Commission on Science and Technology for Development (CSTD)

Contribution to the 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 scheduled to take place from 9 to 18 July 2019. It draws on the two priority themes of the CSTD (i.e. the impact of rapid technological change on sustainable development and the role of science, technology and innovation in building resilient communities, including through the contribution of citizen science) during the 2018-2019 inter-sessional period. The findings and recommendations emerged during the Inter-sessional Panel held from 15 to 17 January 2019, as well as during discussions held at the Workshop on Applying a Gender Lens to Science, Technology and Innovation, that was held back-to-back with the CSTD Inter-sessional Panel on 18 January 2019. These findings and recommendations will be considered by the CSTD during its 22nd session which will take place from 13 to 17 May 2019.

1. **Assessment of the situation regarding the principle of "ensuring that no one is left behind" at the global, regional and national levels**

Given the diverse, multidimensional and ambitious nature of the Sustainable Development Goals (SDGs), it will be practically impossible to achieve all of them by 2030 without the development and appropriate application of science, technology and innovation (STI). STI are cross-cutting issues and can play an important role in empowering people and ensuring inclusiveness and equality. STI drive economic growth and diversification, that can create employment opportunities and increase real incomes. They can also give voice to people, connect them and extend access to education, health and other basic services, including for those who are most vulnerable.

2. **Identification of gaps, areas requiring urgent attention, risks and challenges**

The application of new and emerging technologies represents an opportunity for faster progress towards the SDGs. UNCTAD's 2018 Technology and Innovation Report provides detailed examples of a wide range of applications of frontier technologies that are already demonstrating potential to accelerate progress towards the SDGs.[1] At the same time, rapid technological change can also disrupt markets and economies and exacerbate social divides. Therefore, this year the CSTD is looking at how automation from the convergence of artificial intelligence, machine learning and big data could impact labor markets and employment in both developed and developing countries. The CSTD is also examining how rapid technological change could perpetuate existing divides within and between countries as well as between rural and urban populations, and rich and poor communities. A workshop on gender, organized with the purpose of supporting gender-mainstreaming in the work of the CSTD, examined how new and emerging technologies may widen existing gender digital and science, technology, engineering, and mathematics (STEM) divides.

3. **Successful experiences and lessons learned on empowering people and ensuring inclusiveness and equality**

a. **Technologies to improve access to educational learning and resources**

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[1] For more information, see UNCTAD (2018). *Technology and Innovation Report 2018: Harnessing Frontier Technologies for Sustainable Development*. United Nations publication. Sale No. E.18.II.D.3. New York and Geneva.

New digital platforms, including massive open online courses (MOOCs), provide online courses that allow for open access and unlimited participation through the Internet. Key potential benefits include lower cost replication of high-quality teachers, content, and methods; self-paced learning; and data analytics for optimizing learning on the platform. Other technologies like 3D printing and open hardware and software platforms can enhance the educational experience in developing countries, where it is being used as a tool for education in primary, secondary, and post-secondary schools. Initiatives like Open Labware,[2] Open Neuroscience[3] and the Baden Lab[4] are promoting the collaboration and construction of low cost, open scientific equipment for developing countries for educational and research purposes.

b. Technology and innovation for decent work and economic growth

For countries with requisite technological capabilities, frontier technologies may support structural transformation, promote new sources of employment and income, and enable access to new markets and opportunities. In this regard, the fast reduction in the costs of frontier technologies could provide the chance for developing countries to fast track their progress from low-wage activities towards higher-wages and increasing return industries and benefit more from their participation in global value chains. Historical examples from China, Brazil and Taiwan Province of China show that new technologies (coupled with STI policies, endogenous technological capacities, and an enabling environment) can support the productive upgrading of economies of developing countries. Economic diversification and transformation can be supported by policies involving smart specialization, platforms for economic discovery, and incubators, accelerators, and technology parks.

c. Technologies and new forms of innovation promoting social inclusion

New and emerging technologies can also support inclusion. In India, for example, a technology combining biometric and demographic data, called Aadhaar,[5] enabled the financial inclusion of 1.2 billion people. Some countries are also experimenting with blockchain technologies that may have wide-ranging applications in smart contracts, digital identity systems, land registration, and financial transactions. Initiatives like the ManaBalss.lv ("My voice") platform in Latvia helps to bring people's ideas to Parliament and put them on the agenda. Furthermore, new approaches to innovation (e.g. pro-poor, inclusive, and frugal innovations) can incorporate marginalized and underrepresented communities as producers and beneficiaries of innovation processes in new production models that address social needs, stimulate pro-poor entrepreneurship, and facilitate solidarity across groups.

d. Science, technology and innovation to build resilient communities

Resilient communities empower their people to absorb and adapt to shocks, have economies that can self-organize to continue functioning at times of crises, and are able to carry out all their activities without harming the environment. STI have a critical role to play in each one of these dimensions. With the help of low-cost open-source sensors, communities can assess and monitor the risk of different threats, like air pollution. Satellite technologies are critical for disaster preparedness and emergency response, and drones now offer a low-cost approach to remote sensing with applications for land-use monitoring and rapid mapping in case of emergencies. During disasters, citizens and local governments increasingly turn to social media to seek and share information and to involve community members as first-line informants and responders. Data analytics and big data can also

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[2] For more information, see https://open-labware.net/
[3] For more information, see https://openeuroscience.com/
[4] For more information, see https://badenlab.org/
[5] For more information, see https://uidai.gov.in/

support emergency response. New technologies can be used for resource management (e.g. to monitor terrestrial and marine ecosystems) and could help to decouple economic development from environmental degradation. A new contribution of STI to build resilient societies is citizen science, which uses new technologies to involve non-scientist 'citizens' in the generation of new scientific knowledge. The Earth Challenge 2020 initiative,[6] for example, aims to aggregate and collect more than one billion data points on air and water quality, biodiversity, and human health.

4. Emerging issues likely to affect inclusiveness and equality

This year, the CSTD is examining the concerns regarding how legal, social, ethical, and cultural norms could be affected by new and emerging technologies in aspects ranging from the integrity of human life to the safety of the natural environment, the respect for personal privacy, security, and safety or the prevention of any forms of discrimination. Biased big data may produce unintended and sometimes discriminatory results. There is concern that biased data could scale discrimination in areas like predictive policing, access to financial services, and job recruiting. There are also critical questions about data ownership and access regarding agriculture, particularly in developing countries. Privacy policies of private sector agricultural companies, for example, may impact the livelihoods of smallholder farmers.

5. Areas where political guidance by the High-level Political Forum is required

For many developing countries, achieving the SDGs by 2030 will be practically impossible without effective and widespread application of science, technology and innovation. STI is also necessary to measure the SDG indicators and monitor the progress made. It is equally important to ensure that technology and innovative ideas are disseminated in an inclusive way, without widening existing technological gaps or creating further divides. The High-level Political Forum could recognize and highlight the role of STI in achieving the Goals and advocate the systematic inclusion of STI in policies for sustainable development.

The HLPF may wish to consider the findings and recommendations that emerged during the Inter-sessional Panel in January 2019 (see below).

6. Policy recommendations on ways to accelerate progress in empowering people, ensuring inclusiveness and equality, and achieving the SDGs

The Report of the Secretary-General on the impact of rapid technological change on sustainable development (E/CN.16/2019/2) and the Report of the Secretary-General on the role of science, technology and innovation in building resilient communities, including through the contribution of citizen science (E/CN.16/2019/3) contain several concrete suggestions for the Member States, the international community and the CSTD. Highlighted herewith are several which are highly relevant to the 2019 HLPF theme.

a. Ensure that STI policies are inclusive

Without appropriate STI policies, technologies – new or old – are unlikely to deliver progress on the global development agenda. Countries seeking to orient STI policies towards sustainable development could also consider integrating inclusiveness to their cores. Gender-inclusive innovation policies may be directed to women's participation as innovators or entrepreneurs while youth-oriented policies can also be helpful in making technological change inclusive. Innovation in informal settings is also getting attention as a source of livelihoods, as small, informal crafts-based businesses can play a major

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[6] For more information, see https://www.earthday.org/earth-challenge-2020/

role in adapting external innovations to local conditions and filling the gap when production systems change.

b. Close digital divides, including gender digital divides, through building digital competencies

Digitalization and connectivity are in the centre of rapid technological change. It is therefore critical that digital policies be calibrated according to countries' readiness to engage and benefit from the digital economy. Digital competencies include technical skills, but also generic and complementary skills. Different types of digital skills are needed to adapt to new technologies, including skills required to adopt, use, creatively adapt existing technologies as well as to create entirely new technologies. One major factor keeping women from reaping the benefits of new technologies is access to the Internet. The digital gender gap has increased globally in recent years, which suggests that there is a barrier for women to participate in social networks, access learning opportunities, financial tools or business support. Therefore, education and training programs that focus on digital skills for all should be inclusive and accessible to everyone.

c. Promote regional, international and multi-stakeholder scientific cooperation

Support by the international community, including regional and international cooperation, will need to expand to prevent the evolving digital economy from leading to widening digital divides and greater income equalities. To direct global scientific and research networks towards the achievement of the SDGs, Governments need to move beyond funding and managing R&D to influencing networks, which requires an understanding of their formation, organization, norms, dynamics, motivations and internal control mechanisms. Multi-stakeholder initiatives can also leverage their member's resources to raise awareness about major challenges, such as gender digital divides and advocate for actions to address these challenges. Countries can also consider developing collaborative R&D partnerships involving leading technology companies and their domestic science and technology talent to address their most critical problems.