

## First session of the Preparatory Committee for the fourth International Conference on Financing for Development

### Multi-Stakeholder Round Table Discussion on “Science, technology, innovation and capacity-building”

Thursday, 25 July 2024, 16:30 – 18:00

#### *Issue note*

#### **Background**

The Addis Ababa Action Agenda (Addis Agenda) recognizes science, technology, innovation (STI), and capacity building as critical drivers for sustainable development. It also highlights the concern of the persistent technological divide, i.e., the uneven innovative capacity, connectivity, and access to technology between and within countries, which prevent many from fully enjoying the benefits brought by technological advances. To address these, the Addis Agenda outlines commitments to: 1) **strengthen innovation and diffusion of technology and knowledge to close the technological divide between and within countries;** and 2) **harness STI and capacity building to support the achievement of sustainable development.**

Building the capacity of individuals and institutions to innovate is a central theme of the Addis Agenda. It emphasizes country-driven capacity development, supported by international and multistakeholder partnerships. It also stresses the need for education and training that equip individuals with the skills required for participation in STI as well as strengthening of institutions involved in STI, including public agencies.

The Addis Agenda underscores the importance of creating an enabling environment, including regulatory and governance frameworks, for innovation and technology dissemination. The agenda highlights the need to develop and enhance an ecosystem for national innovation, including through promoting collaboration between governments, academia, domestic and multinational firms, and civil society.

Member States recognize the need for effective mechanisms to transfer and diffuse technology, knowledge and skills, particularly to developing countries. In this regard, the Addis Agenda emphasizes the importance of adequate, balanced and effective protection of intellectual property rights in both developed and developing countries – consistent with national priorities and in full respect of WTO rules – while affirming the right of WTO members to take advantage of the flexibilities in the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights. In addition, the agenda commits to stepping up international cooperation in STI that focuses on developing countries’ development needs and acknowledges the potential of South-South cooperation.

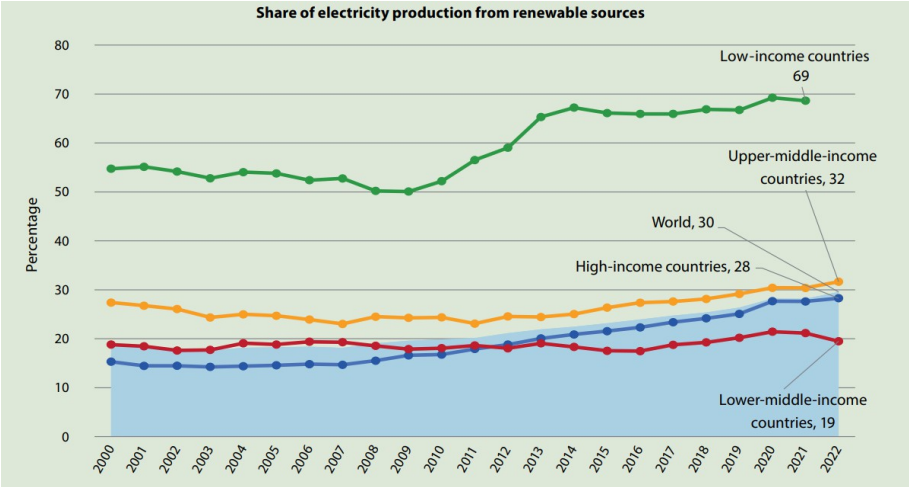
The Addis Agenda highlights the importance of integrating STI into national development plans and policies. This includes support to the development of, and access to, environmental, health, agricultural, and marine technologies.

Member States also commit to strengthening coordination among STI initiatives within the UN system. This includes a decision to establish the Technology Facilitation Mechanism (TFM), with 4 main components: 1) a UN Interagency Task Team on Science, Technology and Innovation for the SDGs; 2) a 10-member group of high-level representatives of scientific community, private sector and civil society; (3) an annual Multi-stakeholder Forum on Science, Technology and Innovation for the SDGs; and (4) an online platform that serves as a gateway for information on existing STI initiatives, mechanisms and programs. Taking into account the recommendations by the Secretary-General’s High-level Panel on the proposed Technology Bank for the LDCs, Member States also commit to operationalize the Technology Bank by 2017.

**How have we done?**

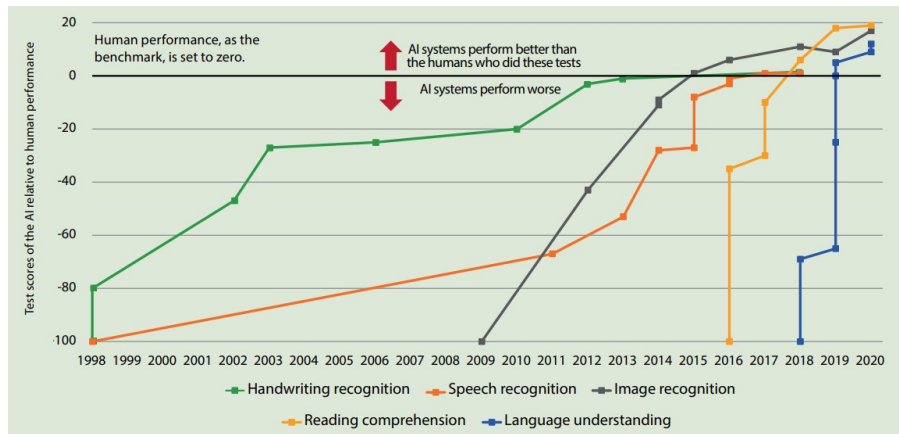
Technological advances have made significant contributions to the SDGs, including increasing renewable energy’s share in electricity production (figure 1). Although the full potential of renewable energy remains untapped, its usage is growing as the technology improves and becomes more affordable. For example, solar photovoltaic was 710 per cent more expensive than the cheapest fossil fuel-fired solution in 2010, but in 2022 it cost 29 per cent less than the cheapest fossil fuel-fired solution.

Figure 1. Share of electricity production from renewable sources, 2000–2022 (Percentage)



Over the past two decades, there has been a rapid advancement in the global technological frontier, illustrated by the development of artificial intelligence (figure 2). AI systems have made rapid progress in executing human tasks. The labour market impacts could vary widely across country income groups due to different occupational structures.

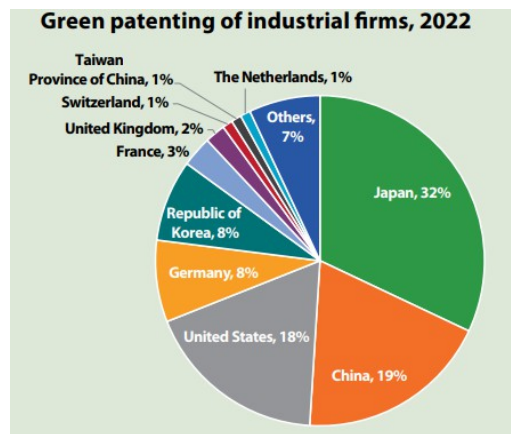
Figure 2. Evolution of language and image recognition capabilities of artificial intelligence systems since the turn of the century (*Test scores of the AI relative to human performance*)



The global technology landscape has continued to be characterized by high geographic concentration of innovation, while technology diffusion has also slowed down.

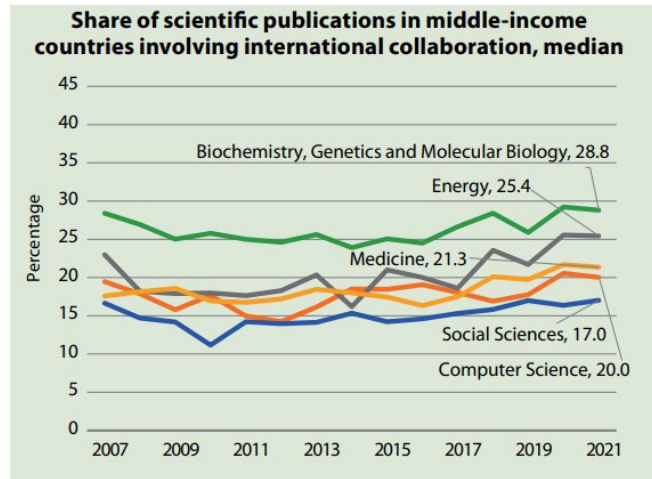
Global R&D spending reached approximately \$2.4 trillion in 2023, up from \$1.7 trillion in 2015, but remains uneven across regions, with developing countries lagging behind. High-income countries continue to account for more than 80 per cent of global R&D expenditure, whereas low-income countries account for less than 1 per cent. Innovation remains highly concentrated, exemplified by the green technology sector where industrial firms from just seven countries account for 90 per cent of all patenting activities (figure 3).

Figure 3. Green patenting of industrial firms, by country of owners, 2022 (*Percentage*)



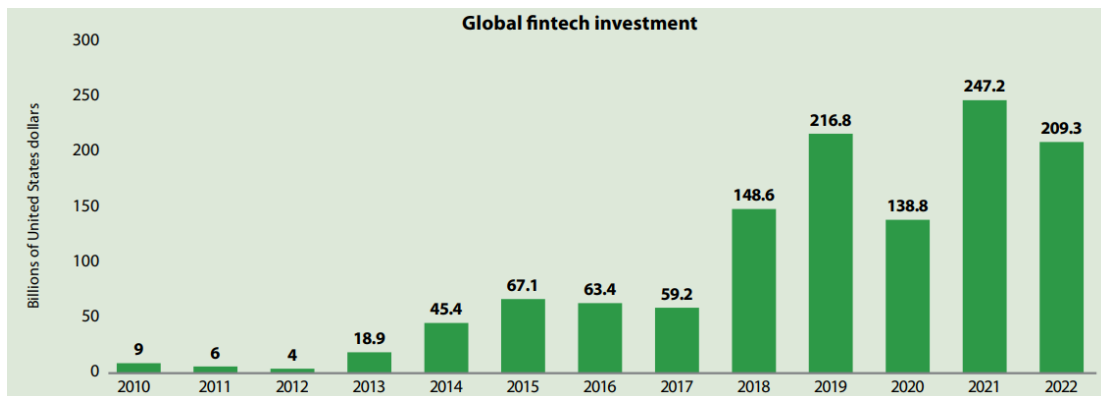
Many developing countries have experienced limited progress in international scientific cooperation, affecting technology diffusion (figure 4). Whereas high-income countries have seen a broad-based increase in international cooperation across different fields of STI over the past decade or so, many developing countries—with the exception of some larger developing economies—have seen limited progress.

Figure 4. Share of scientific publications involving international collaboration, by field, middle-income countries, 2007–2021 (Percentage)



From 2010 to 2022, global fintech investment increased 23-fold, with technological innovations boosting financial inclusion but also presenting new challenges, including economic bubbles (Figure 5). Advances in fintech have facilitated financial inclusion but complementary investments are needed to fully realize the potential of fintech. In 2023, an estimated 26,000 fintech companies operated globally, up from around 12,000 in 2019. Fintech sector revenues are projected to grow sixfold from \$245 billion in 2021 to \$1.5 trillion in 2030, moving from 2 per cent of the \$12.5 trillion in global financial services revenue to 7 per cent.

Figure 5. Global fintech investment, 2010–2022 (Billions of United States dollars)



### Actions and Challenges

Technology has greatly contributed to advancing sustainable development and resilience. It expands economic opportunities, safeguards people’s well-being and maintains hope that the world can still address some of the most critical threats that our planet faces. The transformation of artificial intelligence (AI) from a decades-old niche field of study to a cornerstone of technological advancement provides an impetus to accelerate and amplify these positive impacts of technology.

But technology can also have unintended consequences for economic, social, environmental outcomes and human rights. Automation has contributed to inequality as it favors capital owners and higher-skilled workers. It also reduces the comparative advantage that many developing countries enjoy due to lower labour cost. Growing dominance of major actors in technology sectors raises the risk of regulatory capture, which can hurt consumer welfare in the long run. Technologies such as AI, which rely on a massive amount of data for training can infringe on human rights, including but not limited to privacy, and can be difficult for poor countries with limited capacities to utilize. The environmental footprint of frontier technologies can be significant.

### *Closing the technological divide*

The divide in R&D investment between high- and low-income countries reflects a persistent geographic concentration of innovation. The top 10 countries for patent applications have consistently contributed to at least 87 per cent of the worldwide total during the SDG period, continuing decades-long trend since at least 1980.

The concentration of innovation activities often exacerbates inequality but does not inherently hinder global development, provided there is an adequate and effective diffusion of technology and knowledge. However, technology diffusion has slowed down in past decades.

The increasing complexity of technologies and innovations has raised the need for complementary investment in infrastructure, human and physical capital. It has also amplified the impact of inadequate investment in the national innovation system, a longstanding obstacle to technology adoption in many countries. As a result, there is a persistent capability gap between lower-income countries and those at the capability frontier. On average, low-income countries have seen the improvement of their frontier technology readiness between 2015 and 2021 one-third of that of middle-income countries.

At the same time, barriers to technology transfer persist and could harden in the context of geographic fragmentation. Trade barriers to high-tech inputs and services, strategic intervention by governments, limited market access, data localization and other measures could diminish international technology spillover and discourage R&D investment.

While high-income countries have experienced increase in such international scientific cooperation across fields in the past decade, many developing countries have seen limited

progress in this area. For example, between 2007 and 2021, the median share of computer science publications with international collaboration rose by over 50 per cent among high-income countries but remained largely unchanged in middle-income countries. South-South cooperation in STI has shown some promise, but continues to face challenges related to funding, coordination, and scalability. There is a need for more robust mechanisms to support and scale up South-South cooperation in STI, ensuring that the benefits are widely shared.

Numerous capacity-building programs have been launched to develop human capital and strengthen institutions in developing countries. Such efforts, however, are often fragmented and lack coordination, leading to inefficiencies and duplication of efforts. Developing countries also face challenges in retaining skilled professionals, as many migrate to high-income countries in search of better opportunities.

### *Ensuring the development and use of technology contribute to sustainable development*

Reflecting the recognition of the growing potential of technology in affecting sustainable development, many countries have made efforts to integrate STI into their national development plans and policies. This integration has led to more coherent and strategic approaches to leveraging STI for sustainable development, but the efforts remain uneven across the world, with many countries lacking the necessary frameworks and institutional capacities. Monitoring and evaluation frameworks have been established in some countries to assess the impact of STI policies and programs, but they are often inadequate in measuring progress and identifying areas for improvement.

Since its launch in 2015 following the adoption of the Addis Ababa Action Agenda, the multi-stakeholder TFM has engaged thousands of scientific and technological stakeholders, many of which have not previously been actively engaged with the UN. Participation in TFM activities has continuously increased and widened. The Technology Bank for LDCs has been supporting technology transfers by aligning the technology demands of LDCs with appropriate solutions through needs assessment, design of technology transfer projects and programmes, and capacity building. Despite progress, the coordination of existing STI initiatives within the UN system, including the TFM and the Technology Bank for LDCs, has to be strengthened in response to the growing and increasingly complex development needs, supporting countries in harnessing STI for sustainable development, including through capacity building.

### *Financing and technology*

Different types of financing are needed to fund innovations, depending on the maturity of the technology and financial market and the overall institutional environment of a country, including both public and private funding. To spur innovations that advance sustainable development and to ensure public access to such innovations, the public sector can play a key role in financing and incentivizing research. Governments can also use these financial tools to promote socially and environmentally desirable technologies and to maximize public benefits.

At the same time, technology has brought tremendous changes to finance. The financial

technology (fintech) industry has experienced rapid growth since 2015, experiencing a 212 per cent growth in global investment between 2015 and 2022. This has improved financial inclusion, which helps to mitigate financial constraints on innovative activities. However, access to credit and services still has significant gaps. Moreover, new risks have emerged, as fintech can incentivize riskier activities and exacerbate the cyclicity of financial markets, especially in a suboptimal regulatory environment. The extensive collection and analysis of personal data, which is central to the success of fintech firms, could infringe on consumer privacy. Moreover, fintech has heightened the potential for fraud in financial markets; and the digitalization and automation provided by fintech platforms have created conditions that could be conducive to illicit financial flows.

### **Guiding questions for discussion**

A number of potential solutions have been proposed to i) close technological divides; ii) ensure the development and use of technology contribute to sustainable development; and iii) harness the growing interplay between financing and technology.

These include targeted support for countries in special situations to engage in international collaboration on R&D for SDGs, and initiatives to bring together public and private financing, and R&D capacity support, to generate targeted technological solutions to address the most pressing global development challenges. In addition, the development of principles for the development and use of AI in fintech and standards for disclosure by financial institutions to enhance transparency on their AI use have been proposed to help fully realize the potential of fintech and mitigate its risks.

#### **1. Supporting national innovation**

- What are the longstanding and emerging domestic and international hurdles that limit the development of developing countries' national innovation systems?
- What national and international strategies can be implemented to address such hurdles, increase R&D investment in developing countries, and bridge the global innovation gap?
- How can multi-stakeholder partnerships be leveraged to enhance R&D capabilities and drive technological advancements?

#### **2. Supporting technology diffusion, knowledge sharing, and capacity building**

- What are the longstanding and emerging domestic and international hurdles that limit technology diffusion and knowledge sharing?
- What measures can be taken to address the barriers to technology transfer and create enabling environments for technology diffusion in developing countries?
- How can international cooperation, including South-South cooperation, be strengthened to support technology diffusion, ensure developing countries have access to technologies that are critical for achieving sustainable development?
- How can regional and international initiatives be utilized to enhance global research cooperation?

- How can international community ensure more and more effective funding and capacity for SDG-related research and innovation in all regions?
  - What integrated approaches can be adopted to enhance capacity-building efforts and develop the human capital needed for innovation in developing countries?
3. Ensuring the development and use of technology contribute to sustainable development
- What frameworks and institutional capacities can effectively integrate STI into national development strategies?
  - How can monitoring and evaluation of STI policies be improved to assess their impact and inform policy decisions?
  - What international initiatives can bring together public and private financing and technological capacity to generate targeted technological solutions to tackle global development challenges?
  - What national and international measures can fully realize the potential of fintech and mitigate its risks?
  - What kind of regulatory frameworks can ensure the development and use of AI, including in fintech, is conducted in a manner that is safe, equitable, and beneficial for all stakeholders?