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Diplomacy for Science and Science for Sustainable Development

E. William Colglazier

TWO particularly salient topics for me are diplomacy for advancing the worldwide scientific enterprise and science, technology, and innovation (STI) for making progress on sustainable development. Both are essential for maximizing the potential of science for advancing diplomacy.

The 2010 Royal Society and American Association for the Advancement of Science (AAAS, publisher of *Science & Diplomacy*) report *New Frontiers in Science Diplomacy* highlighted a three-part analytical framework for science diplomacy: "science in diplomacy," "diplomacy for science," and "science for diplomacy." I like to combine the first and third categories so as to leave room for a new category—"science leaping over diplomacy" (i.e., "leapfrogging" over diplomatic hurdles)—that I think is especially relevant when discussing science for sustainable development. The essence of this category is recognition that science—combined with transformative technologies that science makes possible—can create new pathways for making progress on the "wicked" national, regional, and global problems that are sometimes too difficult for politicians and diplomats to resolve. For example, in the 1980s, the development of new refrigerants helped eliminate some of the opposition to enactment of the Montreal Protocol. New advances in affordable clean energy may do the same for dealing with climate change by moderating opposition to the elimination of carbon-based fuels.

E. William Colglazier is the editor-in-chief of Science & Diplomacy.

When I became science and technology adviser to the secretary of state in 2011, I focused on finding ways for science to advance U.S. diplomacy. Every country that I dealt with had a related but slightly different focus: using science and technology to support innovation and economic development. Their government officials were seeking the right policies and investments to upgrade their STI capabilities to make their societies more innovative and competitive, and, therefore, secure and prosperous. To do this, they knew their scientists and engineers had to collaborate with the world's scientific leaders, who were often in advanced countries such as the United States. Therefore, international collaboration is a useful tool for the United States to advance its diplomatic goals.

At the same time, the U.S. scientific enterprise was recognizing that the advancement of science and technology had truly become global with many countries making significant investments leading to remarkable progress in capabilities while U.S. funding support was becoming more limited. As a consequence, the U.S. scientific enterprise has become more focused on ensuring that American scientists have access to the best minds, facilities, and unique research environments wherever they exist in the world.

The Physics Policy Committee of the American Physical Society (APS), on which I serve, has made international issues the first priority in its current strategic plan. The committee is sponsoring a series of discussions with leading physicists on issues related to building international collaborations. Prominent leaders, such as Nobel laureate David Gross of the University of California, Santa Barbara, and Caltech professor Maria Spiropulu of the Compact Muon Solenoid collaboration at the Large Hadron Collider, have organized sessions at recent APS and AAAS meetings focusing on challenges in international collaboration in physics. This renewed emphasis on international collaboration is also taking place in other fields of U.S. science.

The result of these trends—what countries are focusing on and what the science community is focusing on—makes the role of diplomacy advancing international science collaboration even more important. That means our diplomats and policy makers need to help the science community by removing hurdles and bureaucratic roadblocks whenever possible (e.g., approval of visas and access to research environments), by facilitating and negotiating innovative international agreements (e.g., approval of legal and funding arrangements for multinational facilities), by providing more funding for U.S. scientists to work at leading international facilities, and by providing more funding for U.S. scientists to collaborate with scientists from other countries. When I left the Department of State in 2014, I was convinced that maximizing the role of science advancing diplomacy required more effort in diplomacy advancing science.

Turning to sustainable development, I became involved in 2013 with the process at the United Nations for strengthening the "science-policy interface" for what has now become the 2030 Agenda. Last September the UN member countries

approved seventeen Sustainable Development Goals (SDGs) for guiding the world to 2030. Science, technology, and innovation are critical for making progress on every one of these goals. Science can contribute in several ways, by identifying challenges, advising on actions that can make a difference, identifying indicators for monitoring progress, and searching for innovative solutions.

The most significant contributions from STI may come from the latter category, that is, innovative solutions that help bypass intractable political problems, or, "science leapfrogging diplomacy." To accelerate these new scientific and technological advances, science diplomacy and international science collaboration are needed to help all countries become more capable in STI. By doing so, the 2030 Agenda can be as important for supporting the development of knowledge-based and innovative societies as for making near-term progress on the seventeen SDGs.

The world's science communities should view the 2030 Agenda as a great opportunity for strengthening the UN's science-policy interface to benefit all people of the world. One near-term opportunity is the UN initiative to produce a series of Global Sustainable Development Reports (GSDRs). The 2014 GSDR Prototype and the 2015 GSDR were important contributions, highlighting the science-policy interface, integrative perspective, linkages among SDGs, and cross-cutting issues. The GSDR initiative will continue as an ongoing process to 2030. For each cycle of four years, there will be three annual reports focusing on special issues followed by a comprehensive report in the fourth year. The UN professional staff, which has responsibility for the GSDR, is seeking input from the scientific community on emerging issues that will be included in the 2016 report.

A second opportunity for involvement by the scientific community is the Technology Facilitation Mechanism (TFM), which was created by the 2030 Agenda. I am fortunate to be co-chair of a group of ten people representing science and civil society appointed by the UN secretary general to work with the UN agencies and multilateral institutions on the role of STI for achieving the SDGs. The TFM will convene an annual STI forum—the first is scheduled to take place in June. The TFM will also have an online platform that is under development. For the first forum, input is being sought in advance from the world's scientific community on questions such as

- What are the main opportunities and challenges at the policy, organizational, and individual levels for maximizing the STI contribution to the achievement of the SDGs?
- What are the key elements that countries and international organizations may need to take into account in formulating action plans and/or road maps for STI for SDGs?

The results of the first forum will be presented to the highest UN body dealing with the 2030 Agenda, the High-level Political Forum, at its meeting in New York in July.

During the AAAS Annual Meeting in February, I was impressed by the work of one of the world's premier demographers, Wolfgang Lutz of the International Institute for Applied Systems Analysis. His research illustrates the importance of SDG #4 on education, showing how investments in education at all levels (primary, secondary, tertiary) can yield benefits for many of the SDGs, including economic growth, climate change, and health. If the world continues on the current trajectory with an ever-increasing share of the population achieving secondary and tertiary educational levels, it will produce many more scientists and engineers. That in turn will advance the scientific and technological revolution, accruing benefits the world over in this century. Indeed, focusing on education may be our most profound legacy to future generations. SD