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 3: Bridging the science, technology and innovation divides to eradicate poverty and end hunger (SDGs 1 and 2)

(16:30 – 18:00 EDT, 9 May 2024; in-person, Trusteeship Council Chamber)

Background

Despite all our efforts, progress towards SDG 1 and SDG 2 has been insufficient to meet the goals set in the 2030 Agenda for Sustainable Development. The situation has worsened since the COVID-19 pandemic struck in 2019 and recovery has been uneven. Under current trends, 575 million people will still be living in extreme poverty in 2030, and only about one third of countries will meet the target to halve national poverty levels. Shockingly, the world is back at hunger levels not seen since 2005, and food prices remain higher in more countries than in the period 2015–2019 (UN, 2023). Looking ahead, it is projected that almost 600 million people will be chronically undernourished in 2030 – far from the Zero hunger target (FAO, IFAD, UNICEF, WFP and WHO, 2023).

Science, technology and innovation in agrifood systems hold great potential in boosting sustainable agriculture, ensuring food security and nutrition and reducing poverty if it is relevant, accessible and affordable and responds to specific needs and contexts. The role of STI in poverty reduction, social protection and ensuring food security and nutrition is multifaceted, encompassing various technological and innovative solutions in the four dimensions of food security – availability, access, utilization and stability. New data and methodologies which are becoming increasingly available, can improve the adaptability of social protection systems (ILO, 2024). Genetic improvements can increase food supply by developing new varieties with desired traits. Precision agriculture, utilizing advanced technologies such as GPS, remote sensing, and data analytics, can optimize farming practices and enable precise application of inputs such as water, fertilizers, and pesticides in order to increase crop yields while minimizing resource wastage and environmental impact.

Technologies for post-harvest management and food preservation play a critical role in reducing food loss and waste along the supply chain. Innovations and technologies in cold storage, packaging, and transportation systems help extend the shelf life of perishable foods and improve market access for farmers. Biofortification, known for improving nutrition, can help mitigate human micronutrient deficiency. Technology can also enhance the stability of food security and nutrition over time, for example by increasing resilience of agrifood systems against adverse weather conditions or economic factors. Technologies such as drones and satellites, used for territory surveillance, mapping and crop health monitoring, can contribute to more stable agriculture production.

Participatory development of technologies and innovations can augment labor earnings, not replace them, becoming a key contributor to poverty reduction. Historically, technological progress that provides decent employment and enables structural transformation from agrarian to manufacturing and service-based economies enables better lives and the elimination of poverty. While the potential of technology in bringing about transformation is great, using them – especially on a massive scale – can be challenging and costly, particularly for developing nations. Some of the key barriers are low digital literacy and lack of an enabling infrastructure, such as connectivity and access to electricity, in addition to financial constraints (FAO, 2022).

Challenges are particularly grave for the poor and the most vulnerable. Questions of poverty and food security and nutrition are particularly intertwined in the lives of small-scale producers and family farmers who often remain trapped in a vicious cycle of endemic poverty where interconnected challenges limit their ability to improve their livelihoods. In many low-income countries, small-scale producers and family farmers are characterized by low productivity, limited access to resources and markets, and vulnerability to various risks, including climate change and market fluctuations. However, with right support, small-scale producers and family farmers can also be the key contributors in reducing poverty. According to some estimates, with the prevalence of poverty in large sections of rural populations, GDP growth originating in agriculture can have twice the potential to reduce poverty when compared with growth outside agriculture, particularly when agricultural growth focuses on triggering higher incomes for the large numbers of small-scale producers (Arulingam et al., 2022) and family farmers.

While the private sector actors are the major investors in agrifood systems, public support, especially in low-income countries, is crucial as private financing is often meager and commercial credit systems are only accessible to larger actors. Also, the increasingly important role of the private sector in research and development (R&D) in agriculture poses challenges. The concentration of some key agrifood markets and the increased vertical integration could lead to a top-down R&D agenda that favors certain financial interests over sustainability considerations (FAO, 2023) and weak participatory R&D agenda. Thus, public investments in research and development and promoting more coherent and integrated approach for agricultural innovation systems (AIS) by strengthening the functional and technical capacity of national agricultural research and extension systems are critical for participatory R&D and co-creation of technologies and innovations, their adoption and scaling up. Public investments on critical public goods, including physical and digital infrastructure, extension, capacity development and technology adaptation are needed for attracting domestic and foreign private investments and ensuring more inclusive progress.

While potential for progress is vast, use of technologies and innovations do not only hold positive power, and hence their deployment should always consider potential impacts, benefits, risks and trade-offs before they are adopted and scaled up. It is important that relevant technologies and innovations respond to specific needs of most vulnerable and are available, accessible and affordable by all equally leaving no one behind. For example, automation can lead to unemployment, especially for manual laborers and low-skilled workers. However, it also has the potential to stimulate employment in logistics and processing due to increased production as well as generate new jobs that demand high levels of cognitive ability (FAO, 2023). Therefore, the development and use of technologies and innovations should be guided by the assessment of their socioeconomic, environmental and ethical risks and impacts.

Objectives

The session aims to showcase practical areas where science, technology and innovation can boost progress towards eradication of poverty, sustainable agriculture and food security and nutrition. It will also address the ways in which the global community, national governments and STI ecosystems can ensure that the potential of science, technology and innovation can best be harnessed in an inclusive manner, both between and within countries.

Format

The session will be structured as a moderated panel discussion (5 minutes per panelist). The panel discussion will be followed by an interactive discussion and questions and answers from the audience. The session will close with a brief presentation of the main outcomes of the discussion.

Questions for discussion

The discussion will be guided by the following questions:

- *What promising research and technologies, including affordable and open-source technologies, can be employed to rapidly reverse increases in poverty and hunger and address trade-offs with other SDGs?*
- *How can STI in these areas be adapted to local socio-economic environments with different risk factors and engage with local knowledge?*
- *What are some promising cases of STI for poverty eradication and food security that can be considered in other contexts?*

Supporting documents/publications

UN (2023). Special Edition of the Report of the Secretary-General, 2023, Progress towards the Sustainable Development Goals: towards a rescue plan for people and planet; https://unstats.un.org/sdgs/files/report/2023/secretary-general-sdg-report-2023--EN.pdf

FAO, IFAD, UNICEF, WFP and WHO. 2023. The State of Food Security and Nutrition in the World 2023. Urbanization, agrifood systems transformation and healthy diets across the rural–urban continuum. Rome, FAO. https://doi.org/10.4060/cc3017en

ILO (2024). Extending Social Protection During Times of Crisis: The Data Revolution. https://socialprotection.org/discover/publications/extending-social-protection-during-times-crisis-data-revolution

FAO (2022). The State of Food and Agriculture 2022. Leveraging automation in agriculture for transforming agrifood systems. Rome, FAO.

FAO (2023). The State of food security and nutrition in the world 2023: urbanization, agrifood systems transformation and healthy diets across the rural–urban continuum

Arulingam, I., Brady, G., Chaya, M., Conti, M., Kgomotso, P. K., Korzenszky, A., Njie, D., Schroth, G. and Suhardiman, D. (2022). Small-scale producers in sustainable agrifood systems transformation. Rome, FAO.

Case studies

Agaton, C., and Guno, C., "Promoting Sustainable Agriculture Using Solar Irrigation: Case Study of Small-Scale Farmers in the Philippines".

Barroga, K., *et al*., "Inventory and Profiling of Grassroots Innovators in Ligawasan Marsh Towards SDGs 2024".

Calderon, M., *et al*., "The Price is Not Right: The Case of Almaciga Resin in the Philippines".

Dutta, U., “Case Studies from Underserved South Asia: An Initiative to Advance Human Ingenuity in Under-Resourced Contexts”.

Espaldon, M., *et al*., “Institutionalizing Integrated Crop Monitoring and Forecasting (ICMF) towards a Smarter Philippine Agriculture”.

Liao, Z., *et al*., “Exploration and Practice of Decentralized Wastewater Treatment Model”.

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”.

Peramo, E., Piedad, E., and de Leon, F., “Advancing National Development through AI: Policy Recommendations for Enhancing AI Research and Applications in the Philippines”.

Uket, J., “Driving Climate Smart Technologies for Food Security and Poverty Reduction in Nigeria Through the Ward Based Technology Cluster Programme: A case study of the Federal Ministry of Innovation, Science and Technology (FMIST), Abuja, Nigeria, illustrating national STI policy to address SDGs implementation challenges”.

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

Walang, A., et al., “Improving community-based drug rehabilitation outcomes through early diagnostics of client’s treatment motivation and satisfaction”.

Science-policy briefs

Arora, P., “The Failed Science Diplomacy of "Lab to Land” in the Culturing of Macroalgae and Food Security”.

Bakthavatchaalam, V., “Engineering Education and its Current (Un)suitability in Addressing Sustainable Development Goals”.

Burgaz, C., *et al.*, “Good Practice Government Policies on Food Systems to simultaneously address undernutrition, obesity and climate change”.

Escudero, V., and Riepl, F., “Unlocking skills dynamics: Harnessing big online data and NLP methods in emerging economies”.

Falomi, F., and Erguler, G., “Unlocking the Full Potential of Agricultural Transformation in LDCs: The role of traditional and emerging technologies”.

Ferreira, N., et al., “The Role of Waste Valorization in the Transition to the Circular Economy”.

Lüdert, J., “Strengthening the Science-Policy-Society Interface: An Analytical Framework for Science Diplomacy in an Era of Accelerating Technological Change”.

Mooney, K., “The Local Production of Essential Drugs: A Roadmap for Sustainable Health in Low- and Middle-Income Countries”.

Ude, R., *et al*., “Nanofertilizers: A Green Window of Opportunity for Food Security in Sub-Saharan Africa”.

Zee, C., *et al*., “Providing Food Security through Hydroponic Systems”.