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The Indo-U.S. Science and Technology Forum as a Model for Bilateral Cooperation

Norman P. Neureiter and Michael Cheetham

DESPITE the recent Diwali festivities at the White House, it appears the United States and India are entering another period when the "official" relationship between the two countries is, if not strained, at least minimally productive. U.S. industry seeking trading relations chafes under the slow pace of India's economic reforms. Strategic cooperation in defense has long been challenged by India's perception of the United States as an unreliable supplier and may be the reason for India's reticence on the Defense Trade Initiative first proposed in 2012. India has not emerged as a key U.S. ally on Iran, though India would certainly stand to gain from a normalized relationship there. On Syria, India is more sympathetic to the Assad regime than to the jihadi-dominated rebels. In Afghanistan, India perceives that the threat will increase following the 2014 U.S. drawdown. Finally, the U.S. "realignment" to Asia has not brought India and the United States closer, perhaps a reflection of how India's proximity to China—and recent and repeated Chinese incursions into India—make this a dangerous proposition.

However, going back to the earliest days of India's independence, a parallel world of engagement has also existed between India and the United States that has successfully weathered periods of estrangement. The community of scientists, engineers, and health professionals has continued a robust engagement with their

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colleagues from the other country. Born of political and humanitarian goals, U.S. Public Law 480, first passed in 1954, served as a means to build bridges between the United States and countries needing food assistance, including India, using the tools of science. Much has been written about the long-lasting impacts of this cooperation—the Tarapur atomic power station (Asia's first), the NASA-Indian Space Research Organization (ISRO) Satellite Instructional Television Experiment, and the establishment of the Indian Institute of Technology at Kanpur come to mind—but cooperation showed signs of dropping off from its peak of the 1980s when over two hundred scientific projects were launched.

By the 1990s conflict over intellectual property rights (IPR) and India's nuclear weapons tests had all but brought government-backed U.S.-India scientific cooperation to a halt. (The large and technically sophisticated Indian-American community continues to advocate for increased cooperation, though largely without government backing.) The situation improved in 2000 on the occasion of President Bill Clinton's visit to India—the first by a U.S. president since Jimmy Carter in 1978—with the establishment of the Indo-U.S. Science & Technology Forum (IUSSTF): a governmental agreement to establish a nonprofit organization to promote cooperation in science, engineering, and health between the two countries.

Raghunath Mashelkar, who, as head of India's Council of Scientific and Industrial Research in 2000, had described U.S.-India science collaboration as a "frozen chicken"[1] left in the freezer for nine years, welcomed the establishment of IUSSTF, though many others questioned U.S. sincerity given the continuing sanctions on Indian laboratories and the absence of any new U.S. funding. The IUSSTF endowment, while matched by a contribution from the government of India, consisted of U.S. funds left over from the PL 480 program. V. S. Ramamurthy, then head of the Indian Department of Science & Technology and ex-officio co-chair of the new IUSSTF mechanism, also welcomed this development as "a sign the door is opening again."[2] Both Mashelkar and Ramamurthy would go on to make the IUSSTF a success during their tenure on the board, but the success of the IUSSTF goes beyond the contributions of two of its founding board members.

The impact of IPR concerns and sanctions cannot be understated, but they often overshadowed another fact: the very nature of the U.S.-India technical relationship had, over the prior forty or so years, undergone a steady transformation from a donor-recipient model to a partnership model. This growing sense of partnership and, in particular, the lack of a voice by India short of veto power over PL 480 projects, spelled doom for scientific cooperation under traditional government-to-government mechanisms.[3] The IUSSTF acknowledged this ongoing transformation, both in its institutional structure and its programmatic portfolio. Creating a mechanism for the *mutual* benefit of the parties greatly contributed to the success and longevity of the IUSSTF program.

Four other elements also put the IUSSTF on a path to success. First, the formal agreement of two governments gave IUSSTF a firm mandate and space

to operate. As the figurative and literal inheritor of the forty-year legacy of U.S.-India cooperation, IUSSTF was born with instant credibility. Equally important, however, was that the IUSSTF was created outside of government so as to insulate it from the vacillations of the political relationship.

Further insulating IUSSTF from political vagaries was its endowment. Though small, and consisting of rupees held by the U.S. government (approximately $7 million equivalent in 2000), its interest was matched by the Indian Department of Science & Technology, amplifying its impact and, unlike many of the PL 480 mechanisms, giving India a seat at the table in determining scientific collaborations.

Though not immediately apparent at creation, the small size of the endowment also had two positive elements: its modest amount allowed IUSSTF to operate under the radar and support high-risk, high-impact initiatives, and it forced IUSSTF to think of results in terms of outcomes, not inputs. IUSSTF would not replicate the earlier efforts of the much larger United States-India Fund for Cultural, Educational, and Scientific Cooperation, which was a ten-year agreement signed into law under President Ronald Reagan. Instead, IUSSTF would focus on being a catalyst to identify and nurture large scale research collaborations of mutual benefit.

The inputs facilitated by IUSSTF are impressive: over three hundred and fifty bilateral workshops, fifty virtual joint research centers, hundreds of student and faculty fellowships each year, and the involvement of over thirteen thousand U.S. and Indian scientists. The impacts, however, are more significant. A 2004 IUSSTF effort on space science sparked renewed collaboration between NASA and ISRO and ultimately paved the way for the two U.S. payloads on India's Chandrayaan mission. This collaboration gave the world evidence of water beneath the moon's surface. Other successes are in the pipeline: an IUSSTF-funded effort on low-cost medical diagnostics launched a multi-year joint research program between the U.S. National Institute of Biomedical Imaging and Bioengineering and India's Department of Biotechnology. Building on this, IUSSTF supported a Grand Challenge in Heath Care Technologies which has led to the first-ever U.S. National Institutes of Health collaboration with India's Department of Science & Technology, a jointly funded initiative to replace the blood pressure cuff.

Science collaboration between India and the United States has already generated tangible results, witness the number of U.S. technology startups led by immigrants from India (immigrants account for about half of U.S. startups, Indian immigrants for about a third of those). Many of these are products of the robust, if one-sided, educational exchange between the two countries. IUSSTF, the largest coordinator of U.S.-India academic exchanges in 2013, is focusing on increasing the number of U.S. students having a research experience in an Indian institution. Moreover, while IUSSTF has been successful in harnessing the energy and enthusiasm of the Indian diaspora—about half of IUSSTF grants last year went to Indian American

investigators, more work needs to be done to more broadly engage non-diaspora Americans.

The success of the IUSSTF both as a catalyst of science and in strengthening the bilateral relationship is based on some of its basic characteristics. First, there is dedicated, albeit small, core funding in place allowing for a consistent set of activities year by year. Its connection to government is also important, and provides an important link between the technical and more political aspects of the bilateral relationship. Despite this close link to the governments, one of the greatest advantages of the IUSSTF is its existence outside of government, especially on the U.S. side where its secretariat is an NGO and its U.S. board chair is a former Department of State science adviser working outside of the bureaucracy. This latter characteristic has increased the ability of the IUSSTF to link to the broader U.S. science enterprise, its universities and research centers, as well as the private sector.

As U.S. policy makers look to the potential for science cooperation as an important tool for building diplomatic relationships with other countries—such as Indonesia, Turkey, and Egypt, among others—it should look to examples that have worked. They will find that the IUSSTF provides a model that could and should be replicated. SD

Endnotes

1. K. S. Jayaraman, "India and US bring collaboration out of the freezer," *Nature* 404, no. 6777 (March 30, 2000): 427.
2. Ibid.
3. Governmental agreements generally ran from five to ten years under a variety of names and objectives: the S&T Subcommission, the Science & Technology Initiative, the Reagan-Gandhi initiative, the U.S.-India Fund, etc.