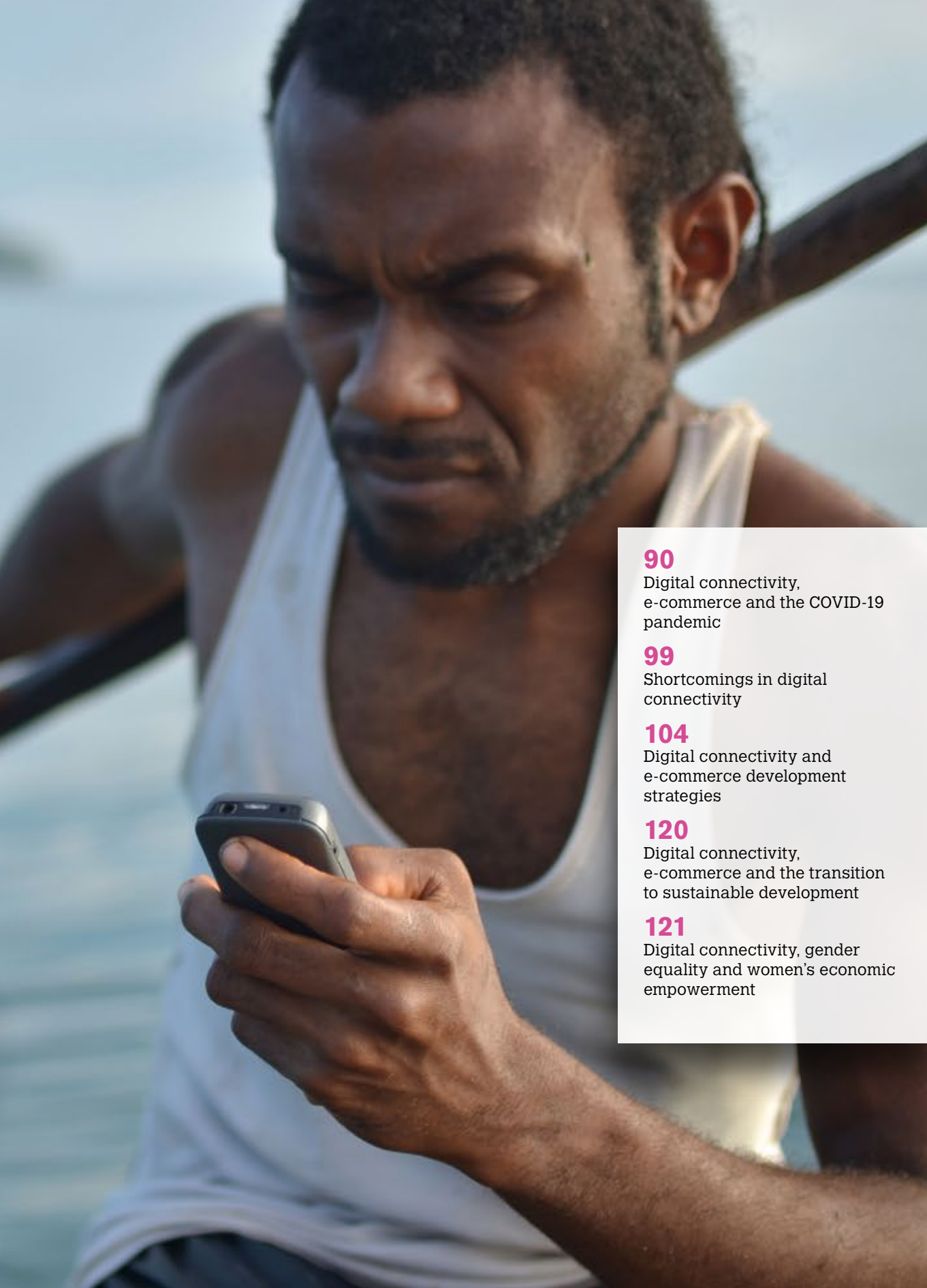


Fisherman, Malekula Island,  
Vanuatu.



**Digital  
connectivity,  
e-commerce  
and sustainable  
trade**

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Digital connectivity, gender equality and women's economic empowerment


## The COVID-19 pandemic produced a connectivity boost



**782  
million**

more people online in developing countries since 2019

### Internet use 2019-2021

-  **Africa +23%**
-  **Asia and the Pacific +24%**
-  **least-developed countries (LDCs) +20%**

 **27%** of the population of LDCs now online

### Connectivity constraints remain...



- Insufficient/uneven internet coverage
- Inadequate network infrastructure and broadband capacity
- Poor access to internet services
- Poor digital skills and IT literacy

### ... but there is growing commitment to tackle them



**80%**

of developing countries prioritize digital issues in their sustainable development strategies

### More financing available



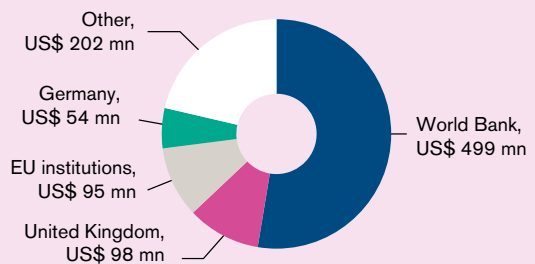
Development finance for digital activities more than tripled in 2015-2019 to

**US\$ 18.6 billion**

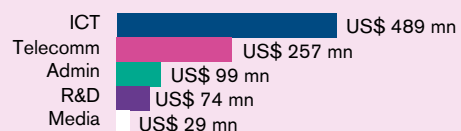
**US\$ 4.2 billion**

from private finance

### Main donors of digital financing



### Areas attracting digital financing



Information and communication technology (ICT) plays an essential role in accelerating digital connectivity and facilitating e-commerce, which can help to address the world's most pressing climate and environmental concerns. In turn, improved digital connectivity is fundamental to fulfil the promise of ICT for trade and development outcomes.

Aid for Trade stakeholders are providing more funding for digital connectivity and e-commerce programmes. Development finance for digital activities more than tripled between 2015 and 2019, with providers investing a total of US\$ 18.6 billion over this period.

The COVID-19 pandemic has prompted an unprecedented surge in digital connectivity and e-commerce growth. The pivot to e-government during the pandemic has been a key driver of this process.

However, the rapid growth in demand for digital connectivity and services has exposed shortcomings in, for example, ICT infrastructure, regulation frameworks, affordability of connection and digital skills. These factors mean the digital divide remains wide, both within and between countries.

Even though digital connectivity is widely recognized as a driver of women's economic empowerment, more than 70 per cent of respondents to a questionnaire, issued as part of the 2022 joint OECD–WTO Aid for Trade monitoring and evaluation (M&E) exercise, highlight that women face particular difficulties in accessing digital technologies.

Digital connectivity and e-commerce are areas where public–private partnerships are flourishing. In 2019, bilateral and multilateral institutions attracted approximately US\$ 700 million in private-sector financing for their digital projects. Private philanthropy mobilized an additional US\$ 4.2 billion.

However, there is still considerable scope to expand Aid for Trade financing for digital connectivity and e-commerce, in particular with regard to bilateral donors, south–south partners and public–private partnerships.

Using the responses given in the questionnaire, this chapter presents an analysis of the general trends and provides explicit examples based on the information the participants included in the questionnaire. The results of the M&E exercise have been divided into the following sections:

- digital connectivity, e-commerce and the COVID-19 pandemic;
- shortcomings in digital connectivity;
- digital connectivity and e-commerce development strategies;
- digital connectivity, e-commerce and the transition to sustainable development;
- digital connectivity, gender equality and women's economic empowerment.

This chapter also includes case studies based on work by the following international organizations:

- Asian Development Bank (ADB): ICT and economic resilience during the COVID-19 pandemic;
- ADB and International Monetary Fund (IMF): satellite observations and sustainable development outcomes;
- European Bank for Reconstruction and Development (EBRD): skills and the digital divide;
- OECD: measuring official development finance;
- United States Agency for International Development (USAID): why the gender digital divide exists;
- World Bank: digitalization and new trade opportunities.

**“Improved digital connectivity is fundamental to fulfil the promise of ICT for trade and development outcomes.”**



Using smart technology to manage sales in a small grocery, Dakar, Senegal.

## Digital connectivity, e-commerce and the COVID-19 pandemic

Digital connectivity quickly emerged as an important factor for economic resilience during the COVID-19 pandemic, as lock-down measures limited person-to-person contact. Research by the ADB (see case study) finds that countries with better ICT infrastructure recorded lower drops in economic activity (ADB, 2021).

In 2021, the International Telecommunication Union (ITU) report that a “COVID connectivity boost”<sup>1</sup> had brought an estimated 782 million additional people online since 2019 (ITU, 2021a):

“Between 2019 and 2021, Internet use in Africa and the Asia-Pacific region jumped by 23 per cent and 24 per cent, respectively. Over the same period, the number of Internet users in the least-developed countries (LDCs) increased by 20 per cent and now accounts for 27 per cent of the population.”

This surge in connectivity has positive implications for economic growth and recovery. ITU research suggests that a 10 per cent increase in mobile broadband penetration yields 1.5 per cent growth in GDP per capita (ITU, 2021b). A recent report by Google and the International Finance Corporation of the World Bank finds that the internet economy in Africa has the potential to contribute 5.2 per cent of the continent's GDP by 2025, currently valued at US\$ 180 billion.<sup>2</sup> By 2050, the value could be as high as US\$ 712 billion by their estimates.

**“A 10 per cent increase in mobile broadband penetration yields 1.5 per cent growth in GDP per capita.”**

ITU (2021b)



## Case study

### ADB: ICT and economic resilience during the COVID-19 pandemic

In a cross-country analysis the ADB investigated whether economies with stronger ICT infrastructure fared better during the pandemic (ADB, 2021). The ADB examined 117 economies (86 emerging markets and 31 advanced economies) and found that for countries with major COVID-19 outbreaks, better ICT infrastructure reduced the negative impact on GDP growth.

Overall, the results were broadly in line with their expectations and, most significantly, lent some support to the notion that countries with better ICT infrastructure have been more successful in cushioning the economic shock of the COVID-19 pandemic by shifting more economic activity online.

In an ADB blog,\* the economists responsible for the study noted that the natural policy implication is that investments in ICT infrastructure make an economy more robust in the face of pandemics and other shocks. The huge economic cost of COVID-19 highlights the huge potential benefits of such investments. In addition to reducing the cost of information and communication, ICT helps economies weather even big shocks.



\* See [https://blogs.adb.org/blog/did-internet-access-improve-economic-resilience-during-covid-19?utm\\_source=weekly&utm\\_medium=email&utm\\_campaign=alerts](https://blogs.adb.org/blog/did-internet-access-improve-economic-resilience-during-covid-19?utm_source=weekly&utm_medium=email&utm_campaign=alerts).

Government workers in Sri Lanka check financial details while following COVID-19 safety measures.



The increase in adoption of digital technologies has led to unprecedented reductions in the cost of engaging in international trade, changing both what is traded and how, contributing to growing competitiveness (López González and Sorescu, 2021). This has created new opportunities for trade for individuals and firms of all sizes in countries at all levels of development, not least in the context of tackling some of the consequences of the COVID-19 pandemic and helping economic recovery.

The M&E exercise reveals that Aid for Trade stakeholders are prioritizing digital issues in development strategies and the number of digital and e-commerce strategies is growing. The clear message is that the COVID-19 pandemic has accelerated e-commerce growth in countries at all levels of development. Responses from LDCs cite e-government as a prominent national digital economy driver. For example, Equatorial Guinea responds that the pandemic has given rise to the heyday of the digital economy and surely there is no turning back.

COVID-19 connectivity boost	
 <b>Peru</b> Internet use jumped 7 percentage points for 6-18 year olds*	<b>Colombia</b> Internet traffic increased 75 per cent* 
* Q1 of 2021 year-on-year, Instituto Nacional de Estadística e Informática.	* March 2020 to April 2021, Comisión de Regulación de Comunicaciones, Colombia.

ICT infrastructure is essential to enable working from home during the COVID-19 pandemic in Madagascar.



## E-government

Responses to the questionnaire show that the pivot to e-government during the COVID-19 pandemic has been an important driver of growth in digital economies, regardless of the level of development of the respondent (see Box 1). Several LDCs report that the move to e-government is in response to the pandemic (see Table 1 for details):

- Mali, Uganda and Zambia report how moving education services and public services online is helping their domestic digital economies to grow.
- The Democratic Republic of the Congo, Guinea-Bissau and Madagascar report that teleworking, teleconferencing and webinars have transformed the business of government.

## Box 1

### Government e-procurement and the COVID-19 pandemic

COVID-19 lockdowns have accelerated the introduction, expansion and development of government e-procurement systems. Conducting government procurement electronically offers various benefits, such as reduced administrative burden and resource savings for both procuring entities and potential suppliers, as well as greater transparency which can, *inter alia*, help to fight corruption.

The pandemic has led some governments to use digital technologies to enhance transparency, especially in the areas of data management and data visualization tools:

- Moldova has created an open data dashboard that visualizes all COVID-related e-procurement transactions.\*
- Bangladesh, with the support of the World Bank, is extending its e-procurement system to include new features to respond to COVID-19 challenges.\*\*
- Colombia, Costa Rica, Peru and Ukraine use e-tools to publish procurement data and to monitor contracts signed during the pandemic (OECD, 2020).
- Some African countries similarly introduced new measures to publish electronically (OECD, 2020):
  - information on procurement contracts exceeding a specific threshold (e.g. Chad, Eswatini, Malawi);
  - the name of the company to whom a contract has been awarded (e.g. Benin, Madagascar, Mali);
  - information on beneficial ownership (e.g. Guinea, Lesotho);
  - expenditure reports (e.g. Mozambique, Namibia, Senegal) (CABRI, 2020).

\* See [https://content.unops.org/publications/The-future-of-public-spending-Responses-to-covid19\\_EN.pdf](https://content.unops.org/publications/The-future-of-public-spending-Responses-to-covid19_EN.pdf).

\*\* See <https://www.worldbank.org/en/news/press-release/2021/02/06/world-bank-helps-bangladesh-expand-electronic-public-procurement>.



Aid for Trade donors and south–south partners also support e-government, and the area is attracting donor attention. The German Federal Ministry of Economic Cooperation and Development (BMZ), for example, is leading a multi-stakeholder public–private initiative to digitalize public administration. Through the GovStack programme, the BMZ is specifying and developing open and interoperable ICT building blocks, such as identification and authentication components for digital identities

or electronic payment services, to promote digital public goods and infrastructure.

Significant pre-pandemic work had already begun in many developing countries to build the digital economy, including in LDCs (see Box 2). Among middle-income countries, Mauritius and Peru note how public entities are accelerating the digitization of public services and processes, including to accommodate working from home.

## Box 2

### Madagascar's digital journey

Madagascar plans to become a leader in ICT services, according to Gil Razafintsalama, President of the Administrative Council of the Higher School for Information Technologies (ESTI). To fulfil this objective, Madagascar has put in place a nation-wide digital transformation process to establish its e-government mechanism, digitalization of administrative procedures and provision of affordable internet to the public.

Digital services already employ around 23,000 formal workers and 85,000 informal workers in sectors such as web development, writing, translation and graphic design, among others. The sector's turnover amounts to nearly US\$ 417.5 million, shared between telephone operators (76 per cent), web subcontracting (17 per cent) and digital services companies (6 per cent).

Madagascar has been connected to several undersea fibre-optic cables through a series of public–private partnerships. These infrastructure consortia have included the African Development Bank, Africa–EU Partnership, the World Bank and commercial partners such as France Telecom and Orange Madagascar, among others.\*

The COVID-19 pandemic further boosted uptake of the digital economy, with e-government and social networks key drivers of growth. However, various constraints still stand in the way of realizing the country's digital economy potential including access to energy, ICT skills, legislative frameworks and slow uptake of e-payments. Madagascar needs to train at least 1,000 ICT engineers each year to sustain and drive further growth. Further Aid for Trade funding in these areas is a priority, said Mr. Razafintsalama.

Severe storms which hit Madagascar in 2022 are a reminder that growth in the digital sector offers opportunities for both advance warnings and economic resilience. Increased Aid for Trade support will help to achieve this goal.

\* See <https://lion-submarinesystem.com> and <https://www.eassy.org>.

## E-commerce

Responses to the questionnaire highlighted that e-commerce accelerated during the COVID-19 pandemic. This expansion of e-commerce is referred to in the responses from Bangladesh, Colombia and the Philippines. Other small economies report similar results, such as:

- the emergence of e-commerce companies;
- many micro, small and medium-sized enterprises (MSMEs) being forced to offer services through online platforms;
- new opportunities for entrepreneurs in delivery and other services with a digital dimension.

WTO statistics highlight how the shift to remote working and increased digitalization is also reflected in trade flows. According to the WTO's estimates, as of April 2022, cumulative global exports of ICT services increased by 30 per cent in 2021 compared to pre-pandemic levels in 2019.<sup>3</sup>

In addition, global computer services exports, as a subsector of ICT services, grew by 38 per cent in 2021 compared to 2019. Rapid growth in

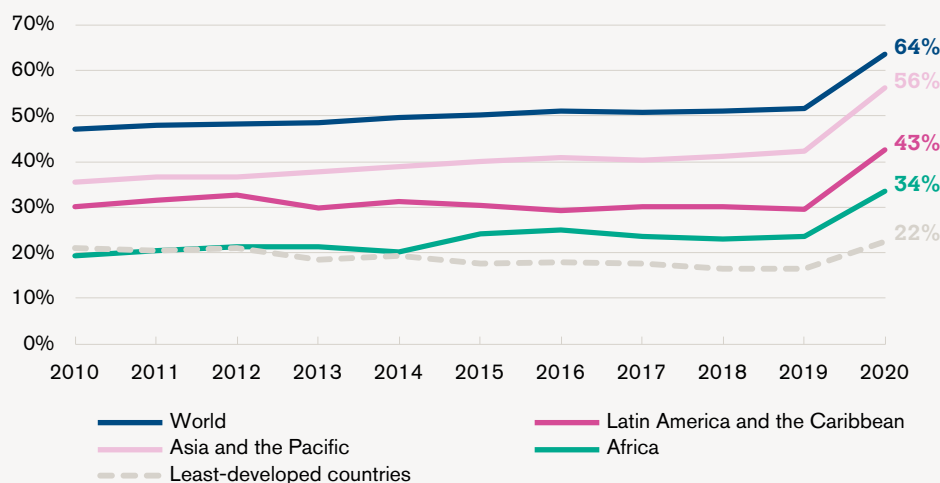
computer services exports was also recorded over the same period in the following developing countries:

- Mauritius, 42 per cent;
- Bangladesh, 60 per cent;
- Indonesia, 65 per cent;
- Pakistan, 98 per cent.<sup>4</sup>

Data from UNCTAD show a strong uptake in the share of digitally deliverable services in global services exports in 2020 (see Figure 1), indicating the accelerating effect of the COVID-19 pandemic towards digital transformation.

**“The COVID-19 pandemic also increased growth in global exports of ICT goods, which was worth US\$ 2.3 trillion in 2020.”**

**Figure 1: Digitally deliverable services as a share of global services exports**



Source: See <https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=158358>.

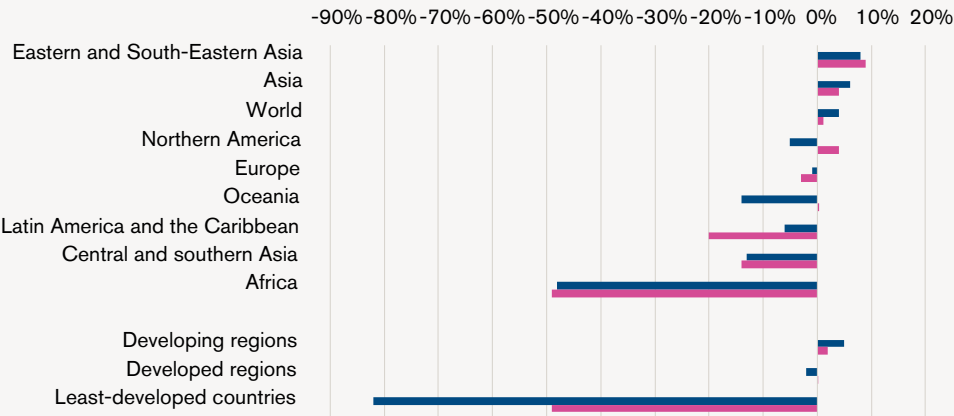


Demonstrating the use of a mobile phone app to farmers in Nepal.

The COVID-19 pandemic also increased growth in global exports of ICT goods, which was worth US\$ 2.3 trillion in 2020 (UNCTAD, 2021). Data from UNCTAD indicates that this growth was narrowly focused on established Asian suppliers and that other regions – notably Africa – and LDCs experienced steep declines in ICT trade (see Figure 2).

However, data measurement issues continue to hamper research and policy-making on e-commerce. In response, UNCTAD is working on pilot projects with a number of Aid for Trade stakeholders to improve data collection on digitally delivered services (UNCTAD, 2018).

Figure 2: Change in ICT goods exports and imports, 2019-2020



Source: UNCTAD (2021).

■ ICT goods exports ■ ICT goods imports

## Case study

### World Bank: Digitalization and new trade opportunities

The World Bank reports in its questionnaire response that digitalization is creating new trade opportunities by giving access to remote and foreign markets to firms of all sizes in any location, and by lowering trade costs and expanding the variety of goods and services that can be traded. New technologies are having a transformative effect on international trade by powering e-commerce.

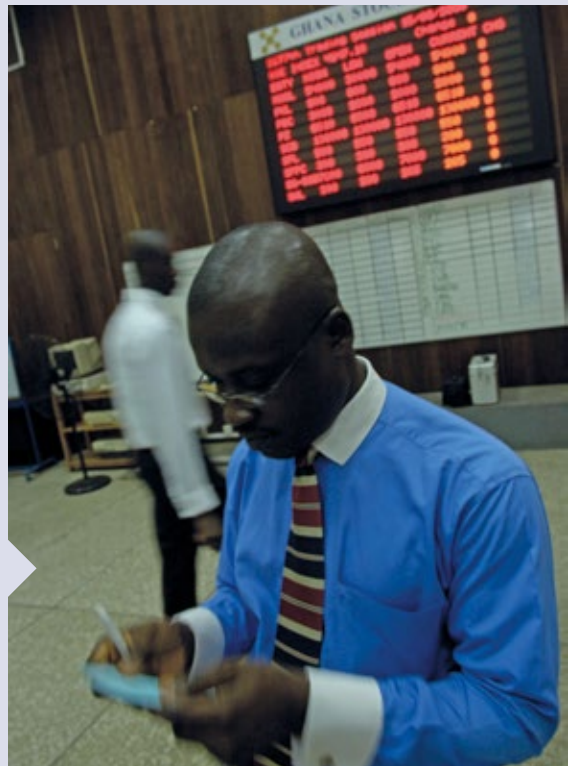
While e-commerce is currently dominated by high-income countries, developing countries are increasingly engaging in e-commerce as exporters of high-value digital services. Establishing a conducive environment for e-commerce, however, remains a complex endeavour.

The foundations of the digital economy rest on a modern ICT infrastructure, a favourable business environment and an educated population. In addition, e-commerce requires specific enabling conditions that build on those foundations:

- businesses require specific digital skills and entrepreneurship to engage in e-commerce;
- cross-border transactions need effective electronic payment systems;
- a sound regulatory framework can strengthen trust in digital markets and provide tools for remote transactions, including cross-border data governance, platform regulation, online consumer protection and digital signatures;
- goods sold across borders through e-commerce need efficient trade facilitation and logistics suited to e-commerce deliveries.

E-commerce would benefit from substantial and clear international rules. Trade agreements have been at the forefront of global digital governance, featuring the first binding international rules on cross-border data flows. Rules on e-commerce are growing in both scope and depth, as well as in importance in trade negotiations, at global, regional and bilateral levels.

Traders work on the floor of the Ghana Stock Exchange in Accra.



**Table 1: Digital economy growth during the COVID-19 pandemic**

Regions and donors	Responses in questionnaire
<b>Africa</b>	
Comoros	Pandemic contributed to the emergence of e-commerce businesses
Equatorial Guinea	Government is aware that the pandemic gave rise to the heyday of the digital economy and there is no turning back
Mali	<p>Videoconferencing replaced face-to-face meetings</p> <p>Online commerce increased</p> <p>Exporters started to take more interest in online sales</p> <p>Administrations achieved economies of scale through teleworking</p>
Uganda	<p>Most government meetings are conducted online</p> <p>Government services are delivered online (e.g. passport and national identity card applications)</p>
Zambia	Increased use of electronic means of supply, with education and public services recently being provided electronically
<b>Latin America and the Caribbean</b>	
Colombia	Expansion seen in e-commerce sectors
Grenada	Many MSMEs forced to offer services through online platforms
Peru	<p>Pandemic accelerated digital technology and internet use</p> <p>In the first quarter of 2021, the percentage of 6-18 year olds accessing the internet increased by 7 percentage points compared to 2020</p> <p>Public entities accelerated the digitalization of public services and processes</p>
Saint Lucia	Effects of the pandemic provided opportunities for entrepreneurs in delivery and other services with a digital dimension
<b>Donors</b>	
Inter-American Development Bank	Pandemic accelerated digitalization but also highlighted and sometimes even exacerbated the structural problems of Latin America and the Caribbean (unemployment, poverty, inequality, corruption) in the context of limited fiscal space
Canada	From the perspective of its involvement at the ITU, the pandemic has highlighted the enormous challenges resulting from the inequity in digital access and ICT use in developing countries and LDCs
Germany	<p>Pandemic demonstrated the central importance of digital transformation for economic development</p> <p>Digitalization offers a key to future-oriented economic activity to counter unemployment (in particular youth) and to improve the quality of work</p>
West African Economic and Monetary Union	Openness to digital services can improve business opportunities and facilitate payment transactions



## Shortcomings in digital connectivity

The M&E exercise reveals shortcomings in digital connectivity exposed by the COVID-19 pandemic (see Figure 3). Of the top five issues identified by respondents, internet coverage and network infrastructure shortcomings come out top of this list for both developing countries and donors. Digital skills, access to services and digital payment issues also emerge strongly. It is important to note that the listing is not a prioritization, but instead refers to the most commonly cited shortcomings by respondents. Further shortcomings Aid for Trade stakeholders gave in the questionnaire included the following (see Table 2 for details):

- basic infrastructure remains a binding constraint for some LDCs;
- continuing investment needed to upgrade ICT infrastructure in developing countries;
- improvements needed in the quality and scope of regulatory frameworks for e-commerce;
- shortfalls in ICT skills.

### Digital divide

Despite the COVID-19 connectivity boost, the digital divide remains wide. Responses to the questionnaire from many LDCs underscore the continuing need for major investment in both basic connectivity and for the development of quality digital infrastructures and services (see Box 3).

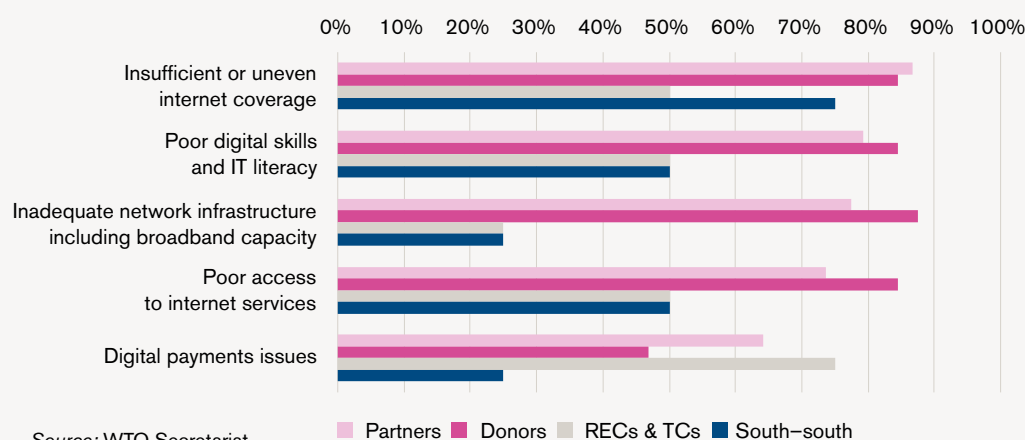
### Box 3

#### The coverage gap

**The coverage gap – those living in areas without mobile broadband coverage – stands at 450 million people or 6 per cent of the world's population. Sub-Saharan Africa is home to 47 per cent of the world's uncovered population, – an estimated 210 million people in 2020. The region's coverage gap is more than three times the global average.**

Source: Text adapted from GSMA (2021a).

**Figure 3: Most commonly cited issues where COVID-19 pandemic has exposed shortcomings in digital connectivity**



The digital divide also exists within countries, such as between urban and rural areas, large firms and MSMEs, and between men and women (see Box 4). Smooth digitalization and deployment of technologies depends on key infrastructure such as network coverage, but also on bringing more people online and making new technologies more affordable.

A barrier to digitalization is the lack of digital skills (World Bank, 2021c):

“There is also the challenge of bringing more people online, especially in countries with a gap between the number of people who have access to networks and those who are online. This gap is a function of affordability, the existence of local content, and digital skills”.

As a result, 2.9 billion people around the world – especially women and girls – are missing out on the benefits of digital transformation (OECD, 2021b).

**“2.9 billion people around the world – especially women and girls – are missing out on the benefits of digital transformation.”**

OECD (2021b)

## Box 4

### Digital payment and financial inclusion

Digital payment programmes were instrumental in delivering pandemic relief and wages. A World Bank study finds that digital payment systems were used on many occasions to disburse social protection benefits quickly and securely (Gentilini *et al.*, 2020).

Since the pandemic, 60 per cent of financial authorities worldwide have noted an increase in digital transactions. Digital payments enable gender inclusion. Digitizing payment of public sector wages and social protection benefits has prompted millions of women without a bank account to open an account in recent years.

Though digital financial services offer a gateway to financial inclusion, women still face barriers to accessing and using them. The OECD recommends prioritizing women's digital financial inclusion to ensure stronger, more resilient economies. Development co-operation providers should share good practices and lessons learned on responsible digital payments to strengthen data protections and build inclusive digital ecosystems to reach the high number of underserved households in low and middle-income countries.

Source: Text adapted from chapter 28 of OECD (2021b).

## Case study

### EBRD: Skills and the digital divide in Central Asia, Central and Eastern Europe and the Southern and Eastern Mediterranean

Insufficient digital skills is holding back digitalization in many EBRD economies. Returns to investment in digital-intensive capital are significantly higher in economies with strong skills. While countries with medium levels of digitalization have been catching up with advanced economies, countries with the lowest levels fall behind.

People better off and city dwellers have been able to order goods and services online and even work from home. However, many remain excluded from such benefits of digitalization. Similarly, while some firms have taken advantage of the new opportunities provided by digitalization, others have also fallen behind. Those with medium levels of education and income and the middle-aged have been catching up with the most digitally literate groups. However, people aged 55 or over, people with only lower-secondary education and people in the poorest income quartile have made only limited gains. These groups are at risk of falling further behind.

Many economies in the EBRD regions are also experiencing significant “brain drain”, with people with strong digital skills moving abroad. The resulting low levels of digital skills are already holding back people’s use of digital technologies, even where the relevant digital infrastructure and services are available. Digital divides may also contribute to increased divergence in the performance of firms, with larger, better managed and more innovative firms being more likely to take advantage of digitalization. Such firms are also more likely to have increased their use of digital technologies during the COVID-19 pandemic, suggesting that digital gaps between firms may widen in the future. That increased dispersion in the productivity of firms could, in turn, weigh on average productivity in the economy.

*Source:* Adapted from chapter 1 of EBRD (2021).



Furniture manufacturer benefits from EBRD funding for digitalization in the Republic of Moldova.

**Table 2: Shortcomings in digital connectivity**

Regions and donors	Responses in questionnaire
<b>Africa</b>	
Madagascar	<p>Digital divide exists in terms of:</p> <ul style="list-style-type: none"> <li>▪ infrastructure</li> <li>▪ broadband internet access</li> <li>▪ digital security of electronic payments</li> </ul>
Mali	<p>A lack of non-operational electronic certification and signature service (which handicaps the development of exchanges and electronic commerce)</p> <p>Inadequate broadband connection infrastructure</p> <p>Poor coverage and insufficient connection access infrastructure</p> <p>Insufficient legislative and regulatory mechanisms in terms of connectivity and electronic exchanges</p> <p>Insufficient human resources</p>
<b>Latin America and the Caribbean</b>	
Peru	<p>Inadequate internet coverage: by 2021, only 52.5 per cent of all households had internet access and only 20 per cent of households in rural areas</p> <p>To promote digital connectivity at the national level, the government has been working in coordination with the public and private sector and academia to determine a joint strategy</p>
Saint Lucia	<p>Digital payments problems: 80 per cent of businesses comprise MSMEs, most of which have no online presence other than social media and are unable to transact business digitally</p> <p>Inadequate broadband capacity: apparent in early phases of the pandemic but has been adequately addressed by service providers with additional efforts ongoing</p> <p>Uneven internet coverage: lack of or inadequate access for poor and vulnerable communities and households</p> <p>Poor digital skills: learning curve for students, teachers and other professionals in the use of various online platforms, and MSMEs require training in online presence and transactions</p> <p>Rules relating to e-commerce: accelerated DigiGov project and government's ability to provide services and transact business online, and added impetus to draft and ratify legislation and policies for connectivity and e-commerce</p>
<b>Donors</b>	
International Islamic Trade Finance Corporation	<p>ICT infrastructure and services:</p> <ul style="list-style-type: none"> <li>▪ affordable and reliable ICT infrastructure is of paramount importance to e-commerce</li> <li>▪ universal coverage of high-speed broadband, regular upgrading of infrastructures and reduced artificial regulatory barriers should be pursued</li> </ul> <p>Trade logistics and trade facilitation:</p> <ul style="list-style-type: none"> <li>▪ an effective and competitive national and international trade environment is vital for achieving effective e-commerce</li> <li>▪ effective trade logistics and cross-border facilitation measures are key for the fulfilment of goods-related e-commerce</li> </ul>

Donors and regions	Responses in questionnaire
<b>Donors</b>	
Norway	Social safety nets and digital public infrastructure that other service providers can build on top of for better service delivery, such as digital identification systems, civil registration and vital statistics
United Nations Conference on Trade and Development	<p>COVID-19 pandemic has demonstrated some important limitations of today's digital connectivity environments:</p> <ul style="list-style-type: none"> <li>▪ those who are less connected have been less able to take advantage of ICT's potential</li> <li>▪ higher demand for connectivity has put greater pressure on communications networks and services</li> <li>▪ increased demand has given greater urgency to measures intended to increase bandwidth and extend connectivity to underserved communities</li> </ul>

## Affordability

The affordability of electronic devices and connecting them to the internet is stifling demand for digital connectivity in many countries where digital coverage exists (see Box 5). On the African continent, for example, the affordability of devices, high data costs and the extent of network coverage remain key challenges.

A report by GSM Association estimates that globally, 3.4 billion people do not use mobile internet, despite living in areas with mobile broadband coverage (GSMA, 2021a). This discrepancy – defined the usage gap – is seven times larger than the coverage gap and represents 43 per cent of the world's population.

More than 1 billion people live in countries where 1 GB of data is simply too expensive; and almost 2.5 billion people live in countries where the most affordable smartphone costs more than a quarter of the average monthly income (OECD, 2021b; Alliance for Affordable Internet and World Wide Web Foundation, 2020).

## Box 5

### Affordability target

**The affordability target set by the United Nations Broadband Commission for Sustainable Development – to bring the cost of entry-level broadband services below 2 per cent of monthly GNI per capita by 2025 – remains elusive.**

**Prices remained far above the 2 per cent target among most LDCs. Of the 18 economies where mobile broadband internet access cost more than 10 per cent of GNI per capita, 16 were LDCs.**

*Source:* Text adapted from ITU (2022).





A solar-energy mobile app is available in Uganda.

The challenges identified by developing and partner countries in the Aid for Trade M&E exercise shows that the benefits of digitalization for trade, and of trade for digitalization, require action across a number of different policy areas if these benefits are to be realized in practice. This requires action across a broad range of areas – from building digital skills and addressing digital divides to improving access to ICT goods and services and the affordability and reliability of internet connections.

## Digital connectivity and e-commerce development strategies

*Aid for Trade at a Glance 2017* (OECD/WTO, 2017) found a “digital trade policy divide”, with many respondents seemingly unaware of national digital connectivity or e-commerce development strategies. Of the 63 respondents to the questionnaire of that year’s M&E exercise, 33 stated that their government did not have an e-commerce or other digital-related strategy.

Further analysis suggested, however, that respondents may simply not have been aware of these strategies. Only 10 respondents cited the presence of trade ministries in national ICT co-ordination mechanisms. Other respondents noted that such mechanisms were absent.

Five years on, this digital trade policy divide seems to have narrowed. Responses to the questionnaire show the following:

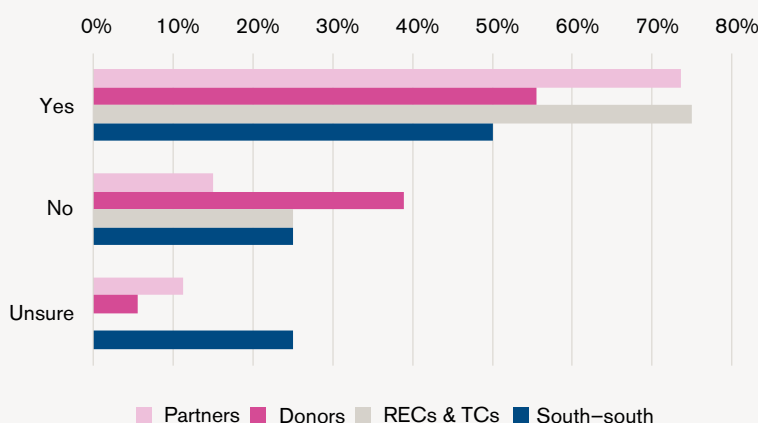
- 80 per cent of the respondents from developing countries highlighted that digital connectivity is reflected as a priority in their development strategies.

- 74 per cent of responses from developing countries indicated a strategy for digital connectivity (i.e. digital economy, e-commerce).

The results of the questionnaire suggests that digital connectivity and e-commerce are being more systematically programmed into national development strategies (see Boxes 6 and 7), and there is growing awareness among the M&E respondents (see Figure 4). Responses to the questionnaire include the following actions (see Table 3 for details):

- adoption of new digital strategies and ministries;
- development of regional strategies;
- creation of strategy documents that range from basic digital connectivity through to more specific policy areas such as national artificial intelligence and blockchain policies.

**Figure 4: Existence of digital connectivity and e-commerce development strategies**



Source: WTO Secretariat.

## Box 6

### Capitalizing on the potential of new technologies: Norway's experience

Norway realized that its development co-operation was not fully capitalizing on the potential of new technologies due to a fragmented, uncoordinated approach to digitalization. To deliver sustainable results in the long term, Norway set out to develop a strategy for digital transformation in development policy.

Following consultations with academia and the private and public sectors, a set of 11 guidelines for the Government were developed and included in the digital development strategy.\* These guidelines are designed to help to integrate established best practices into all programmes.

Norway and Norad – Norwegian Agency for Development Cooperation – also participate in the multi-stakeholder Digital Public Goods Alliance, which seeks to accelerate the attainment of the SDGs in low and middle-income countries by facilitating the discovery, development, use of and investment in digital public goods.

Source: Text adapted from chapter 37 of OECD (2021b).

\* See [https://www.regjeringen.no/globalassets/departementene/ud/dokumenter/utvpolitikk/digital\\_strategynew.pdf](https://www.regjeringen.no/globalassets/departementene/ud/dokumenter/utvpolitikk/digital_strategynew.pdf).

## Box 7

### Colombia's digital policy landscape

Colombia notes that its development strategy *Pact for Colombia, Pact for Equity* focuses on a range of issues, including a call for the “Digital Transformation of Colombia: Government, businesses and households connected to the knowledge era”. The strategy contains a whole-of-government approach to digital transformation and strives for broadband and digital inclusion of all Colombians.\*

To promote digital connectivity, Colombia implemented the Vive Digital I and II Plans, the National Fibre Optic Plan and the National High Speed Connectivity Plan. Its ICT strategy is to broaden access to ICT and to improve the quality of ICT services. One such plan is to promote the affordability of fixed internet services for low-income households through demand incentives to develop ICT habits and skills.

The national strategy on digital development and society has been clearly articulated, and policies include topics such as:

- digital transformation and artificial intelligence\*\*
- technologies for learning\*\*\*
- digital trust and security†
- electronic commerce††

Measures taken to address the COVID-19 pandemic have promoted the use of digital tools for work, social and educational activities to prevent the spread of the virus. Internet provision has been declared an essential, universal public service.



A rural school in La Ceja, Colombia.

\* See <https://www.minvivienda.gov.co/ministerio/planeacion-gestion-y-control/planeacion-y-seguimiento/plan-nacional-de-desarrollo-2018-2022>.

\*\* See <https://colaboracion.dnp.gov.co/CDT/Conpes/Econ%C3%B3micos/3975.pdf>.

\*\*\* See <https://colaboracion.dnp.gov.co/CDT/Conpes/Econ%C3%B3micos/3988.pdf>.

† See <https://colaboracion.dnp.gov.co/CDT/Conpes/Econ%C3%B3micos/3995.pdf>.

†† See <https://colaboracion.dnp.gov.co/CDT/Conpes/Econ%C3%B3micos/4012.pdf>.

## Spotlight: WTO work on e-commerce

In response to the growing importance of e-commerce, ministers adopted the Declaration on Global Electronic Commerce\* at the Second Ministerial Conference in May 1998.

The Declaration called for:

- the establishment of a work programme;
- a provisional moratorium on customs duties on electronic transmissions.

In September 1998, the General Council adopted the Work Programme on Electronic Commerce\*\* to examine trade-related issues relating to global e-commerce, which states:

“For the exclusive purposes of the Work Programme and without prejudice to its outcome, the term ‘e-commerce’ was understood to mean the production, distribution, marketing, sale or delivery of goods and services by electronic means.”\*\*\*

The Work Programme instructed the following four WTO bodies to explore the relationship between existing WTO agreements and e-commerce:

- Council for Trade in Services;
- Council for Trade in Goods;
- Council for Trade-related Aspects of Intellectual Property Rights (TRIPS);
- Committee on Trade and Development.

## WTO joint initiative on e-commerce

A group of 71 WTO members agreed at the 11th Ministerial Conference in December 2017 to initiate exploratory work towards future WTO negotiations on trade-related aspects of e-commerce. In January 2019, 76 WTO members confirmed in a joint statement their intention to commence these negotiations. They agreed to “seek to achieve a high standard outcome that builds on existing WTO agreements and frameworks with the participation of as many WTO Members as possible.”+

As of January 2021, there are 86 WTO members participating in these discussions, accounting for over 90 per cent of global trade.

\* Declaration on Global Electronic Commerce, WTO document WT/MIN(98)/DEC/2, 25 May 1998.

\*\* See [https://www.wto.org/english/tratop\\_e/ecom\\_e/ecom\\_work\\_programme\\_e.htm](https://www.wto.org/english/tratop_e/ecom_e/ecom_work_programme_e.htm).

\*\*\* Work Programme on Electronic Commerce, WTO document JOB/GC/73, 6 February 2015.

+ For further information, see [https://www.wto.org/english/tratop\\_e/ecom\\_e/joint\\_statement\\_e.htm](https://www.wto.org/english/tratop_e/ecom_e/joint_statement_e.htm).

**Table 3: Digital connectivity and e-commerce development strategies**

Regions and donors	Responses in questionnaire
<b>Africa</b>	
Benin	Digital connectivity as a priority is outlined in the various government action programmes, specifically, accelerating massive investments for the development of quality digital infrastructures and services
Burkina Faso	Developing national e-commerce strategies
Comoros	<p>Digital strategy focuses on:</p> <ul style="list-style-type: none"> <li>▪ strengthening the legal and institutional framework</li> <li>▪ promoting the use and dissemination of ICT</li> <li>▪ pooling infrastructure and capitalization of investments</li> <li>▪ diversifying the sector beyond communications</li> </ul> <p>Ambition to become “an information society, actor of the digital revolution” by 2030</p>
Ethiopia	Strategy in place but is still to be implemented
Madagascar	<p>The e-commerce sector is beginning to be structured, and most of the laws protecting users already exist</p> <p>Some laws still need to be promulgated:</p> <ul style="list-style-type: none"> <li>▪ accreditation of certification centres for electronic signatures</li> <li>▪ establishment of the Commission malagasy sur l'informatique et des libertés (CMIL) for the protection of personal data</li> <li>▪ establishment of computer incident response teams for digital security</li> </ul>
Mali	Established the National Policy for the Development of the Digital Economy
Mauritius	<p>Government to invest further to digitalize public services and:</p> <ul style="list-style-type: none"> <li>▪ create an “e-Mauritius”</li> <li>▪ introduce relevant legislation to consolidate cybersecurity</li> <li>▪ encourage online and cashless transactions</li> <li>▪ promote an open data culture</li> <li>▪ improve access to high-speed internet</li> </ul>
Senegal	Developing national e-commerce strategies
Zambia	Developing national e-commerce strategies, such as the creation of the Ministry of Science and Technology to promote a sustainable digital economy
<b>Asia and the Pacific</b>	
Bangladesh, Cambodia, Nepal	Drafted strategy documents for digital connectivity and e-commerce
Philippines	Strategies in the broader context of e-government
Sri Lanka	In the process of developing a national digital transformation strategy
<b>Europe</b>	
Republic of Moldova	Creation of national digital strategies
<b>Latin America and the Caribbean</b>	
El Salvador	Policy work focuses on specific issues such electronic signatures and the digitalization of procedures
Mexico, Peru	Creation of national digital strategies
Saint Lucia	Digital connectivity is a key area for development both as a stand-alone sector and as an enabler for other sectors
Saint Vincent and the Grenadines	In the process of developing a national digital transformation strategy



Donors and regions	Responses in questionnaire
<b>Donors</b>	
Australia	Digital connectivity is highlighted to varying degrees and according to partner circumstances and needs in regional and bilateral COVID-19 development response plans
Canada	Its efforts to promote connectivity around the world include its membership and contributions to the ITU (annually C\$ 4.8 million)  Increased connectivity and access to ICT is essential to achieve the SDGs
European Union	Through the Global Gateway (European Commission, 2019b), the European Union aims to mobilize infrastructure development investments of up to €300 billion between 2021 and 2027  It will offer digital economy packages that combine infrastructure investments with country-level assistance on ensuring the protection of personal data, cybersecurity and the right to privacy, trustworthy AI, as well as fair and open digital markets
Japan	Science and technology innovation is one of the priority issues in the SDGs Implementation Guidelines and is a priority issue in the SDGs Action Plan 2021
Pacific Islands Forum Secretariat	Developing a regional and sub-regional e-commerce strategy
Russian Federation	Digital connectivity is covered by the priority areas set out the Concept on International Development Assistance
TradeMark East Africa	Focusing on the digitization of trade procedures have a very large component of its programmes related to automation of trade agencies (customs systems, standards, cargo tracking, single windows, online information portals) as well as programmes promoting e-commerce

Among donor respondents, a similarly diverse picture emerges. Donors such as the ADB, the European Union, Germany, the Netherlands, Norway, (see Box 6), UNCTAD, the United States and the World Bank have specific strategies to promote digital connectivity.

Other donors such as Australia, Canada, the EBRD, Japan, the Republic of Korea, the Russian Federation, Slovenia, Sweden, Chinese Taipei and the United Kingdom are seeking to mainstream digital connectivity into their development cooperation strategies.



Using a mobile device to observe patterns of tree cover loss, San Cipriano, Colombia.

## Case study

### OECD: Measuring official development finance for digitalization

Development finance for digital activities more than tripled between 2015 and 2019, with providers investing a total of US\$ 18.6 billion and mobilizing another US\$ 4.2 billion in private finance, according to estimates based on the Creditor Reporting System.

Accurately tracking financing for digitalization is challenging. There is no standardized general definition. Financing can take many forms and support a range of activities, such as:

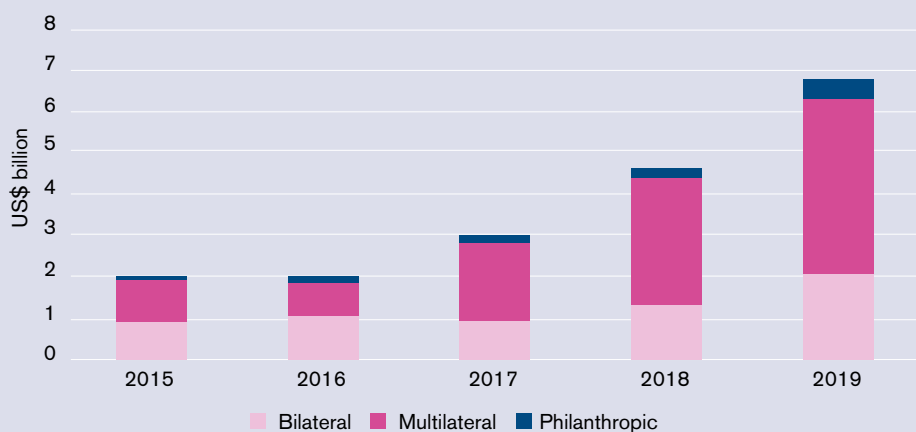
- introducing digital infrastructure such as networks, computing and communication tools;
- developing (i.e. through training and education) the broad set of skills and technical abilities required to take advantage of digital technologies;
- implementing organizational changes that take advantage of new technologies and enable new activities on which they are based.

Apart from investments in hard digital infrastructure, most support for digitalization and digital transformation is cross-sectoral. In 2020, the European Union developed a marker to track investment in digitalization.

Bilateral and multilateral development finance institutions and finance from private philanthropic institutions increased from US\$ 2 billion in 2015 to US\$ 6.8 billion in 2019. To put these figures in perspective, these institutions' financing for digitalization in 2019 is of the same order of magnitude as their commitments to the development of the industry sector (US\$ 7 billion) and to renewable energy sources (US\$ 7.7 billion).

Development finance for digitalization from multilateral institutions alone more than quadrupled, rising from US\$ 1.0 billion in 2015 to US\$ 4.2 billion in 2019. Multilateral development finance institutions represented 62 per cent of the total committed by multilateral and bilateral providers and private philanthropic institutions in 2019.

#### Development finance for digitalization more than tripled from 2015-2019



Source: OECD estimates based on the data available in the Creditor Reporting System database.

## Philanthropic institutions

Private philanthropic institutions' support to digitalization reached US\$ 491 million in 2019. In relative terms, private philanthropic institutions devote a greater share of their investments to support digitalization than do bilateral and multilateral institutions. Digitalization-related activities accounted for 4.6 per cent of the 2018-2019 portfolio of private philanthropic institutions, compared to 2.7 per cent for multilateral institutions and 1 per cent for bilateral providers. It is useful to note that private philanthropic finance is provided on an exclusively grant basis.

Development finance for digitalization is concentrated among a few private philanthropic institutions. In absolute terms, the Bill & Melinda Gates Foundation is estimated to be the largest philanthropic institution giving digital-related finance, committing 4 per cent of investment, or US\$ 556 million, over 2015-2019. The MasterCard Foundation was the second largest private philanthropic provider, committing 19 per cent of its portfolio (US\$ 161.7 million) to digital projects over the period. The Wellcome Trust was third with 10 per cent of its portfolio (over US\$ 80 million).

## Bilateral and multilateral institutions

Digital connectivity and the digital economy are an area where bilateral and multilateral institutions are also engaging in public-private partnerships and mobilizing additional private finance. In 2019, bilateral and multilateral institutions attracted approximately US\$ 700 million, with a large share benefiting the financial sector.

The data analysed reflect activities relating to digitalization reported by more than 100 bilateral, multilateral and philanthropic institutions over 2015-2019. Of these, the ADB, EU institutions, France, Germany, the Inter-American Development Bank (IDB), the Republic of Korea, the United States and the World Bank (through the International Development Association, the International Bank for Reconstruction and the International Finance Corporation) provided 68 per cent of total support.



Students at Khowaja Institute of Information Technology (KIIT) learn computing skills, Hyderabad, Pakistan.

## Case study

### OECD: Measuring official development finance for digitalization

The ADB's support in digital technology focuses on several sectors: agriculture and food safety, education, health, public sector management, and telecommunications. ADB incorporates innovative strategies for the application of digital technologies in its policies for key sectors. Over the period 2000-2015, ADB extended 402 digital technology-related loans, grants, and technical assistance projects with a value of US\$ 11.9 billion.

Africa received the most bilateral development finance for digitalization of any region (37.9 per cent), with sub-Saharan Africa alone receiving 27.5 per cent of the total (US\$ 1.7 billion) in 2015-2019.\* Asia received 25.0 per cent of bilateral development finance for digitalization activities and the Americas, Europe, the Middle East and Oceania each received around 5 per cent.

The breakdown is different for multilateral development finance. The Americas received the biggest share of total multilateral finance for digitalization – 36.6 per cent (US\$ 4.1 billion). This is due to investments by the IDB, which emerged in the estimates as the largest provider of digitalization-related development finance. Bilateral providers appear to be investing more in digital projects in Africa, followed by Asia.

**Regional distribution of digitalization-related development finance by bilateral and multilateral institutions (2015-2019)**

	Share of bilateral finance provided to the region (%)	Total bilateral share (%)	Share of multilateral finance provided to the region (%)	Total multilateral share (%)
Africa	5.5		1.0	
North of Sahara	4.9	37.9	8.9	25.2
South of Sahara	27.5		15.2	
America	0.3		0.8	
Caribbean and Central America	2.0	5.5	5.8	36.6
South America	3.2		30.1	
Asia	1.7		0.3	
Far East Asia	7.3	25.0	7.2	30.1
South and Central Asia	15.9		22.6	
Europe	5.1		3.5	
Middle East	4.7		2.6	
Oceania	4.8		1.8	
Developing countries unspecified	16.9		0.3	

Source: Text adapted from chapter 40 of OECD (2021b).

\* See Box 8 for more information on startup hubs in Africa.

The African Union adopted the Digital Transformation Strategy for Africa (2020-2030)<sup>5</sup> in 2020 with the objective:

“To harness digital technologies and innovation to transform African societies and economies to promote Africa’s integration, generate inclusive economic growth, stimulate job creation, break the digital divide, and eradicate poverty for the continent’s socio-economic development and ensure Africa’s ownership of modern tools of digital management.”

The African Development Bank (AfDB) is supporting this agenda through digital connectivity initiatives such as the Central African Backbone and the Trans-Saharan Backbone projects for fibre-optics.

The AfDB has also rolled out skills and training programmes, including Coding for Employment. The AfDB sees the key role the ICT sector can play in realizing the potential of the African Continental Free Trade Area for industrialization.

The European Union is an important development partner for Africa’s transition to the digital economy. The African–European Digital Innovation Bridge (AEDIB) was initiated by EU member states Belgium, France and Germany together with the European Commission to create opportunities for employment and to pave the way for economic growth and recovery.<sup>6</sup> The AEDIB will establish a pan-African network of digital innovation hubs to encourage joint ventures and to provide technical innovation expertise and experimentation for MSMEs,

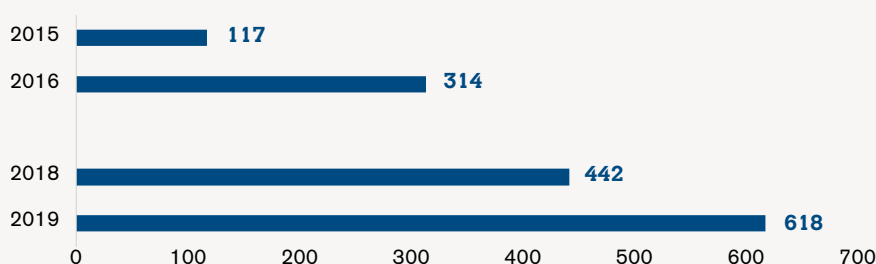
## Box 8

### Startup hubs in Africa

An area where private philanthropic institutions are involved is supporting technology hubs and social entrepreneurship in Africa. Startup hubs foster innovation for tech start-ups and help businesses scale and achieve their goals by offering them working spaces, electricity, internet connectivity and other forms of assistance.

The figure below shows the substantial increase in the number of tech hubs in Africa since 2015.

Number of tech hubs in Africa



Source: Text adapted from <https://qz.com/africa/2130846/swedens-norrskan-foundation-is-creating-the-largest-startup-hub>.



with a special focus on youth and women through a specialized academy.

South–south cooperation (i.e. between developing countries) and triangular cooperation (i.e. in collaboration with a developed-country government or international organization) is playing an increasingly important role (see Table 4 for details). Examples include:

- The United Nations Office for South–south Cooperation (UNOSSC) and the China Association of Trade in Services (CATIS) have organized capacity-development webinars on cross-border e-commerce.<sup>7</sup>
- South–south trust funds such as the India, Brazil and South Africa Facility for Poverty and Hunger Alleviation (IBSA Fund) and the India–UN Development Partnership Fund are also instrumental in testing and scaling-up digital innovations.
- Through the China–Africa Digital Innovation Partnership Program, China seeks to strengthen Africa's digital infrastructure by sharing its digital technology and promoting digital infrastructure interconnectivity (see Box 9).<sup>8</sup>

## Box 9

### China–Africa Digital Innovation Partnership Program

At the China–Africa Internet Development and Cooperation Forum held on 24 August 2021, the China–Africa Digital Innovation Partnership Program was announced. Through the programme, China seeks to strengthen Africa's digital infrastructure by sharing its digital technology and promoting digital infrastructure interconnectivity. Chinese enterprises are encouraged to work with their African counterparts to build digital infrastructure, including fibre-optic cable backbone networks, cross-border connectivity, new-generation mobile network and last mile connection.

China also agreed to support Africa in improving the digitalization of the public and private sectors, and accelerate Africa's industrialization through advanced technologies such as cloud computing, AI, the internet of things and mobile payment. E-commerce cooperation to facilitate the access of African brand products to the Chinese market through cross-border e-commerce is an area identified for cooperation.

Measures are proposed to break the “talent bottleneck” in digital innovation, including through enhanced China–Africa distance education cooperation. Digital inclusiveness is another area of cooperation that involves using digital technologies for people's wellbeing, such as traffic management, healthcare and finance, smart cities, governance and COVID-19 responses. Chinese enterprises are encouraged to support e-government, e-payment and digital currencies.

The need to build digital security and to improve Africa's digital governance capacities is also recognized through initiatives on cyberspace\* and data security\*\*.

Source: Text adapted from <https://www.mfa.gov.cn/ce/ceme//mon/wjbxw/t1901752.htm>.

\* See <https://www.fmprc.gov.cn/ce/ceka/rus/sqxx/sgdt/t1842433.htm>.

\*\* See <https://www.mfa.gov.cn/ce/ceus/eng/zgyw/t1812951.htm>.

**Table 4: Aid for Trade projects and programmes for digital connectivity and e-commerce**

Donors	Responses in questionnaire
<b>Bilateral projects and programmes</b>	
Australia	<p>A key priority areas of its Pacific Aid for Trade strategy is e-commerce:</p> <ul style="list-style-type: none"> <li>▪ e-commerce Aid for Trade Fund helps to build e-commerce capabilities in Asia and the Pacific, promoting the participation of MSMEs and women</li> <li>▪ supported the development of the Pacific e-commerce strategy and roadmap, which complements investment in undersea cables in the region</li> </ul>
European Union	<p>Launched the Digital for Development (D4D) Hub in December 2020 – a global multi-stakeholder platform:</p> <ul style="list-style-type: none"> <li>▪ a range of digital initiatives put together for coordinated impact</li> <li>▪ 11 EU member states signed a letter of intent to cooperate towards a single European digital development strategy</li> <li>▪ D4D Hub to form regional branches in Africa, Asia, Latin America and the Caribbean, as well as in the EU's Eastern neighbourhood</li> </ul>
Germany	<p>Make-IT Initiative supports the establishment of local and digital innovation for inclusive and sustainable development, enabling local actors to participate in the global economy</p>
Republic of Korea	<p>Economic Development Cooperation Fund (EDCF) to offer concessional loan contributions prioritizing green, digital and health sectors</p> <p>Improvements made to the digital connectivity of public institutions and households in El Salvador, with US\$ 35 million for resilient digital infrastructure and digital skills</p>
United States	<p>Highlighted USAID's five-year digital strategy, which aims:</p> <ul style="list-style-type: none"> <li>▪ to improve development and humanitarian assistance outcomes through responsible use of digital technology</li> <li>▪ to strengthen the openness, security and inclusiveness of national digital ecosystems</li> </ul>
<b>Multilateral projects and programmes</b>	
International Trade Centre	<p>Digital Transformation for Good strategy seeks to use digital technology for inclusive growth and to help clients in trade-related digital innovation</p>
United Nations Conference on Trade and Development	<p>Developed the eTrade for all initiative and eTrade readiness assessments together with developing countries, especially LDCs, with the aim to create action plans to enhance digital development</p>
United Nations Development Programme	<p>Digital strategy seeks to enhance support to e-commerce as a resilience tool for MSMEs for the COVID-19 response</p>
United Nations Industrial Development Organization	<p>Provides e-commerce training courses for MSMEs and has a strategic framework for the Fourth Industrial Revolution 2022–2030</p>
World Bank Group	<p>Trade support priority concerns the development of regulatory frameworks for e-commerce, with support to developing countries:</p> <ul style="list-style-type: none"> <li>▪ to enhance understanding of the regulatory frameworks for e-commerce in place</li> <li>▪ to assess regulatory practices for the different pillars of e-commerce regulations</li> <li>▪ to consider how the policy interests and concerns of developing countries can be best addressed in international rules on e-commerce</li> </ul>



## EXPERT OPINION

## Digital trade, connectivity and sustainable development

By Torbjörn Fredriksson

Head, E-commerce and Digital Economy Branch,  
United Nations Conference on Trade and Development  
(UNCTAD)

The COVID-19 pandemic has boosted digital transformation around the world, including an accelerated shift towards more digital trade. While digital solutions have for many businesses offered a lifeline in the midst of travel and other restrictions, far from all enterprises have been able to take advantage of them. Remaining divides in multiple areas of digital readiness make it even more important to reinforce provide effective support to countries lagging behind in order to avoid widening inequalities. The UNCTAD-led eTrade for all initiative should be effectively leveraged in this context.

In the area of trade, while global information and communications technology (ICT) goods trade has grown during the pandemic, least-developed countries (LDCs) and African countries saw their exports and imports of ICT goods fall sharply. Similarly, the growth of the share of digitally deliverable services in total services exports was considerably smaller in lower-income countries than in more advanced ones (UNCTAD, 2021). In other words, countries with low levels of income and digital readiness have fallen further behind during the pandemic, raising the risk of widening inequalities. Doubling the share of LDCs in world trade – as stipulated in United Nations Sustainable Development Goal Target 17.11 – will be very difficult unless more is done to strengthen their ability to participate in and benefit from digital trade.

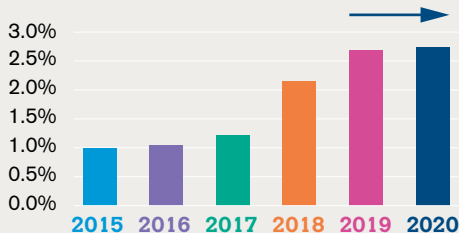
Regrettably, available data on the share of Aid for Trade funding going to the area of ICT suggest that it levelled off in 2020 at 2.7 per cent of the total, rather than continuing to grow (see figure). However, in absolute terms the resources allocated to the ICT area rose by US\$ 300 million in 2020 (UNCTAD, 2022).

Given the urgency to bridge the gaps in digital readiness and insufficient levels of development assistance, members of the international community, including bilateral donors, need to work together in innovative ways. It takes time to develop and implement solutions to improving legal and regulatory frameworks to enhance trust online, building skills for the digital economy, strengthening women digital entrepreneurship and facilitating digital financial inclusion.

The eTrade for all initiative offers practical solutions that international development partners can use when considering how to prioritize limited funds in the area of digital for development. Its online platform provides a wealth of information about 34 partner organizations and their strengths that can be leveraged for greater impact. Its listing of available technical assistance and existing products and programmes can help pinpoint areas that are currently not well covered and in which catalytic investment and initiatives could be particularly useful.

Going forward, there is still scope for strengthening co-ordination. Given the huge demands for assistance, it will be important to avoid duplication of work where possible and rather seek to implement the support needed through joint efforts. This would be an efficient use of taxpayers' money and reduce the burden on the beneficiary country governments in terms of managing relations with development partners. Effective partnering and collaboration are likely to resonate with donors, thereby hopefully helping to secure more resources and produce better results.

**Share of all Aid for Trade resources, 2015-2020**



Source: UNCTAD analysis based on OECD data on Aid for Trade expenditures.

## Case study

### Satellite observation and sustainable development outcomes

#### Asian Development Bank

The Earth Observation for a Transforming Asia and Pacific is an initiative of the European Space Agency (ESA) and the ADB. Satellite-based environmental information provides new ways to address development challenges (ESA/ADB, 2017).

The use of satellite observation has advanced significantly for many environmental applications. Satellites are non-intrusive, objective and consistent in recording information. Increasing emphasis is being placed on putting the technology to work in addressing societal challenges (e.g. population, food, water, energy).

The ESA scaled up the project in 2016 to focus on ten priorities: urban development; agriculture and rural development; water resources management; marine resources; risk management and disaster reduction; energy; forest management, ecosystems services; fragile and conflict states; and climate resilience and proofing.

#### International Monetary Fund

On 26 May 2022, a team working on a platform that uses satellite observations and big data analytics to track trade disruptions due to climate-related natural disasters won the IMF's Climate Innovation Challenge.\* The seed funding awarded to the team will further develop their PortWatch platform to allow policy-makers to monitor local and global spillovers from extreme weather events and to explore exposure to port closures in the global supply chain. Small developing states will be among the key beneficiaries of this work, given their vulnerability to natural disasters, high dependence on international trade and limited statistical capacity.

\* See <https://www.imf.org/en/Topics/innovation-at-the-imf/imf-climate-innovation-challenge>.



Cyclone Idai,  
west of Madagascar  
and heading for  
Mozambique,  
13 March 2019.



## EXPERT OPINION

# Seizing the benefits of digital trade for sustainable development

Javier Lopez Gonzalez, Senior Trade Policy Analyst,  
and Silvia Sorescu, Trade Policy Analyst, Trade and Agriculture Directorate,  
Organisation for Economic Co-operation and Development (OECD)

Digitalization offers new opportunities for developing countries and firms of all sizes to overcome existing trade cost disadvantages and deliver their products to a wider range of markets. More digitalization means more trade: a 10 per cent increase in digital connectivity between countries raises goods trade by nearly 2 per cent, parcels trade by 4 per cent and trade in services by over 3 per cent. Importantly, these positive effects emerge across all sectors.

Access to cheaper, more sophisticated and diverse digital inputs – including productivity enhancing software, communications technology or e-payment services – can help firms deliver their output to a broader customer base. Access to digitally deliverable business services, such as internet banking or online accounting services, also helps drive export competitiveness, especially in lower middle-income and low-income countries.

Digital trade facilitation tools can help reduce the costs of trade at different stages of the supply chain. Greater use of such tools, including through the sustained implementation of the WTO's Trade Facilitation Agreement, can support MSMEs in developing countries to engage in trade and increase the value of their exports and imports by more than 4.5 per cent.

However, the benefits of digitalization for trade, and of trade for digitalization, are not automatic. A range of policy levers are needed to promote greater participation and benefits, including

through new approaches to market openness, and including for developing countries.

Action is required across a number of policy areas, from building digital skills and addressing digital divides to improving access to ICT goods and services and the affordability and reliability of internet connections. Taking a holistic approach to market openness means understanding how trade policy issues interact with other policy domains such as privacy and data protection, innovation, competition, infrastructure, connectivity, taxation or skills.

Market openness also needs to take into consideration the full range of measures that affect any particular transaction. For instance, while internet access is a necessary condition for digitally enabled trade in goods to flourish, it is not sufficient on its own. If transportation, logistics or e-payment services in the receiving or delivering country are costly due to services trade restrictions, or if goods are held up at the border by inefficient procedures, then the benefits of digital trade may not materialize.

Ensuring that benefits are realized and shared more widely requires a regulatory environment that allows governments, in developed and developing countries alike, to respond to new challenges raised by digitalization. Discussions on digital trade are ongoing, such as the WTO Joint Statement Initiative (JSI) on E-commerce and across a number of trade agreements. The recent



OECD Digital Trade Inventory highlights that there is already substantial uptake of instruments being discussed at the JSI in many developing economies. Moreover, some regional trade agreements or co-operation fora that include developing economies are considering new rules of varying “depth and density” in areas of importance to digital trade.

It is important that developing countries participate in ongoing digital trade discussions and help shape the rules that will underpin a growing part of their economies, as cross-border regulatory divergences and lack of interoperability can result in additional transaction costs where activities need to be aligned across multiple regulatory frameworks.

Strengthening Aid for Trade commitments in categories such as communications and trade policy and regulations can play a key role in supporting countries to close digital connectivity and skills gaps and to address technical and regulatory challenges.

Digital trade allows the owner in Kenya to grow her business online.





## Digital connectivity, e-commerce and the transition to sustainable development

The ITU reports that ICT has the potential to help to address the most pressing climate concerns and to enable the much-needed shift towards a circular economy (ITU, 2019). ICT can be used to monitor climate change (i.e. using observations from space to track deforestation) and to mitigate – and adapt to – the effects of climate change (i.e. developing smart electric grids, improving early warning systems in response to more frequent extreme weather events).

Moving to digital approaches can promote better accessibility, efficiency and sustainability. Responses to the questionnaire indicated how digital connectivity and ICT can support sustainable development outcomes, including (see Table 5 for details):

- providing climatic, hydrometeorological and meteo-marine data for early warnings of extreme weather events;
- making weather forecasting available to farmers on cellular devices;
- boosting agricultural productivity by using sensors to monitor relative humidity and soil fertility;
- using digitalization to provide services that offer a range of other benefits (e.g. improved transport mobility reduces energy consumption, online health and education services, e-commerce to rural areas with the help of digital connectivity);
- utilizing digital connectivity to help reduce relatively large carbon footprints in service delivery, economic transactions, logistics and energy use.

An important application of digital technology in the area of sustainable development cited in the questionnaire is traceability. The Open Timber Portal is an initiative launched by the World Resources Institute to create an open data platform which provides information on forest producers. The data can be used, for example,

to monitor enforcement of the EU Timber Regulation<sup>9</sup> as part of the voluntary partnership agreement<sup>10</sup> process between the producer country and the European Union.

Responses to the questionnaire indicate that it is the services sector where digital connectivity could best support the transition to sustainable development (see Figure 5). Whilst recognizing that answers are context specific, the European Union notes that increased digital connectivity could improve productivity, job creation and the move towards sustainable development in all sectors; however, some sectors stand out more than others. In particular, the services sector includes IT services and digital financial access, which are enablers for competitiveness in other sectors.

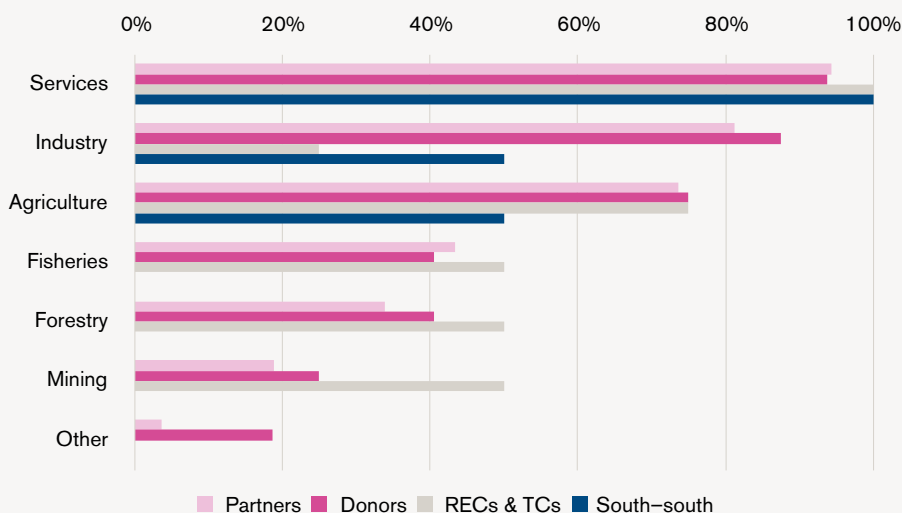
Mauritius notes the role that digital platforms can play in informing the public about eco-friendly and sustainable products. The public can change their consumption patterns by choosing the most eco-friendly product for consumption. However, responses to the questionnaire also refer to the negative environmental impacts of digital connectivity and ICT products, as discussed by the ITU (2019):

"ICTs also consume energy and are, therefore, likely to contribute to global emissions and waste during their production, usage and obsolescence, and they are dependent on the source of the energy being used. For example, technological advancements – and the proliferation of frontier technologies (such as artificial intelligence, the Internet of Things, 5G, digital twins, robotics, etc.), in particular – are contributing to the growing number of data centres and the concern over their energy consumption, which is increasing at an alarming rate. The growing number of ICT-related services is also increasing the environmental footprint of the ICT sector, which calls for action to monitor this trend."

**Table 5: Digital connectivity, e-commerce and the transition to sustainable development**

Regions and donors	Responses in questionnaire
<b>Africa</b>	
Madagascar	Digital connectivity offers promise in the agriculture and fisheries sector
Mali	<p>Introduction of ICT can boost agricultural productivity by:</p> <ul style="list-style-type: none"> <li>▪ using sensors to monitor relative humidity and soil fertility</li> <li>▪ using of probes to measure the density of fish or fishery resources</li> <li>▪ automating industrial and agricultural production</li> <li>▪ developing electronic commerce</li> </ul>
Mauritius	<p>The Economic Development Board platform can facilitate ease of doing business for attracting potential investors in the field of recycling</p> <p>The Consumer Information System is a digital platform to inform the public about environmental friendly and sustainable products</p>
<b>Asia and the Pacific</b>	
Indonesia	<p>Start-ups providing funding and training for agriculture and fisheries sector to use technology, as well as connecting local fishermen to a wider market using digital technology</p> <p>Provision of services with the help of digitalization and digital connectivity can:</p> <ul style="list-style-type: none"> <li>▪ reduce energy consumption in public transport and hence reduce reliance on unsustainable fossil fuels</li> <li>▪ provide health and education services to rural populations</li> <li>▪ disseminate e-commerce to rural areas</li> <li>▪ empower the digitization of MSMEs as a form of digital transformation</li> </ul> <p>Aims to be the “world’s food barn” by 2045 and has several policies to maintain a stable food security chain</p>
Pakistan	<p>Weather forecasting made digitally available to farmers on their cellular devices</p> <p>Beneficiaries of government programmes identified through the database Kissan card scheme</p>
<b>Latin America and the Caribbean</b>	
Colombia	Adaptation to climate change strategy seeks to use digital connectivity and to promote ICT tools for climate change mitigation and adaptation, such as making climatic, hydrometeorological and meteo-marine information available for early warnings of extreme weather events
<b>Donors</b>	
Australia	Moving to digital approaches could promote better accessibility, efficiency and sustainability
Pacific Islands Forum Secretariat	<p>Digital connectivity can:</p> <ul style="list-style-type: none"> <li>▪ be used to monitor activities that threaten to deplete natural resources (e.g. fisheries, forestry, mining)</li> <li>▪ enable sustainable small-scale tourism</li> <li>▪ help farmers in remote rural areas to pursue sustainable agriculture practices</li> </ul>
Sweden	Sida – The Swedish International Development Cooperation Agency – supports the International Trade Centre (ITC) in initiatives such as GreenToCompete and SheTrades
Chinese Taipei	The product trace system iFarm is being developed

**Figure 5: Sectors in which digital connectivity could best support the transition to sustainable development**



Source: WTO Secretariat.

## Digital connectivity and gender equality and women's economic empowerment

Students at Tailulu College make the most of high-speed broadband services, Nuku'alofa, Tonga.

Digital connectivity as a driver of women's economic empowerment is the message which emerges strongly from the responses to the questionnaire. Where ICT and digital technology are introduced to meet the needs of women and girls, they offer great potential to reduce gender gaps (ADB, 2016a):

"The sector is a growing source of full-time and part-time employment, particularly for young women and men in urban centers. While supervisory and management positions tend to be dominated by men, women's share of ICT jobs at all levels is increasing."

A report by GSM Association estimates that in low and middle-income countries, another 112



million women started using mobile internet in 2020 (GSMA, 2021b). There has been little change in the mobile internet gender gap in recent years, with the exception of South Asia, where it has narrowed, albeit from a high disparity.

Responses to the questionnaire refer to the digital gender divide in a national context (see Figure 6). Among the main difficulties influencing women's access to digital technology are the following (see Table 6 for details):

- low school attendance rates for girls;
- low purchasing power for women to acquire devices;
- difficulties for uneducated women with the functionality and operation of related technologies;
- negative attitude of family members towards women accessing digital technology;
- lack of relevant content for women;
- online and offline vulnerability felt by women;
- socio-cultural barriers;
- lack of confidence for some women in using digital technologies;
- lower levels of ICT infrastructure in rural areas, where many women reside.

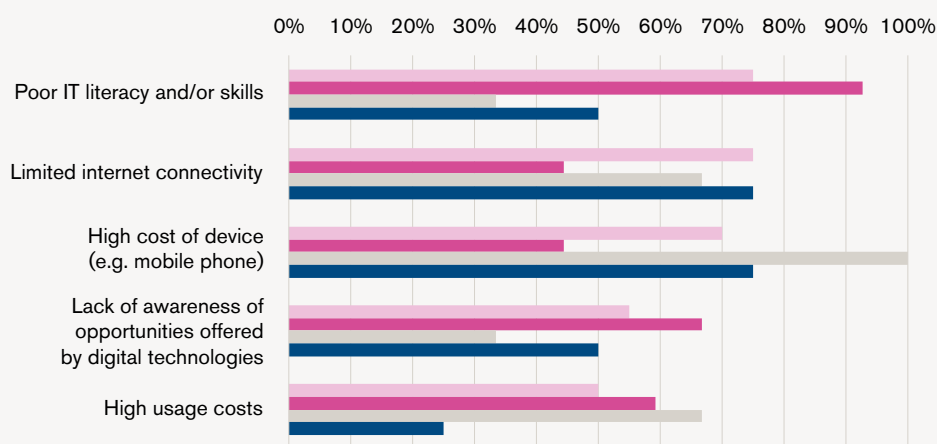
More than 70 per cent of the responses to the questionnaire highlight that women face particular difficulties in accessing digital technologies. This is in line with studies on the digital divide women face to access the internet:

"According to ITU's latest data, the proportion of women using the Internet globally amounts to 48 per cent, compared to 55 per cent of men. In relative terms, this means that the global Internet use gender gap stands at 12.5 per cent."<sup>11</sup>

In some regions, this gender gap is more pronounced. For example, the ADB finds digital gender gaps prevalent in Asia and the Pacific, with a 17 per cent gap between women's and men's use of the internet. In 2020, the Inter-American Development Bank reported on research on the digital exclusion of women in rural areas (Rotundi *et al.*, 2020):

"In 17 of the 23 Latin American and Caribbean countries analyzed, the number of women who report owning a mobile phone is lower compared to men. The greater the gender gap with respect to mobile phone ownership, the lower women's participation in the workforce. Rural women are the least connected group."<sup>12</sup>

**Figure 6: Most commonly cited barriers by respondents that prevent women from accessing digital technology**



Source: WTO Secretariat.

Partners Donors RECs & TCs South-south

**Table 6: Digital connectivity and gender equality and women's economic empowerment**

Regions and donors	Responses in questionnaire
<b>Africa</b>	
Mali	<p>The three main difficulties influencing women's access to digital technology:</p> <ul style="list-style-type: none"> <li>▪ low school attendance rates</li> <li>▪ low purchasing power to acquire devices</li> <li>▪ difficulties with the functionality and operation of related technologies</li> </ul> <p>The support provided effectively corresponds to the objectives and priorities of women in terms of trade, which are:</p> <ul style="list-style-type: none"> <li>▪ strengthening women's economic empowerment</li> <li>▪ fostering the socio-economic integration of women with equal access to employment opportunities and productive factors</li> <li>▪ improving the institutional, legal and organizational environment</li> <li>▪ promoting the productivity and competitiveness of women's businesses</li> </ul>
Uganda	<p>Obstacles largely emanate from:</p> <ul style="list-style-type: none"> <li>▪ patriarchal, institutionalized work ethics</li> <li>▪ limited physical ICT facilities</li> <li>▪ individual characteristics, perceptions and attitudes</li> </ul>
<b>Asia and the Pacific</b>	
Pakistan	Alignment with trade priorities and objectives is proven by incorporation of gender balances and empowerment in national plans such as the Strategic Trade Policy Framework, e-commerce policy and MSME policy
Sri Lanka	<p>Additional barriers that prevent women accessing digital technology include:</p> <ul style="list-style-type: none"> <li>▪ negative attitude of family members towards women accessing digital technology</li> <li>▪ lack of relevant content</li> <li>▪ online and offline vulnerability</li> <li>▪ socio-cultural barriers</li> <li>▪ lack of confidence</li> <li>▪ lower IT literacy</li> </ul>
<b>Latin America and the Caribbean</b>	
Mexico	<p>2019 economic census, with regard to the gender digital divide and businesswomen in more than 4 million businesses surveyed, finds:</p> <ul style="list-style-type: none"> <li>▪ 10.3 per cent of businesses owned by women had computer equipment (compared to 20.3 per cent for men)</li> <li>▪ 8.7 per cent of businesses owned by women used the Internet (compared to 17.5 per cent of men)</li> </ul>
Peru	Digital skills gap is one of the barriers to access ICTs and affects women to a greater extent and that also leads to segregation both in the type of work that men and women do and in the reasons that lead them to seek employment within digital platforms
<b>Donors</b>	
Australia	Women and girls have less, or restricted, access to digital technologies due to socio-cultural norms that influence education, resource and employment decisions

Donors and regions	Responses in questionnaire
Donors	
Canada	<p>A project conducted by the Montreal Institute for Genocide and Human Rights Studies reveals the growing amount of gendered online abuse and disinformation and that this harmful content aims to threaten and dehumanize women and is an obstacle to women's political participation</p> <p>The underrepresentation of women in science and technology industries may impact the design of technologies and create a male-centric bias in how technology curates information</p> <p>Through the Feminist International Assistance Policy, Canada seeks to address the gender digital divide, including in relation to physical access, education and training in digital ecosystems, and the unique experiences of women and girls online</p>
Germany	<p>Barriers are interrelated and include:</p> <ul style="list-style-type: none"> <li>▪ limiting socio-cultural gender biases</li> <li>▪ lack of e-literacy and digital skills (including digital financial literacy)</li> <li>▪ underrepresentation of women in the IT sector</li> <li>▪ limited access to and affordability of the internet</li> </ul>
Japan	<p>Higher barriers and constraints for women and girls:</p> <ul style="list-style-type: none"> <li>▪ to access the internet (including affordability of technology)</li> <li>▪ to develop digital skills</li> <li>▪ to find employment in the ICT sector</li> </ul> <p>Security and privacy concerns from harassment and violence in cyberspace discourage women from becoming active in internet use</p> <p>The Japan International Cooperation Agency believes that addressing the gender digital divide is imperative for ensuring women and girls gain better access to healthcare, education and jobs and to improve civic participation</p>
United Nations Conference on Trade and Development	<p>Digital sector remains widely male-dominated and women still face obstacles to making the most of the digital transformation</p> <p>Pre-existing gender inequalities make it more difficult for women to access digital technology:</p> <ul style="list-style-type: none"> <li>▪ gender bias</li> <li>▪ lower participation in decision-making processes</li> <li>▪ more limited digital skills</li> <li>▪ lack of trust</li> <li>▪ unequal access to funding</li> </ul> <p>COVID-19 pandemic accelerated digitalization and exacerbated the need to address persistent bottlenecks and to give more prominent consideration to gender issues in the digital economy</p>
United Nations Industrial Development Organization	<p>Bridging the digital gender divide is a prerequisite for achieving sustainable economic growth and prosperity.</p>
World Bank	<p>Through the Trade and Gender Study in the Pacific Island region, the WBG found that of the women respondents across the five surveyed countries, fewer women are aware that import and export declarations can be submitted electronically</p> <p>Benefits to traders include faster clearance times, transparent and predictable processes, and less bureaucracy</p> <p>More women traders tend to have difficulty in finding information on border regulations and procedures than male counterparts</p>



## Case study

### USAID: Why the gender digital divide exists

The key reasons for women's and girls' limited access to and use of mobile technology and the internet are interrelated and complex but are grounded in global gender inequality. The main barriers can be categorized into four broad areas.

#### Affordability

Because of social norms, women are often less financially independent than men and have lower levels of income. Since women are thus more price-sensitive than men, they tend to have less sophisticated devices and poorer user experiences. They also have less disposable income to spend on mobile or internet services.



Young women attend an ICT course in Mauritius.

#### Availability

Low levels of network quality and coverage create additional barriers for women and girls. Women's choice of network is often restricted by factors such as more basic handsets (or lower-end smartphones), cost of data and fewer choices of provider.

#### Ability

Women's use of mobile and internet platforms is often limited by their lower levels of technical and digital literacy skills, as well as by their lack of confidence in using technology and the lack of relevant content for women's needs, especially in local languages. There is strong evidence that mobile and internet access and use follows broader social patterns of deep social exclusion of women and girls; women are disadvantaged in their access and use of technology because of underlying social conditions, including lower levels of education.

#### Appetite

Safety, security, and harassment is increasingly a major concern for women more than for men, and it acts as a serious deterrent to women's and girls' technology use. This includes a fear of harassment from strangers (e.g. cyberbullying and harassment, unsolicited calls, texts and online messages), as well as concerns about online data security and privacy. Women also tend to report a lower level of understanding of the potential of the internet, and a perceived lack of value.

Source: Adapted from Tyers (2020).

## Endnotes

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1. See <https://www.itu.int/en/mediacentre/Pages/PR-2021-11-29-FactsFigures.aspx>.
2. See <https://www.ifc.org/wps/wcm/connect/e358c23f-afe3-49c5-a509-034257688580/e-Conomy-Africa-2020.pdf?MOD=AJPERES&CVID=nmuGYF2>.
3. See [https://www.wto.org/english/news\\_e/news22\\_e/serv\\_01feb22\\_e.htm](https://www.wto.org/english/news_e/news22_e/serv_01feb22_e.htm).
4. *Ibid.*
5. See <https://au.int/sites/default/files/documents/38507-doc-dts-english.pdf>.
6. See <https://futurium.ec.europa.eu/en/Digital4Development/discussion/flagship-african-european-digital-innovation-bridge-aedib>.
7. See <https://www.southsouth-galaxy.org/blog/accelerating-digital-transformation-through-south-south-and-triangular-cooperation>.
8. See <https://www.mfa.gov.cn/ce/ceme//mon/wjbxw/t1901752.htm>.
9. See *Regulation (EU) No. 995/2010 of the European Parliament and of the Council of 20 October 2010 laying down the obligations of operators who place timber and timber products on the market*, 12 November 2010.
10. A voluntary partnership agreement is a legally binding trade agreement between the European Union and a timber-exporting country outside the European Union that ensures that all the timber and timber products destined for the EU market comply with the laws of the exporting country.
11. See <https://www.itu.int/en/mediacentre/backgrounders/Pages/bridging-the-gender-divide.aspx>.
12. See <https://www.iadb.org/en/news/digital-exclusion-obstacle-hinders-rural-womens-work>.