



## **Commission on Science and Technology for Development (CSTD)**

### **Contribution to the 2023 High-level Political Forum on Sustainable Development**

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 10 to 19 July 2023. It follows the outline proposed by the HLPF secretariat and draws on the two priority themes of the CSTD during the 2022-2023 inter-sessional period, namely (a) Technology and innovation for cleaner and more productive and competitive production; and (b) Ensuring safe water and sanitation for all: a solution through science, technology and innovation, and the findings and recommendations emerged during the Inter-sessional Panel held on 25 and 26 October 2022. These findings and recommendations will be considered by the CSTD during its 26th annual session on 27 - 31 March 2023. The 26th CSTD will also review progress made in the implementation of the outcomes of the World Summit on the Information Society and launch of the report on science, technology and innovation policy reviews of Angola and Botswana. In addition, this note includes the findings and recommendations in relation to sustainable urban development under SDG11, as it was a theme for the 25th CSTD (28 March to 1 April 2022).

#### **1. Progress, experience, lessons learned, challenges and impacts of the COVID-19 pandemic on the implementation of SDGs 6, 7, 9, 11 and 17 from the vantage point of your intergovernmental body, bearing in mind the three dimensions of sustainable development and the interlinkages across the SDGs and targets, including policy implications of their synergies and trade-offs,**

The CSTD examines the priority theme on “Technology and innovation for cleaner and more productive and competitive production” (see: [E/CN.16/2023/2](#)). The report on this theme shows that to achieve SDG 7 and 9, technologies and innovation for cleaner, more productive, and competitive production can catalyze economic growth and structural transformation while also addressing the existential threat posed by climate change. National policies are vital to preparing for and creating these green windows of opportunity, and several Member States have shared their policies and strategies. However, many countries need assistance in designing and implementing the required sector-specific strategy due to low technical and financial resources. International cooperation, therefore, plays a critical role in filling those gaps and supporting developing countries to benefit from these green windows of opportunity.

The CSTD also explores the priority theme on “Ensuring safe water and sanitation for all: a solution through science, technology, and innovation” (see: [E/CN.16/2023/3](#)). The report on this theme

analyzes the role and potential of STI as key enablers for catalytic change in the world's achievement of Sustainable Development Goal 6 on clean water and sanitation for all. It highlights the deep-rooted relationship between the two and analyses how STI can contribute significantly to overcoming the persistent challenges in delivering on Sustainable Development Goal 6, with a focus on the distribution and delivery of safe water and sanitation, integrated water resource management, use of frontier technologies, and addressing inequalities in the sector, notably in relation to gender. Countries are recommended to consider STI as part of an answer that requires careful context-specific policies to bring it to fruition, embracing decentralized solutions, and considering nexuses that water shares with other sectors.

During the 25<sup>th</sup> annual session, the CSTD considered the theme "Science, technology and innovation for sustainable urban development in a post-pandemic world" (E/CN.16/2022/3). The Commission recognized that the Covid 19 pandemic has generated profound impact on sustainable urban development: firstly urban areas became pandemic epicenters as up to 90% of the COVID-19 cases worldwide were reported to be in urban areas; and secondly the pandemic led to a global economic crisis and job losses. Consequently, it widened the existing inequalities and increased the level of poverty in urban areas. In general, the pandemic severely damaged the quality of urban life. The pandemic provided important lessons about inclusiveness and sustainability issues in urban communities which point to the need for more innovation to address development challenges in a post pandemic world. Twelve challenges were identified in achieving sustainable urban development in a post-pandemic world where urban areas will absorb most future population growth and 2/3 of the global population will live in urban areas by 2050. Some concern inclusiveness issues, such as ensuring access to quality education and healthcare systems. Others focus on environmental aspects, for example, inefficient and polluting urban energy systems. A third group of challenges concern economic questions such as the limited access to decent urban employment opportunities, poor housing, and growing inequalities.

Furthermore, in relation to the SDG 17, the Commission has been suggesting that international community must assist developing countries by pooling its knowledge and technological know-how to achieve the SDGs. International community should consider to: a) promote knowledge transfer and capacity building through North-South, South-South, and triangular cooperation; b) Promote technology transfer between developed and developing countries through transferring complete packages, including building local capacity and capability to operate, maintain, and, where needed, adapt them to the local context; and c) Develop financial mechanisms which promote financial assistance from high-income countries and investment from the private sector to developing countries, especially LDCs, LLDCs and SIDS, recognizing the cross-cutting role these play in achieving the 2030 agenda for sustainable development.

Digital cooperation has been increasingly recognized at the CSTD as a central element of partnerships to achieve the SDGs. The context for development cooperation on digital issues remains challenging and fast-changing. In spite of steady growth in the numbers of Internet users, the digital divide persists in several key dimensions. Although 63% of the world's population is connected, least developed countries still only count 27% of their populations as internet users. Partnering and cooperation in different areas of digitalization, including technology sharing remains crucial for connecting remote and underserved populations. The Global Digital Compact (GDC) that is currently

under consultations, could present opportunities for synergies and complementarity with the actions undertaken by many WSIS stakeholders. The CSTD, with its longstanding experience in bringing together, through the WSIS review process, evidence, perspectives, expectations and concerns about the progress and prospects of the evolution of the information society, is well placed to make a major contribution to the future GDC.

**2. Three key areas where transformative actions for accelerated progress have been successful, and three key areas where support is most urgently needed, with regard to the cluster of SDGs under review in July 2023.**

**i. Three key areas where transformative actions for accelerated progress have been successful.**

First, science, technology and innovation (STI) have offered effective solutions to the challenges we face in achieving SDG 6 on clean water and sanitation. For instance, frontier technologies, such as artificial intelligence, drone technology, big data and Internet of things, can be catalysts in monitoring water and sanitation infrastructure and accelerating the achievement of Goal 6. Better forecasting and early warning systems, meanwhile, are crucial to the preparation of responses for the floods and droughts which have become more frequent due to climate change. Implementing technology-based early warning systems and predictive models, including some that rely on drone technologies or deeply integrated earth observation systems, enables early disaster threat prediction, and knowledge as to which areas will be particularly badly affected.

Second, the development of more sustainable technologies has offered “Green Windows of Opportunity” to countries who are latecomers. Since a lot of radical change is required in a short space of time, more established digital economies may take more time to change their practices than those who are still building their capacities from scratch. Changes to global policy, business models, funding availability and the demands of the global market brought on by the urgent push for sustainability thus lower barriers to entry that were far less penetrable previously. Renewable energy technologies and frontier technologies for sustainable production and consumption are areas where countries in the early stages of their digital transition may find opportunities for growth.

Third, during the pandemic, scientific knowledge production, digital technology adoption, and innovations in organizational and institutional settings have substantially contributed to address those challenges in urban settings and mitigate the impact of COVID-19. STI will help us mitigate most pressing urban sustainability challenges. They will also help us harness the values embedded in the global population growth. While there is certainly a need to look for new STI solutions, there is a pool of STI solutions to address the main challenges in our pursuit of sustainable urban development.

**ii. Three key areas where support is most urgently needed.**

First, climate change poses an increasingly significant challenge to the achievement of SDG 6 and other SDGs as well including SDG 2, 7, 9 and 11. Floods and droughts driven by climate change, which, as

shown in 2022, now affect all continents, are among the most critical events influencing the availability of water resources and, in turn, the adequate supply of clean water for drinking and sanitation purposes. Water scarcity is projected to rise due to climate change and over 1.7 billion people (mostly in the developing countries) currently live in river basins where water use exceeds recharge.

Second, the North-South divide in STI is widening. One reason is uneven investment in R&D as a % of GDP. The top global performers, such as Israel and the Republic of Korea, invest 5% of GDP in R&D for STI, while the EU invests 3% on average, China invests 2.4% and developing countries invest an average of just 0.5-1%. A large part of this problem includes the fact that innovation and production for many frontier technologies directly relevant to countries in the Global South are led by the Global North.

Third, digital divide continues and has been even exacerbated in some countries by the Covid19 pandemic. It is unlikely that the the SDGs may be achieved without addressing the existing global divide in digital capacity, in particular for the poor developing countries and LDCs. Digital cooperation, such as technology sharing, investments, and other partnerships, is crucial for connecting remote and underserved populations.

**3. Examples of specific actions taken to recover from the COVID-19 pandemic that also accelerate progress towards multiple SDG targets, including actions identified by your intergovernmental body, building on interlinkages and transformative pathways for achieving SDGs.**

In spite of the devastating impact of COVID-19, many governments around the world took advantage of the disruption caused by the global pandemic to pursue transformative policy reforms. The CSTD has identified various such initiatives through its intergovernmental activities.

One such initiative is South Africa's Economic Reconstruction and Recovery Plan (ERRP), which envisions to tackle structural problems affecting the country's economy and society by building a renewed and inclusive economy that engenders shared prosperity (see E/CN.16/2023/2). The ERRP addresses directly an array of SDGs, including SDGs 6, 7 and 9. South Africa faces a dearth of funding for R&D on cleaner, efficient and competitive production, and adoption of frontier technologies particularly by MSMEs, partially due to the risky nature of investments in green and digital technologies. As a result, the Government of South Africa decided to step in and provide direct support to investment in research, development and innovation to modernise existing industries and to implement green innovation. For example, using retrofitting technologies to improve energy performance, and creates an artificial intelligence institute to focus on advanced manufacturing and new materials. The country also plans to promote green industrialisation to ensure the provision of sufficient water, and to expand the programme to retrofit public and private buildings with the objective to improve water efficiency.

Another example of transformative initiative is UNIDO's project regarding the transfer of a Japanese technology exploiting solar power to produce clean water in rural Ethiopian. This activity employs a water-centred nexus approach that permit the achievement of SDG 6 on clean water and sanitation while simultaneously contributing towards the accomplishment of other SDGs such as SDGs 2, 7 and 9 (see E/CN.16/2023/3). Rather than viewing competing goals as constraints to the achievement of water security, water-centred nexus approaches avail of the interlinkages between water and other sectors to develop sustainable and efficient solutions that benefit multiple stakeholders. In particular, UNIDO's project generated clean water through solar-powered slow filtration systems by keeping in mind considerations of gender of equality and gender while improving public health awareness. The initiative also advanced the community's technical capacity to independently operate the systems, as well as fostered the development of the local industrial, engineering, procurement and construction capacity to strengthen their role in Ethiopia's water and sanitation sectors.

A third example is the project implemented by the United Nations Economic and Social Commission for Western Asia (ESCWA) on enhancing resilience and sustainability of agriculture in the Arab region against the backdrop of COVID-19, among other global and regional crises (see E/CN.16/2023/2). The region faces several challenges, including land degradation, climate change, and dearth of water resources, and the pandemic further exposed the fragility of its agricultural sector. As such, a resilient and sustainable use of water is essential, also through the use of agricultural innovations and technologies. By partnering with Algeria, Egypt, Jordan, Lebanon and Sudan, this initiative promoted

the adoption of agricultural technologies such as rainwater harvesting and produced five technical booklets on their application with a focus on the role of women and youth. Besides targeting SDG 6, this project contributed towards the achievement of SDGs 2, 12, 15 and 17.

Finally, e-commerce provides a prime example of using ICT and digital technologies to mitigate the adverse impacts of Covid 19 pandemic. During the pandemic people have switched to the use of e-platforms to meet their daily needs. UNCTAD data show that in 2020 the share of e-commerce grew from 16 to 19 per cent of total retail sales. For example, in Uganda, the United Nations Capital Development Fund collaborated with the main ride hailing company in Kampala and launched a digital e-commerce platform for home deliveries during the pandemic. The platform helped 18,000 people keep their jobs, 800 vendors to maintain revenue during lockdown and thousands of customers to receive deliveries of food and other essential goods. This initiative contributed to the implementation of SDGs 2, 9, 11 and 17.

**4. Assessment of the situation in the mid-point of the implementation of the 2030 Agenda and the SDGs, against the background of the COVID-19 pandemic and within the respective areas addressed by your intergovernmental body, and policy recommendations, commitments and cooperation measures for promoting a sustainable, resilient and inclusive recovery from the pandemic while advancing the full implementation of the 2030 Agenda.**

In order to advance and fully implement the 2030 Agenda, the CSTD has outlined various policy recommendations on SDGs 6, 7, and 9 that have also positive impact on other SDGs, in an attempt to exploit broad and integrated approaches to addressing issues with a view to ensuring sustainable, resilient and inclusive solutions.

The CSTD encourages the adoption of STI-driven policies and initiatives to accelerate the energy transition that address issues related to SDG 7 and 9 while also tackling problems pertaining to other SDGs. Against the backdrop of increasing natural disasters, deteriorating food security, and other consequences of a worsening climate change, there is an urgent need to embed STI in solutions that take advantage of green windows of opportunities as a basis for sustainable development.

In particular, developing countries are encouraged to develop and expand national policies and strategies to further promote green innovation and the use, scaling-up, development, and production of green and renewable energy technologies. These policies should guarantee state commitment and the continuity of long-term plans, creating an enabling environment for adopting green technologies. This could be done by incentivizing domestic firms to adopt and produce more green technologies through financial grants, subsidies, and tax reliefs, and by extending services to support these activities. Another element that requires further impetus is the implementation of green procurement reforms.

In order to ensure the success of these initiative, national mechanisms for coordination will be required to convene, exchange information, organise plans and actions, and network with the private sector and non-governmental partners. This mechanism can take the form of a National Council composed government and sub-national level representation, as well as members of NGOs, universities, research centres, and the private sector.

Furthermore, Governments, private sector and other stakeholders must work in close coordination to raise awareness of the technological development happening in green technologies. They should provide necessary technical education and skills development training to increase firms' capacity for applying green technologies. Capacity-building activities are needed to upskill and prepare the manufacturing sector to adopt green technology outputs from research and development institutes. Also, Governments should develop effective strategies for investing in R&D and support effective technology transfer ecosystems. green technology transfer that meets the needs of the private sector. For example, university research funding should be more responsive to innovation-driven demand for scientific and technological knowledge and encourage public-private partnerships, while greater priority should also be given to measures that encourage spin-offs from public research and the creation and operation of incubators.

Also, Governments should expand opportunities for the adoption and innovation of green technologies in SMEs. This entails easing restrictions that bar SMEs from procuring and adopting green and renewable energy technologies, such as providing risk guarantees, supporting R&D in renewable energy to reduce technology costs, and carbon pricing. Governments should also expand financing opportunities for the adoption and innovation of green technologies and address the financial constraints of the entrepreneurs and the sustainability of the technologies by also providing subsidies and tax deduction.

In doing so, all stakeholders should increase their efforts to tackle gender imbalances in green technology sectors. Some of the possible actions include raising awareness of opportunities for women in green industries, increasing access to technical vocational education and training, investing in training and capacity-building initiatives for women who are professionals in green industries, and promoting women entrepreneurs who are successful in the green industry as role models.

The CSTD also promotes the mobilisation of innovative STI solutions to address challenges in meeting the targets of SDG 6 on water and sanitation, such as improving access to and delivery of safe water, increasing the quality of water treatment, and making general advances in water and sanitation management. The process can be accelerated not only through scientific and technological approaches, but also through other forms of innovation, including social innovation, innovative policy or governance, and enabling laws that encourage practitioners and service users to find effective solutions. In this regard, national governments, particularly from developing countries, are encouraged to cultivate and empower local innovation ecosystems to build technology acceptance, and, given the increasing use of digital tools, the capacity around digital mindsets and skills to use them. When choosing technology and innovation to ensure safe water and sanitation for the population, consideration should be given to the economic and geographical conditions in target communities as well as their ability to operate and maintain the interventions.

Deficiencies in wastewater management or solid waste disposal not only impinge on accessing the right to clean water and sanitation, but can also have disruptive consequences on the environment. At the same time, global warming increasingly poses substantial challenges to the provision of drinking water, especially in developing countries. Furthermore, wastewater management solutions can bring about negative ripple effects on ecosystems, or vice versa, if long-term considerations cognizant of

the multiple challenges are not considered. As such, the CSTD recommends government action to consider sustainability and climate resilience when designing water and sanitation policies and projects, as well as to design sustainable and climate-friendly water and sanitation systems, by also prioritising the development and distribution of modular, off-grid, decentralized, and low-tech solutions.

Finally, Governments should scale up good practices for universal access to water and sanitation and integrated water management resources with proven track records. They should also assess what factors hinder or accelerate local and national scale-ups of good practices and should seek to address or promote them appropriately by supporting them both financially and practically. Local actors should be encouraged to participate in international networks of cooperation where they can learn from successful actors from other countries. Circular economy and nexus approaches to water and sanitation should be explored, considering how synergies between sectors can increase impact and turning treated wastewater into a water resource where appropriate. An important aspect will be the transformation of existing data governance structures to ensure a more systemic, human-centric, and multi-stakeholder collaborative system to support more comprehensive water resources assessment in planning and decision-making processes. Frontier technologies such as big data, cloud-based solutions, satellite, and Internet of Things, present opportunities for reliable data collection and thus better decision-making in water and sanitation management, supporting a more comprehensive water resources assessment, improving decision-making, and minimising water losses and waste.

## **5. Key messages for inclusion into the Political Declaration of the September 2023.**

The Commission proposes five key messages for inclusion into the ministerial declaration of the 2022 HLPF, as follows:

**First, digitalization is increasingly central to all aspects of society and has proved to accelerate technological and innovative solutions for achieving all SDGs**, apart from the evidence that the world has witnessed in countries' response to the Covid 19 pandemic and their recovery from the pandemic. Policymakers in all fields need to pay close attention to digital development in their countries. Countries could exchange their good practices in fostering digital development, at platforms such as the UN Commission on Science and Technology for Development as it provides a central venue for all stakeholders to learn what others are doing in respect of application of digital technology in areas within their respective mandates.

**Second, the global community should address imperatively the persisting and continued digital divide.** The majority of the world's citizens are now connected, yet many still need access to the Internet and online services. Many of those who are connected have limited connectivity, which does not offer them the full benefits of digitalization. The lack of affordability, digital skills, and relevant content and services also constrains inclusion and equality. As a result, those already more advantaged often gain more from digital development than those in greater need. Leaving no one behind, the key message of the 2030 Agenda, is critical in this regard.

**Third, achieving universal access to clean water and sanitation requires *appropriate* technological and innovative solutions.** Though advanced technological solutions have a significant role in



implementing SDG6, effective and affordable seemingly low-tech tools for water and sanitation should not be ignored, as they are often more appropriate for reaching underserved populations. In doing so, countries should take affirmative action to design policies and projects focusing on marginalized groups, particularly women, who often shoulder the burden where access to water and sanitation is limited.

**Fourth, technological innovation to achieve the SDG 6 must be implemented with innovation in respect of policy, governance and process as well as enabling socially and culturally behavioral change.** Policymakers must develop close partnerships with local actors on water and sanitation to build technology acceptance and nurture the relevant digital and practical capacities necessary to deploy solutions.

**Fifth, countries should develop or expand national policies with clear strategic direction and accompanied by roadmaps, regulatory and legal frameworks,** to further promote green innovation and the development, production, use, and scaling-up of green and renewable energy technologies. Furthermore, the government, private sector, and other stakeholders must cooperate closely to raise awareness of the technological development happening in green technologies. They should provide technical education and skills development training to increase firms' capacity for applying green technologies.

**Sixth, the international community should create a cross-border open system for green innovations,** to facilitate efficient communication and collaboration between authorities, corporations, researchers, academia, and individuals and providing avenues and incentives to those who collaborate. In addition, the international community should establish, expand and strengthen international R&D and innovation support programmes (such as Horizon Europe). Such support has a vital role in advancing green technologies by supporting, promoting and financing international R&D projects on green technologies and clean production.

Finally, **governments should take an integrated approach to policy setting for sustainable urban development.** This entails an adjustment to existing institutional frameworks to integrate urban sustainability policy settings, horizontally and vertically, and ensure the coordination needed to maximize synergies among STI actions and minimize fragmentation and trade-offs.