STI FORUM
Science, Technology & Innovation for the Sustainable Development Goals

Eighth annual Multi-stakeholder Forum on Science, Technology and Innovation for the Sustainable Development Goals

Special event 3: A celebration of ideas: Policy perspectives of experts and stakeholders on emerging science, frontier technologies, future scenarios, and the SDGs

(08:15-09:30 EDT, 4 May 2023; in-person, Trusteeship Council Chamber)

Background

This special event will provide an opportunity to hear directly from the authors of the science-policy briefs submitted by scientists, engineers, economists, policy analysts from academia, private sector, UN system, and government institutions, in response to the UN call for substantive inputs to the Multi-Stakeholder Forum on Science, Technology and Innovation for the SDGs (STI Forum). The objective is to facilitate a frank discussion on the proposal between authors and interested policy makers.

The open call for inputs was conducted in the six official UN languages by the Interagency Task Team on Science, Technology, and Innovation for the SDGs in early 2023. Authors were encouraged to highlight issues arising from their research that they would like to urgently bring to the attention of policy and decision makers. All contributions were subject to rigorous peer-review.

Firstly, the event will review progress and explore the latest developments in science and technology and their current and potential future impacts on sustainable development and the SDGs. It will explore technology convergence and the multiple technology divides and challenges associated with these trends related to clusters such as blockchain, biotechnology, nanotechnology, artificial intelligence and quantum technologies. Secondly, it will take stock of lessons learned from science and technology scenarios for sustainable development, including an identification of high-impact technologies and actions and proposals for policy and cooperation. Thirdly, it will provide perspectives on improving the science-policy-society interfaces and the cross-cutting issue of human-centred approaches to STI.

The event is being organized in the spirit of General Assembly resolutions 73/17 and 75/316 which called for collecting information, analyze and disseminate the findings on the impact of rapid technological change on the achievement of the SDGs from which specific STI policies and feedback systems can emerge, as well as A/RES/76/213 which established a framework for these STI4SDGs endeavours.

"Intelligent digitalisation" is beginning to unleash its full potential in many companies and governments. The more its impact is spread and optimized, the greater its scalability, reach, learnability, and capture and creation of useful information, innovations and emerging technologies. This is increasingly transforming operating models of businesses and the efficacy of public policies. All main general-purpose technologies should be explored, particularly IA, IoT, cognitive and physical-cybernetic systems, autonomous vehicles, drones and intelligent logistics, clean energy technologies, hyper-connectivity systems, 3D and 4D printing, Big Data and high computational capabilities, nanotechnology, VR and AR, blockchain, brain-machine interface, and others.

A key idea for the establishment of the UN Technology Facilitation Mechanism was to bring decision-makers closer to the pulse of scientific and technological progress, and the event will also explore the best means and ways to achieve that. In particular, the interagency task team IATT will present an update to the "*TFM findings on the impacts of rapid technology change on the SDGs*", and science-policy briefs submitted by scientists and engineers from academia, private sector, UN systems and governments. The informal event will feature focused conversations on selected issues and allow a frank discussion of policy suggestions. The discussions will also draw upon work of the Work Stream 10 of the Interagency Task Team on Science, Technology and Innovation for the SDGs.

Objectives

The special event will present a range of perspectives from scientists and engineers in academia, NGOs, the UN system and the private sector on issues in emerging science, frontier technologies and the SDGs. It will hear policy proposals by experts who submitted science-policy briefs to the STI Forum and broader perspectives on policy implications related to recent science and technology trends.

Format

The event will be structured in the form of selected presentations by key TFM partners on identifying emerging issues, and by authors on their policy recommendations, followed by a moderated conversation. They will be clustered along the following broad areas:

a) Presentation of science-policy briefs
b) Conversation on lessons from science-policy inspired futures and scenarios
c) TFM partners work on harnessing scientific breakthroughs and frontier technologies for the SDGs

As in the previous years, a senior UN official will present the "TFM findings on the impacts of rapid technology change on the SDGs" as a brief synthesis of the science-policy briefs this year, and as an update of what science and technology communities have learned on the wider societal and developmental impacts of scientific and technological breakthroughs in the preceding year.

Authors of science-policy briefs have been encouraged to prepare short videos to summarize their briefs. As they become available they will be made available on the UN website.

Guiding questions

The discussion will be guided by a series of questions:

1. Sustainable development impacts of scientific breakthroughs and frontier technologies
   • What opportunities and risks does recent rapid technology change have for developing and developed countries? What have been the wider societal impacts since 2015? What are the implications for SDG pathways? How can countries best prepare for these changes? What initiatives and types of cooperation are needed?
   • What have been the achievements and failures of emerging science and frontier technologies during recently years? What lessons can we learn for sustainability crises?
   • How can the world close global science and technology divides and achieve the SDGs by 2030? What are the implications of technology convergence for sustainability?
2. Science-policy inspired futures:
   • How can we improve science-policy interfaces to deliver on the promise of a better life for billions of people across the world?

- • What are key lessons from science and technology futures and scenarios for sustainable development in general and the SDGs in particular? What is possible to achieve and what does it take?
3. What are your most important recommendations for policy action and high-impact initiatives to be considered at the SDG Summit in 2023 and the Futures Summit in 2024?

Supporting documents/publications

[United Nations Call for Science-Policy Briefs for the Multi-stakeholder Forum on Science, Technology and Innovation for the SDGs 2023](#)

IATT (2023). *Emerging science, frontier technologies, and the SDGs - Perspectives from the UN system and science and technology communities*. New York: United Nations Interagency Task Team on Science, Technology and Innovation for the Sustainable Development Goals, 3 May 2023.

IATT (2022). *[Emerging science, frontier technologies, and the SDGs - Perspectives from the UN system and science and technology communities](#)*. New York: United Nations Interagency Task Team on Science, Technology and Innovation for the Sustainable Development Goals, 6 May 2022.

IATT (2021). *[Emerging science, frontier technologies, and the SDGs - Perspectives from the UN system and science and technology communities](#)*. New York: United Nations Interagency Task Team on Science, Technology and Innovation for the Sustainable Development Goals. May 2021.

Toth., F. (2022). *Science and technology futures and scenarios for the SDGs and beyond: What is possible and what does it take?* Synthesis Report prepared for the UN Department of Economic and Social Affairs.

Nübler, I. (2023). A human-centred approach to promote Science, technology and innovation for sustainable development, ILO and IATT WS10, April 2023

UNCTAD (2023). [Technology and Innovation report - Opening Green Windows: Technological opportunities for a low-carbon world](#), UNCTAD/TIR/2022 and Corr.1,

The following *science-policy briefs* have been prepared by TFM stakeholders on emerging science and technologies this year (will be made available here: [https://sdgs.un.org/tfm/STIForum2023)](https://sdgs.un.org/tfm/STIForum2023)

- • **Rapidly emerging frontier technologies and emerging science issues and sustainable development**
  - o Victorien Dougnon et al, Improving the Quality of Biological Diagnostics for Better Control of Antimicrobial Resistance, Bloodstream Infections and Pandemics in Benin: A Policy Brief, University of Abomey-Calavi, Benin
  - o Bartlomiej Kolodziejczyk, Scaling Quantum Computing Technologies – Opportunities, Challenges and Policy Interventions, Boston Consulting Group, Australia
  - o Erik Kamenjasevic et al, Cyber(in)security of medical devices, KU Leuven, Belgium
  - o Samantha-Kaye Johnston, Privacy considerations of using social robots in education: Policy recommendations for learning environments, University of Oxford, United Kingdom
  - o Anjali Mehta, The Threat of Facial Recognition Technology, University of Virginia, United States

- Joni Jupesta et al, Digital Traceability on Agriculture Industry towards Net Zero GHG Emissions in Developing Countries: Case of Southeast Asia, United Nations University, Japan
- Somya Joshi et al, Anticipating Futures: How Artificial Intelligence acts as an Amplifier of Inequity, Stockholm Environment Institute, Sweden
- Yuto Kunitake, The Potential of Virtual Reality for the SDGs: Infrastructure Development through Content and Cultural Policies, NPO Virtual Rights, Japan
- Johannes Trüby et al, How green hydrogen conquers the world – An outlook on the global clean hydrogen market, Deloitte, France
- Anshul Pachouri, Regulating AI through sandbox: Roadmap for developing and under-developed countries, MicroSave Consulting, India
- Larissa Magalhães et al, Open Data and Emerging Technologies Connecting SDG Performance and Digital Transformation, United Nations University, Portugal
- Olivia Abbey, Artificial Intelligence, Bias, and the Sustainable Development Goals, University of Virginia, United States
- Alison Regan Cathles et al, Opportunities and Challenges for the Twin Transition in Latin America and the Caribbean, Inter-American Development Bank, United States
- Alejandro Mentaberry et al, La bioeconomía como camino para el desarrollo sostenible, Instituto Universitario para el Desarrollo Productivo y Tecnológico Empresarial de la Argentina, Argentina
- Maluta Mufamadi, Harnessing the power of nanotechnology to achieve the Sustainable Development Goals in South Africa and beyond, Nelson Mandela University, South Africa
- Botto et al, Solar Radiation Modification and youth perspectives on its governance, World's Youth for Climate Justice, the Netherlands
- Karen Mulberry, Emerging Technology, Standards and Sustainability, IEEE Standards Association, United States
- Sheng Wu, Innovative Digital Public-Private Partnership from Pandemic Response to Resilient Recovery, United Nations University, Portugal
- Shan Yin, Fundamental principles of data sovereignty policy making, China Academy of Information and Communication Technology, China
- Taimur Mazhar Sheikh et al, Concrete, CO2, and catalysis: merging industry and research goals for sustainable development, University of Wah, Pakistan
- Pablo Carcamo et al, Artificial Intelligence applications in agriculture need a justice lens to address risks and provide benefits to smallholder farmers, Virginia Tech, United States
- Syeda Saleha Fatim Ali, Promoting GIS and IoT Powered Climate Smart Technology Among Smallholder Farmers of Pakistan, Institute of Space Technology, Pakistan
- Christoph Ernst et al, Bioeconomy in Argentina in support of the implementation of the Agenda 2030, ILO, Switzerland
- Uma Rani et al, Digital labour platforms and their contribution to development outcomes, ILO, Switzerland

- o Eluemuno Blyden et al, The Mother of Birds Initiative: Building biopharmaceutical sectors from the ground up with enabling technologies and local resources, Avril Biopharma Inc, United States
- o Salome M. Guchu et al, Leveraging on Emerging Technologies Landscape to Bolster Kenya's Innovation Ecosystem, Inter-University Council for East Africa
- o Thien-An Tran Luuet al, AI Application for Solid Waste Sorting in Global South, Van Lang University, Viet Nam
- o Anh Quan Nguyen et al, Atmospheric water harvesting using solar energy technology, Van Lang University, Viet Nam
- o Azmery Afnan et al, Policy Considerations for Successful Implementation of Anaerobic Digestion in the Global South, State University of New York, United States
- o Alice Rotiroti et al, Drones for Improving Medical Infrastructure, Wageningen University & Research, the Netherlands
- o Caterina Ossio et al, The Potential of Gene Editing in Wastewater Bioremediation, Wageningen University & Research, the Netherlands
- o Anne-Tara Singh et al, Blockchain and IoT for water - A Game-Changing Opportunity or a Risky Proposition?, Wageningen University & Research, the Netherlands
- o Joël Hollander et al, Printing Applications for Solar Microgrid Implementation in Remote Areas, Wageningen University & Research, the Netherlands
- o International Centre for Genetic Engineering and Biotechnology, Trends and future prospects of genome editing in human and plant health, Italy
- o International Centre for Genetic Engineering and Biotechnology, Existing and advancing trends in -omics development for the study of complex biological interactions in different organisms, Italy
- o Kaveesha Wijesinghe, Accessibility of life saving biotherapeutics is still a dream for citizens in low- and middle-income countries (LMIC), University of Colombo, Sri Lanka
- o Huadong Guo, Developing the SDG Satellites for Measuring and Evaluating Indicators of SDGs, International Research Center of Big Data for Sustainable Development Goals, China

- **Lessons for improving the science-policy-society interfaces**

- o Christine Xu, A New Way of Designing Fisheries Management to Support SDG 14, Aquatic Life Institute, United States
- o Nilushi Kumarasinghe et al., Lessons learned on leveraging digital transformations to meet the SDGs, Sustainability in the Digital Age and Future Earth Canada, Canada
- o Marlene Kanga, Sustainable and Climate Resilient Solution for Water Services - from Policy to Implementation – a Case Study, World Federation of Engineering Organisations, Australia
- o Dario Gabriel Codner et al., Mapeo de instrumentos de promoción de la transferencia de tecnología y el desarrollo de negocios tecnológicos, Universidad Nacional de Quilmes and

- Instituto Universitario para el Desarrollo Productivo y Tecnológico Empresarial de la Argentina, Argentina
- María Cecilia Sanmartin et al., Between regional convergence, and locally rooted technological and cultural aspects: lessons from the case of COVID-19 vaccines in Latin America, Universidad de San Martín and CONICET, Argentina
- William Kelly, Tech Ethics for Sustainable Development, WFEO, United States
- Natalie Harms et al., Bridging science and policy for evidence-based action on plastic pollution in the East Asian Seas and beyond, UNEP, Thailand
- International Federation of Library Associations and Institutions, A Permanent Science-Policy Interface: Realising the Potential of Libraries to Integrate Science into Policy-Making, the Netherlands
- Sarosh Nagar, Lessons for SPIs from Novel Developments in Emerging Biotechnologies, Harvard University, United States
- Bocchetto et al., STI Policies to enhance the role of the bioeconomy as a vector of sustainable development in the Norte Grande of Argentina: a foresight study, Instituto Nacional de Tecnología Agropecuaria and Instituto Nacional de Tecnología Industrial, Argentina
- Cristina Uriarte Toledo, Strengthening SDG dimension in Science, Technology and Innovation policies: The case of the Basque Country, Basque Regional Government, Spain
- Cintia Hernandez, Promoción de la innovación mediante acciones de co-desarrollo en Argentina, Ministry of Economy, Argentina
- Katya Klinova et al, Steering AI for shared prosperity: practical lessons from 3 years of multistakeholder work at the Partnership on AI, Partnership on AI, United States
- Patricia Agupusi et al., The Importance of 'Ordinary' Science, Technology, and Innovation and the Science-Policy Interface in sub-Saharan Africa, Worcester Polytechnic Institute, United States
- Jayeesh Chennupati, Addressing the Urban Poverty Crisis through Refugee Camps, University of Virginia, United States
- Alma Cristal Hernandez Mondragon et al, The possibilities for improving science-policy-society interfaces through training programs, Centro de Investigación y de Estudios Avanzados del IPN and Centro de Estudios de Derecho e Investigaciones Parlamentarias, Mexico
- Nina Jamal et al, One Health, breaking institutional siloes and achieving health for all, FOUR PAWS International, Austria
- Alexander Dill, Science shift to supporting the SDGs, Basel Institute of Commons and Economics, Switzerland
- Emily Chang, Broadband Expansion: Disseminating Policy Lessons on COVID-19, University of Virginia, USA
- Catarina Baptista et al, Bridging the science-policy-society gap for water management: lessons learnt from the G-STIC international conferences, VITO, Belgium
- Valentine Goddard et al, Gender Equality and the Environment in Digital Economies, AI Impact Alliance, Canada

- Pete Furlong et al, Technology and Geopolitical Crisis – A New Compact for a New World Order, Tony Blair Institute for Global Change, United States
- Felipe de Andrade et al., Roadmap for a Role for Intellectual Property Offices in the Governance of Green Innovation, University of Antwerp/KU Leuven, Belgium
- Franklin Carrero-Martínez et al.,Operationalizing Sustainable Development: Positive Case Studies for Improving the Science-Policy-Society Interfaces, The National Academies of Sciences, Engineering, and Medicine,   United States
- Daniel Xue, Strategies for mitigating the global energy and carbon impact of artificial intelligence, University of Virginia, United States
- Luisa Echeverría-King et al., Science in Latin America: towards public policy proposals focused on the development of international cooperation, Corporación Universitaria del Caribe, Colombia
- Josefina Moya et al, Iniciativas y desafíos para el fortalecimiento del Asesoramiento Experto en política en los Poderes Ejecutivo y Legislativo, Facultad Latinoamericana de Ciencias Sociales, Argentina
- Jonathan Andre Morales Marroquín et al., Biodiversity and Environmental policy challenges in Central America towards natural resource governance, University of Campinas, Brazil
- Crystal H. Brown, Sustainable Solutions for Climate Change Adaptation in Africa: Combining Indigenous Knowledge and Modern Technology, Worcester Polytechnic Institute, United States
- David Schatsky et al., Full-spectrum innovation: What is needed to create the low-carbon economy, Deloitte, United States
- Rita Luthra, Open Science to Achieve United Nations 2030 Agenda, Women's Health and Education Center, United States
- Shivani Nayyar et al., Girls and Women as Innovators, UN DESA
- Kelsey Stoddard et al., Stress-testing the resilience of critical infrastructure, CREDERE Associates, United States
- Communication and Information Sector, AI and Digital Transformation Competencies for Civil Servants, UNESCO
- Carlos Leónidas Leiva et al., IgY-technology for sustainable development: A policy brief, Vrije Universiteit Brussel
- Fouad Mrad et al., Data Innovation Deploying the SDG indicators for Change, UN ESCWA, Lebanon
- Alex Tveit et al., Tech Stewardship as a foundation for Multi-Stakeholder Collaboration (MSC) to enable STI4SDGs, Engineering Change Lab, Canada
- David Silvestre, The difficult marriage of biopharma and the sustainable development goals, Université de Liège, Belgium
- Anastasia Gracheva, The Russian Federation's Challenges in Response to SDG Goals 13 and 15: A Stakeholder Perspective, University of Pennsylvania, United States
- Nizar Al Halasah et al., Promoting green techn in the Arab countries, Jordan

- Ahlam Ahmad, From Big Data to Big Insights: The Power and Efficiency of Big Data and Data Science in Statistical Work, Jordan Department of Statistics, Jordan
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- Diego Chavarro et al., A call for action for coupling Artificial Intelligence Research and Sustainable Development, Sociedad Colombiana de Ingeniería Física, Colombia
- Altaf Hussain Samo et al., Strategizing for the Innovation and Sustainability of Green Agriculture Enterprises, Sukkur IBA University, Pakistan
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- Janine Berg et al., Automation hits the knowledge worker: ChatGPT and the future of work, ILO, Switzerland
- Willem Fourie et al., Using machine learning to improve the science-policy-society interface on the SDGs in South Africa, University of Pretoria, South Africa
- Vanina Saraullo, Enfermedades infecciosas zoonóticas: Importancia de la notificación de casos positivos en animales, Instituto Nacional de Tecnología Agropecuaria, Argentina
- Khalid Mahmood, Primary & secondary education syllabus to be revised based on current Science & Technology requirements of SDGs, University of Engineering and Technology, Lahore, Pakistan
- Muhammad Tariq, Sustainable Dairy Production in Pakistan: Lesson Learned and Way Forward, University of Agriculture, Faisalabad, Pakistan
- Javaria Nasir, Developing and accessing adaptation strategies against climate vulnerability in cotton wheat cropping system, University of Agriculture, Faisalabad, Pakistan
- Naureen Naeem et al., Challenges and opportunities of integration of community-based Nutrition services in Punjab, Pakistan, Lahore Garrison University, Pakistan
- Sandra Piesik et al., Enables for Transformative Change to Sustain People and Nature Centred World, 3 ideas, the Netherlands
- Alejandro Pablo Arena et al., Strategies, technologies and policies recommendations aimed at a more sustainable food and beverage sector in Argentina, National Technological University, Argentina
- Shaiha Afaal et al., Assessment of policy-society interface to increase female participation: A study of Aerospace engineering in the Maldives, University of the West of England, UK
- Shan Xu et al., Youth engagement in promoting digital innovation to accelerate the UN SDG 4, China Academy of Information and Communications Technology, China
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- Jaako Kuosmanen et al., Science Sparring: An Emerging Science-for-Policy Interaction Model for Systemic Policy Issues, Finnish Academy of Science and Letters, Finland

- o Dang Thu Giang, Linking science and technology tasks from the state budget with the implementation of sustainable development goals in Vietnam: Efforts and future actions, Ministry of Science and Technology, Viet Nam
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- o Dorothea Kleine, A human-centred approach to innovation to accelerate progress towards the SDGs, University of Sheffield, United Kingdom
- o Marguerite Nyhan et al., Harnessing Emerging Technologies for Scalable, Global, Ethical & Equitable Education for sustainability, University College Cork, Ireland
- o Marco Zennaro et al., Bridging the Digital Divide: the Promising Impact of TinyML for Developing Countries, ICTP/UNESCO, Italy

- **Review of progress in science, technology and innovation, and looking ahead to 2030 and beyond**
  - o Rachel Figard et al., STEM Education's Misalignment to Proactive Accessible Design, Arizona State University, United States
  - o Lorena Lamas, Gender lens into STI policies to effectively address socio-economic development challenges, UN Women, Uruguay
  - o William Kelly, Tech Standards for Sustainable Development, WFEO, United States
  - o Vanderleia Radaelli et al., The role of Science, Technology, and Innovation in Industrial Decarbonization in Latin America and the Caribbean, Inter-American Development Bank, United States
  - o Tommaso Ciarli et al, Steering science, technology and innovation towards the Sustainable Development Goals, University of Sussex, United Kingdom
  - o Carolina Rojas et al, Mobilizing and equipping the technical workforce for the SDGs through platforms for interdisciplinary and multi-stakeholder collaboration, Engineering for Change, Panama
  - o Heike Brugger et al., Energy Efficiency Vision 2050: How will new societal trends influence future energy demand in the European countries?, Fraunhofer Institute for Systems and Innovation research, Germany
  - o Alina Game, Harnessing satellite data to measure progress towards decent work and economic growth, ILO, Switzerland
  - o Muhammad Tariq, Future policy interventions for the development of livestock sector in Pakistan, University of Agriculture, fFaisalabad, Pakistan