



LDC5
5TH UNITED NATIONS
CONFERENCE ON THE
LEAST DEVELOPED COUNTRIES

Issues Note for Theme 2

Leveraging the power of science, technology and innovation to fight multidimensional vulnerabilities and to achieve the SDGs

Issues Note

The critical importance of science, technology, and innovation for achieving the sustainable development has been confirmed in the 2030 Agenda for Sustainable Development and Istanbul Programme of Action for LDC for the Decade 2011-2020. STI is an enabler for all SDG from social protection delivery to environmental protection. It is an important driver of productivity, growth and economic transformation, and a game changer for rapid structural transformation of least developed countries. STI can speed up the path towards sustainable development of LDC and their achievement of the sustainable development goals.

Despite advances in STI, significant gaps remain for bridging the scientific and technological divide between developed countries and LDC. The highly uneven global distribution of scientific capacity and access to knowledge threatens to derail the 2030 Agenda.¹ Over 60 per cent of total scientific literature and most research and development are carried out in high-income countries. The Report of the Secretary-General on progress in the implementation of the Istanbul Programme of Action (IPoA) over the period 2011-2020² highlights that LDC faced significant lags in major indicators related to STI. It is clear that fully leveraging the potential of STI requires substantial investment in research and development (R&D). However, the ratio of R&D expenditure in LDCs as a share of GDP was 0.6 per cent or less between 2011-2017, compared with around 2 per cent of developed countries' much larger GDP. Citizens of LDCs, comprising both residents and non-residents, filed only 1536 patents in 2018, increasing from 960 in 2011. As a share of patents globally the figure is almost zero. The LDCs published only 11 journal articles for every 1 million people in 2018, a marginal increase from 6 in 2011.

Access to modern technologies for sustainable development. Building human capital, infrastructure and institutions to reap the benefits of the Fourth Industrial Revolution.

The Fourth Industrial Revolution has the potential to raise global income levels and improve the quality of life for populations around the world.³ Advances in artificial intelligence, connectivity, digitization of information, additive manufacturing, virtual reality, machine learning, blockchains, robotics, quantum computing and synthetic biology, amongst others, have potential to be a key enabler for

¹ https://sustainabledevelopment.un.org/content/documents/24797GSDR_report_2019.pdf

² Implementation of the Programme of Action for the Least Developed Countries for the Decade 2011-2020 Report of the Secretary-General, A/76/71- E/2021/13

³ <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>

sustainable development. However, the largest beneficiaries tend to be the providers of intellectual and physical capital—the innovators, shareholders, and investors, and consumers who are able to afford and access the digital world. As a result, there is a risk that LDCs will not be able to participate and benefit from these advances, due to their limited capacities and limited access.

During the period of the implementation of the IPOA, internet access in LDCs increased to 19% in 2019⁴ from about 5% in 2011. While in developed countries, 87% of individuals used the internet in 2019. There is also a wide gap in digital connectivity between urban and rural areas in the LDCs. Eighty-nine per cent of urban households had a mobile phone compared 63 per cent of rural ones (ITU, 2018).

In most least developed countries, successful applications are still largely narrowband, especially in rural areas. These range from text alerts with diet reminders for diabetics to mobile platforms for farmers to check agricultural prices, natural disaster monitoring and, increasing mobile money services. These services have been successful as applications operate on widely available basic handsets and they require modest user skills to operate.

This digital divide results from low broadband coverage especially in rural and remote areas, the relatively higher cost of using the internet, lack of local content and lack of relevant digital skills in LDCs. In addition, the digital divide in LDCs also has a gendered dimension, with only 14% of women using the internet compared to 25% of men in 2019. This means that approximately 800 million people in LDCs are not online and have no possibility of participating in online services, including e-commerce, e-governance, e-health and e-learning, and communication. The five most populated countries (Bangladesh, Ethiopia, DRC, Tanzania, and Myanmar) account for almost half that number (ITU, 2018). There is an urgent need to identify rural, remote, low-population density and hard-to reach communities that need broadband coverage and that cannot be served through terrestrial connection. Governments should include satellite broadband as an available alternative and make it an integral part of any national broadband plan to bring broadband to rural and remote areas.

Affordability of internet access and usage remains another key issue for many LDCs. There are several ways in which affordability can be improved, including through promoting a competitive market so that operators will compete for low-use customers through a variety of internet plans that cater to different income levels. Ensuring a more competitive mobile internet market can be done through regulatory actions such as infrastructure sharing, open and cost-based access to wholesale facilities, liberal spectrum policy, and promotion of IXPs. Furthermore, taxes and other sector-specific charges need to be examined for their impact on affordability. Governments need to rationalize their ICT sector taxation and other fees and find the right balance between the need for revenue and the development of their digital economy. In addition, making internet access available at community centers can serve as low-cost or free venues for accessing the internet and can be used for training people.

The digital revolution perpetuates inequalities and create new ones. It has the potential to lead to loss of job, increase inequality, and further shift of income from labor to capital. There are concerns on security and the invasion of privacy, including cyberattacks, requiring government action to maximize the potential benefits, while mitigating harmful outcomes, and ensuring universal access. This calls for effective governance and investment in human and physical resources⁵ and development of national STI capacities - a prerequisite for the social and economic transformations that enable sustainable economic growth, human development and poverty eradication.⁶ The digital transformation also calls for a comprehensive set of regulatory and normative frameworks, physical infrastructure and digital systems.

An essential priority should be to develop science, technology and innovation road maps⁷ for achieving the Sustainable Development Goals and related action plans at the national and subnational levels, ideally with measures for tracking progress and in line with national and global development strategies. The road maps and action plans will serve as a strategic tool to ensure policy coherence, linking public and private actions and optimizing investments.⁸

⁴ Implementation of the Programme of Action for the Least Developed Countries for the Decade 2011-2020
Report of the Secretary-General, A/76/71- E/2021/13

⁵ UNCTAD Technology and Innovation Report 2021 <https://unctad.org/webflyer/technology-and-innovation-report-2021>

⁶ Report of the UN Secretary-General, Science, technology and innovation, and the potential of culture, for promoting sustainable development and achieving the MDGs, 2013 Annual Ministerial Review of ECOSOC (referred to hereunder as 'UN SG Report, AMR ECOSOC 2013')

⁷ https://sustainabledevelopment.un.org/content/documents/24797GSDR_report_2019.pdf

⁸ https://www.un.org/ga/search/view_doc.asp?symbol=E/HLPF/2019/6&Lang=E

Income, gender, age, education, health and other inequalities also affect access to new technologies and risk further exacerbating social divides.⁹ For reducing inequalities, governments can draw from a broad range of instruments, including regulatory measures and economic and fiscal instruments, as well as smarter policies on trade, investment, industry, education, and innovation. They can also ensure that vulnerable and low-income groups have access to valuable new goods and services some of which can be subsidized or provided free.¹⁰

There is need to promote science and technology-led innovation ecosystem in the LDCs and link STI to socio-economic priorities; increase investment in research and development and align STI to sustainable development by prominently featuring capacity-building in information and communications technologies and STI in national development planning; and promote collaboration between academies of science in providing scientific advice to governments on policy formulation.

STI for recovery from the COVID-19 pandemic and building resilience against emerging challenges.

STI policies will play a key role not only in post-COVID-19 recovery plans, but also in the decade of action to deliver on the 2030 Agenda for Sustainable Development. The recovery from COVID-19 offers an opportunity to build the world back better, including using STI to help recover from the pandemic and become more resilient to future systemic shocks and crises.

During the COVID-19 pandemic, the central role of STI has been recognized at various stages, from prevention to treatment. Its role has also been experienced through new and innovative ways of learning, such as tele-education, tele-working, tele-medicine, digital finance, etc. However, for LDC, access to such facilities were limited by availability of broadband connectivity, equipment, technology, STI infrastructure and relevant skills.

The COVID-19 pandemic has underscored the pressing need for countries to elevate STI in both policy and practical terms. There is need for more research, collaboration, data and knowledge sharing to cope with the immediate impacts of the coronavirus crisis and go beyond it.¹¹

As new technologies require skilled workers, there is need to invest in education, including e-education, and to improve education and training in LDCs, especially in STEM subjects. There is need to provide affordable internet access and devices to utilize during online learning.

Access to the internet is another key challenge that hampers adoption in STI in LDCs. Most of the offline population live in LDCs, where only 19 per cent use the internet, compared with 87 per cent in developed countries (State of Broadband Report, 2020). Some key reasons for this large gap are the cost of using the internet and the lack of necessary skills.

There is need for a coordinated multilateral response to help leverage digital technologies, finance SMEs and address market failures that prevent LDCs from enhancing their STI capacity.

STI development and implementation play an essential role in addressing increasingly complex and unpredictable threats in a globally interdependent world – beyond the immediate COVID-19 pandemic. STI is needed to better understand and advance strategies to reduce shocks and build more resilient societies, including by mitigating and adapting to increasing climate risks. It can help policymakers address cascading shocks in a comprehensive and systematic manner, rather than handling one crisis at a time without understanding interlinkages and underlying risk drivers.

For this LDCs will depend on enhanced development cooperation, investment and partnerships for data and technology to strengthen the generation, management and accessibility of risk knowledge. In LDC, vulnerability and risk levels are often high, while the capacity to respond and recover is limited. Support is needed to collect and analyze disaster loss data, conduct risk assessments, and establish transboundary early warning systems, among others.¹²

⁹ https://developmentfinance.un.org/sites/developmentfinance.un.org/files/FSDR2021_ChptIII.G.pdf

¹⁰ UNCTAD Technology and Innovation Report 2021 <https://unctad.org/webflyer/technology-and-innovation-report-2021>

¹¹ See <https://unctad.org/topic/commission-on-science-and-technology-for-development/covid-19>

¹² https://developmentfinance.un.org/sites/developmentfinance.un.org/files/FSDR2021_ChptIII.G.pdf

The United Nations Technology Bank for the LDCs has an important role to play in the advancement of science, technology and innovation, as well as bridging the digital divide and contributing to COVID-19 response and recovery.

Promoting private sector engagement, digitalization and broadband connectivity

Broadband internet, and information and communication technologies promote economic development. Given its potential applications in diverse sectors of the economy, failure to ensure high levels of broadband access and use will have significant implications for LDC, with the risk of seeing them fall further behind.¹³

As an enabling technology, broadband creates value and reduces costs by supporting applications in many different sectors such as agriculture, education, financial services, government, health and disaster management. Yet broadband internet access in the majority of the LDCs remains below the global average.¹⁴ COVID-19 has highlighted that internet access is an essential public service. A whole-of-government approach to digital investment can benefit the entire value chain: citizens, businesses, governments and their partners, and the supporting ecosystem of ICT developers and implementers.

During the lockdown period, many LDCs found it challenging to avail online facilities for remote learning and working, primarily due to insufficient broadband services combined with often high costs. In order to build a resilient society in the face of new and emerging challenges, there is need to promote digital access and broadband connectivity in LDCs.

Developed countries have seen rapid fixed broadband connectivity increases since 2005, while developing countries on average saw an acceleration after 2014. However, fixed broadband connectivity growth in LDCs was from a very low starting point, causing a new digital divide. In 2020, the average number of subscriptions per 100 inhabitants in LDCs was only 1.3, compared to an average of 11.5 per 100 in developing countries and 33.6 per 100 in developed countries. While mobile broadband network coverage now reaches over 95 per cent of the global population, around one quarter of the population in LDCs still does not have access to mobile broadband.¹⁵

For LDCs to leapfrog to frontier technologies, there is need to deal with structural constraints, including enabling universal access to electricity and broadband internet connections. Additionally, attainment of a minimum level of education is required to utilize digital technologies. In order to bridge the technology and development divides, national development strategies will therefore need to target both basic infrastructure development and human capital accumulation.¹⁶ There is need to create an enabling environment that allows for, inter alia, the development of the required infrastructure.

COVID-19 has highlighted the importance of building inclusive digital economies that can increase resilience while ensuring that no one is left behind. Those without access to the internet or digital skills have fallen behind, and businesses that had not gone digital have struggled more than those that had. Looking ahead, public and private stakeholders need to work together to build a more equitable and inclusive digital economy.¹⁷

A recent International Telecommunication Union study estimates that achieving universal access to broadband internet by 2030 will require bringing over three billion people online in the next ten years, at an estimated cost of \$428 billion (including \$135 billion for South Asia and \$97 billion for sub-Saharan Africa). This includes investment needs in infrastructure; the

¹³ https://www.itu.int/dms_pub/itu-d/opb/ldc/D-LDC-BROAD_IMP.01-2019-PDF-E.pdf

¹⁴ https://www.itu.int/dms_pub/itu-d/opb/ldc/D-LDC-BROAD_IMP.01-2019-PDF-E.pdf

¹⁵ https://developmentfinance.un.org/sites/developmentfinance.un.org/files/FSDR2021_ChptIII.G.pdf and ITU 2021a.

¹⁶ UN-DESA, 2018

¹⁷ https://developmentfinance.un.org/sites/developmentfinance.un.org/files/FSDR2021_ChptIII.G.pdf

design and implementation of appropriate policy and regulatory frameworks; investments in basic and the creation of locally relevant digital content. Reaching this goal will require both public and private financing.¹⁸

Guiding Questions

1. What conditions are needed to encourage widespread generation, adoption and use of relevant technologies in LDCs?
2. How can LDC reap the benefits of digitalization? What is the role of Governments, development partners and other stakeholders, in particular the private sector and research and academic institutions, in promoting f digitalization for development?
3. What role can the Technology Bank for the LDCs play in the advancement of science, technology and innovation, as well as bridging the digital divide and contributing to COVID-19 response and recovery, including building back better during the next ten years?
4. How can digital access and broadband connectivity in LDCs be expanded to all?
5. What are the conditions required to stimulate North-South, South-North and South-South transfers of technologies for achieving the Sustainable Development Goals?
6. How can national academies of science support STI development and access to new technologies?

¹⁸ ITU. 2020b. Connecting Humanity: Assessing Investment Needs of Connecting Humanity to the Internet by 2030. Geneva: ITU