Science and Technology in Society *forum* (STS *forum*)
18th Annual Meeting
Kyoto, Japan, October 5, 2021

STATEMENT

1. The 18th Annual Meeting of the Science and Technology in Society *forum* took place from October 2 to October 5 live online from a base studio in Kyoto, with online participation of around 1,400global leaders in science and technology, policymaking, business, and media from 125 countries, regions, and international organizations.

Analysis and Synthesis in Science—Earth and Commons

2. Humanity today is at a critical juncture. For a very long time, many of us believed that our economic development had been supported by a stable and resilient Earth system—our global commons. But the reality is that we have pushed the carrying capacity of this system to the breaking point. Earth's climatic, ecological, and human systems are converging towards an existential crisis for global civilization within the lifetime of children now living. To build a sustainable, inclusive, and resilient future, we must find ways to change how we live, and how we interact with the ecological systems we are all part of. We need to transform key economic systems and look for new social norms, so that we can be stewards to the global commons. Global governance is needed not only to manage the global commons, but also to assess the revolutionary changes that are coming in science and technology and how their deployment can help or harm different aspects of our lives.

Breaking Silos in Education

3. In terms of human activity, our knowledge base has shown the greatest growth from the 20th century onwards. However, knowledge is in a chaotic state, just like the pieces of a huge jigsaw puzzle. Education must break down the silos of organizations, subjects, or regions so that we can create a multidisciplinary approach to deal with the complex issues of our time and cultivate our ability to overcome known and unknown challenges and attain the double goal of solving societal challenges while nurturing human resources.

Global Pandemic

4. Pandemics have always been part of human history; still, the COVID-19-pandemic came as a surprise to the entire world, and we must continue to confront the emergence of more virulent strains. At the same time, the threat of new pandemics is always with us. It has become obvious that effective systems of global disease surveillance, rapid reporting, and early warning are essential for preventing pandemics. Quick and effective communication is key in fighting a pandemic, starting with health care providers, and among scientific experts from both academia and industry. The science community must have an open dialogue with policymakers and ensure that clear messages are communicated to the public.

5. New or recent discoveries and approaches in biology, for example, mRNA vaccines and the use of CRISPR technologies in testing, have had a major direct impact on dealing with the pandemic. While science has been critical for vaccine development, understanding viral spread, and developing treatment, there have been many challenges. The impact of the pandemic has been felt by those directly affected, the health system, and national economies, and on global interactions and supply

chains. The pandemic has taught us that we need collaborative systems that work in a crisis. It has also taught us that we must confront anti-science misinformation that uses social media and other platforms to obstruct the effective deployment of vaccines and remedies.

Advanced and Precision Medicine

6. Driven by new approaches such as bioinformatics and synthetic biology, medical technology is currently making great strides. The fusion of polymer chemistry and life sciences has created new drug delivery systems, which are expected to contribute to combatting central nervous system diseases. The mRNA vaccine, a possible game changer in the fight against COVID-19, was promptly and successfully developed by bringing together the best of these advanced technologies. We must discuss the advantages and disadvantages advanced science and technology bring to human life and health and how we can deal with them.

Energy and Environment

7. The 26th UN Climate Change Conference of the Parties (COP26) will be held in Glasgow, UK next month, calling for speeding up all countries' climate change efforts. Green investment is also gaining momentum in the business community. Nevertheless, additional efforts must be made to accelerate energy efficiency, provide access to clean electricity, and decarbonize industry and transportation. In particular, radical actions will be required, including strong incentives such as forcing users to pay the full environmental cost of their energy consumption, and targeted state interventions will be needed if we are to have significant reductions in the use of fossil fuels. The impact of significant changes in energy use on economic activity must be minimized by improving the quality of energy management, expanding renewable energy, and using hydrogen systems, storage battery systems, and possibly Small Modular Reactors (SMRs).

Resilient Society

8. Across the planet, societies are currently confronted with multiple challenges including the COVID-19 pandemic, increasingly frequent extreme weather events, and escalating degradation of the biophysical environment. While these impacts are occurring across the planet, the ways in which they manifest themselves are highly location specific. For this reason, societies must find ways to adapt and develop resilience in the face of the specific challenges they face. Building resilience at the community level will require a convergence of science, technology, and social sciences with input from and engagement with civil society.

Nurturing Talent in Developing Countries

9. We discussed the various ways in which science and technology can be encouraged, taught, and moved into practice in the often-challenging environments of the developing world. In addition to just learning and becoming excited about science, ways in which practical outcomes through business development and research opportunities can both stimulate and nurture a love of science and technology and lead to true economic benefits were explored. Universities, businesses, and other developed-world institutions should engage with young people in developing countries by providing opportunities for visits, advanced education, and collaborative endeavors that can benefit all parties.

Collaboration

10. The United Nations' Sustainable Development Goals (SDGs) are a call for action by all countries in a global partnership to combat the urgent challenges we face. But these challenges interact among themselves, sometimes in a conflicting manner, and no goal can be truly dealt with in isolation of action on the others. Global issues cannot be addressed by any single nation or institution acting alone. The 2030 Agenda for Sustainable Development cannot be achieved without strong, coordinated collaboration between governments, industry, and academia. We must continue to strengthen this collaboration within and between nations to address current and future global threats.

Digital Economy

11. It is widely recognized that digitalization has unleashed a new wave of innovation with profound implications for existing economic models and that have impacted businesses, public organizations, and personal life. Emerging digital technologies such as the Internet of Things, artificial intelligence, and Big Data will lead to further disruptive innovation, creating many benefits for consumers and businesses on the one hand, but also generating new problems and policy issues on the other. In particular, AI has a wide range of potential economic and social implications, including new forms of economy and governance. An appropriate ethical and legal framework is needed to ensure that digital technologies are designed and deployed in an inclusive and transparent manner.

12. We look forward to convening again next year in Kyoto and have agreed to hold the 19th Annual Meeting of the STS *forum* from Sunday, October 2 to Tuesday, October 4, 2022.