



Multi-stakeholder Forum on Science, Technology and Innovation for the SDGs

New York, 15-16 May 2017

Concept Note for Session 6 on

“Emerging frontiers: Evolving STI developments with implications for SDGs”

Conference Room 4, UN Headquarters New York, 16 May 2017, 15:00 - 16:00 am

1. Background

The first annual Multi-stakeholder Forum on Science, Technology and Innovation for the Sustainable Development Goals in 2016 noted the fast pace of technology change in recent years and that current technology revolutions have broad impacts on the economy, society and environment. Some of the areas of rapid advances, which are expected to have great effect in the society at large, are the information and communications technologies (ICT), energy technology, biotechnology, nanotechnology, and neuro-technology, among others.⁴

Recognizing that some technologies are disruptive in nature, the Forum noted that technology change is not neutral and that in the short term it may create winners and losers. Such disruptive technologies are essential for achieving the SDGs, but there is a risk that their benefits may be disproportionately distributed across countries and segments of the population, which could perpetuate and exacerbate inequalities.

For example, rapid technology change that leads to automation impacts employment and the capacity of developing countries to catch up with the countries at the frontier of technological development.^{5,6} It has important implications for future technology perspectives in areas of greatest concern to developing countries. It also has important cross-border implications for the development perspectives of countries.⁷ As technology change is fundamentally cumulative in nature, technology change in one country ultimately leads to lock-in of specific technology clusters across borders in many countries and thus can potentially constrain certain development options and paths. Automation emerges in many areas, from industrial production to household services and personal assistants, encompassing both physical tasks and purely virtual ones.

Related but separate issues include artificial intelligence (AI) technologies which have increasingly managed to replace cognitive tasks previously carried out by humans. The AI field is rapidly advancing and promises enormous and exponentially improving productivity gains, but has also raised concerns about extreme inequality which is expected to be a consequence of widespread application of AI. Some experts have also raised concerns about the potential emergence of machine super-intelligence - "an intellect that is much smarter than the best human brains in practically every field, including scientific creativity, general wisdom and social skills"⁸ - which might be realized sometime between 2024 and 2070.⁹

Biotechnology is another area which has advanced rapidly with many new applications emerging in recent years. Biotechnology refers to the set of capabilities to decode and manipulate DNA to endow new characteristics in an organism. It allows the development of completely new products. In order to harness the benefits and reduce any downside negative risks, countries need to develop a whole set of scientific capabilities, tools, and expertise. For strategic capacity building in this respect, an understanding of the broad contours of the future landscape of biotechnology products is needed. New risks and frameworks for risk assessment need to be identified and areas in which the risks or lack of risks relating to the products of biotechnology need to be well understood.

⁴ Table 3-3 in “Perspectives of scientists on technology and the SDGs” and Annex 3 in the Global Sustainable Development Report 2016, https://sustainabledevelopment.un.org/content/documents/10789Chapter3_GSDR2016.pdf

⁵ Technology at work v2.0. The future is not what it used to be. Citi GPS and Oxford Martin School, Jan. 2016.

⁶ Economist (2016). March of the machines – What history tells us about the future of artificial intelligence – and how society should respond. Economist magazine, 25 June 2016.

⁷ There is evidence that automation has started reversing offshore outsourcing and relocated economic activities back to high-income countries that are technology leaders.

⁸ Bostrom, Nick (2006). "How long before superintelligence?" Linguistic and Philosophical Investigations. 5 (1): 11–30.

⁹ Müller & Bostrom (2016), pp. 3-4, 6, 9-12.

Transformational change can arise from visionary plans of scientists, business and governments and the scale-up of technologies. Partnerships between these groups might determine the direction of such transformational change. Will it lead to widespread human well-being and sustainable development or jeopardize it?

2. Objectives

The overall objective of the session is to discuss the opportunities and threats of transformative change arising from the emerging technology frontiers, especially disruptive technologies. Within this broad context, the session will identify key issues related to emerging technologies and their present and future impacts on sustainable development, and propose actions to be taken by the international community, governments, businesses and relevant stakeholders in the context of achieving the SDGs.

3. Format

The session will be organized in the form of a panel discussion on emerging technologies and their implications for the SDGs. The moderator that will introduce the theme (3 min) and several panellists will address the topic with 7-minute remarks. Thereafter, the floor will be open for a series of 3 min remarks, followed by a moderated discussion and remarks from the other participants.

4. Questions for discussion

The discussion will be guided by the following questions:

- What is the broad picture of most important emerging technologies and their implications for the SDGs?
- What are the most significant sustainable development impacts of biotechnology, automation technology, robotics and artificial intelligence – now and in the future?
- What are your top three recommendations for action by the United Nations system, governments, businesses, scientists, civil society, and others?

5. Supporting documents/publications

There are many supporting documents and/or publications that could be listed here. For example, a recent “*UN Expert Group Meeting on Exponential Technological Change, Automation, and Their Policy Implications for Sustainable Development*”¹⁰ reviewed the state of knowledge and came up with a list of recommendations, and the US National Academy of Sciences published an in-depth report on biotechnology entitled “*Preparing for Future Products of Biotechnology*”¹¹.

¹⁰ <https://sustainabledevelopment.un.org/index.php?page=view&type=13&nr=2042&menu=1634> , <https://sustainabledevelopment.un.org/content/documents/12808KeyRecommendations2.pdf>

¹¹ <https://www.nap.edu/catalog/24605/preparing-for-future-products-of-biotechnology>