A New Frontier for Government-Supported International Science and Technology Cooperation: Transferring Urban Innovations to the United States

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TODAY, over half of the world’s population lives in urban regions. According to the United Nations, by 2030 that number is expected to climb to over 75 percent. On the one hand, these demographic changes, coupled with global climate change, present profound and unprecedented challenges to cities’ abilities to provide reliable energy supplies, safe drinking water, shelter, mobility, health care, jobs, and economic development. At the same time, these trends present special opportunities to further international science and technical cooperation—particularly for the United States. Urban environments and development are high priorities in the United States, where deteriorating water and transportation infrastructure is an economic and human health threat. In addition, U.S. performance lags behind many OECD-member countries in per capita greenhouse gas emissions, water infrastructure development and maintenance, renewable energy production, mobility, and health care.¹

It is generally recognized that good science is not limited to the United States, and that other countries are pioneers in multiple scientific and technical sectors related to urban environments. However, the U.S. government lacks effective processes to meaningfully integrate international science and technology (S&T) cooperation and

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the knowledge that comes with it into the domestic science and research programs of U.S. agencies that have urban and environmental responsibilities.

To alleviate urban development and environmental challenges in the United States, U.S. cities must be able to find, understand, and test urban innovations abroad from which they might benefit. To ensure that U.S. cities have access to the best knowledge available, a broader vision for the international S&T cooperation of U.S. agencies is needed. Beyond relationship-building or development goals, U.S. science diplomacy can and should include achieving tangible outcomes that serve U.S. priorities at home, especially at local and regional levels.

A new approach to government-led international cooperation could help to ensure that the U.S. investment in technical international cooperation contributes meaningfully to programs that improve urban environments in the United States. Examples of such programs include the Environmental Protection Agency (EPA) improving water infrastructure in New York City, the Department of Energy (DOE) working on renewable energy in Sacramento, the Department of Housing and Urban Development (HUD) creating ecological housing in Seattle, and the Department of Transportation (DOT) running highway safety programs in New Jersey.

This paper discusses past and current challenges to U.S. government-supported international urban programs and the lack of international S&T components supporting U.S. government urban environmental priorities in the United States. The United States could maximize the benefit of its investment in government-supported international urban science and technical cooperation through improved U.S. government interagency coordination. This coordination should align and prioritize projects in contexts that are problem-focused, goal-oriented, geographically specific, and that also foster continuous transfers of urban science and technical innovations from overseas to the United States. More effective coordination would ensure that practical, applied technical and policy exchanges serve urgent U.S. domestic urban priorities, such as water and transportation infrastructure, renewable energy, watershed restoration, and public health, supplementing the “soft” public diplomacy and development assistance goals of conventional Department of State-led international science and technology cooperation.

The Dilemma of International Cooperation for Domestic U.S. Agencies

In the late nineteenth century, U.S. academics, scientists, and researchers regularly engaged in scholarly and scientific research about urban innovations overseas and how they could be applied in the United States. College presidents, architects, urban planners, engineers, technicians, and scientists routinely traveled to cities in pioneering countries such as Germany and France for long periods of time to understand how specific urban systems, technologies, and programs functioned and compared to equivalent work in the United States.
There are many examples of the benefits that accrued to the United States from such international collaboration. In 1876, after a summer in Germany, Daniel Gilman applied the German research university model in the creation of Johns Hopkins University. In 1890 Gifford Pinchot transferred German and French forestry management and conservation practices to the U.S. National Forest Service, and in 1909 Benjamin Marsh returned from Frankfurt am Main with innovative public health practices that transformed urban planning methods in New York City. Under a U.S. Department of Agriculture fellowship, Aldo Leopold traveled to Germany in the 1930s to study the potential transfer of forestry and wildlife management plans to the United States.

Efforts to formally find and apply urban environmental lessons from abroad that can benefit domestic urban environmental programs in the United States diminished after World War II. U.S. technical agencies today tend to view urban environmental programs and related international science and technical cooperation primarily as extensions of U.S. diplomacy and/or development assistance. This approach in many ways is an understandable outgrowth of the United States’ S&T dominance in the postwar era. It also reflects the Department of State’s traditional—and foreign policy focused—lead role in coordinating government-supported international science and technology and related activities.

In a common practice, the U.S. Department of State will ask U.S. domestic departments and agencies, such as the EPA, DOE, or NOAA, to participate in global science and technology initiatives, which frequently contain many urban or environmental research themes. Most often, the focus of this cooperation is on development assistance, as seen, for example, in EPA’s air, toxics, or water quality projects in Russia or Libya. While this approach has served U.S. diplomatic and development aims very well and has helped improve environmental conditions at a global scale, it has almost invariably overlooked the important domestic goals of the participating U.S. government agencies.

And even the development objectives of such programs may not be best served. Many U.S. agencies find it difficult to effectively implement international science and technical cooperation programs. Much of this has to do with the fact that most domestically focused U.S. government agencies and departments are rarely suited programmatically or operationally to handle international development assistance requests. For example, the EPA’s legal authority, congressional oversight, and budget are oriented and anchored to attaining domestic rather than international objectives. The U.S. Clean Water Act or the U.S. Clean Air Act provide a meaningful context for the EPA’s actions and priorities in the United States, but are poorly suited to determine whether water quality in the Nile River and lives in Cairo, Egypt, are more vital to U.S. interests than air quality and human health in Jakarta, Indonesia, or New Delhi, India. Funding EPA’s international work in developing countries also is most often tied to external sources such as the U.S. Agency for International
Development, the Department of State, or the World Bank, which adds to the burden and complexity of program prioritization and impact assessment.

Prioritization is all the more difficult because international development assistance often addresses broad and complex issues, especially when targeting urban environmental themes such as public health, energy, and water infrastructure. When the geographic focus of development projects includes the entire world, the depth and breadth of geography and themes easily overwhelm the domestic agencies’ abilities to prioritize, plan, budget, or assess outcomes.

The result too often is that the international activities of these domestically focused agencies and departments produce few concrete or clear outcomes. For example, while hundreds of scientists and technical researchers from the U.S. EPA travel overseas each year, their travel is often conducted in a programmatic vacuum that is void of goals, accountability, or results. Many U.S. domestic agencies such as the EPA instead tend to view the desired end of international urban and science and technical programs as events in which to participate. Understandably, international urban—and often science and technical—cooperation within these agencies by default becomes easily relegated to the margins of the agency’s activities rather than serving as a vital instrument in support of important domestic priorities, such as economic development and competitiveness, environmental protection, or public health.

In the final analysis, the focus on broad diplomatic or development aims—an understandable preoccupation given the Department of State’s coordinating or lead role in many initiatives—diverts attention and resources from the agencies’ domestic urban science and research agendas. It is the exception rather than the rule when U.S. government-supported international urban cooperation focuses on the domestic priorities of U.S. technical agencies. The reluctance to use international S&T cooperation in service of national interests means wasted opportunities, for example, to transfer wastewater treatment innovations from Austria to clean up the Chesapeake Bay or new methodologies from the Netherlands to help remediate contaminated industrial sites in New York.

The weak alignment between agencies’ international urban cooperation and their domestic priorities and missions also feeds the perception that international cooperation delivers marginal returns rather than tangible improvements to environmental quality, public health, energy efficient housing, economic development, or job creation in the United States. Not surprisingly, the international science and technical work within domestically focused U.S. government agencies is choked for resources and funding because legislators and the public see little benefit from these programs for cities in the United States. Congressman Randy Neugebauer summarized this dilemma when he asked before the House Subcommittee on Research and Science Education hearings on international S&T cooperation why “we are exporting American tax dollars” in the name of “our international participation in science diplomacy?”

In March 2013, Congressman
Ed Whitfield, chair of the House Energy and Commerce Subcommittee on Energy and Power, introduced a bill—H.R. 959. The bill would prohibit EPA from awarding any grants under Section 103 of the Clean Air Act—an important piece of authority for EPA’s international science and research—for any projects outside of the United States. The language of this bill also would prevent grantees in the United States from awarding sub-grants to activities or organizations outside of the country.\(^5\)

### Making U.S. Government-Supported International Programs Relevant to Domestic Agencies through Improved Coordination

U.S. government-sponsored international urban environmental programs could be made more relevant by coordinating the international and domestic research, science, and technology agendas of urban and environmentally based federal agencies. This could start through the creation of a U.S. government umbrella committee for international urban environmental research with a mandate equivalent in some regards to committees for international science and technology proposed in 2012 under the International Science and Technology Partnerships Act. Described in this act, the director of the White House Office of Science and Technology Policy (OSTP) would lead an interagency body in the identification and coordination of international science and technology cooperation to strengthen the U.S. science and technology enterprise, improve economic and national security, and support U.S. foreign policy goals.

A similar OSTP-led coordinating committee could plan and coordinate the international science and research activities of HUD, EPA, DOE, DOT, and the Economic Development Administration—as well as other agencies with urban environmental mandates—so as to focus on outcomes relevant to high-level U.S. urban priorities, such as water infrastructure, energy efficiency, transportation, and public health. From the start, the committee’s mandate would require that the international activities of relevant domestic agencies serve vital U.S. domestic urban environmental goals. In planning and coordinating international programs, the committee would be required to give clear priority only to activities that involve the unilateral transfer of urban environmental and related science and technology innovations from overseas and the application of these innovations to the United States. This committee would adopt the premise that international urban environmental cooperation, including relevant S&T efforts, would focus only on high-priority U.S. domestic urban challenges, would result in U.S. domestic outputs or outcomes, and would be continuous and long term.

The domestic technical agencies would ensure representation on the committee by their senior leaders with responsibility for the core domestic affairs of the agency to ensure that the committee remains focused on the unilateral transfer of urban environmental lessons from abroad to the United States. This is important in order to avoid repeating the pattern of the past with analogous committees,
whereby the domestic technical agencies tended to send just representatives from their international offices, which by their nature are often far removed from the main domestic affairs of the agency or department. A useful model for a possible interagency coordinating body existed in the form of the Committee on International Science, Engineering, and Technology (CISET) in the Clinton administration under the auspices of the White House OSTP’s National Science and Technology Council. The involvement in the committee of representatives with responsibility for the domestic activities of technical agencies would send a strong positive signal about the agencies’ abilities and desire to engage partners at the state, regional, and local level in international collaborations.

One example of how a realignment of U.S. government-supported international urban science and technical cooperation might assist domestic priorities in the United States is the “Partnership for Sustainable Communities (PSC).” The PSC is a three-year, joint grant-making program ($68 million in FY 2011) administered by HUD, DOT, and the EPA. Under the PSC program, cities across the country receive coordinated grants from these agencies to support activities related to sustainable urban development and human health.

The impact of PSC grants could be enhanced if cities had more opportunities to tap into cutting-edge international expertise in relevant technical and scientific areas such as nonpoint urban storm water runoff, toxic air emissions from mobile sources, and risk remediation technologies for contaminated land redevelopment. When it comes to sustainable urban development and human health, extremely creative and innovative science and research related to urbanization is being done abroad in countries including Austria, Denmark, Finland, Germany, Japan, Korea, the Netherlands, Sweden, and Switzerland. Germany is a leader in cost-effective energy-efficient housing, urban water infrastructure, and transportation management technologies. The Netherlands is a world-class pioneer in technical development and the science of urban climate adaptation and contaminated land redevelopment and Austria has pioneered energy efficient processes for removing nitrogen from wastewater. Berlin’s experiences calculating zoning of impermeable surfaces for onsite storm water treatment could help inform Cleveland’s storm water management, for example, if agencies created opportunities for grantees to access data, technical expertise, and information. Similarly, methodologies to assess risk at polluted industrial sites in Trenton, New Jersey, could draw from lessons learned in the Netherlands, among many other examples.

To maximize the benefit to U.S. cities, a CISET-like organization could coordinate international exchanges, grants, and research and link those activities—and other relevant research supported by the National Science Foundation’s international grants or the “Partnership for International Research and Education”—to the domestic goals and outcomes of PSC and large-scale, coordinated U.S. government domestic grant-making programs. Clearly research—domestic and international—supported by U.S. government science-funding agencies must preserve room for
pure research and should not always be tied to applied or tangible outcomes. But new and improved coordination mechanisms would improve the flow of problem-focused and geographically specific scientific information, data, and expertise toward the existing domestic environmental, public health, and economic development goals of the EPA, HUD, DOE, HHS, or DOT. Importantly, strategic and enhanced coordination would yield increased value at no additional cost to the federal government and without creating new funding programs.

The enhanced effectiveness of PSC-funded programs, such as the Brownfields Pilot Projects, could also help bring about the engagement of the multiple umbrella science, professional, and technical organizations in the United States, such as the American Chemical Society or the American Society of Civil Engineers (ASCE). These organizations might also develop programs within their own organizations that promote international data gathering, technical analysis, benchmarking, and the evaluation and transfer of lessons to the United States. In other words, ASCE’s international work might focus on how its U.S. infrastructure priorities could be supported by working with counterparts in OECD countries—perhaps even in direct support of PSC-type activities. Such creative new partnerships might even attract funding from organizations in the business of supporting international science and research exchanges such as the German Research Foundation, the Alexander von Humboldt Foundation, or the U.S. Fulbright Commission.

More meaningful international technical cooperation focusing on domestic benefits might also invigorate existing bilateral S&T agreements, with attendant benefits for U.S. diplomacy. For example, the 2010 S&T agreement between the United States and Germany is intended to promote long-term science and research cooperation between the two countries through collaboration on themes such as healthcare, nanotechnology, and renewable energy. As stated earlier, Germany is a world leader in many areas relevant to the future of U.S. cities, including greenhouse gas emissions, renewable energy, energy efficiency, water infrastructure, public health, and vocational training. With more effective coordination and strategic prioritization, U.S. cities might find and apply urban science and technical innovations from Berlin, Freiburg, or Mannheim. Similarly, the EPA’s domestic research agenda on contaminated land redevelopment could be advanced through facilitated collaborations with Germany’s environmental research centers, such as the centers supported by the Leibniz Association or Fraunhofer institutes.

**Moving Forward**

In 2005, U.S. Undersecretary of State for Public Diplomacy Karen Hughes conceded that the United States suffers from a global “image problem,” often linked to perceptions from abroad that the United States sees itself as “exceptional” or too dominant of a global presence. This notion of U.S. exceptionalism has made it harder for the country to learn from foreign success in specific international
urban environmental or science and technical areas in which the U.S. lags. While the United States is clearly a global leader in many fields of urban development, environmental protection, science, and research, that leadership role should not preclude a vigorous pursuit of technical innovations from which it can learn and apply.

There are new opportunities and advantages to promoting U.S. government-supported international urban environmental and S&T cooperation that makes substantive and practical improvements to U.S. domestic urban environmental programs. A new paradigm for U.S. government-sponsored urban environmental and S&T cooperation could yield substantial domestic benefits, multiplying the return on the investment of U.S. agencies such as HUD, EPA, DOE, and other domestically focused departments. As the United States enters a time of protracted fiscal stringency, this will be a necessity. Better interagency coordination will be needed, as well as an acknowledgement that international cooperation can and should serve domestic scientific and technological priorities.

Endnotes

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