and boosting digital literacy and access to Internet-connected devices.



## Digital Data Infrastructure

Maximizing social and economic value of data through investment in data centers and cloud adoption, strengthening data governance, building digital public infrastructure (digital ID and data sharing), and developing platforms and capabilities for data use and innovation such as Artificial Intelligence (AI).



## Digital Safeguards

Building and strengthening trust in usage of digital platforms and services among people, governments, and businesses by strengthening data protection, raising cyber awareness, and building capacity to protect critical infrastructure and systems from cyber threats.



## Digital and Climate

Accelerating climate action with digital technologies in a way that is good for both people and the planet by greening digital infrastructure (by reducing GHG emissions and strengthening resilience) and by harnessing the power of digital technologies and data for climate action across sectors.



## ICT Industry and Digital Jobs

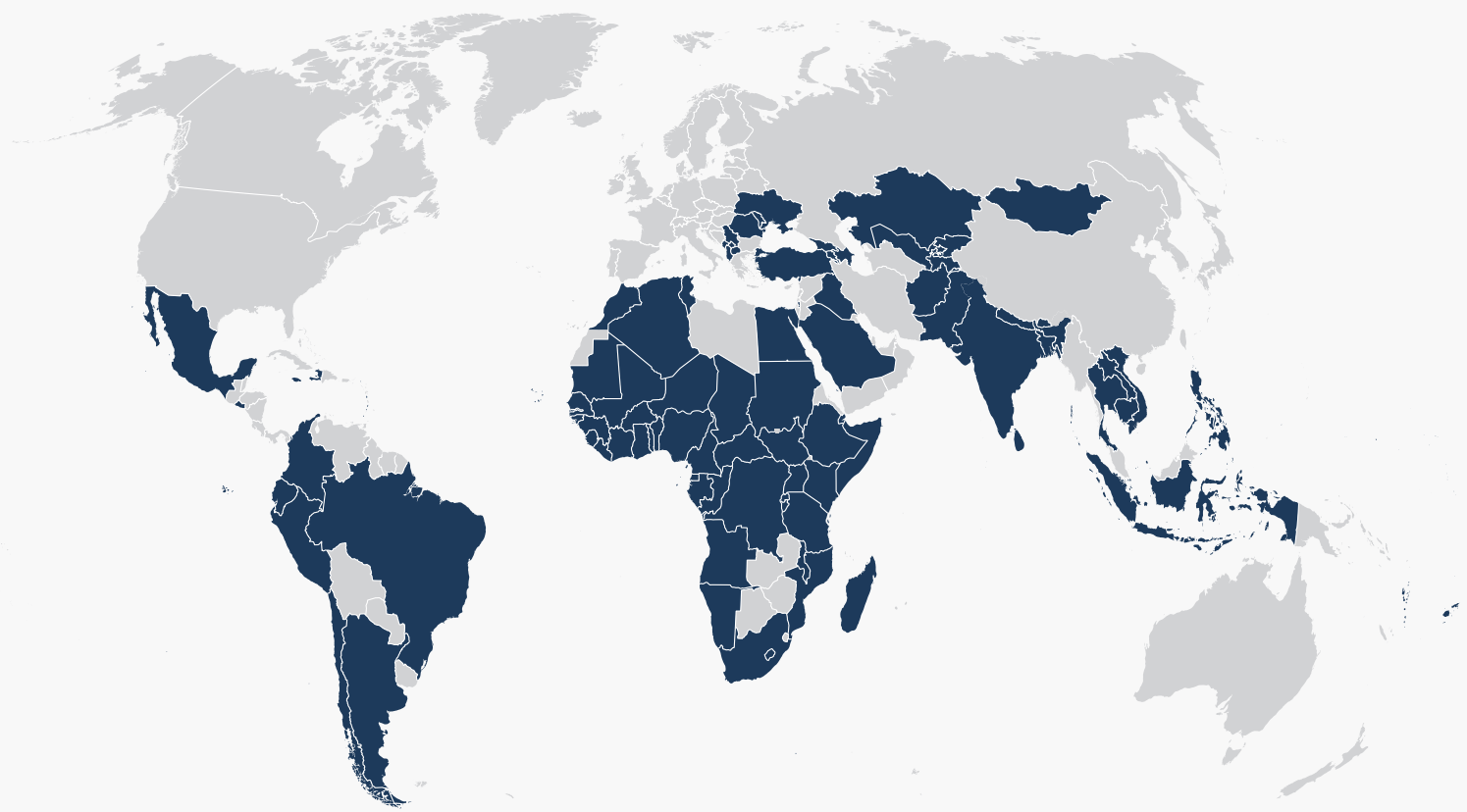
Boosting economic growth and creating jobs by encouraging investment in ICT and ICT enabled services industries and facilitating industry-academia partnerships to develop digital skills and job placement programs tailored to market demand.



## Accelerating Digital Use Across Sectors

Building upon our primary business lines, we support our partner Global Practices across a wide range of sectors to accelerate the deployment of digital technologies and utilization of data to drive innovation, increase operational efficiency, and develop more accessible, user-friendly, and productive digital products, services, and other use cases.

# Where We Work



**100+**

Countries DD is actively supporting

**80+**

Countries DD is leading or contributing to at least one project













# Broadband Connectivity, Access, and Use

## Development Challenges

Broadband connectivity lies at the heart of building well-functioning digital economies that help countries achieve inclusive and sustainable economic growth; enhance productivity and job creation; and offer innovative, useful and convenient products and services to people. The recent experiences of the COVID-19 pandemic and ongoing global conflicts have further demonstrated the importance of universal Internet access for basic services and staying connected, especially in emergency and crisis situations. However, with 2.7 billion people globally remaining unconnected in 2022, many countries remain far from reaching universal broadband access by 2030, the target set by the International Telecommunication Union (ITU). Gaps in network coverage and network capacity in urban areas continue to be significant, particularly in Africa, where only half of the population was reached by 4G networks as of 2021. Fixed networks, critical for higher bandwidth and higher productivity use cases

in areas such as education and health, are even more underdeveloped across many low- and middle-income countries. Worldwide, 81 percent of households are in presence of fixed networks, but only 7 percent in Africa and 35 percent in Arab States according to recent figures from the ITU. Further, only around 5 percent of fixed subscriptions in low-income countries reach download speeds of 10Mbit/s and higher, the minimum necessary for meaningful connectivity.

In addition to the needs for network expansion and upgrading, a wide demand-side access and usage gap persists: around 30 percent of the global population who live within coverage zones were still not using the Internet in 2022. High prices of mobile and fixed broadband services and digital devices (handsets, computers, tablets) are the primary barriers. High prices can be driven by lack of competition, lack of good practice regulations, lack of infrastructure sharing, high spectrum pricing, and barriers to interconnection.



Market failures also contribute to high prices, for example in areas where geography, low consumer incomes, high costs of deployment and operations or other factors render the provision of telecommunications services unviable and/or result in prices beyond the reach of many, regardless of how competitive the markets are.

The digital divide cuts across and within countries. Despite improvements, people in urban areas are still 1.8 times as likely to use the Internet, compared to people living in rural areas. In Africa, this gap is particularly stark, with over 64 percent of urban dwellers online in 2022, versus less than a fifth of the rural population.<sup>1</sup> Women and girls face additional barriers in using the Internet in many countries and are now 16 percent less likely than men to use mobile Internet, which translates into

264 million fewer women than men online.<sup>2</sup> These barriers include local social norms and pressures that discourage or prevent access.

The adoption and use of Internet-based technologies requires individuals to first have an understanding of the relevance and benefits of being online, as well as the necessary skills. Availability of relevant content (including in local languages) is critical in facilitating user engagement online, but a local content-creation ecosystem is unlikely to take root and flourish until there is a sufficient user base to serve. Further exacerbating this challenge is the digital literacy gap, which is most prominent across rural areas and amongst disadvantaged and vulnerable groups such as the poor, people with disabilities, young people and children, and women and girls.

**Figure 2:** Infrastructure Supporting Internet Connectivity





## How we support countries

We work with countries and global partners in promoting universal access to inclusive, affordable, safe, and resilient broadband connectivity, access, and use. Our support for countries is organized across three pillars: promoting markets, expanding coverage, and finally increasing access, use, and inclusion.

### Promoting Effective Markets

We work with governments on policy and regulation for open and competitive telecommunications markets. This includes support for policies that reduce barriers to market entry, promote competition, and create an enabling environment for private investment. We advise countries on how to structure the regulatory environment needed for inclusive and affordable connectivity and open and well-functioning telecommunications markets, including licensing, interconnection, spectrum management, taxation, open access policies, infrastructure sharing, and economic and technical regulation. We support capacity and institution building for digital ministries and effective, independent regulatory bodies. We support restructuring or repositioning of state-owned telecommunications providers to improve competitiveness and reduce market distortions.

### Expanding Coverage

We support countries on policy and regulatory interventions and in investing in broadband infrastructure to expand coverage, including in commercially unprofitable areas such as rural and remote areas and connecting public institutions. We work with policymakers, regulators, and industry to find ways to improve economic viability of broadband investments and enable private sector investments. We use instruments such as gap financing, universal service funds, risk mitigation instruments for investors, demand stimulation and aggregation through public procurement, public-private partnerships (PPPs), and promoting infrastructure sharing among operators. Our approach is technology-neutral and aims to help countries remain flexible in an ever-changing technological environment.



## Increasing Access, Use, and Inclusion

We help countries bridge the digital divide with a focus on helping underserved populations, including people living in rural areas, women, people with disabilities, and the elderly. We support governments with targeted reforms and investments aimed at expanding inclusive digital access and use, including tackling gender-specific social barriers. Our solutions include digital devices and broadband service affordability schemes, investments in public Internet access points and facilities, and the expansion of digital literacy and skills programs, particularly those focusing on vulnerable and disadvantaged groups.

# 2.7

**billion people globally  
remain unconnected in 2022<sup>4</sup>**

# 18%

**of the population in Africa  
is not reached by basic 3G  
network coverage<sup>5</sup>**



## A selection of our projects and results



In **Ethiopia**, work on a Telecom Sector Reform is contributing to the realization of the Government of Ethiopia's vision of a competitive telecommunications sector. Starting with the adoption of a new Telecoms Proclamation (Act) in 2019, and the establishment of an independent regulator for the digital sector (Ethiopian Communications Authority), the reform process proceeded with the licensing of a new full-service private telecoms operator in June 2021. As the reforms progressed between 2018 and end of 2020, the number of broadband subscribers jumped by 29 percent and prices fell by more than 50 percent. The reforms have also led to the introduction of new services in the market, such as mobile money. IDA, IFC, and MIGA have worked closely together to assist the Government in the telecom reform process.

women and girls are

# 16%

less likely than men to use mobile Internet, which translates to 264 million fewer women than men globally <sup>6</sup>



In **Malawi**, the World Bank supported the Regional Communications Infrastructure Program (RCIPMW) where a sub-component focused on demand aggregation for broadband services across government to crowd-in private sector investment in connectivity infrastructure across the country. Under RCIPMW, the government pre-purchased a large volume of international bandwidth, connectivity, and other enterprise services over a 10-year period through a competitive bidding process. To supply these services, SimbaNet, a regional Internet service provider (ISP), constructed a nearly 900 km fiber network to serve both government and private customers. As a result, 145 public institutions, including 100 secondary schools, have been provided robust connectivity. Further, other telecommunications operators and ISPs can connect to the SimbaNet network on an open access basis, benefiting from reduced costs for wholesale bandwidth, which decreased by 96 percent between 2008-2016. This has in turn contributed to a more competitive telecommunications market, a proliferation of small Internet service providers across the country, and a reduction in retail broadband prices.



In **Bhutan**, the World Bank has been providing technical assistance since 2007 to enable regulatory reforms and institutional capacity building for this small landlocked country to expand access to secure, resilient, and affordable digital infrastructure. This includes advising on options to strengthen reliability of international and domestic connectivity, and modernization of the regulatory framework to increase private investments and improve competition in the broadband market through spectrum management reform, tariff and quality of service regulations, and infrastructure sharing. This support has helped increase Internet access from 5 percent of the population in 2006 to 86 percent by the end of 2021. e-Commerce activities have also increased fourfold over a period of 2016-2021, demonstrating improved confidence in Bhutan's digital sector.



In **Kosovo**, the World Bank provided technical support to enable infrastructure sharing – in this case, the use of the surplus capacity of the Optical Ground Wire of Kosovo's electricity transmission System for telecommunications purposes. This also included support for the design of innovative broadband pilots to provide public gap financing to expand coverage to nearly every unconnected rural village in the country through an open, competitive process. Since 2018, private capital has provided 30 percent (around USD 4 million) of the total financing amount raised to build this infrastructure.





# Global Knowledge and Analytics

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## Digital and Telecommunications Regulation Guidance

**Digital Regulation Handbook:** To help decision-makers better understand best practices in digital regulation, the Bank partnered with the ITU to develop a reference handbook that includes actionable guidance on good-practice regulation around governance and independence of regulatory bodies, competition and economics, access for all, consumer affairs, data protection and trust, spectrum management, emerging technologies, technical regulation, and emergency communications. This guide is an update to the widely referenced ICT Regulatory Handbook, which provides insights on the challenges, opportunities, and solutions relating to ICT regulation.

**Regulatory Watch Initiative:** The Regulatory Watch Initiative (RWI) developed a platform that provides a regularly updated dashboard on five main operational inputs for regulatory reform: fair markets, licensing and authorization, international access, spectrum management, and regulatory governance. Detailed snapshots across 18 key indicators are available for 27 countries, with new countries being added each year.

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## Infrastructure Technologies and Devices

### **Smartphone Affordability, Financing Schemes, Policy Options, and Private Capital Mobilization:**

To help governments better understand how they can address the most critical affordability factors as well as potential solutions, the Bank developed a reference to help governments assess supply and demand side factors in their local markets affecting mobile phone ownership. Our resource provides policy options, as well as guidance on how governments can work with the various stakeholders along the device and Internet services value chain to support the design and deployment of innovative and sustainable financing schemes for mobile device ownership and use, including various products and solutions that can help mobilize private capital through credit and risk guarantees, loans, syndication of debt, and blended finance.

**Open Fiber Data Project:** To address major gaps in information regarding existing telecommunications infrastructure, the World Bank and the Partners2Connect Digital Coalition (P2C) are working to create a digital map of terrestrial fiber infrastructure worldwide (beginning with Africa) using open standards for data entry and sharing with public and private stakeholders. This tool will help inform and support decisions for targeted and cost-efficient digital infrastructure investments by the private and public sectors.



## DEEP DIVE CASE STUDY

# Connecting the Unconnected across the Caribbean

### The challenge:

In 2010, telecommunications in Grenada, St. Lucia, and St. Vincent and the Grenadines was characterized by low bandwidth, high prices, and poor service quality due to a reliance on legacy copper networks. There were also several large coverage gaps. Governments were paying high prices for obsolete services and equipment, and citizens had to deal with substandard services and limited access to global networks.



As a consequence, schools in Grenada and Saint Lucia had serious network capacity problems. Many had limited Internet connection to support up to a thousand students per school. Weak connections made the service so slow that it was often unusable. In addition, the existing mobile carriers did not have sufficient capacity to offer 4G mobile services, a critical building block for online education initiatives, which had become even more critical after COVID-19 pandemic.

Saint Vincent and the Grenadines were becoming uncompetitive in the tourism industry due to slow speed Internet services. Residents also faced a severe digital divide, meaning unequal access to broadband services.

### How we helped:

The three governments recognized that advanced, safe, affordable, and reliable access to digital services was essential for economic growth. Through the **Caribbean Regional Communications Infrastructure Program** (CARCIP), we helped the governments jointly pursue high quality fiber optic networks for their countries to be able to provide robust digital public services, as well as digital content and Internet services for the education community. This included development of an internal network connecting all government offices, establishment of a dedicated education network, and deployment of missing sub-sea cable links. The program



also supported development of digital skills, the local ICT industry and development of digital jobs through a training program, and financial and technical assistance to support growth and competitiveness of local digital firms. The program design included a unique Public Private Partnership (PPP) to Design, Build, Operate, Finance, and Transfer Broadband Internet Services for government administration buildings (Government Wide Area Network), schools, community centers, and other locations. This innovative approach was the first of its kind in the region and leveraged approximately **\$45 million** in investments from governments and private partners.

## Results:



The percentage of population in each country with access to the internet increased from less than 30 percent in 2008 to over **53 percent** in St. Lucia, **57 percent** in Grenada, and **56 percent** in St. Vincent and the Grenadines in 2020.



Deployment of fiber optic links between 2019 and 2021 **connected 769 public buildings**, including government offices, schools, and health centers (184 in Grenada, 352 in St. Lucia, and 233 in St. Vincent and the Grenadines). The new infrastructure has also allowed private operators to offer high quality connectivity services to individuals and businesses on the private market.



To ensure inclusive and sustainable connectivity, CARCIP first created an updated policy and regulatory environment managed by regional authorities and offered skills development for women and youth employability and digital entrepreneurship. The programs contributed to training over **3,500 people**, as well as certifications for **800 people** after the training. Close to **3,000 individuals** who graduated from the ICT skills training courses gained employment, and more than **100 businesses** received support to purchase equipment or receive consulting services.





# Digital Data Infrastructure

## Development Challenges

With real-time market and climate data, a farmer can improve their yield and incomes. With access to and control over their utility bill data, a poor household can access lower cost financial services. Entrepreneurs can use data to build innovative products and services.

Data is the lifeblood of inclusive and dynamic digital economies, societies, and governments. As highlighted by the 2021 World Development Report on *Data for Better Lives*, with reliable data that can be seamlessly used and re-used with appropriate safeguards against misuse, people, businesses, governments, civil society, and academia can benefit from the value of data. This includes the greater exercising of rights, more effective and efficient public services and government planning, more innovative and competitive private sectors, markets fueled by the power of the data economy, enhanced research, and resilience and response to crises. For instance, research by the World Bank Group's G2Px initiative found that the countries

that could use data effectively as part of the social protection response to the COVID-19 pandemic could reach three times more beneficiaries than those that could not (51 percent of the population vs 16 percent). Having data infrastructure in place, including to store and share information, was a key enabler. More broadly, data infrastructure can drive economic growth: a 10 percent increase in data centers results in an expansion of exports in data-related services of about 1.6 percent.<sup>7</sup>

Despite these benefits, many low- and middle-income economies lack hard and soft infrastructures to collect, store, manage, and share data efficiently and responsibly. Hard infrastructure includes the data centers and cloud computing resources to store and process data. Less than 20 percent of low- and middle-income countries have modern data infrastructure such as colocation data centers and direct access to cloud computing facilities.<sup>8</sup> Such infrastructure needs to





be scalable and, increasingly because of climate change, more resilient and energy efficient. Soft infrastructure includes data governance frameworks and personal data protection laws and regulations, digital public infrastructure (e.g., digital identity, digital payments, verifiable credentials, and data exchange platforms), and emerging technologies like AI and big data.

Some of the challenges that countries face in developing their digital data infrastructure include inadequate data infrastructure capacity (e.g., bandwidth and storage), weak and unenforced legal and policy frameworks, insufficient capacity and knowledge to effectively plan and manage digital data infrastructure, regulatory environments that constrain private sector competition and investment, and structural impediments to investment (e.g., population size and density and geographic location). Unreliable power is a significant constraint in many low- and middle-income economies.

These cross-cutting hard and soft infrastructures are critical for ensuring that all sectors – from government and financial services, e-commerce, and agriculture to health, education, and social protection – can harness data for development. Moreover, as real-time data (including geo-spatial mapping and early warning systems) becomes even more critical for understanding and mitigating the threats of climate change, there is an even more urgent need for countries to build their digital data infrastructure.



# <20%

of low- and middle-income countries have modern data infrastructure<sup>9</sup>

# 10%

increase in data centers results in an expansion of exports in data-related services of about 1.6 percent<sup>10</sup>

# 850

million people globally are without any form of official identification<sup>11</sup>

## How we support countries

Our digital data infrastructure support for countries is organized across four themes: data governance, data hosting, digital public infrastructure, and data use and innovation.

### Data governance

We help countries develop the cross-cutting enablers and safeguards needed for collection, management, utilization, and interoperability of data (personal and non-personal, and within and across borders). This includes, but not limited to, laws and regulations (e.g., freedom of information, data transparency); policies, strategies, and standards (e.g., data catalogs, data architectures, interoperability frameworks, trust frameworks, data classification); and agencies and institutions responsible for standardizing, making policy, and managing data. In addition to developing data governance at the national level, we support countries and regional organizations to develop transnational data governance to unlock digital trade and cross border data flows (including emerging models of data free flows with trust), which like Internet governance is a global public good.

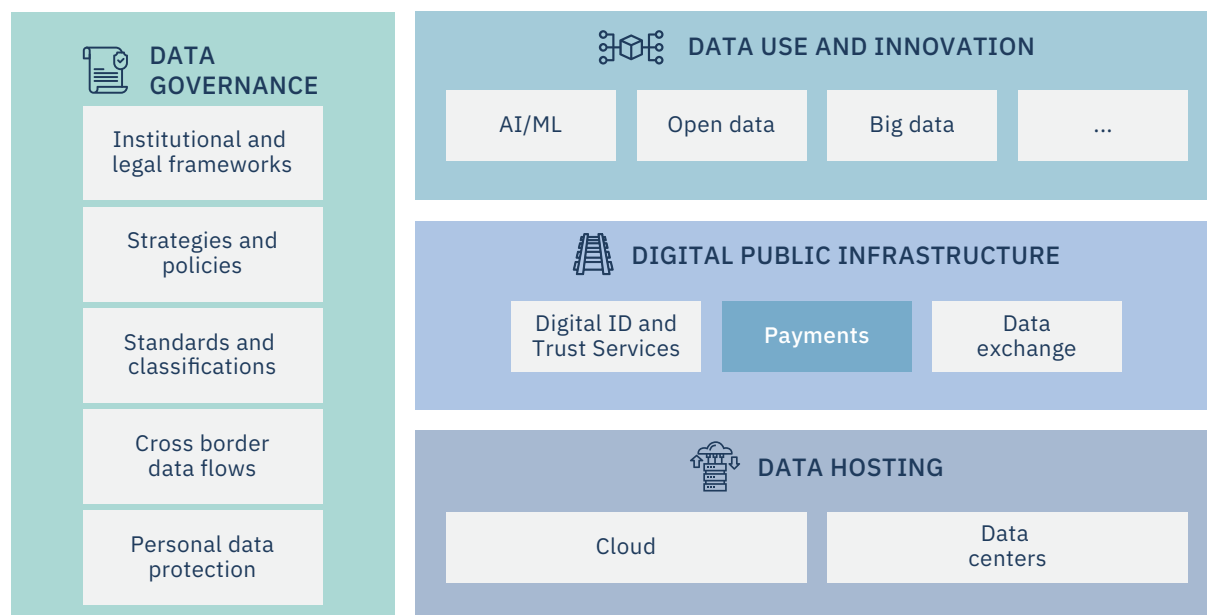
### Data hosting

We help countries to design and build context-appropriate and fit-for-purpose data hosting capabilities, whether that is through cloud computing and/or on-premise co-location data centers. This includes supporting governments with migrating data and processes to cloud-based systems. More broadly, we help countries create a conducive regulatory and market environment for private sector investments in data center and cloud computing that support the whole economy, such as by aggregating public sector demand, reducing red-tape, and formulating innovative business models. In addition to private capital mobilization, we advise governments on how to make data centers and cloud computing more energy efficient.

More recently, we have been assisting low-income, fragile, and small economies to overcome the unique challenges they face in terms of realizing



**Figure 3:** How we support Countries with Digital Data Infrastructure



sufficient data hosting capabilities and attracting investment, such as by unblocking cross-border data flows, regional approaches to data infrastructure, and ensuring security.

### Digital public infrastructure (DPI)

In collaboration with the ID4D and G2Px initiatives, we help countries build the roads and railways of the 21<sup>st</sup> century: the digital platforms and organizational underpinnings that enable service delivery. This includes digital identity and trust services (e.g. public key infrastructure, e-signatures, and verifiable credentials), digital payments (which is led by the FCI GP), and data exchange. We also

carry out cutting edge research on international good practices and support the development of digital public goods to support DPI. There is a particular focus on data exchange platforms, which has become increasingly important in light of the challenges government agencies faces in using data as part of various responses to the COVID-19 pandemic, and trust services, which are necessary for ensuring that transactions in the digital economy are trusted. We also support developing countries to harness emerging decentralized models of data storage and use, including verifiable credentials.



# 69

**countries and territories have established AI policies or initiatives as of 2023, many with having established National AI Strategy Plans<sup>12</sup>**

# >50%

**of firms surveyed have adopted AI as of 2022, more than doubling since 2017<sup>13</sup>**

# 3x

**more beneficiaries received social protection support during the COVID-19 pandemic in countries that had elements of digital public infrastructure in place**

## **Data use and innovation**

We help countries build the cross-cutting capabilities needed to take advantage of emerging and disruptive technologies that depend on data, and increasingly AI systems. This includes, but is not limited to, developing the governance frameworks and technological infrastructure to apply these solutions in a responsible and scalable manner, convening partnerships between industry, the research community, and governments, and developing the capacity and talent needed for countries to develop homegrown products and services. This work is done in collaboration with sectoral units across The World Bank to unlock use cases such as energy management, logistics, healthcare, education, taxation, and anti-corruption.





## A selection of our projects and results



In **Bangladesh**, we financed the development of the National Data Center (NDC), which hosts systems, applications, and services for more than 200 government departments. The NDC will be enabled in the form of a government cloud to provide on-demand support to public sector service providers under a subsequent ongoing project. We also supported development of the National Enterprise Architecture and the Government Interoperability Framework to provide whole-of-government policies, standards, and guidelines used by more than 50 percent of government agencies for their system development and public service delivery. These investments have resulted in more than 20 percent cost savings for the beneficiary agencies' digital investments since 2019, and now forms the technology foundation for the country's Smart Bangladesh vision.



In **Moldova**, through the Governance e-Transformation Project, we helped modernize the Government's shared data infrastructure towards cloud computing (known as 'M-Cloud'). The M-Cloud provides core processing, storage, virtualization, and a suite of shared service delivery platforms such as secure authentication, e-signature, data exchange, and e-payments among others. The Project also supported more than 36 ministries with migrating to the M-Cloud, which helped them both develop better digital services and improve security of critical information infra-

structure. This has helped the country rise significantly in key digital government indicators, such as a doubling of its UN Online Service Index score from 36 percent in 2012 to 74 percent in 2022.



In the **Philippines**, we advised the government as it rolled out its first national digital ID system in 2021. As of March 2023, 77 million Filipinos have enrolled for a digital ID, more than 80 percent of the target population. More than 8 million registrants opened bank accounts at the same time as registration through an innovative co-location approach that was designed with the Bank's support. Technical assistance and financing are now being provided to integrate the digital ID into the delivery of social protection, learning from the experience during the COVID-19 pandemic that paper-based application processes became a significant bottleneck for the delivery of social assistance.



In **Gabon**, we are supporting the development and adoption of a common interoperability framework as part of the e-Digital Gabon Project to govern secure data exchange across the public sector. To improve how services are accessed and delivered, the Project is also developing an interoperability platform (IoP) that will allow government agencies – and eventually the private sector – to seamlessly access data held in official databases, with data protection safeguards.

# Global Knowledge and Analytics

## National Data Governance and Ecosystem Assessments

MENATech Data Ecosystem Assessment and Case Studies in Jordan and Morocco: The Data Ecosystem Assessment methodology provides a comprehensive diagnostic of a country's cross-cutting data governance. It is the basis for a Global Data Regulation Diagnostic that is currently under development. The case studies in Jordan and Morocco offer examples of how these countries have made substantial progress in developing their data governance but also on the challenges that lie ahead for them to reach the next level.

Unraveling Data's Gordian Knot: Enablers and safeguards for trusted data sharing in the new economy: This report examines how countries are approaching data governance by drawing on the experiences of India, Estonia, Singapore, Mauritius, Chile, Uruguay, and Mexico, as well as the experiences of governing open banking in the financial sector (drawing extensively from the experiences of the United Kingdom and Australia) and health sector data sharing (drawing from a range of government responses to the COVID-19 pandemic).

## Government Cloud Strategies and Data Sharing Platforms

Government Migration to Cloud Ecosystems: Multiple options, significant benefits, manageable risks: This report disentangles the challenges and misconceptions governments face in transitioning systems and data to the cloud. It offers practical advice for policymakers, drawing on case studies from Denmark, Israel, Moldova, Nigeria, Singapore, and the United Kingdom.

National Digital Identity and Government Data Sharing in Singapore: A case study of Singpass and APEX: This case study, developed in partnership with the Singapore Government Technology Agency, provides a detailed look at how Singapore designed its world-leading national digital identity and whole-of-government data sharing platform, as well as the linkages between the two and the use cases they power.

## Global Datasets

Global ID4D Dataset: This is the seminal dataset for understanding the coverage and characteristics of ID systems around the world. Without official IDs, people face barriers to accessing basic services and the economic opportunities being created by the digital economy. The latest edition estimates there are 850 million people around the world without any form of official ID, most of whom are in Sub-Saharan Africa and South Asia.







# Digital Safeguards

## Development Challenges

As digital transformation advances, individuals, businesses, and governments are increasingly vulnerable to cybersecurity risks. With the provision of essential goods and services such as energy, banking, water, and healthcare becoming more reliant on digital technologies, the impact of cyber incidents is increasing significantly. Geopolitical tensions are further fueling the global cyber threat landscape and cybercrime is also becoming increasingly industrialized, as illustrated by the exponential growth of the lucrative “ransomware-as-a-service” business model.

In this context, developing countries stand out as particularly vulnerable, as they often need to strengthen institutional capacity and technical know-how to prevent, respond, and recover from cyber incidents, and to effectively protect the data that fuels their digital transformation, including the personal data of their citizens. According to the latest ITU Global Cybersecurity Index, 23 countries in Africa, 14 countries in Latin America and the

Caribbean, and 11 countries in Asia-Pacific still do not have a national Cybersecurity Incident Response Team (CIRT), as shown in Figure 3. In contrast, most developed countries have established networks of CIRTs at the national and even sectoral level. The total economic cost of cybersecurity breaches in 2020 was about 4-6 percent of global GDP.<sup>14</sup> From 2019–2023, approximately \$5.2 trillion in global value will be at risk from cyberattacks. Alongside a rise in cybercrime, attempts to disrupt critical technology-enabled resources and services will

**The total economic cost of information and technology asset security breaches in 2020 is estimated around**

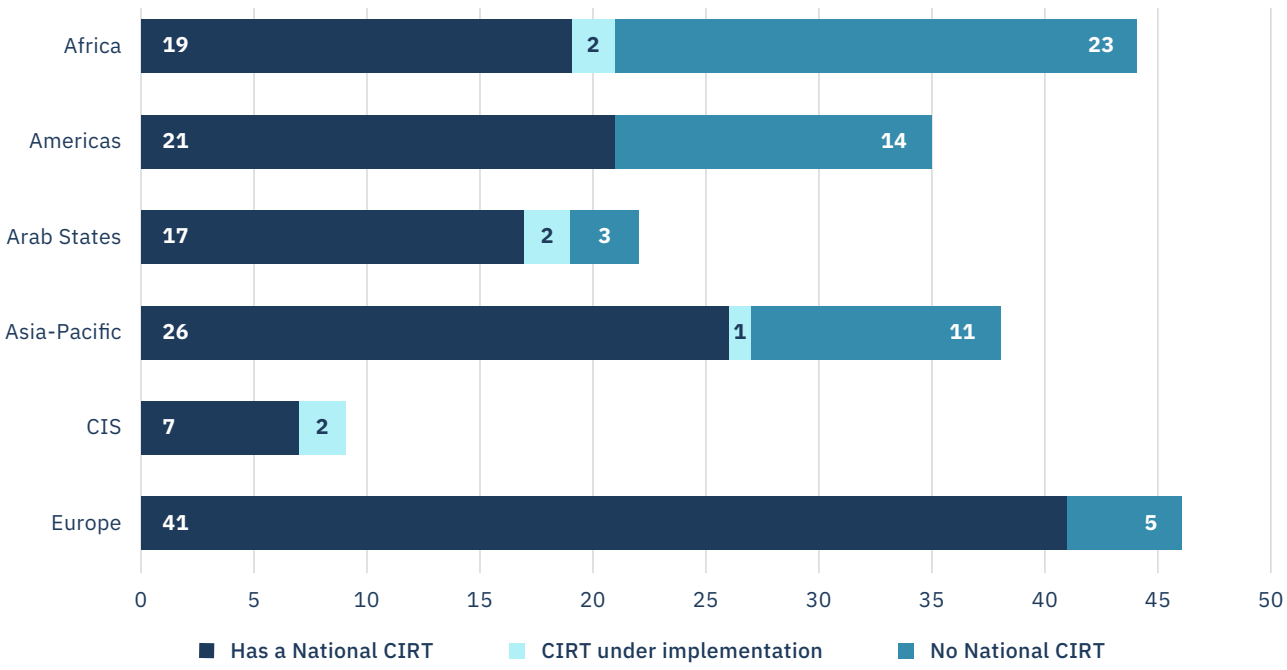
**4-6%**

**of global GDP<sup>15</sup>**





**Figure 4:** Number of countries with a National CIRT among countries surveyed in 2020



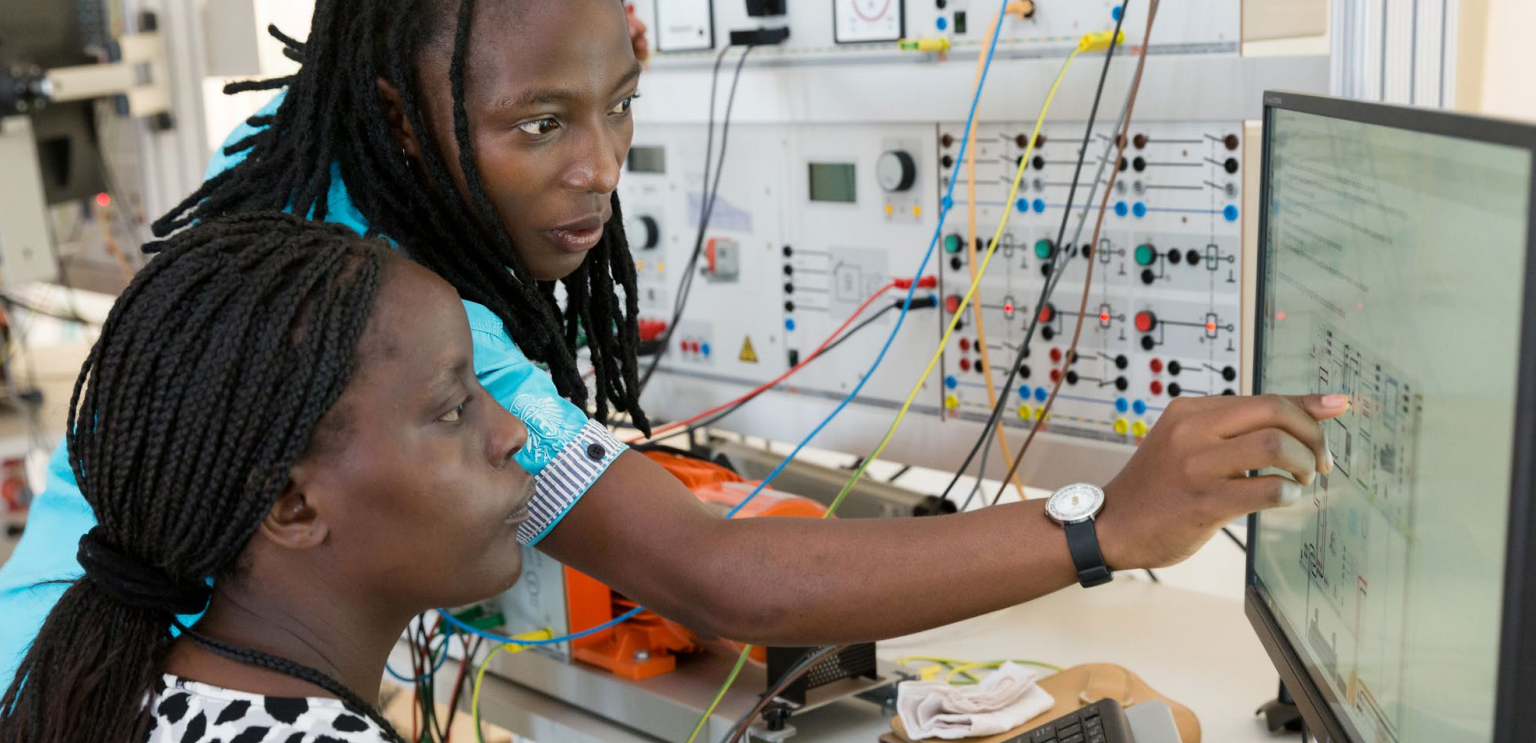
Source: Global Cybersecurity Index 2020 (Published June, 2021)

become more common and costly, with developing countries most vulnerable.

The scale and impact of cyber incidents affecting low- and middle-income countries has been rapidly escalating. A few examples from 2022 are illustrative. The government of Costa Rica recently fell victim to multiple waves of crippling ransomware attacks. The cyberattacks hit more than 30 public institutions, caused major disruptions to the functioning of essential government services, and led to more than US \$125 million of losses in just a few days, as the government was forced to shut down the IT systems used for taxes, customs,

and for controlling imports and exports. The government of Albania also fell victim to a wave of sophisticated cyberattacks, which targeted public agencies and e-government websites, rendering basic public services such as tax declaration and customs unavailable. The Electricity Company of Ghana (ECG) recently fell victim to a ransomware attack, which disrupted access to electricity in the country for several days. The small Pacific Island of Vanuatu was also targeted by a ransomware attack, which disrupted the provision of essential public services such as police hotlines for weeks. These cyber incidents – and their economic and





social consequences – demonstrate that digital transformation, while bringing tremendous development benefits, also comes with significant risks that need to be managed effectively.

The utilization of data – including personal data – can provide tremendous development benefits, including for key public services such as education, healthcare, and social security. However, without adequate safeguards, it can also infringe on fundamental rights such as privacy and undermine overall trust in digital technologies. With cross-border data flows becoming an integral part of international trade and new data-driven digital business models, the need for safeguards is even further underscored. Developing countries need to develop strong legal frameworks for data protection and put in place empowered public authorities to ensure their implementation and effectiveness. At the same time, it is important to

find a balance that allows for public and commercial use of data to drive innovation and development of vibrant, local data-driven industries, applications, and services while protecting personal data.

# 91%

**of the leaders surveyed by the World Economic Forum for its 2023 Global Cybersecurity Outlook considered that “a far-reaching, catastrophic cyber event is at least somewhat likely in the next two years.”<sup>16</sup>**



## How we support countries

We help developing countries build robust cybersecurity and data protection frameworks, infrastructure, institutions, and capacity to enable digital transformation while safeguarding against risk and ensuring trust in online transactions. Our cybersecurity support is civilian in nature, intended to protect developing countries' individuals, businesses, governments, and their critical infrastructure and economies from attacks and financial loss. We support countries through our knowledge and analytical products, technical assistance, and investments across the following workstreams:

### Cybersecurity Safeguards

#### Cybersecurity Governance and Institutions

We support countries in establishing clear and comprehensive cybersecurity governance structures and the corresponding physical and institutional infrastructure to support effective implementation. This includes development of good practice legal and regulatory frameworks for cybercrime and cybersecurity. We also support countries with the development of national cybersecurity strategies and financing for corresponding implementation plans as well as development of the institutional capacity of cybersecurity authorities and regulators.

#### Cybersecurity Risk Management and Critical Infrastructure Protection

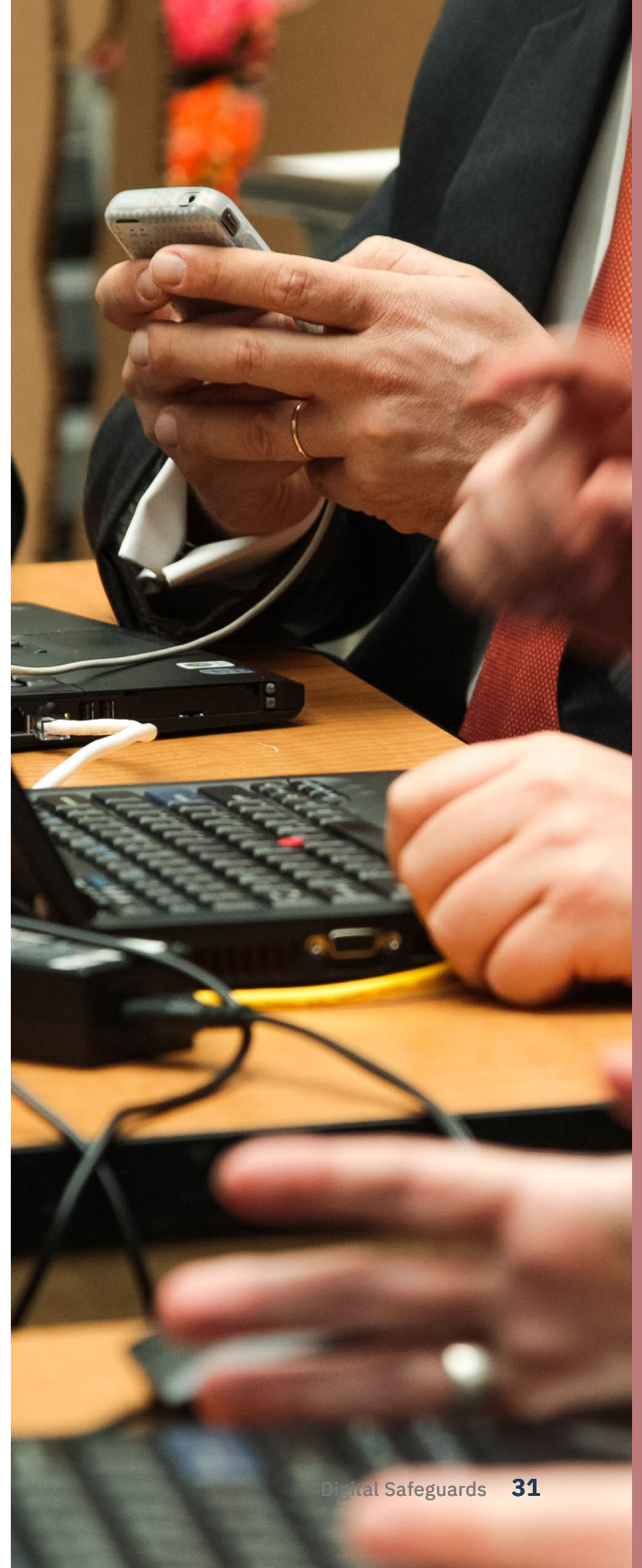
We support governments in managing cybersecurity risks at national, sectoral, and organizational levels by helping them identify the probability and potential consequences of such risks, then implementing mitigating measures to effectively address them based on established tolerance levels. This includes identification of national critical infrastructure – the assets, systems, and networks considered vital to national economic security, national public health or safety, security, or a combination thereof – and establishment of regulatory and capacity building measures and investments to manage and protect it.

### **Cyber Incident Response**

We support the development of national capabilities to prepare for, prevent, detect, mitigate, and respond to major cybersecurity incidents. This includes comprehensive support to countries in strengthening their national incident response teams, such as CIRTs (hardware, software, procedures, personnel, training, etc.). We advise on establishing contingency plans for cybersecurity crisis management, business continuity, and disaster recovery. We also support the promotion of information sharing among relevant stakeholders to help countries identify potential cybersecurity threats and risks in a timely manner. We finance countries' cybersecurity simulations, drills, and exercises to prepare for and effectively respond to potential incidents.

### **Cybersecurity Skills Development and Awareness Raising**

We support a wide range of training programs, curriculum development, and industry-academia partnerships to address the growing cybersecurity skills gap in developing countries. The programs are designed to help grow a local cybersecurity-skilled labor force and talent pool to serve both government and the private sector as well as to increase participation and cybersecurity job opportunities among female and minority professionals. We also support cyber awareness campaigns, both for the public sector and the population at large.







## Data Protection Safeguards

### Data Protection Governance and Institutions

We provide governments with advice and financing to adopt good practice data protection legislation as a foundation for establishing a trusted online environment. We also support establishment and capacity building of data protection authorities, including strategic and operational planning and development of regulatory frameworks, guidelines, and enforcement mechanisms.

Once a data protection authority has been established, we support and finance its technical and operational activities as a data regulator. This includes assistance for the implementation of data protection risk assessments, registering the country's data controllers and processors, investigating complaints, and publishing decisions.

### Data Protection Skills Development and Awareness Raising

Many developing countries are starting their data protection journeys or preparing to do so, with data protection officers needed across government agencies and in the private sector. We provide financing for comprehensive training programs to create and nurture a cadre of data protection officers across public, private, and civil sectors, for instance through establishing relevant specializations at law schools in local universities. We also support awareness campaigns for businesses and the wider public to increase understanding of data privacy and data management rights, expectations, and requirements.

## A selection of our projects and results



In **Rwanda**, under the Digital Acceleration Project (RDAP), we are supporting the operationalization and capacity building of two newly established digital safeguard agencies, the National Cybersecurity Authority (NCSA) and the Data Protection Office (DPO) with US\$20 million in investments. We are supporting the Rwandan NCSA and DPO in all manners of support that new agencies might need – from foundational governance documents to technical and operational investments including hardware, software, and services, as well as training programs for their staff and public awareness campaigns. Recently, 75 Rwandan public sector officials received training to obtain an industry standard cybersecurity certification, CISSP. Large-scale investments are being made into strengthening the incident response capabilities of the Rwandan Computer Emergency Response Team (Rw-CERT) and national skills development programs.



In **Ghana**, we are supporting the newly established Cyber Security Authority (CSA) with implementation of the recently adopted Cybersecurity Act (2020). As part of the Ghana Digital Acceleration Project, US \$12 million are dedicated to strengthening digital safeguards and cybersecurity institutional capacity building. This includes financial support and technical assistance for the establishment of sectoral CIRTs, including in

the healthcare sector, as well as for cybersecurity skills development for operators of critical activities. The project also supports Ghana's multi-stakeholder and whole-of-society approach to cyber resilience, including development of a cybersecurity culture through awareness-raising campaigns and programs to nurture an ecosystem of cybersecurity specialists to serve both private industry and the public sector.



In **Bangladesh**, we are supporting increased efficiency and cybersecurity of digital government through the Enhancing Digital Government and Economy Project (EDGE). The project supports the e-Government Computer Incident Response Team (BGD e-GOV CIRT), which receives, reviews, and responds to computer security incidents and activities in Bangladesh while collaborating with international partners to secure the national cyberspace. As a result, the e-GOV CIRT has been monitoring and responding to cybersecurity incidents in the government's ICT infrastructure and has resolved 70% of all reported incidents (out of a total of 1,246) in under 2 hours. It has also conducted 67 training sessions in 2021, with over 1,800 trainees from government, the private sector, and academia.



## Global Knowledge and Analytics

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### Sectoral Cybersecurity Maturity Assessments

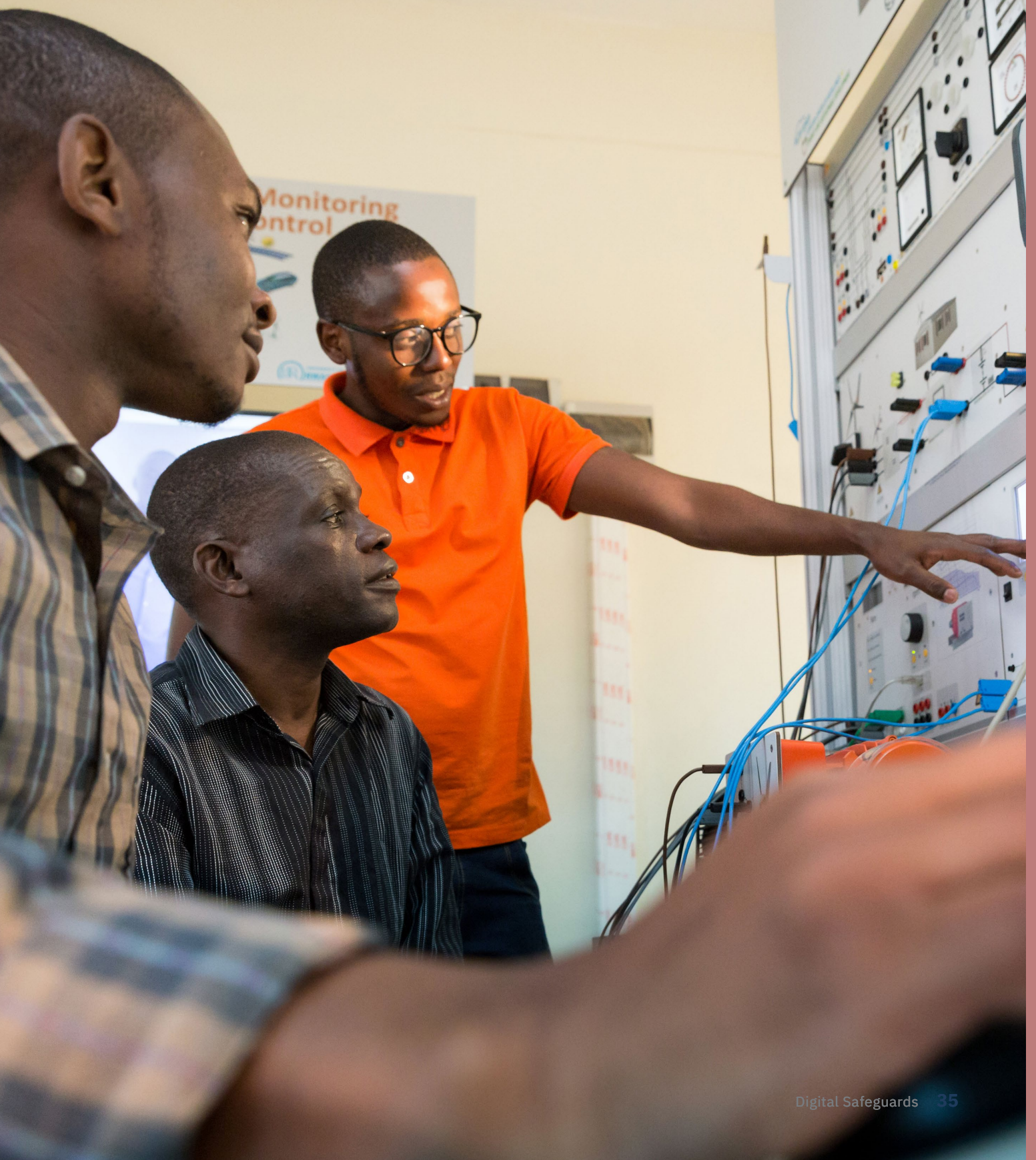
Jointly with other GPs, we support countries in conducting maturity and resilience assessments in critical sectors of the economy, including through the development of a new methodology and country pilots in collaboration with Tel Aviv University. The Sectoral Cybersecurity Maturity Model (SCMM) expands the breadth and depth of a traditional cybersecurity risk assessment and evaluates a sector's overall cybersecurity posture. Four pilot projects were conducted in: 1) Georgia, focused on the Health sector; 2) Sierra Leone, focused on the Digital Infrastructure and Telecommunications sector; Tajikistan, focused on the Energy sector; and 4) regionally in West Africa, focused on the Financial sector.

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### Cyber Knowledge Sharing Program

We have an active knowledge sharing program that provides an opportunity for developing countries and global cyber experts and practitioners to exchange views about cybersecurity trends, good practices, challenges, and cost-effective solutions. These knowledge sharing events also help developing countries to participate in a multi-stakeholder approach to cyber capacity building and develop connections with public and private sector organizations, academia, and civil society.











# Digital and Climate

## Development Challenges

Climate change is accelerating amid the greatest information and communication revolution in history. Digital technologies have become prevalent in all aspects of economic and social life, changing the way production and consumption take place, and yielding significant potential for shaping climate change action. Unchecked, climate change poses huge risks to countries' long-term development, growth, and stability, particularly to developing countries. Climate change disproportionately affects the poorest and most vulnerable populations, threatening to push as many as 130 million people into poverty by 2030 and causing 200 million to migrate by 2050, according to the World Bank's 2021 Groundswell report.

The targets of the 2015 Paris Agreement on Climate Change will not be reached at the present level of effort and investment. Accelerating the pace will depend, among other things, on technological innovation, much of which will be powered by digital technologies. Digitalization can help nations fight climate change by enabling novel solutions and greater efficiency in a wide

range of practices, processes, and services. The importance of technology-focused climate action is aligned with climate strategies of developing countries with 64 percent of the Nationally Determined Contributions (NDCs) referencing digital technologies for climate change adaptation or mitigation. However, digital technologies are beyond the reach of many of the people and countries who need them most.

Alongside benefits, digital technologies carry climate costs as well, stemming from the use of energy (often from carbon-intensive sources) and resources to build, power, and dispose of digital

# 20%

**reduction in greenhouse gas emissions by 2050 is possible due to digital technologies<sup>18</sup>**



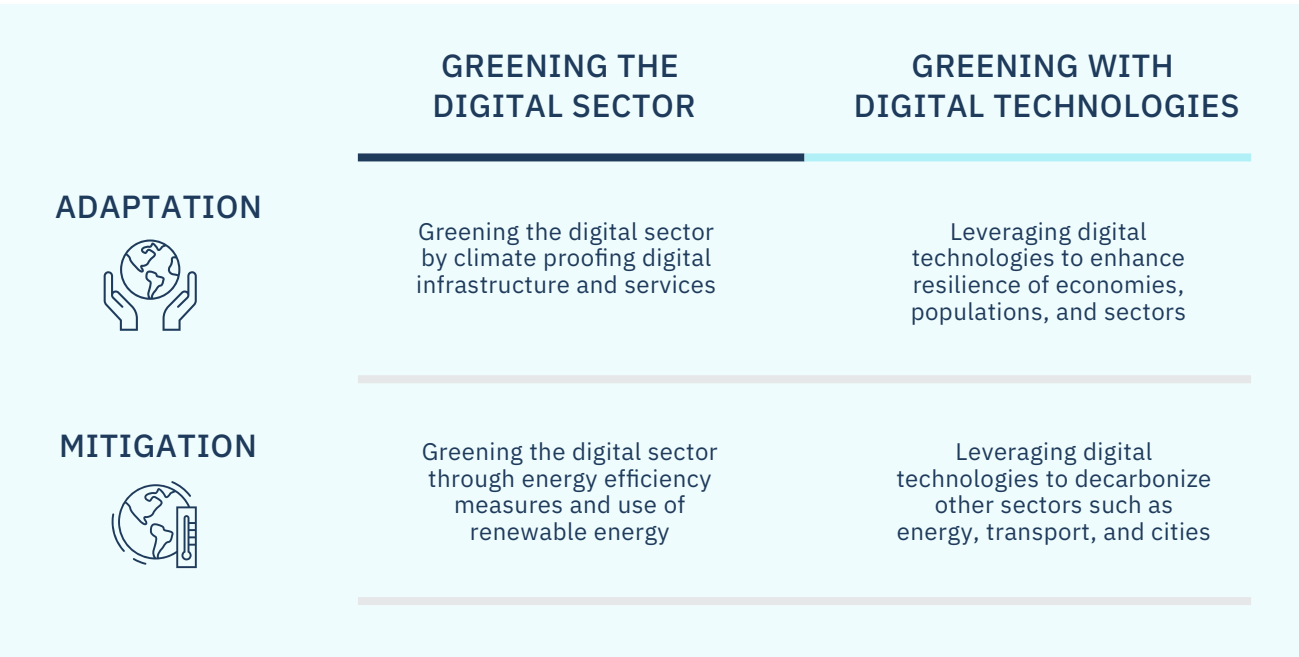


infrastructure, devices, and components. Carbon emissions from the sector range from 1.5 percent to 4 percent of global emissions, similar to that of the airline industry. To contribute proportionally to the reduction of global warming commitments agreed in the Paris Accords, the ITU estimates that total emissions from the telecommunications sector alone must be cut in half by 2030. This challenge is even greater given rapid growth and investment in the industry needed to meet rising global demand and universal access goals. The development challenge is therefore, how to close the digital

divide and harness the power of digital technologies in a way that is green and sustainable.

A green digital transformation can help countries adapt effectively to the impacts of climate change and create greener growth pathways as economies digitize. This means combining a focus on digital transformation and inclusion with a strategic and sustainable use of digital technologies to address climate change.

**Figure 5:** The Green Digital Nexus



## How we support countries

We work with countries and global partners in promoting a green and digital transformation. Through our analytical work, technical assistance, and financing, we provide countries with tailored support to address challenges and harness opportunities at the nexus of digital technologies and climate change. Our support for countries is organized across four themes that form the green-digital nexus:

### Greening the Digital Sector

#### **Climate resilient digital infrastructure and services**

Digital infrastructure is increasingly susceptible to climate risks, including flooding, powerful storms and winds, water scarcity, and extreme heat. Damage to digital infrastructure disrupts connectivity and datacenters, which impacts communication, banking, power grids, railways, and government services. To address these climate risks, we work with countries to integrate resiliency by design into digital infrastructure investments, including ensuring redundancy of critical networks and backup facilities to store and process critical data and systems. We work with policymakers and regulators to develop industry-wide requirements, incentives, and cooperation mechanisms to maximize overall uptime and ensure rapid recovery in the wake of disruptive climate related events and other natural disasters. We also support geospatial

and contingency planning to identify infrastructure vulnerabilities and inform site selection and specifications of sensitive digital infrastructure.

#### **Low-emissions digital infrastructure and services**

We work with countries to deploy energy efficient equipment, devices, and data informed management techniques to lower the energy demands of publicly financed networks and datacenter investments. We also support the use of renewable energy solutions to power core telecom and data infrastructure and last mile connectivity. We work with policymakers and regulators to create an enabling environment and private sector ecosystem that encourages adoption of energy efficiency, infrastructure sharing practices, and renewable energy across industry. We also look to create cross-sector partnerships between



# 45%

**of total emissions from the telecommunications sector must be cut by 2030 to contribute proportionally to the reduction of global warming commitments agreed in the Paris Accords - ITU<sup>19</sup>**

the telecom and energy sectors to jumpstart development of the local renewable energy industry. Finally, we support countries with adoption of e-waste management frameworks and management practices to mitigate the rising climate and wider environmental impact of digitization.

## **Greening with Digital Technologies**

### **Digital technologies and data for enhanced resilience**

Based on the Global Climate Risk Index 2021, eight of the ten countries most affected by extreme weather events were low- and middle-income economies. Geographically, many of these countries are exposed to rising temperatures and increased flooding, as many lie at low elevation and have densely populated coastlines or riverine zones.

Since digital technologies can be part of the solution for the gradual effects of climate change, as well as climate shocks, we work with countries to leverage these technologies to enhance predictive analytics and to build adaptive capacity before, during, and after climate shocks. We also support migration toward a data and digitally enabled services driven economy and jobs as a means to promote economic diversification and resilience and to reduce dependency on climate vulnerable natural resources for growth.

### **Decarbonizing with digital technologies:**

Achieving decarbonization at scale will require innovative, data driven solutions across all sectors, underpinned by robust digital foundations to make this possible. The World Economic Forum estimates that Digital technologies can help reduce GHG emissions by 20 percent by 2050 in the three highest-emitting sectors: energy, transportation, and materials.<sup>17</sup> For instance, in the transport sector, digital technologies can accelerate the transition to electric vehicles and modal shifts in passenger transport toward less carbon intensive public transport and shared mobility solutions. They can also optimize traffic flows and contribute to digitally enabled logistics systems that enhance freight management efficiency and reduce vehicle trips. In the energy sector, smart grids powered by AI can dramatically improve network efficiency and enable the system to handle widely distributed





and variable renewable energy inputs from solar, wind, and electric vehicle batteries among others. To harness the potential of digital technologies for decarbonization, we work with countries to establish the necessary digital foundations of universal connectivity and data management capabilities. We also support direct investments in or incentives for adoption of high impact efficiency and emissions reductions use cases in key sectors,

and capacity building and knowledge exchange for policymakers and industry to increase awareness and accelerate adoption.



## A selection of our projects



In the **Maldives**, we are supporting a climate data platform that will improve analysis, information sharing, and support the government to make data-driven decisions in managing and protecting natural resources such as coral reefs. This platform will bring together many sources of climate data and facilitate easier data-sharing and re-use across public, private, and non-governmental entities. For this to happen, we are working with the government to put in place the necessary policies, laws, regulations, institutional frameworks, and digital infrastructure.



In **Cameroon**, we are helping the government develop digital agriculture management information systems to effectively collect, process, and disseminate agricultural data to map populations vulnerable to climate variability, which will be used to provide timely disaster information and early warnings. This project will also support development of an information platform for animal health improvement, helping the sector with early detection of disease outbreaks, including climate-sensitive zoonotic diseases. The project will develop an e-waste management strategy to reduce the digital sector's carbon footprint.



In **Mozambique**, we are supporting the government with investment in renewable energy powered broadband services for government offices, schools, and health centers and adoption of standards for network resilience and efficiency across the telecoms industry. We are also supporting joint deployments of home solar systems and renewable energy powered mobile networks covering up to 1.3 million individuals in rural communities.



In **Sierra Leone**, we are supporting a data-driven early warning system to help the country to better predict, prepare for, and respond to severe weather events and natural disasters, as well as manage e-waste. In particular, we are supporting multistakeholder capacity development workshops to adopt a Common Alerting Protocol (CAP) standard, and the development of an e-waste management policy framework based on a circular economy approach.



In **Peru**, we are supporting the development of a centralized emergency response system, including physical infrastructure, platform, and protocols. The project tackles both climate change mitigation and adaptation by building infrastructure that adheres to international energy efficiency standards and increases the capacity for climate-related disaster response.

# Global Knowledge and Analytics

## Green Digital Transformation Notes and Toolkits

**Catalyzing the Green Digital Transformation in Low- and Middle-Income Economies:** This report proposes a path toward low-emissions applications of digital technologies to help countries mitigate and adapt to climate change and to achieve the goals of the 2015 Paris Agreement. The report examines how to increase synergies between socioeconomic development goals, climate change policies, and digital technologies, offering guidance on how government institutions and private organizations in the digital field can make the transition to a green, resilient, and inclusive future.

**Practitioner's Guide on Climate Resilient Network Infrastructure:** This report provides guidance on how to build climate resilient telecom infrastructure, including recommendations for improving resilience as part of project design, preparation, and implementation stage.

**Practitioner's Guide for Greening Telecom Network Infrastructure in Developing Countries:** This toolkit provides guidance on how to achieve GHG emissions reduction from the telecom network, including through energy efficiency and renewable energy options.

**Practitioner's Guide on Green Data Infrastructure:** This toolkit provides guidance on designing and implementing green data infrastructure and includes recommendations on the resiliency and energy efficiency of this infrastructure.









# ICT Industry and Digital Jobs

## Development Challenges

A thriving local ICT Sector in low- and middle-income countries is central to digital transformation, and critical for driving deployment of digital infrastructure, provision of IT and IT enabled services, and development of locally relevant digital applications and content. It is both the beneficiary and driver of digital inclusion. The ICT industry supports technology adoption by local firms and individuals and provides digital tools, content, and innovations targeted at local communities and local challenges. This helps increase the value proposition of getting populations online that are not always well served by global technology firms headquartered in digital hubs beyond their borders. It can also be an important engine for growth, job creation, and innovation. Historically, value-added growth in the IT services sector averaged 7.8 percent from 2000-2018, surpassing all other sectors and significantly higher than the 5.3 percent overall global growth rate. Digital applications and job-matching platforms are increasingly creating opportunities for low and

high skilled remote work for multi-national firms, without the need for migration and resulting brain drain which robs developing countries of talent and the related economic and knowledge spillovers in the local economy.

Digital skills is one of the biggest drivers of development of the ICT sector and uptake of digital jobs. While the shortage of digital skills is prevalent worldwide, it is most severe in low- and

# 7.8%

**average value-added growth in the IT services sector from 2000-2018, surpassing all other sectors and significantly higher than the 5.3% overall global growth rate**



middle-income countries. While there are pockets of excellence, most traditional education systems in developing countries are not producing enough graduates with advanced digital skills needed to support a thriving ICT industry, and the graduates they do produce are often not equipped with the real world, job-ready technical and socio-emotional skills in demand from industry. Likewise, low levels of digital literacy, intermediate digital skills, and relevant language and socio-emotional skills hold back the potential and competitiveness of export-oriented knowledge and business process outsourcing firms and associated job opportunities.

Resolving the digital skills gap alone will not automatically foster development of the sector. The overall enabling and business environment and broader ecosystem plays an equally important role. This includes policy and regulation, particularly with respect to the telecommunications sector and data governance, size of the local B2B, B2C, and B2G markets, access to finance, and access to and integration with global digital markets. Other key elements include local government procurement opportunities in ICT and ICT-enabled services, taxation and administrative compliance requirements, the presence or lack of investment incentives for digital firms and startups, visas and work permits for digital talent and entrepreneurs, and intangibles such as culture and overall quality of life to attract digital nomads and investors as well as to retain domestic digital talent. The development of local ICT hubs also requires clustering of a critical mass of complementary



# 12

**indirect jobs are created for every one job created in ICT services<sup>20</sup>**

# >6%

**of global GDP was accounted for by the ICT sector and more than 2 percent of employment in 2022<sup>21</sup>**

and competing firms and suppliers of digital infrastructure, equipment, services, and skills to create the economies of scale, network effects, and knowledge spillovers critical for success.



## How we support countries

Our support for governments to develop their local ICT industry and digital jobs markets is focused on the development of firms and industries, including export-oriented ICT-enabled service industries, and the development of skills for digital jobs.

### Development of ICT/ICT-enabled services firms and industry

A robust local ICT industry is a foundational aspect for development of a digital economy. We support countries to establish a vibrant enabling ecosystem consisting of IT parks (both physical and virtual), local venture funds and grant mechanisms to enhance access to capital, setup of industry associations, and development of comprehensive government policies and incentives schemes for local ICT industry development. We use a comprehensive framework for industry development that is based on a four-pronged approach which includes building skills, establishing financial mechanisms to support nascent industries, investing in research and development, and attracting investment by “anchor” IT/Tech firms. To support execution, we assist governments to design national ICT industry development strategies that cover relevant policy, legal, and regulatory frameworks around key areas such as foreign trade, education, tax, telecommunications and data regulation,

information security, and intellectual property (IP) protection. We also support governments to upgrade the enabling infrastructure critical to the sector, including data infrastructure, utilities, and transportation links. To support governments with strengthening the local business environment, we also help establish and assist ICT industry investment promotion agencies with capacity building, market intelligence, and incentives to attract investment by technology and ICT-enabled services firms.

# 2/3

**of global venture capital investments have gone to the ICT sector and firms with digital business models in 2022<sup>22</sup>**



### **Development of Export-oriented ICT-enabled service industries**

Linked with efforts to promote development of the domestic market, we also support development of export-oriented ICT-enabled services industries. This includes conducting a comprehensive location attractiveness analysis, including an assessment of local skills, infrastructure, risk profile, and other aspects of the enabling environment. Based on these assessments, we provide recommendations and financing for attracting and growing export-oriented Business Process Outsourcing (BPO), Knowledge Process Outsourcing (KPO), and IT Outsourcing industries (ITO).

### **Development of digital skills and creation of a skills-to-jobs pipeline**

To support digital skills and uptake of digital jobs we help countries develop industry-specific training programs including language and accent skills for IT jobs, quality certifications, development of national skills databases, upgrading relevant secondary and tertiary educational infrastructure and curriculums, promoting linkages between academia and industry both locally and globally, and development of programs and incentives to attract private sector providers of digital skills. Our support includes a focus on helping governments design mechanisms and incentives for creating employment among vulnerable and marginalized groups in ICT and ICT-enabled jobs.

## A selection of our projects and results



In **Armenia**, the e-Society and Innovation for Competitiveness Project helped drive development of knowledge and technology-intensive industries in the country from 2010-2016, yielding a more digitally connected society, innovation, and investor confidence in the ICT industry. The World Bank's investment supported the creation of a comprehensive ecosystem for industry development. This included the establishment of the country's first Venture Fund and a grant scheme which provided access to finance for ICT startups and firms and helped build their capacity and ability to compete in international markets. The venture fund leveraged over US \$15 million in private capital to complement the public contributions. Global market access was strengthened through the establishment of industry representation offices in Silicon Valley. Two regional innovation and acceleration centers were created in Gyumri and Vanadzor, achieving full occupancy at the end of the project and shifting opportunities out of the capital to help create new jobs in the regions. The project has changed the ICT landscape of Armenia, and impacted its international reputation in this sector, with over 16,000 people becoming trained and certified and over 12,000 jobs created in the ICT and ICT-enabled industry over the 5 year project lifecycle.

# 16,000

**Armenians trained and certified over the 5-year project life cycle**

# 12,000

**jobs created in the ICT-enabled industry**





In **the Caribbean region**, the Caribbean Digital Transformation Project has since 2020 been stimulating

both the demand and supply side both the demand and supply side of the ICT jobs ecosystem by supporting both the development of intermediate and advanced digital skills of individuals as well as supporting local firms to incorporate greater use of digital technologies and services in their core businesses. This project has undertaken a digital skills assessment at the regional and global level to identify advanced and intermediate skills that are in high-demand in the digital ecosystem, to inform the selection of specific digital skills development trainings and certifications – for example, big data analytics, AI, cloud services, digital marketing, and content development – to be delivered in the Commonwealth of Dominica, Grenada, Saint Lucia, and Saint Vincent and the Grenadines. In addition to supporting digital skills development, this project also stimulates domestic demand for digital talent through a technology adoption program to enable digitalization of domestic businesses utilizing management training courses and a matching grant component to support participating firms invest in adopting digital technologies and developing digitally enabled jobs in their organizations. Finally, this project also includes a “matchmaking” element, connecting individuals being trained to these domestic businesses, as well as to global remote-work opportunities, in turn developing a skills-to-jobs pipeline for the domestic digital talent pool.



In **Ghana**, the E-Ghana Project, which was completed in 2014, generated sector growth and employment by leveraging public-private partnerships to help develop

the ICT-enabled services industry. The project financed development of BPO skills standards and implementation of a ‘train the trainer’ program that allowed massive outreach and upskilling of the labor force to support entry into the BPO industry. To support institutional development, this project financed the establishment of GASCOT, the first professional BPO industry association in Ghana, and the establishment of an Office responsible for public-private cooperation. An in-depth analysis of Ghana’s competitiveness and location attractiveness using some of our diagnostic tools for assessment has put Ghana into prominent position in the global location attractiveness index. The project contributed to the increase in jobs in the business processing sector from 2,000 in 2006 to over 8,700 by 2011, with a high percentage of the jobs being held by women. The growth rate of the ICT sector during the same period was 23.3 percent compared to the 8.1 percent of growth experienced across other sectors.

# 335%

**increase jobs in the BPO sector from 2,000 in 2006 to over 8,700 by 2011, with a high percentage of the jobs held by women**

# Global Knowledge and Analytics

## Location Attractiveness Index

In collaboration with McKinsey, we have developed a robust framework for assessing location attractiveness for ITO, KPO, and BPO industries to help policymakers take advantage of the opportunities presented by the global ICT services and ICT-enabled services industry. The framework enables analysis of factors crucial to a country's ICT and ICT-enabled industry competitiveness including skills, cost, infrastructure, and the business environment. Using this tool, we've carried out assessments in more than 10 countries to help governments understand where they stand in terms of key indicators so that they can better navigate policy options for enabling growth in ICT industries.

## The Global Online Gig Jobs Study

In collaboration with the World Bank's Jobs Group, this report provides an assessment of recent trends in online gig work, a database of large local, regional, and global platforms for online work – highlighting those based in developing countries as well as non-English platforms – an assessment of drivers of demand, key operational insights for implementing programs to encourage gig work opportunities for vulnerable populations, and a policy roadmap for governments to leverage the gig economy to create more job opportunities while at the same time avoiding risks associated with this new form of work in the digital era.











# Accelerating Digital Use Across Sectors

Building upon our primary business lines and the corresponding digital foundations and accelerators, we support our partner global practices to accelerate the deployment of digital technologies and utilization of data to drive innovation, increase operational efficiency, and develop more accessible, user-friendly, and productive digital products, services, and other use cases across other sectors.

## How we coordinate and partner with other Global Practices (GPs)

### **Coordination and Advocacy**

Partnering with other GPs to establish and execute a shared vision and cohesive implementation framework for digital transformation initiatives supported by the World Bank Group at national, regional, and global levels.

### **Accelerating Digitalization in Key Sectors**

Supporting our partner GPs in accelerating the development of sector-level digital strategies and roadmaps, data architecture, institutional capacity development, big data analytics including

AI informed policymaking, and rollout of high-impact priority digital initiatives, services, and use cases.

### **Collaboration through Joint Projects and Analytics**

Collaborating with our partner GPs in specific projects with digitally-enabled use cases, pairing sector domain knowledge in areas such as agriculture, health, and energy with digital technology and data expertise.



# Our Partnership Platforms



## Digital Development Partnership

Established in 2016, the Digital Development Partnership (DDP) was founded as a partnership between the World Bank and public and private sector partners to help developing countries accelerate sustainable, resilient, and inclusive digitalization. DDP's support of analytical and advisory services help shape the global digital agenda and support countries in the formulation and execution of their digital transformation strategies, underpinned by significant World Bank Group development financing. Strategic priority areas have included broadband connectivity, data infrastructure development, telecommunications and digital market policy and regulation, data protection and cybersecurity, development of digital industries and jobs, digitalization of public sector operations and services, digital skills and inclusion, and mainstreaming of digital applications and services across sectors.

Since its inception, the DDP portfolio has reached a total of over \$37 million, supporting 125 activities

in more than 80 countries around the world. As of 2023, the DDP is supported by Denmark, Finland, Germany, Google, GSMA, Israel, Japan, Korea, Microsoft, the Netherlands, Norway, the Kingdom of Saudi Arabia, Sweden, and the United Kingdom.

The DDP is transitioning to a new strategy for 2024-2028. This new strategy cycle, DDP 2.0, will be

# \$37

million in portfolio

# 125

activities supported in  
more than 80 countries  
around the world



instrumental in supporting the Digital Development GP in scaling-up efforts. DDP 2.0 also reflects the GP's adjusted offering around the global Business Lines and benefits from a strengthened results measurement and an impact assessment program. The significant financial resources to be made available to low- and middle-income countries, together with the DDP-supported activities, will continue contributing to the World Bank's Twin Goals, its 2023 Evolution Roadmap, as well as the Sustainable Development Goals (SDGs).



## Cybersecurity Multi-Donor Trust Fund

The Cybersecurity Multi-Donor Trust Fund (MDTF) was launched in 2021 under the DDP Umbrella Program to provide knowledge, technical assistance, and advisory services to help build cyber and digital security capability and capacity. Activities help countries develop and implement strategies that allow them to take advantage of the opportunities of the digital age while safeguarding their infrastructure against cyber risk, leveraging lending operations for both investment needs and institutional strengthening. This initiative also supports expanding global cybersecurity knowledge and evidence and contributes to fostering global policy coherence. The MDTF is supported by Japan, Germany, the Netherlands, the United States, the Bill & Melinda Gates Foundation, Israel, and Estonia.



## ID4D and G2Px

Identification for Development (ID4D) and Digitizing Government to Person Payments (G2Px) are cross-GP sister initiatives helping countries realize the transformational potential of identification and civil registration systems and digital G2P payments as part of digital public infrastructure (DPI). Both of these initiatives harness global knowledge, cross-sectoral expertise, financial and technical assistance, and partnerships across three pillars of country and regional action: analytics, thought leadership, and global convening platforms.

ID4D has supported more than 60 countries to make progress towards inclusive and trusted ID and civil registration systems, leveraging over \$2.1 billion in active and pipeline World Bank and co-financing for implementation. Similarly, G2Px has supported more than 40 countries on the adoption or improvement of their digital G2P payments, influencing over US\$10 billion in financing. ID4D and G2Px have helped accelerate critical development outcomes such as financial inclusion, women's economic empowerment, and government fiscal savings.

Various parts of the World Bank Group are part of these initiatives, including teams working on digital development, social protection and jobs, health, governance, gender, social inclusion, financial and private sector development, regional integration, data, and forced displacement. The ID4D and G2Px MDTF partnership platform includes the Bill & Melinda Gates Foundation, the Norwegian Agency for Development Cooperation, the Omidyar Network, and the Governments of France and the United Kingdom.

## Other organizations we coordinate with on projects and initiatives

### International Telecommunications Union (ITU) and the Broadband Commission

The ITU is the United Nations specialized agency for ICTs, founded in 1865 to facilitate international connectivity in communications networks. They support allocation of global radio spectrum and satellite orbits, develop the technical standards that ensure networks and technologies seamlessly interconnect, and work to improve access to ICTs among underserved communities worldwide. Key areas of collaboration have focused on regulatory reforms, primarily through regulatory handbooks and toolkits, joint initiatives on universal access, financial inclusion, digital ID, cybersecurity, school connectivity, climate change, and device affordability. ITU and DD staff regularly speak at respective events, and coordinate activities around knowledge and training events. The ITU – jointly with UNESCO – also co-leads the Broadband Commission for Sustainable Development, which is an initiative dedicated to promoting broadband in developing countries. The World Bank has coordinated activities with various working groups of the Broadband Commission over the years, most recently smartphone affordability.

### Global System for Mobile Communications (also known as GSM and GSMA)

The GSMA has been a long-standing external partner of our GP, and one of the initial partners of the DDP. The GSMA is a non-profit industry trade body representing mobile operators and organizations across the mobile ecosystem and



adjacent industries, focusing on Connectivity for Good, Industry Services and Solutions, and Outreach. The GSMA Intelligence Unit often participates as external peer reviewers of our analytical research and reports, including the Africa Moonshot project, the Affordable Smartphones Financing report, the Africa Digital Flagship Study, and the Pathway to 5G Report, just to name a few. Other forms of engagement over the years include participating as speakers and discussants at World Bank report launch events, and as presenters in the World Bank's knowledge and training events for Bank staff and clients.

# Resources

More information can be found at:

- <https://www.worldbank.org/en/topic/digitaldevelopment>
- <https://www.worldbank.org/en/programs/all-africa-digital-transformation>
- <https://www.digitaldevelopmentpartnership.org>
- <https://id4d.worldbank.org>
- <https://www.worldbank.org/en/programs/g2px>

## Endnotes

- 1 <https://www.itu.int/itu-d/reports/statistics/2022/11/24/ff22-internet-use-in-urban-and-rural-areas/>
- 2 <https://www.gsma.com/r/gender-gap/>
- 3 <https://www.aeaweb.org/articles?id=10.1257/aer.20161385>
- 4 <https://www.itu.int/en/mediacentre/Pages/PR-2022-09-16-Internet-surge-slows.aspx>
- 5 <https://www.itu.int/itu-d/reports/statistics/2022/11/24/ff22-mobile-network-coverage/>
- 6 <https://www.gsma.com/r/gender-gap/>
- 7 <https://www.worldbank.org/en/publication/wdr2021>
- 8 <https://www.worldbank.org/en/publication/wdr2021>
- 9 <https://www.worldbank.org/en/publication/wdr2021>
- 10 <https://www.worldbank.org/en/publication/wdr2021>
- 11 <https://blogs.worldbank.org/digital-development/850-million-people-globally-dont-have-id-why-matters-and-what-we-can-do-about>
- 12 <https://oecd.ai/en/dashboards/overview>
- 13 <https://www.mckinsey.com/capabilities/quantum-black/our-insights/the-state-of-ai-in-2022-and-a-half-decade-in-review>
- 14 <https://www.weforum.org/agenda/2019/11/cost-cybercrime-cybersecurity/>
- 15 <https://policyaccelerator.unCDF.org/policy-tools/brief-cybersecurity-digital-economy>
- 16 [https://www3.weforum.org/docs/WEF\\_Global\\_Security\\_Outlook\\_Report\\_2023.pdf](https://www3.weforum.org/docs/WEF_Global_Security_Outlook_Report_2023.pdf)
- 17 <https://www.weforum.org/press/2022/05/digital-tech-can-reduce-emissions-by-up-to-20-in-high-emitting-industries/>
- 18 <https://www.weforum.org/press/2022/05/digital-tech-can-reduce-emissions-by-up-to-20-in-high-emitting-industries/>
- 19 <https://www.itu.int/en/mediacentre/Pages/PR04-2020-ICT-industry-to-reduce-greenhouse-gas-emissions-by-45-percent-by-2030.aspx>
- 20 <https://camoinassociates.com/resources/the-multiplier-effect-which-industries-are-the-biggest-job-creators/>
- 21 Digital Progress Report, forthcoming
- 22 Digital Progress Report, forthcoming





Investigación  
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