

UN Call for Inputs on the
Impacts of rapid technological change on the achievement of the Sustainable Development Goals

The UN Secretariat is calling upon scientists, engineers, economists and policy analysts to contribute to a UN report on the impacts of rapid technological change on the achievement of the UN Sustainable Development Goals (SDGs). You may want to consider the following types of contributions focused on one or more of the questions listed in this announcement below:

- (a) **Written, informal responses** highlighting empirical evidence and your views grounded in the literature (peer-reviewed references and background papers); and/or
- (b) **Short science-policy briefs** comprising abstract, outline of empirical facts and issues, and policy recommendations. The briefs are limited to a maximum of 1600 words including tables and figures. Annexes are not included in the word count. Upon review and acceptance, the brief will be published.

We are looking forward to your submissions to roehrl@un.org, as soon as possible and hopefully no later than 29 March 2018.

This work aims to focus on rapidly emerging technologies that progress so fast and have such broad-ranging socio-economic and environmental impacts so they pose serious challenges for institutions to adapt. Examples include - but are not necessarily limited to - highly interdependent, emerging technology clusters in the areas of automation, robotics, artificial intelligence, biotechnology, nanomaterials, and various digital technologies.

The present call is in follow-up to UN General Assembly Resolution A/RES/72/242 on the “*Impact of rapid technological change on the achievement of the Sustainable Development Goals*” which requested the UN Technology Facilitation Mechanism to present its findings, with an evidence-based approach, at its 3rd Multi-Stakeholder Forum on Science, Technology and Innovation” (New York, 5-6 June 2018).

The UN Secretariat will synthesize contributions from experts within the UN system and beyond, in the form of a report and presentation. This work will build on an earlier UN Expert Group Meeting held in 2016¹ and ongoing work under the Technology Facilitation Mechanism. A second Expert Group Meeting on Exponential Technological Change, Artificial Intelligence, Automation, and Their Policy Implications for Sustainable Development (Mexico City, 26-27 April 2018) is expected to, inter alia, provide feedback on a draft synthesis.

All contributors will be acknowledged in the UN report, unless requested otherwise. Please feel free to focus your answers on the questions that are most related to your work and expertise. You may also propose to refine the questions themselves and/or add other important questions. Please include full references, especially empirical evidence, in support of your contributions. You may also wish to share copies of relevant articles and data with us.

Disclaimer: We acknowledge that some of the questions are far-reaching and difficult to give a straightforward answer. Nevertheless, we hope you will give it a try. If in doubt, imagine you were part of a panel discussion and confronted with these questions.

¹ <https://sustainabledevelopment.un.org/unsystem/index.php?page=view&type=13&nr=2042&menu=23>

Survey questions:

Scope: Unless explicitly mentioned otherwise, the scope of the questions refers to “**exponential technologies**” - **technologies that progress so rapidly that institutions face significant challenges to adjust**. Examples are, *inter alia*, a number of highly interdependent, emerging technology clusters in the areas of **artificial intelligence, automation, robotics, biotechnology, nanomaterials, and various digital technologies**.

Overview and definitions

1. What characterizes and defines exponential technology change, emerging technologies, and frontier technologies, respectively? Does such technology change differ from past patterns of change? If so, how does it differ (e.g., in terms of pace, scope, and potential impact)?
2. What are the key existing and emerging exponential technologies, including in the areas of artificial intelligence, automation, biotechnology, nanotechnology? Where are they currently being used? What are their potential impacts on sustainability in general and the achievement of the SDGs in particular?

Past trends and future scenarios

3. What has been the historical evidence and general past trends in terms of rapid technology evolution in recent decades? What have been the key drivers of change, slow variables, and invariants?
4. Based on the historical evidence, what are plausible scenarios of how the development, dissemination and adoption of various exponential technology clusters might unfold in the production base of developed and developing countries in the coming decades? What might this mean for the global sustainable development aspirations?

Artificial intelligence and automation - societal challenges and opportunities

5. What is the overall sustainable development significance of artificial intelligence and automation? How are they linked to other technology clusters? What can be expected for the future?
6. What systemic issues should be considered? What are preconditions for AI to lead to mostly positive impacts?

Economic prosperity and development considerations: Impacts of exponential technology change on employment (SDG8) and inclusive industrialization, development and economic growth (SDG 8, 9, 11, 12)

7. What are the mechanisms through which technological change impacts employment? To which extent has innovation caused technological unemployment? Will the future be different because of emerging exponential technologies? How will it impact countries at different stages of development?
8. What are your views on the potential effects of emerging exponential technologies on industrialization, structural transformation, growth and consumption patterns in developing and least developed countries, taking into account historical experiences? What will be the effect in the future until 2030 or 2050? Will development options for the poorest countries differ from the past and if so, how? What does it all mean for overall consumption and production patterns?

Societal harmony considerations: Impacts of exponential technology change on inequality and poverty (SDG 1, 2, 5, 10), health, aging, and education (SDG 3, 4) and peaceful societies (SDG6).

9. What are your views on the current and potential future effects of exponential technologies on various segments of population in developed and developing countries? What does this mean in terms of inequality within and across countries – today and in coming decades?
10. What are the mechanisms through which technology change impacts on and interacts with health, education and demographic change? What have been the impacts? Will the future be different?
11. What are the mechanisms through which technological change impacts the goal of peaceful societies? What have been the impacts? Will the future be different?
12. What can be learnt from applying the values and principles in the UN Charter and the 2030 Agenda to exponential technological change? What are the most important ethical considerations in this context? What conclusions can be drawn from technology assessments grounded in common values?

Natural environment perspectives: Impacts of exponential technology change on the energy-water-cities-infrastructure-climate nexus (SDG 6, 7, 11, 13), oceans and biodiversity (SDG 14, 15), including the concepts of circular economy and IoT (SDG12).

13. What are the mechanisms through which technological change impacts the energy-water-cities-infrastructure-climate nexus? What have been the impacts? Will the future be different?
14. What are the mechanisms through which technological change impacts oceans and biodiversity? What have been the impacts? Will the future be different?
15. What will be the impact of these new technologies on resource use and pollution, and how might they help managing environmental issues?

Lessons-learnt from current responses, good models for collaboration, and recommendations for consideration

16. What is the status of current policy responses to the challenges posed by exponential technological change? Have they addressed systemic underlying issues? What lessons have been learnt and what do they mean for developing and developed countries?
17. What are good models for collaboration, and how are they shaped by emerging technologies (e.g., block chain decentralization, open-source and open-data collaboration, etc.)? What should be the respective roles of stakeholders?
18. What are key policy actions (if any) to address the challenges and harness the opportunities identified? At global, regional and national levels - by Member States, UN system and IOs, science and engineering communities, the private sector and various stakeholders? In particular, what actions do you recommended to the UN Technology Facilitation Mechanism, the UN Commission on Science and Technology for Development, regional Forums, and the UN system as a whole?