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 2: Strengthening scientific cooperation, technology and knowledge sharing and accelerating innovation for integrated climate action (SDG13)

(15:00 – 16:30 EDT, 9 May 2024; in-person, Trusteeship Council Chamber)

Background

Climate action – SDG13 – lies at the heart of solutions to tackling today's interconnected crises of nature, biodiversity, pollution but also inequality, poverty, and development. Addressing the climate emergency and its interlinkages to other crises requires transitions in energy, agrifood, mobility, and other key sectors in ways that are just and leave no one behind. Science, technology, and innovation (STI) play critical roles in these transformations, which are critical to reach a net-zero and climate-resilient future. Climate change and STI are deeply intertwined in several ways:

1. **Mitigation and Adaptation Technologies**: STI plays a crucial role in developing and deploying technologies aimed at mitigating and adapting to climate change. This includes renewable energy technologies like solar panels, wind turbines, and biofuels, as well as carbon capture and storage (CCS) technologies to reduce greenhouse gas emissions from fossil fuel combustion. Advancements in agricultural technologies, such as drought-resistant crops and precision farming techniques, also help in adapting to changing climate conditions. It must be noted that there is a particular need to expand access to such technologies in lower-income countries, including through advances in technology transfer arrangements. It is also important to take into account context-specific technology development that take into account regional and local challenges as well as gender dimensions in technological applications.

2. **Data Collection and Monitoring**: STI provides essential tools for monitoring and understanding climate change. Remote sensing technologies, satellite imagery, and geographic information systems (GIS) enable scientists to track changes in the Earth's climate, such as temperature increases, sea-level rise, and deforestation. Advanced climate models, powered by supercomputers and complex algorithms, help predict future climate scenarios and assess the impacts of different policy interventions. Data availability is also a critical issue in the context of many countries, including those most vulnerable to the impacts of climate change such as SIDS. Access to data is another critical issue. For example, climate change and biodiversity loss are considered existential challenges for humanity, yet over 60% of research articles published over the past decade on the topic of climate change and nearly 50% of those related to biodiversity are still locked behind paywalls.

3. **Climate Resilience and Disaster Management**: STI contributes to building resilience against climate-related disasters and extreme weather events. This includes early warning systems for hurricanes, floods, and droughts, as well as infrastructure innovations like seawalls, stormwater management systems, and green infrastructure to reduce vulnerability to climate impacts. Furthermore, advancements in risk assessment methodologies and decision-support tools aid policymakers and

communities in planning and implementing effective adaptation strategies. Technologies related to climate resilience and disaster management is of particular importance to countries most vulnerable to impacts of climate change, including SIDS and LLDCs. Yet, to-date one third of the world's population, mainly in SIDS and LDCs, does not have access to early warning systems. Key challenges in capacity development, putting in place regulatory frameworks, and ability to develop digital and physical systems and infrastructure in the context of these vulnerable countries is critical.

4. **International Collaboration and Knowledge Sharing**: Addressing climate change requires global cooperation and the exchange of scientific knowledge and technological innovations across borders. International partnerships and platforms facilitate collaboration on research and development efforts, technology transfer, and capacity-building initiatives to support developing countries in their climate change mitigation and adaptation efforts, but these need to be strengthened with both resources and capacity to overcome key barriers to climate action acceleration.

5. **Policy and Governance Innovations**: STI also contributes to the development of innovative policy solutions and governance mechanisms for addressing climate change. This includes market-based instruments like carbon pricing, emissions trading schemes, and green finance mechanisms to incentivize low-carbon investments and promote sustainable development. Additionally, emerging technologies such as blockchain and artificial intelligence (AI) hold potential for enhancing transparency, accountability, and effectiveness in climate governance and decision-making processes.

Objectives

This session explores the role of STI in accelerating integrated climate action and synergistic solutions. The session brings together leading experts in this field to shed light on what it takes to unlock ambitious STI policies, approaches, and initiatives that can help leverage knowledge, innovation, and technological solutions in inclusive ways towards a net-zero and climate-resilient future that addresses diverse conditions across groups and countries and enables rapid knowledge sharing and co-creation of solutions.

Format

The session will be structured as a moderated panel discussion. The panel discussion will be followed by interactive discussion. After their intervention, the moderator will take comments and questions from the audience. The session will close with a brief presentation of main outcomes of the discussion by the moderator.

Questions for discussion

The discussion will be guided by the following questions:

- *How can the open sharing of climate data and knowledge be improved?*
- *What can be done to facilitate the transfer of environmentally sound technologies to developing countries?*
- *What can be done to accelerate climate-relevant innovation for transformation in developing countries?*
- *How can siloes be broken at all levels to ensure integrated STI approaches to climate mitigation and adaptation?*

- *What cases can be highlighted to illustrate the potential of open science and inclusive approaches to STI for climate action?*

Supporting documents/publications

UNDESA and UNFCCC (2023). Synergy Solutions for a World in Crisis: Tackling Climate and SDG Action Together United Nations Climate Change, https://sdgs.un.org/synergy-solutions-world-crisis-tackling-climate-and-sdg-action-together

UNEP and Climate Technology Centre and Network (2023). Annual Progress Report 2022-2023, Dec. 2023 https://www.ctc-n.org/news-events/progress-reports

UNCCTEC and CTCN (2023). Technology and NDCs: Stimulating the Uptake of Technologies in Support of NDC Implementation 2023, UN Climate Change Technology Executive Committee and UN Climate Technology Centre and Network, https://unfccc.int/ttclear/tec/techandndc.html

IPCC (2022). Chapter 16: Innovation, Technology Development and Transfer, in: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.018, https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_Chapter16.pdf

OECD (2023). Science, Technology and Innovation Outlook 2023, https://www.oecd-ilibrary.org/science-and-technology/oecd-science-technology-and-innovation-outlook-2023_0b55736e-en

World Economic Forum (2015-2023). Top 10 emerging technologies, various reports since 2015, https://www.weforum.org/publications/series/top-10-emerging-technologies/

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

Barbosa, S., *et al*., "The Geographic Information System and the provision of information to the public transport user: a study based on the Integrated Transport System of Florianopolis".

Carafa, A., "Storing CO2 in the Ocean: Emerging Technologies, Challenges, and Enabling Factors".

Erokhin, D., and Komendantova, N., "Application of science, technology and innovation solutions to increase participation in climate change adaptation".

Inácio, J., "Integrating Energy Grids: A Must in the Fight Against Climate Change in the Developing World".

Kotani, M., "Building a circular society through comprehensive approaches".

Lagura, R., and Marasigan, A., "The LaRuS Model as a Science Model that can Address SDG Challenges".

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

Lima, A., *et al*., "Health, Environment and Climate Change: A Brazilian case".

Lozano, L., *et al*., "Manure to Treasure: converting animal wastes to valuable products by black soldier fly".

Lui, R., "Renewable Energy: emerging technologies and innovations to reduce climate change".

Palma-Torres, V., *et al*., "Seeking an Alternative Natural All-around Oil: Prospects of Tamanu Oil Production in the Philippines".

Saks, S., “Adapting to Sea Level Rise in Small Island Developing States: Employing IoT Technology, Leveraging Coastal Infrastructure and Ecosystem-based Adaptation, and Continually Engaging the Public”.

Vieira, G., *et al*., “Environment and Wellbeing: Assessment of Quality of Life Through Vegetation Index in a Neighborhood of a Small-Medium Size Brazilian City”.

Wong, D., “The Royal Golden Cocoon of Java: Cricula Trifenestrata (Indonesia)”.

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

Al-Thobaiti, F., “The financial impact of regulations aiming to unify government digital platforms: Insights from Saudi Arabia”.

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

de Boer, F., *et al*., “Cultivating Sustainability in Fashion Industry Using Agriculture Residue”.

Díaz, S., “Living Nature – State of the field and bases for action”.

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

Fidler, K., “Flooding and Vulnerable Communities: Working Toward Proper Preparation and Protection via RS and GIS Developments”.

Fouch, E., “Using Natural Language Processing to Make the United Nations 2030 Connect Platform More Accessible”.

Gupta, J., Bosch, H., and van Vliet, L., “AI’s excessive water consumption threatens to drown out its environmental contributions”.

Gupta, J., *et al*., “Reinforcing the SDGs to live within safe and just thresholds”.

Jones, E., and Ramesh K., “Metal Recovery from E-Waste Using Flash Joule Heating and Super Critical Fluid Extraction”.

Mackey, B., Kormos, C., and Young, V., “Maximizing Climate-Biodiversity Synergistic Outcomes: Prioritizing ecosystem integrity in SDG 13”. *[peer-review pending]*

Mikova, N., “How technological and new societal trends may influence the European sustainable energy transition: analysis of policies, methodologies and impacts”.

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”.

Nagar, S., “Artificial Intelligence in Scientific Research: Lessons for SPIs”.

Pereira, S., *et al*., “Sustainable City Indicators: Comparative Study Between the Global Standard and the Main Indexes Used in Brazil”. *[peer-review pending]*

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

Scrivener, K., “Towards a Strategic Roadmap for Decarbonizing Building Materials”.

Suga, T., *et al*., “Expanding the functionality of integrated ocean observing systems to address marine ecosystem change”.

Tabañag, I., “Plastik sa Kapaligiran: Addressing Mismanaged Single-Use Plastics”.

Thang, C., *et al*., “Hybrid Renewable Energy System Featuring Pem Green Hydrogen in Regions with High Solar and Wind Density”.