



**Commission on Science and technology for Development (CSTD)**  
**Contribution to the 2021 High-level Political Forum**

This note synthesizes findings from the Commission on Science and Technology for Development (CSTD) as a contribution to the High-level Political Forum (HLPF) scheduled to take place from 6 to 15 July 2021. It follows the outline proposed by the HLPF secretariat and draws on the two priority themes of the CSTD during the 2020-2021 inter-sessional period, namely (a) using science, technology and innovation to close the gap on Sustainable Development Goal 3, on good health and well-being; and (b) harnessing blockchain for sustainable development: prospects and challenges, and the findings and recommendations emerged during the virtual Inter-sessional Panel held on 18 and 22 January 2021. These findings and recommendations will be considered by the CSTD during its 24<sup>th</sup> annual session in 2021. The 24<sup>th</sup> CSTD will also review progress made in the implementation of the outcomes of the World Summit on the Information Society and listen to presentations on science, technology and innovation policy reviews of Dominican Republic, Uganda (post-review follow up) and Zambia.

**1. Impacts of the COVID-19 pandemic on the implementation of the SDGs under review in the 2021 HLPF from the vantage point of your intergovernmental body, bearing in mind the interlinkages with other SDGs;**

**a. Equal access to the benefits of science, technology and innovation in healthcare is necessary to stop the COVID-19 pandemic but also for future health emergencies.**

One of the CSTD's priority themes this year is "Using science, technology and innovation (STI) to close the gap on Sustainable Development Goal 3, on good health and well-being" (see E/CN.16/2021/2). The CSTD examined how the whole spectrum of STI can make a significant contribution to the achievement of Goal 3, especially to primary health care, poverty-related diseases, and disease outbreak early warning and response.

During the COVID-19 pandemic STI have been key enablers in the response to the health, economic, and social disruptions. STI and information and communication technology (ICT) tools are supporting the development and deployment of diagnostics, community- and self-testing, and digital contact tracing. STI are also essential for early warning and disease surveillance as data aggregation systems provide epidemiological insights and play an important role in COVID-19 surveillance.

The COVID-19 pandemic has underscored the pressing need for countries to focus more on elevating STI in both policy and practical terms. But countries also need to make sure that the development benefits of STI translate directly into the daily lives of people all over the world. Therefore, it is important to ensure that all countries have equal access to the benefits of life-saving

treatments, not only for the pandemic but also for future health emergencies and infectious disease outbreaks. The COVID-19 pandemic has revealed ethically and politically unacceptable inequalities in access to treatments, vaccines, and health-related technologies. Strengthening international cooperation and a commitment to global solidarity are critical enablers for ensuring that all countries have the requisite technological capabilities and productive capacities to produce requisite health supplies for current and future health emergencies.

**b. The COVID-19 pandemic has demonstrated enduring digital divides.**

The CSTD also examined the priority theme “Harnessing blockchain for sustainable development: prospects and challenges” (E/CN.16/2021/3) and reviewed progress made in the implementation of the outcomes of the World Summit on the Information Society (see A/76/64–E/2021/11). As a contribution to the HLPF, the CSTD wants to raise awareness about digital divides and the inequalities in digital provision, themes interlinked with Goal 8 on decent work and economic growth and Goal 10 on reduced inequalities.

ICTs have played a crucial role in enabling greater resilience to the impacts of pandemic. They have facilitated continuity in health care provision, education, areas of the economy and entertainment. In so doing, they have accelerated digitalization and the transition to an information society. Increased demand has also put greater pressure on communications infrastructure. Remarkably, networks have proven more resilient than expected, and the Internet has survived huge surges in traffic due to the COVID-19 pandemic.

But the pandemic has also demonstrated the enduring inequalities in digital provision. Those with access to ICTs and those with jobs that rely on their use have been better placed to overcome some of the difficulties caused by the pandemic than those without such access. Those who lack affordable connectivity have been disadvantaged in comparison with those that have such connectivity. Manual and casual workers have been less able to work online than others. Children without access to computers and connectivity have been disadvantaged regarding receiving education. The lack of equality in digital access, connectivity, affordability and digital literacy and resources has contributed to inequalities in social and economic welfare. The COVID-19 pandemic has demonstrated access to the digital world must be made available more equally to all.

**c. The COVID-19 pandemic is showing cracks in the gender equality achievements of the last 50 years.**

Finally, at its 24th annual session the CSTD will hold a dedicated session on gender considerations in STI policies, reviewing a new paper prepared by UNCTAD in collaboration with the CSTD Gender Advisory Board, entitled “Applying a Gender Lens to STI in the 21st Century” (forthcoming).

According to recent reports by the UN Secretary-General<sup>1</sup> and UN Women<sup>2</sup> the COVID-19 pandemic reinforced gender inequalities by destroying many micro -, small and medium enterprises where women are often overrepresented, increasing unpaid care work, hampering women’s access to sexual and reproductive health, and triggering domestic violence against women and girls.

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<sup>1</sup> See: UN Secretary-General’s [policy brief on the impact of COVID-19 on women](#) (2020).

<sup>2</sup> See [From insights to action: Gender equality in the wake of COVID-19](#) (2020).

Meanwhile, the pandemic has accelerated digitalization of the economy, posing new risks for women. The gendered effects of new and emerging technologies (such as artificial intelligence, Internet of things, big data, gene editing, blockchain) are not fully understood. These fast-changing and wide-ranging technological changes have implications for every facet of the society and economy. As women tend to be underrepresented in science, technology, engineering and mathematics (STEM) careers, there is a growing concern that new technologies may reverse the momentum before the pandemic in gender equality and empowerment through adverse effects on women's employment and labor force participation, as well as economic and livelihoods opportunities. Failure to address women and girls' needs by new technologies and to help them become users and developers of such technologies is likely to reverse progress made in gender equality and achieving the Sustainable Development Goals.

## **2. Actions, policy guidance, progress, challenges and areas requiring urgent attention in relation to the SDGs and to the theme within the area under the purview of your intergovernmental body**

For many developing countries, achieving the SDGs by 2030 will be practically impossible without effective and widespread application of STI. It is necessary to ensure that technology and innovative ideas are disseminated in an inclusive way, without widening existing technological gaps or creating further divides. The 2021 HLPF could recognize and highlight the role of STI in addressing the COVID-19 pandemic and achieving almost all of the other SDGs, and advocate for the systematic inclusion of STI in policies in national development strategies.

The three reports of the Secretary-General prepared for the 24th annual session of the CSTD (E/CN.16/2021/2, E/CN.16/2021/3, and A/76/64–E/2021/11) contain several concrete suggestions for Member States, the international community and the CSTD. Highlighted herewith are some of the most relevant to the 2021 HLPF theme.

### **a. Build stronger national capacities in STI for health and beyond**

STI are cross-cutting issues that touch upon all areas of the SDGs. The need to harness STI in tackling the on-going COVID-19 pandemic and for a sustainable recovery is more stressing than ever. Countries need to continue to create an enabling environment for research, capacity-building, innovation, and technologies complemented by coherent policies that integrate STI in all policy areas focusing on issues such as health, education, food systems, energy, urbanization, employment and the economy. Regarding health, some of the immediate actions for STI policy makers include building the science and talent base for health care innovation, assisting R&D stakeholders in translating innovative capacity into health products and services for patients, and promoting a whole-of-government and multi-sectoral approach when it comes to innovation in the health sector.

### **b. Work towards more equitable access to scientific knowledge and technologies**

To ensure that no one is left behind, there is a critical need for international cooperation and coordination in STI. These need to extend beyond the immediate urgency of the COVID-19 pandemic and should enable all countries, especially developing and least developed countries, to develop STI capabilities and become more able in the medium- and long-term to build resilience against natural disasters, climate change, and public health emergencies. To address the needs of health systems in developing countries, international collaboration in scientific research can play

a critical role in improving health, equity, and sustainable development. It can make an important contribution in the context of diseases that are disproportionately prevalent in developing countries, but where research capacity may be limited. To enable their success, collaborative arrangements should seek to foster equitable relations between the collaborating parties through partnerships towards a common goal including the possibility of joint ownership of intellectual property rights.

**c. Close digital divides including gender digital divides**

Digital transformation has a great potential to advance sustainable development but developing countries, least developed countries, and marginalised groups of the society need to build capabilities to not to be left behind. The COVID-19 pandemic has demonstrated that ICTs must be made available more equally to all. Effectively harnessing ICTs – for health, but also in other areas of the SDGs – requires the building of digital competencies and an enabling environment. Digital competencies can be strengthened by an education policy that accommodates digital skills’ training schemes. The creation of an enabling environment can make access to ICT-enabled innovations possible for example through investments in ICT infrastructure, and incentives encouraging investment and labor market participation in the digital economy. However, the needs of different countries and communities are diverse. Understanding the impact of new technologies in different contexts is critical to maximizing their value for development. One way to maximize the developmental value of ICTs is by cooperation among various stakeholders. The COVID-19 crisis has demonstrated how partnerships, for example between technologists and experts in education, health and the environment, are essential if technology is to help meet unmet needs in these areas.

**3. An assessment of the situation regarding the principle of “ensuring that no one is left behind” at the global, regional and national levels against of background of the COVID-19 pandemic in achieving the 2030 Agenda and the SDGs, within the respective area addressed by your intergovernmental bodies;**

**a. Digital divides**

The COVID-19 pandemic has shown the critical role of science, technology and innovation, including digital technologies, for inclusive, sustainable and resilient development. A recent example is the application of AI and big data during the COVID-19 pandemic for fast-tracking the development of vaccines, monitoring the outbreak, tracing cases of the disease, predicting its evolution and assessing infection risks. Digital technologies have also been the lifeline for economies and societies, through digital solutions such as e-learning, e-health, telework, e-commerce and e-government. But the pandemic has also exposed digital gaps - the lack of Internet access, low network speed, gaps in skills, and social factors that affect people’s access and participation.

As highlighted in the 2019 Report of the Secretary-General on the progress made in the implementation of and follow-up to the outcomes of the World Summit on the Information Society (A/75/62–E/2020/11), prepared by UNCTAD, there have been great gains in the deployment and access to digital technologies. For example, mobile cellular signals now reach more than 95 per cent of the global population, and it is estimated that more than 50 per cent use the Internet. However, these are unequally available within and across countries, with large digital divides,

particularly regarding internet access and digital equipment. For example, the proportion of people using the Internet in developed countries is more than four times that in the least developed countries. On average, women are 17 per cent less likely than men to use the Internet. The gap ranges from 3 per cent in developed countries to 43 per cent in the least developed countries.

Affordability is a barrier to access for many people, reducing opportunities to take advantage of new technology and potentially exacerbating other inequalities. Fixed and mobile broadband prices exceed 5 per cent of average gross national income per capita in various developing and the least developed countries, while in many developed countries prices are lower than 2 per cent.

There is also a wide gap in technological capabilities between developed and developing countries. As highlighted in the UNCTAD's *Technology and Innovation Report 2021*, research and development (R&D) expenditures in most developing countries remain much smaller, both in absolute terms and relative to GDP than the world average: 0.29 per cent of R&D in low-income developing countries and 0.2 per cent in the least developed countries compared with 1.72 per cent for the world average. In 2017, there were 1,098 researchers per million people globally, but only 99 per million in sub-Saharan Africa, and 71 per million in the least developed countries.<sup>3</sup> A key issue is the gender divide in STEM, ICT and computing. Women are also a minority among computer science graduates and are underrepresented among STI decision-makers and the digital sector.

What is critical to note is that these digital divides result from social inequalities and, in their turn, reinforce existing inequalities, in a vicious cycle. Technical solutions using digital technologies can benefit marginalized groups and those who are further behind. Still, they can also help even more those that already have an advantage in several social and economic dimensions (wealth, education, health). Digital inequality is a consequence and a subset of broader economic and social inequalities. Policies to solve the digital divide need to be multidimensional: technological, economic, educational, social and persuasive (creating awareness). The digital divide is a complex problem, and all these perspectives are valid and needed. As new digital technologies are developed, and the digital and the physical worlds get more connected, digital and social inequalities will become more and more the same. Therefore, there is a need to address social and digital inequalities simultaneously.

#### **b. Frontier technologies and inequalities<sup>4</sup>**

As emphasized by UNCTAD's *Technology and Innovation Report 2021*, the world is at the beginning of a new technological revolution, that could entrench or aggravate the great divides between countries seen today and that started after the first industrial revolution. Very few countries create the technologies that drive this revolution, but all will be affected by it. Almost none are well prepared for the consequences. This is a critical issue in which leadership to ensure development-friendly outcomes is urgently needed.

Before the industrial revolution there was little income disparity in the world. Since then, every wave of progress was associated with sharper inequality between countries. Now, the gap in the average income per capita between developed and developing countries is \$40,749. In the past 40

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<sup>3</sup> UNCTAD (2020). *Technology and Innovation Report 2021: Catching technological waves: Innovation with equity*. Geneva, 2021.

<sup>4</sup> Based on UNCTAD (2020). *Technology and Innovation Report 2021: Catching technological waves: Innovation with equity*. Geneva, 2021.

years, inequality within countries has also increased in many developed and developing countries. There is no consensus about how the dynamics of economic inequality should be interpreted, and many factors affect inequality: wars, epidemics, the effects of trade and globalization. One of these factors is the impact of technological revolutions. At present, one can argue that the world is at the peak of the “Age of ICT” and is starting a new paradigm, the Industry 4.0. Much of its effect on inequalities between countries will depend on country’s national policies and on their involvement in international trade.

When analyzing the impact of frontier technologies on inequalities, we observe that each wave of technological change brings inequality in new shapes. Nowadays, one of the major concerns is that AI and robotics will reduce employment. However, most estimates of severe impact of AI on jobs do not take into consideration that not all tasks in a job are automated, and, most importantly, that new products, tasks, professions, and economic activities are created throughout the economy.

The way to be prepared to benefit from frontier technologies is by promoting their use, adoption and adaptation. But developing countries have many challenges. One of them is the change in demographics. By 2050, most of the increase in population will be in sub-Saharan Africa, with an increase by 1 billion people. Firms in Africa may have fewer incentives to use automation as a form of saving labour costs.

Another challenge is the technological gap. There are several and increasing disparities between developed and developing countries in their production structure. For example, between 2000 and 2016, the share of medium and high-tech in total value added in least developed countries decreased from 17 to 9 per cent. The risk is that lower-income countries will also fall behind in the adoption of Industry 4.0, widening the technological gap.

In face of these challenges and prospects, many national and local governments are stimulating the growth of new industries and services in frontier technologies. To be fully effective, effective measures to support frontier technologies need to be consistent with proactive industrial policies. In many cases this will require better access to patented technologies and opportunities for technological learning through public-private R&D. Some of the finance for innovations can come from alternative models for funding like impact investment, venture capital, crowdfunding, and Innovation and technology funds.

Policymakers also need to anticipate the impacts on the workforce. Workers should also be able to rely on stronger mechanisms of social protection and different forms of income redistribution. There are many proposals on financing such measures: such as a robot or automation tax, combined with removing corporate tax deductions for investment.

Frontier technologies also impact inequality through the perspective of the users of the technology. Some of the major concerns in this regard are related to the biased design and unintended consequences of AI, and inequalities and ethical considerations of gene editing. Biases within AI systems can arise in several ways, either because they employ biased algorithms, or they use biased data for training. For example, one study found that being signed into a Google account as a woman reduced the likelihood of seeing advertisements for higher-paying positions. Regarding gene editing, a 2017 study shows that most clinical trials of gene therapy have been carried out in the United States (63%) and Europe (23%). Most non-clinical gene-editing studies have also been conducted in the United States (55%), and China (19%)

Developing countries also face particular challenges in this regard. A major issue is the higher level of poverty in developing countries as compared with developed countries, with persistent pockets of extreme poverty, particularly in rural areas. In upper-middle-income and high-income countries, the average share of the population living in extreme poverty is only 2%, but in low-income countries it is 45%.

Poor communities are harder to reach. In this case the barriers are not technological but economic and social. Another challenge is the digital divide - almost half of the world's population remains offline, and the shortage of skills in developing countries when compared with developed countries.

To overcome these challenges, countries individually, but also through concerted international efforts, needs to guide the development and deployment of new and emerging technologies so that they support sustainable development and leave no one behind. This is too critical to be left to the operations of markets on their own.

#### **4. Cooperation, measures and commitments at all levels in promoting sustainable and resilient recovery from the COVID-19 pandemic;**

Science, technology and innovation (STI) have been critical in the global response to the COVID-19 pandemic. We see that all around, from the fast development and production of new vaccines to the lifeline provided by e-commerce, remote working, e-health, and so on. At the same time, the increasing push towards digitalization has exposed and deepened the digital divide. As the physical and digital worlds get more integrated, digital and social divides become the same. Therefore, we have to urgently strengthen our efforts to narrow the digital divide within and between countries to reduce inequality.

Beyond the immediate COVID-19 crisis, STI directed to inclusive and sustainable development is essential for building more resilient societies. They make economies more agile in adapting and recovering from shocks, giving people a voice, increasing their agency, and reducing the impact on the environment.

For all of this, enhanced development cooperation, investment and knowledge sharing are needed, particularly for LDCs, to strengthen their technological learning and innovation capacities, which helps to address complex hazards. In the Addis Agenda, Member States committed to enhancing international cooperation, including ODA for STI. However, as shown in the *2021 Financing for Sustainable Development Report*, prepared with the instrumental participation of UNCTAD, in 2019, ODA for STI fell by 3.6% year-on-year, most worryingly, ODA for STI directed to LDCs fell by 27.5%. We need to reverse this trend urgently.

#### **5. Various measures and policy recommendations on building an inclusive and effective path for the achievement of the 2030 Agenda in the context of the decade of action and delivery for sustainable development.**

Achieving the 2030 Agenda for Sustainable Development requires the full use of all the available tools and harnessing rapid technological change such as frontier technologies like blockchain must be an essential part of this process. In this regard, the following are recommended for policymakers:

- Connect everyone through sufficient ICT infrastructures and making internet access as a public good. Internet connection has increasingly become essential in today's world. Providing internet access as a public utility like electricity and water could help address to a large extent the enduring inequalities in digital provisions faced by the poor people as manifested in the present pandemic.
- Increase the effectiveness of STI policy making. It is essential to identify gaps and incoherencies in national STI policies, then design and implement corresponding STI policies that are conducive to building an inclusive and effective path for the achievement of the SDGs. Without appropriate policies, technologies, be they old or new, are unlikely to deliver progress on the development agenda. In this regard, UNCTAD's STI Policy Reviews support Governments to integrate policies for STI into their national development strategies while working towards the SDGs.
- Build stronger national research capabilities in developing countries. It is imperative that developing countries enhance scientific research, which lays down the foundation for development of technology and innovation. Developing countries often lack financial and human resources to be invested in scientific research while international aid does not often go into this area. There is a need for international coordination in this regard, for example, to ensure that a proportion of the official aid could be allocated for research and development in areas that are critical such as health care. Financing young scientists from developing countries to undertake research and advanced study in developed countries could be a useful venue to build research capabilities in the former.
- Scale up the application of STI solutions. Governments need to adopt and implement policies and supporting measures including financial support to facilitate the use, dissemination, adoption, and adaptation of technologies and innovative solutions for the SDGs and for achieving national development goals. International cooperation should be also scaled up to help developing countries build up capabilities to access and apply STI solutions, including North-South and South-South cooperation.
- Increase women participation in STEM and young females in STEM courses. Given that STEM is driving rapid technological change, Governments should encourage young females' participation in STEM course and facilitate women's access to technology, participation in priority setting, policy decisions and creation of research and development agendas. Governments and the international community need to advance the understanding of the different roles that women play, their specific needs, and the differential impact that they face from technologies.
- Improve foresight and technological assessment. The international community needs to advance its understanding of risks and benefits and policy options to steer innovation in ways that leave no one behind. Countries are encouraged to undertake strategic foresight and technological assessment initiatives to better the socio-economic and environmental implications of new and innovative technologies.
- Strengthen international cooperation and coordination in STI, especially in strengthening international normative frameworks including standards related to AI and blockchain and other frontier technologies to ensure respect for citizen's rights, privacy, data ownership and online security. An inclusive dialogue with the full involvement of the developing countries is necessary to help advance normative frameworks and regulatory regimes for data collection, use and access, and for data privacy and security, balancing individual and collective rights, and allowing private sector innovation.



- Voluntary contributions are invited to support capacity building in STI in the least developed countries and low-income developing countries, in particular to support the efforts such as the STI policy reviews being deployed in this area by UNCTAD as well as efforts by other agencies participating in the IATT of the Technology Facilitation Mechanism.