SCIENCE & DIPLOMACY

A quarterly publication from the AAAS Center for Science Diplomacy

Bridget M. Dolan, "Science and Technology Agreements as Tools for Science Diplomacy: A U.S. Case Study," *Science & Diplomacy*, Vol. 1, No. 4 (December 2012). http://www.sciencediplomacy.org/article/2012/science-and-technology-agreements-tools-for-science-diplomacy.

Science and Technology Agreements as Tools for Science Diplomacy: A U.S. Case Study

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SCIENCE diplomacy has the potential to strengthen or improve relations between countries, promote goodwill, and advance the frontiers of knowledge. Some advocates argue that science diplomacy can also spread the principles of science—including transparency, peer review, and evidence-based decision making—to governance. However, this scientific dimension of diplomacy is only powerful if the tools that promote it are effective. The United States has a suite of tools available to promote science diplomacy. A specific tool wielded by the U.S. Department of State on behalf of the U.S. government is the bilateral Agreement on Science and Technology Cooperation (S&T agreement). This paper explores the drivers for S&T agreements involving the United States and how they have been used to support science diplomacy.

A Formal and Legally Binding Agreement

International agreements to promote cooperation in scientific research and development can be bilateral or multilateral, government-wide or at the level of individual technical agencies (e.g., the National Science Foundation or the National Institutes of Health). The focus of this paper is on bilateral, government-wide agreements, also referred to as umbrella agreements, framework agreements, or

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simply S&T agreements. Scientific cooperation between the United States and other countries is undertaken using a variety of arrangements, from informal scientist-to-scientist collaborations to cooperation between research institutions to formal agreements between technical agencies. While S&T agreements are not necessary for these types of interactions, other nations often seek S&T agreements with the United States because they carry the weight of being legally binding and having been negotiated on behalf of the U.S. government. These agreements endeavor to establish a framework to foster international science collaboration while protecting intellectual property, establishing benefit sharing, and preventing taxation of research equipment. The contents of an S&T agreement usually include common features such as types of cooperative activities and ways to encourage access to facilities and personnel, as well as clarification that some information or equipment—such as those requiring protection for national security reasons—are not covered under the agreement. There are three areas where the agreement text often varies: (1) the preamble, which is not legally binding and is often used to highlight the public motivations behind the agreement; (2) the intellectual property rights annex, which delineates how the parties share and exploit intellectual property generated; and (3) the implementation plan, including whether to establish a joint committee that would meet regularly to review execution of the agreement.

History Highlights Their Potential

During the Cold War, S&T agreements came to the forefront in demonstrating their value as diplomatic tools.[1] The United States signed a historic S&T agreement with Japan in the 1960s that sought to help mend the "broken dialogue."[2] It was initiated by a short statement in a joint communiqué released following a 1961 meeting between President John F. Kennedy and Japanese Prime Minister Ikeda Hayato and resulted in one of the longest running S&T programs. Similarly, just one month after diplomatic relations were restored between the United States and the People's Republic of China in 1979, President Jimmy Carter and Chinese leader Deng Xiaoping signed an S&T agreement, "affirming that such cooperation can strengthen friendly relations between both countries." In both of these cases, this formal declaration of desire to "establish closer and more regular cooperation between scientific entities and personnel in both countries" came at a time when the political relationship was transforming.[3]

With China, there was a desire by the United States to broaden the scope of the newly re-established relationship by promoting scientific exchanges, among other cooperative efforts. In the case of Japan, there was the hope that building relationships between the university and research communities in the two countries would help to decrease the potential for Japan to drift toward the Soviet Union and the rise of communism, thereby protecting U.S. national security.

Contemporary Drivers for U.S. S&T Agreements

The S&T agreements with Japan and China were part of larger U.S. foreign policy strategies and were intended to be transformative. Since the end of the Cold War, many other S&T agreements have been signed, and the contemporary rationales or drivers for these agreements have diversified. Examining what motivates the United States to sign S&T agreements and engage in bilateral S&T cooperation can demonstrate their potential as a tool in science diplomacy. While many S&T agreements may have a spectrum of drivers, there are four typical motivations behind U.S. engagement with these agreements.

Transforming a Diplomatic Relationship

At the time the United States signed S&T agreements with China and with Japan, the diplomatic relationships were changing dramatically. The use of S&T agreements in cases like these seeks to signal a shift in relations. By expressing the desire to enter into an agreement, the United States indicates its intentions to build bridges using science as a tool of diplomacy. Therefore, the S&T agreement, and the sentiment which it represents, has the potential to serve as a catalyst for a new relationship, ideally one built upon the scientific principles of transparency, merit-based achievement, and evidence-based decision making. As these principles also arguably apply to good governance, an open dialogue on these topics may also be relevant for broader diplomatic objectives with many countries, but in particular those undergoing significant transformations. An S&T agreement can lay a foundation for cooperation in areas meant to connect societies and benefit all people, such as public health, water resources, environmental protection, and education.

Promoting Public Diplomacy

Whether the bilateral relationship has recently changed or remains stable, the signing of an agreement—and the media attention that this brings—is an opportunity to send a message to the people of another nation. An S&T agreement offers an occasion to publicize a number of beneficial topics, like recent scientific accomplishments, initiatives to promote education, or efforts to grow an innovation-based economy. This can be valuable in a stable bilateral relationship with a nation such as Germany that wants to attract top U.S. talent to its research institutions. It can also foster engagement with developing nations as the United States can reach out to communities around the world to achieve foreign policy objectives through well-designed public diplomacy campaigns that center around cooperation in S&T. Using S&T engagement as a platform, media coverage can be used to connect the principles of science to those of good governance or to support the role of women in science and society. In addition, as surveys have shown that American science and ingenuity are respected abroad, publicity for joint S&T activities is good press

for the bilateral relationship and can improve the American image abroad. For example, public diplomacy, including leveraging respect for American science to promote goodwill toward the United States, was a priority for U.S. engagement with Muslim-majority nations following the September 11, 2001, terrorist attacks.

Highlighting Cooperation during a Diplomatic Visit

While an S&T agreement can be a tool for outreach to the public, it is also a way to engage the diplomatic community as an S&T agreement brings scientific engagement into the sphere of diplomacy. It gives diplomats a way to use their own language—the language of diplomatic deliverables—to speak of cooperation in national priority areas like nanotechnology, disease surveillance, or renewable energy. In addition, it gives proponents of science diplomacy the opportunity to demonstrate the value of S&T engagement to diplomats otherwise focused on the threat of terrorism, hard economic choices, or disputes over territories.

Protecting U.S. National Security

National security concerns often motivate bilateral engagement, including S&T. In the early years of the post-Soviet era, science diplomacy focused on demilitarization of science infrastructure and redirection of former Soviet weapons scientists into careers that were peaceful as well as meaningful and sustainable. The security concerns of the last decade with Muslim extremism following 9/11 have motivated S&T engagement with Muslim-majority countries. The United States signed seven S&T agreements with Muslim-majority nations between 2003 and 2008 as part of the Bush administration's strategy to fight the "war on terror." Another five S&T agreements have been finalized since President Barack Obama's "New Beginnings" speech, and one more is awaiting a signature.[4] This represents a shift in the S&T engagement strategy from that prior to 9/11 when only one of the twenty-nine S&T agreements was with a predominantly Muslim nation (Egypt). This indicates that the U.S. government considers science a strategic asset for national security and uses S&T agreements as tools for relationship building with the long-term benefits of mitigating international conflicts.

Examples of Contemporary U.S. S&T Agreements

While there are unique circumstances leading up to every S&T agreement, in most cases, one or more of the four motivations described above contributes to U.S. engagement. The following examples highlight these motivations and touch upon the role that additional differentiators—such as existing research capacity, joint commission meetings, and commitment of resources—can play in the realization of the agreements.

Libya

In the case of Libya, the signing of an S&T agreement in 2006 signaled the occasion of a dramatic change in the political relationship. In December 2003, after more than three decades of tense relations, with the United States designating Libya a state sponsor of terror, Libya announced plans to dismantle its weapons of mass destruction and long-range ballistic missile programs and began to cooperate with international partners. With these measures, the United States re-engaged in a stepwise fashion, sensitive to public concerns over compensation for the families of victims of the Lockerbie airliner and Berlin disco bombings. American diplomats returned to Tripoli in February 2004, after a twenty-four-year absence. Then in the summer of 2006—one week after the U.S. Department of State lifted Libya's designation as a state sponsor of terrorism—Under Secretary of State for Democracy and Global Affairs Paula Dobriansky was on a plane to Tripoli, accompanied by a senior delegation of U.S. science leaders. Science was at the forefront of this diplomatic trip, which was meant to signal a "new phase in U.S.-Libyan relations" and demonstrate the U.S. commitment to bilateral cooperation in areas like disease surveillance that would benefit Libyan society.[5]

In two additional steps toward reconciliation, Secretary of State Condoleezza Rice held talks with Libyan Foreign Minister Abdel-Rahman Shalqam in Washington, DC, and later that day he signed the S&T agreement. This was seminal as the first time a senior Libyan official visited Washington in thirty-five years and as the first bilateral agreement since reinstatement of diplomatic relations. This marked a dramatic change in U.S. policy toward Libya and symbolized the shared desire to improve the relationship. This is perhaps best stated in the preamble to the agreement itself:

> Recognizing the historic decisions undertaken by the Great Socialist People's Libyan Arab Jamahiriya in December 2003 to forswear weapons of mass destruction, and the resumption of full diplomatic relations between the Parties in June 2006;
>
> Realizing that international cooperation in science and technology will strengthen the bonds of friendship and understanding between their peoples and will advance the state of science and technology of both countries, as well as mankind;
>
> Sharing responsibilities for contributing to the world's future prosperity and well-being, and desiring to make further efforts to strengthen their respective national research and development policies . . .

Moreover, Libya was part of a broader effort to reach out to the Maghreb countries in particular and Muslim-majority countries more broadly, and to improve international public understanding of "American values, policies and

initiatives."[6] From 2004 to 2006, Under Secretary Dobriansky and Assistant Secretary for Oceans and International Environmental and Scientific Affairs Claudia McMurray traveled to Tunisia, Algeria, and Morocco to sign S&T agreements and promote regional dialogues on S&T issues. These S&T agreements with nations having predominantly Muslim populations were gestures of goodwill. They did not establish joint commissions to review progress, nor were they associated with dedicated funding. Nonetheless, following the signing of the Libya agreement, there was some S&T engagement. For example, a program was launched that brought twenty-four Libyan high school students to space camp in Alabama to spark interest in math and science and engage the younger generation. (However, since the Arab Spring political unrest, cooperative activities have been put on hold.)

Pakistan

Following 9/11, the U.S. relationship with Pakistan changed rapidly. Pakistan had become a vital ally in antiterrorism efforts that were important for U.S. national security. During state visits to Washington, DC, in 2002 and 2003, President George W. Bush and President Pervez Musharraf announced their commitment to friendship and broader bilateral engagement. An S&T agreement was signed during the second visit, and cooperation was launched in education, health, and S&T capacity building. In this way, the United States was motivated by the desire to transform a diplomatic relationship and protect U.S. national security, and they selected projects that would broadly benefit the public.

Cooperation under this S&T agreement continues to this day, in part because of three features of the agreement. First, options for collaborations in specific areas of S&T were explored prior to signing the agreement. Second, the U.S. and Pakistani governments committed funds for joint projects.[7] This program—implemented by the U.S. National Academy of Sciences—has been an effective model for S&T collaboration, as it co-funds joint Pakistan-U.S. teams through a competitive and transparent review process in which all funding decisions are made by consensus. Third, a joint committee was established that has met twice.

India

The United States and India have a rich history of collaboration in scientific research and education. As early as the 1950s, agricultural research collaboration flourished as U.S. Public Law 480 (PL480, also known as Food for Peace) supported the Green Revolution in India.[8] Over the years, the funding mechanisms and research collaborations evolved and included an increasingly large number of U.S. technical agencies. The scientist-to-scientist partnerships continued through the ups and downs of the diplomatic relationship—predominantly disputes over nuclear nonproliferation and Pakistan—and representatives from the countries discussed an S&T agreement as early as 1993. In 2000, President Bill Clinton's

visit to India strove to "engage India in developing a qualitatively new and closer relationship across a broad range of global, regional, and bilateral issues."[9] While the two governments envisioned science as a strong pillar of this new partnership, the United States could not enter into a treaty-level agreement as India was under U.S. sanctions for its 1998 nuclear tests. Instead, during this presidential trip, the Indo-U.S. S&T Forum (IUSSTF) was established. This co-funded joint program went on to support the interaction of more than twelve thousand U.S. and Indian scientists in over three hundred technical workshops, forty virtual joint research centers, and thirty advanced training programs. The U.S. side financed its part of IUSSTF by redirecting rupees leftover from PL480 funding. When additional U.S.-controlled rupees were uncovered a few years later, support for an S&T agreement resurfaced, as some officials thought a formal framework agreement would make it easier to direct PL480 funds to joint research projects.

While potential availability of funds was one factor motivating the S&T agreement, the drivers for S&T engagement were much broader. At this time, the Indo-U.S. relationship was maturing rapidly: the United States lifted sanctions; India tightened its patent laws; and President Bush launched the Next Steps in Strategic Partnership initiative to expand cooperation in high-tech trade, civil nuclear power, and civil space exploration. Enthusiasm for bilateral partnership was strong and drove the process to formalize the S&T relationship in a way previously thwarted by sanctions and disputes over intellectual property rights.

S&T engagement between the United States and India remained robust following the signing of the agreement in 2005. Two joint commission meetings have been held, allowing for the review of implementation of the agreement. In addition, these bilateral meetings have provided a venue for discussing obstacles to cooperation.

Germany

U.S. research institutions and individual scientists have close ties with their counterparts throughout Europe and especially in Germany. In fact, the tradition of extensive S&T cooperation between the United States and Germany dates back more than two hundred years, when the German scientist Alexander von Humboldt met with President Thomas Jefferson in 1804. Today it is carried out through more than fifty bilateral cooperation agreements between institutions.[10] As the scientific enterprises in both Germany and the United States are decentralized, these partnerships have thrived without oversight from a central body in the federal governments. While many of its European neighbors have had umbrella S&T agreements in place, Germany did not have one until 2010.

Deputy Secretary of State James Steinberg signed the German S&T agreement in the Department of State's Benjamin Franklin Room when Federal Minister of Education and Research Annette Schavan visited Washington, DC, in February 2010. This S&T agreement—like those with many other European and advanced

scientific nations—served as a diplomatic deliverable for a high-level visit and was not needed to support bottom-up cooperation. However, this agreement—like the launch of the German Center for Research and Innovation in New York, which Minister Schavan presided over the day after signing the agreement—was an opportunity to bring positive publicity to the bilateral relationship and raise the status of science in diplomacy. The agreement established a joint commission, which met for the first time in the fall of 2011.

Future of S&T Agreements

As this paper has elaborated, U.S. decisions to enter into S&T agreements are often motivated by the desire to transform a diplomatic relationship, promote public diplomacy, enhance a diplomatic visit, and/or advance U.S. national security. An S&T agreement can be a limited one-time deliverable or it can be a launching pad for extensive engagement. While the discussions above have focused on drivers for S&T agreements from the U.S. perspective, for these agreements to be effective tools of science diplomacy, implementation matters. In the last decade, the number of S&T agreements involving the United States has doubled. At the same time allocation of U.S. federal resources to designated international programs that support engagement in science and technology has not kept pace.[11] Some science diplomacy practitioners and academics in the United States and abroad are concerned that an S&T agreement with the United States, while once considered an important tool, is no longer taken seriously.[12] As these types of formal intergovernmental agreements continue to expand, however, the long-term benefit to official and nongovernmental relations between countries depends upon the ability to foster substantial scientific cooperation. It is essential that these agreements and science diplomacy more generally—while cognizant of the realities of limited resources—are ambitious enough to foster meaningful international partnerships. SD

Endnotes

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The information in this report was gathered through numerous in-person and telephone interviews with current and former employees of the U.S. government including technical agencies and the U.S. Department of State, as well as foreign embassy science councilors, academics, and NGO staff (from January to June 2012).