STI FORUM

Science, Technology & Innovation for the Sustainable Development Goals

9th Multi-stakeholder Forum on Science, Technology and Innovation for the Sustainable Development Goals

Session 7: STI partnerships for accelerating structural transformation in African countries, Least Developed Countries and Landlocked Developing Countries

(16:20 – 17:45, 10 May 2024; in-person, Trusteeship Council Chamber)

Background

Structural transformation leading to economic diversification and more sophisticated productive capacities is key to free the least developed countries from the vicious circle of commodity dependence (UNCTAD, 2022). Structural transformation is intrinsically linked to economic development, and it cannot happen without technological learning and innovation. The most recent Global Sustainable Development Report (UN, 2023) and the Technology and Innovation Report (UNCTAD, 2023), show the persistent and serious asymmetries between the developed and developing countries that affect the current global landscape of science, technology, and innovation, with the Least Developed Countries (LDCs), Landlocked Developing Countries (LLDCs) and many African countries suffering the greatest shortfalls.

The gap remains huge when considering investments in research and development (R&D), scientific publications, patents, human and institutional capacity, and enabling policy environments. UNESCO analysis shows that per capita national spending on R&D in high-income countries is 65 times higher than in lower-middle-income and low-income countries (UNESCO, 2024). Meanwhile, the Technology and Innovation Report 2023 unveils a high market concentration in terms of technology providers, talent, as well as knowledge creation in frontier technologies.[1] Specifically, frontier technologies are primarily supplied by a few countries, notably the United States, China, and some countries in Western Europe. Similarly, the knowledge landscape in frontier technologies is dominated by the United States and China with a combined 30 per cent share of global publications and almost 70 per cent of patents in that domain over the past two decades.

The technological and industrial imbalances, coupled with the slowdown of technology diffusion across and within countries observed in the last decades (Andrews et al., 2016; Berlingieri et al., 2020; Knez, 2023), could further widen technological divides, creating difficulties for latecomers to catch up. The increasing complexity of technologies and innovations requires higher levels of human (knowledge) and physical capital to keep pace with the accelerated technological change in leading economies. UNCTAD's Frontier Technology Readiness Index - which combines indicators for ICT, skills, R&D, industrial capacity and finance - shows that LDCs, LLDCs and African countries are the least-ready for the equitable use, adoption and adaptation of frontier technologies and are at risk of missing current technological opportunities. The average index scores of LDCs, LLDCs and African countries is half or less than the global average, signifying the wide gaps to be addressed.

[1] While there is no single definition of frontier technologies, they are generally understood as new and rapidly developing technologies that take advantage of digitalization and connectivity.

To promote structural transformation and to accelerate progress towards the Sustainable Development Goals (SDGs), it is crucial to reinforce technological capabilities and leverage the power of STI. Technological development offers opportunities to upgrade economies without increasing their carbon footprint. It is not only about innovating at the frontier, but also about adopting and adapting existing products and technologies to achieve higher levels of productivity according to the specific local contexts. This requires broader opportunities and resources for engagement of technology users and producers in LDCs, LLDCs and African countries.

Less developed countries have limited fiscal space to increase investment in STI and lack the capacities to extensively participate in global innovation networks. Robust and creative science and technology partnerships that engage the Global North and South are important, as well as investments and initiatives that discourage "brain drain" and reward practitioner-academic hybrid careers. The Africa Higher Education Centres of Excellence Project, a collaboration between the World Bank and Governments in Africa, is a good example that enhances Science, Technology, Engineering, and Mathematics (STEM) in African higher education institutions and promotes regional specialization to address common development challenges.[2] Other key areas of STI partnerships include digital infrastructure, research funding, research collaboration, technology and knowledge transfer.

Objectives

This session will discuss strategic options to strengthen the contribution of STI to structural transformation for accelerating the achievement of the SDGs in African countries, LDCs and LLDCs, focusing on the role of STI-driven partnerships. This session will spotlight successful experiences and lessons learnt of STI partnerships that contributed to structural transformation and explore how national, regional, and international institutions could scale up STI partnerships.

Format

The session will be structured as a panel discussion, featuring representatives from government, academia, civil society, the private sector, and other relevant stakeholders. High-level respondents and lead discussants will add their own experience and comment on the panel discussion. There will be a lightning talk from winners of the UN innovation competition, followed by an open Q&A session in which the audience will have the opportunity to ask questions and contribute to the discussion.

Guiding questions

The discussion will be guided by the following questions:

- *How can STI contribute to structural transformation in African countries, LDCs and LLDCs?*
- *How can partnerships improve connectivity and enable digitalization?*
- *What key gaps need to be addressed to scale up STI in these areas and how can national, regional, and international institutions contribute?*
- *What policy lessons can be drawn from partnerships that have strengthened the links between STI and SDG achievement in countries in special situations?*

[2] https://ace.aau.org/

Supporting documents/publications

UN (2023). Global Sustainable Development Report 2023: Times of crisis, times of change: Science for accelerating transformations to sustainable development, prepared by the Independent Group of Scientists appointed by the Secretary-General, United Nations, New York, September 2023, https://sdgs.un.org/gsdr/gsdr2023

UNCTAD (2023). Technology and Innovation Report 2023 - Opening Green Windows: Technological opportunities for a low-carbon world, UNCTAD/TIR/2022, 16 Mar 2023, https://unctad.org/publication/technology-and-innovation-report-2023

UNCTAD (2022). The low-carbon transition and its daunting implications for structural transformation, The Least Developed Countries Report 2022, UNCTAD/LDC/2022 https://unctad.org/system/files/official-document/ldc2022_en.pdf

Andrews, D., Criscuolo C., and Gal P. N. (2016). "The Best versus the Rest: The Global Productivity Slowdown, Divergence across Firms and the Role of Public Policy", OECD Productivity Working Papers, 2016-05, OECD Publishing, Paris, https://www.oecd-ilibrary.org/economics/the-best-versus-the-rest_63629cc9-en

Berlingieri, G., Calligaris, S., Criscuolo, C., and Verlhac, R. (2020). Last but not least: laggard firms, technology diffusion and its structural and policy determinants, OECD Science, Technology and Industry Policy Papers, March 2020, No. 86, https://www.oecd-ilibrary.org/science-and-technology/laggard-firms-technology-diffusion-and-its-structural-and-policy-determinants_281bd7a9-en

Knez, K. (2023). Technology diffusion and uneven development. J Evol Econ 33, 1171–1195 (2023). https://doi.org/10.1007/s00191-023-00830-w, https://link.springer.com/article/10.1007/s00191-023-00830-w#Sec4

UNESCO (2024). Website on Research and Development, UNESCO Institute of Statistics, https://uis.unesco.org/en/topic/research-and-development

Case studies (will be made available here: https://sdgs.un.org/tfm/STIForum2024):

Cham, I., "Accelerating the Deployment of Cost-Effective and Affordable Technologies through the Technology Deployment Cooperation Program (TDCP)".

Decena, R., "A call for support and promotion of the Community-led Integrated Non-Cyanide, Non-Mercury Gold Extraction Method (CLINN-GEM)". *[peer-review pending]*

Doherty, M., and Kelly, W., "Technical Standards as Tools for Cohesive Governance and Policies for the SDGs".

Min, J., *et al.*, "Insights from the case studies on the Water-Energy-Food Nexus and its STI implications for the SDGs in Mekong region".

Mustafa, L., "Accelerating Capacity of Telehealth in Afghanistan – Promoting Inclusive Health Services in Fragile IsDB Member Countries".

Mustafa, L., "Mapping of Affordable and Transferrable Food Security-related Technologies - IsDB-FAO-IFAD Partnership".

Ngila, J., Matheri, A., and Mbohwa, C., “STI Solutions to Accelerating Implementation of SDGs: Case Studies in Africa”.

Pendere, A., “Projet de Stratégie de Transformation Numérique pour l'Afrique (2020-2030) : une aubaine pour la Société centrafricaine de télécommunication (Socatel)”.

Moreno, M., *et al*., “Implementation of Science, Technology and Innovation Policy Instruments towards the Sustainable Development Goals”.

Pousty, D., and Mamane, H., “UV-LED Water Disinfection System: Considerations for implementing UV disinfection technologies in rural areas”. *[peer-review pending]*

Tagawa, K., “It’s not rocket science - Science, Technology, and Innovation (STI) can unleash sustainable industrialization in Africa”.

Travaly, Y., Ranaivozanany, H., and Konstantinidi, A., “From good will to action: Accelerating the development and implementation of AI governance for sustainable finance”.

Uket, J., “A Case Study of the Federal Ministry of Innovation, Science and Technology (FMIST), Abuja, Nigeria Illustrating National STI Policy To Address SDGs Implementation Challenges”. *[peer-review pending]*

Vermouth, A., Mdumuka, J., and Rojas, C., “Bridging the Gap: Web3 Technologies for Sustainable Food Systems”.

Science-policy briefs (will be made available here: https://sdgs.un.org/tfm/STIForum2024):

Accone, T., “Illuminating 'unknown' domains of impact and uncovering new practices and pathways for transformative innovation for children”. *[peer-review pending]*

Alwahsh, S., and Bakthavatchaalam, V., “Exploring Sustainability Challenges in the UK Aerospace Industry: Insights from a qualitative research”.

Bostrom, A., and Nayyar, S., “The Summit of the Future: Health Technologies for the Common Good”.

Gmyrek, P., Berg, J., and Bescond, D., “Generative AI and Jobs: Policies to Manage the Transition”.

Nyhan, M., and Marshall, K., “The Ethical Application of Generative Artificial Intelligence in Supporting Education for Sustainable Development Globally”.

Petrovics, D., “The Institutionalization of Energy Communities for a Just and Democratic Energy Transition”.

Scrivener, K., “Addressing Urgent Residential and Infrastructure Needs for Sustainable Growth in the Global South”.