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# *Section 8*

## *Service to Local and World Communities*

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# Service to Local and World Communities

Founded with the mission of advancing knowledge to serve the nation and the world, MIT has been strongly committed to public service from its start. While MIT faculty, students, and staff regularly engage in conventional projects such as raising money for hurricane victims, renovating old housing, or restoring local nature reserves, MIT's scientific and technological orientation gives much of its public service outreach a particular emphasis. Many of its public service programs are specifically devoted to inventing new technologies and applying new knowledge that will advance social well-being.

## Priscilla King Gray Public Service Center

The Priscilla King Gray Public Service Center (PKG Center) helps MIT achieve its mission of working wisely, creatively, and effectively for the betterment of humankind. Through our programs, we provide encouragement, advice, logistical support, and funding to help students engage in meaningful and effective public service projects, working with communities in the greater Boston area, throughout the United States, and around the world.

Our goal is to enrich the MIT education for students through hands-on, real-world opportunities that complement the innovative culture of MIT. Our programs (described below) are designed to help students apply classroom learning, develop new skills, and understand the complexities of resolving community challenges.

<http://studentlife.mit.edu/pkgcenter>

## Public Service Fellowships Program

MIT students tackle a great variety of human and environmental challenges in communities around the world through this program. Participating students build their skills and reflect on their experiences to enhance classroom learning. Students can work individually or as part of a team on projects during IAP, summer, and the academic year. Fellows tackle some of the most pressing issues in the United States and abroad, working in sectors such as agriculture, water and sanitation, climate change, community development, assistive technology, education, environmental sustainability, food and agriculture, health and health technology, technology dissemination, and urban planning.

## IDEAS Global Challenge

Through this annual innovation and social entrepreneurship competition, students form teams to work with a community partner to design and implement innovative projects that improve the quality of life in communities around the world. Teams work in many sectors, including energy, mobile technology, health and medical devices, water and sanitation, education, and agriculture.

## ReachOut Tim Tutors

The ReachOut Tim Tutors program recruits, trains, and matches MIT students, faculty, staff, spouses, and partners with children at a local community center to engage and challenge them with reading and math activities. The program currently partners with three local community centers. In addition, ReachOut Tim Tutors is a Federal Work-Study eligible program. Students who are eligible for Federal Work-Study as part of their financial aid package can be paid for providing this valuable community service.

### **Community Service Work-Study**

This program enables MIT students to give back to the community while earning a paycheck during the semester, summer, or winter break. Students who qualify for Federal Work-Study are able to add to their work experience while assisting nonprofit organizations with finding creative solutions to the problems they face. For instance, Work-Study students might help staff a local homeless shelter, create communication materials for a lead-poisoning prevention program, serve as advocates for low-income clients, or tutor Boston high school athletes. Through a partnership between Community Service Work-Study and the Externship program, four students traveled to Los Angeles to design material for a STEM program with the i.am.angel Foundation.

### **CityDays**

CityDays is a series of one-day volunteer opportunities for all members of the MIT community. All students, faculty, and staff are encouraged to engage with the Cambridge and greater Boston community by devoting a few hours to volunteer with CityDays throughout the year. In conjunction with MIT's mission, the CityDays campaign aims to work for the "betterment of humankind" by connecting those who are a part of the MIT community with local organizations who need volunteers.

### **Four Weeks for America**

This program enables MIT students to spend IAP working with Teach for America teachers on science and math projects in classrooms in small rural areas or big inner cities while learning about educational change and policy. Participating students might develop hands-on science curriculum, perform data analysis of classroom performance, or research tools that improve learning.

### **Alternative Spring Break**

Alternative Spring Break enables MIT students to spend spring break participating in service in our local region. The PKG Center typically arranges week-long group experiences with community agencies in Greater Boston and New Jersey. Students combine hands-on service activities with learning about local issues and exploring societal challenges. They also offer grants to service groups who plan their own alternative spring break trips combining service and reflection.

### **LEAP Grants**

Learn, Explore, Act, & Prepare (LEAP) Grants provide MIT students with funding to carry out a service project, volunteer day, or philanthropy event in the United States. LEAP grants also help students learn about service and social responsibility or build their skills to tackle a community challenge.

### **Freshman Urban Program**

Through this week-long freshman pre-orientation program, incoming MIT students can help others while exploring their new neighborhood, learning about community challenges, and making friends. Freshman Urban Program participants volunteer with local agencies such as the Charles River Conservancy and Bridge over Troubled Waters and explore how issues like hunger and homelessness affect our community.

## **Office of Government and Community Relations**

Since its founding, MIT has maintained a commitment to serving the local community as both a resource for education and technology and as a good neighbor. Through the Office of Government and Community Relations (OGCR), MIT works collaboratively with dozens of Cambridge nonprofits that address local challenges and opportunities such as meeting the needs of underserved populations, youth programs, and environmental sustainability. The Institute supports these organizations by providing direct financial support as well as in-kind resources including facility use, faculty & staff expertise, and volunteer engagement. In addition, OGCR collaborates with the MIT PKG Center and MIT Community Giving to oversee the MIT Community Service Fund (CSF). The CSF provides support for nonprofits where MIT volunteers are at work and encourages the creation of new community service projects by providing grants to MIT affiliates.

Service to the community is not just centralized in one office at MIT—the Institute's various Departments, Labs and Centers have a diverse array of programs that support our host community.

## Abdul Latif Jameel Poverty Action Lab

The Abdul Latif Jameel Poverty Action Lab (J-PAL) is a global research center based at MIT working to reduce poverty by ensuring that policy is informed by scientific evidence. Anchored by a network of more than 150 affiliated professors at universities around the world, J-PAL draws on results from randomized evaluations to answer critical questions in the fight against poverty. J-PAL builds partnerships with governments, NGOs, donors, and other organizations to share this knowledge, scale up effective programs, and advance evidence-informed decision-making.

J-PAL was launched at MIT in 2003 by professors Abhijit Banerjee, Esther Duflo, and Sendhil Mullainathan as a research institute in the Department of Economics, and now has regional offices at leading research universities in Cape Town, Jakarta, New Delhi, Paris, and Santiago. With more than 300 research, policy, and training staff, J-PAL works across eight broad sectors: Agriculture; Crime, Violence, and Conflict; Education; Environment and Energy; Finance; Health; Labor Markets; and Political Economy and Governance.

### Research

J-PAL believes investing in rigorous research is essential to finding solutions to the world's greatest challenges. Working with governments, NGOs, donors, and private firms, J-PAL affiliates have conducted more than 800 randomized evaluations across a diverse range of topics, from clean water to microfinance to crime prevention.

J-PAL's research group works with affiliates to forge relationships with implementers on the ground and contributes to the design of survey instruments, data collection and survey efforts, statistical analysis, and data publishing. J-PAL also creates practical research resources, available to the public, designed to help people develop and carry out high-quality randomized evaluations. Their comprehensive library features evaluation manuals, analysis and survey tools, coding tools, and guidelines on ethics and transparency.

### Education and Training

The education and training group at J-PAL works to build the capacity of researchers who produce evidence, policymakers and donors who use it, and advocates of evidence-informed policy. J-PAL's training offerings include half-day workshops, five-day Executive Education courses, and full-year degree programs, and cover topics from applied statistical analysis to ethics and responsible decision-making.

To make this capacity building more accessible, J-PAL and MITx have developed a series of free open online courses for students and professionals. These twelve-week courses are taught by J-PAL's affiliated professors and are open to all who are interested in using evidence to promote effective policies and programs.

### Policy Outreach

The policy group at J-PAL bridges the gaps between researchers and policymakers. Policy staff work with J-PAL affiliated professors to distill research results into lessons that are clear, concise, and relevant to policymakers. With an in-depth understanding of the landscape of high-quality scientific research, they develop and disseminate cross-cutting policy insights and user-friendly frameworks for applying global evidence to local contexts.

Through government partnerships spanning the globe, J-PAL provides funding, technical assistance, and embedded staff to help shape programs and policies that deliver results. J-PAL's research and policy outreach work has contributed to cost-effective programs being scaled up to reach more than 300 million people.

### **J-PAL North America**

J-PAL North America (NA), one of J-PAL's six regional offices, is based at MIT. To address the complex causes and consequences of poverty, J-PAL NA's work spans a range of sectors including health care, housing, criminal justice, education, and labor markets. J-PAL NA works with decision-makers at the local, state, and federal level to conduct randomized evaluations of social policy, share research results, and train policymakers and practitioners to generate and use evidence. J-PAL NA runs three major initiatives to support randomized evaluations and evidence-informed policymaking: the State and Local Innovation Initiative, Health Care Delivery Initiative, and General Research Initiative. Amy Finkelstein (MIT) and Lawrence Katz (Harvard University) lead J-PAL NA as its two scientific directors. J-PAL affiliates have carried out over 200 ongoing or completed randomized evaluations in the region.

### **MIT D-Lab**

MIT D-Lab works with people around the world to develop and advance collaborative approaches and practical solutions to global poverty challenges. The program's mission is pursued through interdisciplinary courses, research in collaboration with global partners, social entrepreneurship, capacity building, humanitarian intervention, technology development, and community initiatives—all of which emphasize experiential learning, real-world projects, community-led development, and scalability.

D-Lab classes and projects are connected to communities around the world in countries including Botswana, Brazil, China, El Salvador, Ethiopia, Ghana, Guatemala, Greece, Haiti, Honduras, India, Indonesia, Lesotho, Mali, Nepal, Nicaragua, Niger, Nigeria, Pakistan, Philippines, Peru, Sudan, Tanzania, Uganda, Zambia, and others.

### **Programs & Opportunities**

#### **Courses**

D-Lab challenges and inspires talented students to use their math, science, engineering, social science, and business skills to tackle global poverty issues. D-Lab's 20+ MIT courses include design courses as well as courses that cover the principles of creativity, collaborative design, cross-cultural dialogue, supply chain management, and business venture development. Many courses provide an option for fieldwork.

<http://d-lab.mit.edu/courses>

#### **Research**

MIT D-Lab's research groups produce accessible knowledge and tools that support technology-enabled solutions to global poverty challenges. The research teams specialize in field research that involves working closely with partners and community members around the developing world. D-Lab specializes in sectors relevant to developing world contexts and the use of the effective, respectful, and collaborative research methodologies for collecting data that inform product and service development. D-Lab's research groups include Agriculture & Water, Biomass Fuels & Cookstoves, Developing World Mobility, Off-Grid Energy, Mobile Technology, Local Innovation and Development, and Lean Research.

<http://d-lab.mit.edu/research-about>

#### **Humanitarian Innovation**

The world is facing an unprecedented humanitarian crisis with 65 million people displaced by conflict or persecution. Available resources are heavily strained and organizations urgently need creative solutions to providing basic needs to this population.

MIT D-Lab is pioneering a new approach to humanitarian that is teaching refugees and displaced persons the design process and the use of tools, so that they can create the kinds of things they need—cookstoves, fans, water coolers, pumps, for example—to improve their lives and ultimately improve the way humanitarian work is delivered. This initiative is led by D-Lab Founding Director Amy Smith and D-Lab Instructor Martha Thompson.

### ***International Development Innovation Network***

Launched at MIT in 2012, the International Development Innovation Network (IDIN) is a program implemented by a global consortium of academic, institutional, and innovation center partners that empowers a diverse, global network of innovators to design, develop, and disseminate technologies to improve the lives of people living in poverty. IDIN manages the International Development Design Summits (co-founded by D-Lab Founding Director Amy Smith) that are held around the world each year. More than 800 inventors and social entrepreneurs from more than 60 countries have participated in the summits over the past 10 years.

<http://www.idin.org/>

### ***D-Lab Scale-Ups Fellowship***

The MIT D-Lab Scale-Ups Fellowship offers one year of support to social entrepreneurs bringing poverty-alleviating products and services to market at scale. Scale-Ups Fellows receive a \$20,000 grant, tailored mentorship, skills building, and networking opportunities. MIT alumni and alumni of the International Development Design Summit (IDDS) are eligible to apply. Now in its sixth year, the program has provided fellowships to 33 social entrepreneurs working on four continents in sectors including agriculture, energy, water, health care, housing, livelihoods, mobility, recycling, education, and personal finance.

<http://d-lab.mit.edu/scale-ups/about>

### ***Comprehensive Initiative for Technology Evaluation***

Launched at MIT in 2012, Comprehensive Initiative for Technology Evaluation (CITE) is a pioneering program dedicated to developing methods for product evaluation in global development. CITE researchers evaluate products from three perspectives, including suitability—how well a product performs its purpose, scalability—how well the product’s supply chain effectively reaches consumers, and sustainability—how well the product is used correctly, consistently, and continuously by users over time. To date, CITE has conducted nearly a dozen studies and reports on products ranging from water filters to wheelchairs.

<http://cite.mit.edu/>

### ***Practical Impact Alliance***

The Practical Impact Alliance, launched by D-Lab in 2015, is a network of leaders working across industries and geographies on market-driven social impact initiatives. Members include leading multinational corporations, non-governmental organizations, government agencies, and social ventures. The current members are Ajinomoto, CARE, Danone, Johnson & Johnson, Melton Foundation, OCP PHOSBOUCRAA Foundation, PACT, SC Johnson, Siemens Stiftung, USAID, and World Vision.

## **Local Programs**

### **Amphibious Achievement**

Amphibious Achievement is an MIT undergraduate student run group that mentors high school students in the greater Boston area in athletics and academics. Under the guidance of MIT student coaches/tutors, Amphibious Achievers train to row and swim competitively while also working on college-preparatory academics. It is free of cost to all students who participate.

<http://amphibious.mit.edu/>

### **Cambridge Science Festival**

The annual Cambridge Science Festival, the first of its kind in the United States, is a celebration showcasing Cambridge as an internationally recognized leader in science, technology, engineering, and math. The festival is presented by the MIT Museum in collaboration with the City of Cambridge, community organizations, schools, universities, and businesses. A multifaceted, multicultural event held every spring, the festival makes science accessible, interactive, and fun, while highlighting the impact of science on all our lives.

<http://www.cambridgesciencefestival.org/>

### **Edgerton Center—K–12 Programs**

The Edgerton Center continues the learning-by-doing legacy of “Doc” Edgerton. The Center’s K–12 programs educate, inspire, and motivate kindergarten through 12th grade students through hands-on science and engineering challenges with the aim of increasing students’ curiosity and desire to pursue these fields in their future. Concentrating in the Greater Boston area, with selected out-of-state and foreign endeavors, the Edgerton Center’s multi-faceted approach supports over 150 on-campus classroom workshops annually, intensive summer programs, innovative curriculum, and professional development workshops for teachers. The Edgerton Center instructors mentor faculty and students in local public schools as well. In all aspects of these programs, MIT students are closely involved. All of the programs are provided at no or minimal cost.

### **Educational Studies Program**

Founded by students in 1957, the MIT Educational Studies Program (ESP) shares knowledge and creativity with local high school students in the Boston, Cambridge, and MIT communities. Through an extensive offering of academic and non-academic classes, ESP is dedicated to providing a unique, affordable educational experience for motivated middle school and high school students. ESP courses are developed and taught by MIT students, alumni, faculty, and members of the community.

<http://esp.mit.edu/>

### **Giving Tree**

The MIT Giving Tree allows students, alumni, faculty, staff, and friends to provide gifts to local children and families each holiday season. The MIT PKG Center works with several campus groups, along with hundreds of individuals across campus to collect gifts for 12 local agencies serving low-income children. This program provides MIT a means to expand our ethic of caring to local children and families.

### **MIT Integrated Learning Initiative (MITili)**

Launched in 2016, MITili’s mission is to transform learning through research and applied practice. This initiative studies learning the MIT way: through rigorous, interdisciplinary research on the fundamental mechanisms of learning and how we can improve it. MITili draws from fields as wide ranging as cognitive psychology, neuroscience, economics, health, design, engineering, architecture and discipline-based education research to study learning from several perspectives. MITili considers the fundamental processes behind motivation, curiosity, knowledge acquisition, retention, mastery, integration, creativity, transfer, and self-efficacy at the individual level from pre-kindergarten to adulthood. At the system level, MITili researchers consider topics such as school effectiveness, school system design, social factors, education policy, the economics of education, and the impact of socio-economic status.

## Teaching Systems Labs

MIT's Teaching Systems Labs (TSL) helps prepare teachers for the complex, technology-driven classrooms of the future, by developing games, simulations and other tools for teaching, offering practice spaces for teachers to design and test new pedagogies, and offering online and in person training for teachers on innovative content.

## World Programs

MIT has a strong commitment to service. There are programs that are active both domestically and abroad while others cover more than service. Below are a couple of examples of work abroad. Please see descriptions of J-PAL and D-Lab on pages 124–126, and the Global Engagement section beginning on page 103 for additional work.

### Abdul Latif Jameel World Education Laboratory

Founded in 2017, the Abdul Latif Jameel World Education Laboratory (J-WEL) is an incubator for change in education at MIT and around the world. It brings together educators, technologists, policymakers, and societal leaders to address global challenges in education through online and in-person collaborations, workshops, and conferences. It consists of three collaboratives that address these challenges across all levels of education: pK–12, higher-ed, and workplace learning.

### Legatum Center for Development and Entrepreneurship

The Legatum Center for Development and Entrepreneurship at MIT was founded on the belief that economic progress and good governance in low-income countries emerge from entrepreneurship and innovations that empower ordinary citizens. The center administers a highly competitive fellowship program for MIT graduate students who intend to launch innovative and inclusive for-profit enterprises in developing countries. In addition to supporting the Legatum Fellows, the Legatum Center aims to catalyze entrepreneurship for broad-based prosperity by administering programs including case writing, research, articles, lectures, conferences, and seed grants.

<http://legatum.mit.edu/>

## Selected Service Projects

### Combined energy and water system could provide for millions

Many highly populated coastal regions around the globe suffer from severe drought conditions. In an effort to deliver fresh water to these regions, using clean-energy resources, a team of researchers from MIT and the University of Hawaii has created a detailed analysis of a symbiotic system that combines a pumped hydropower energy storage system and reverse osmosis desalination plant that can meet both of these needs in one large-scale engineering project.

The researchers, who have shared their findings in a paper published in *Sustainable Energy Technologies and Assessments*, say this kind of combined system could ultimately lead to cost savings, revenues, and job opportunities.

The basic idea to use a hydropower system to also support a reverse osmosis desalination plant was first proposed two decades ago by Professor Masahiro Murakami of Kochi University of Technology, but was never developed in detail. Recognizing the potential of the concept now, Alexander Slocum and his co-authors developed a detailed engineering, geographic, and economic model to explore the size and costs of the system and enable further analysis to evaluate its feasibility at any given site around the world.

Typically, energy and water systems are considered separately, but combining the two has the potential to increase efficiency and reduce capital costs. Termed an “integrated pumped hydro reverse osmosis system,” this approach uses a reservoir placed in high mountains near a coastal region to store sea water, which is pumped up using excess power from renewable energy sources or nuclear power stations. When energy is needed by the electric grid, water flows downhill to generate hydroelectric power. With a reservoir elevation greater than 500 meters, the pressure is great enough to also supply a reverse osmosis plant.

This work is available as an open access article on *ScienceDirect*, thanks to a grant by the S.D. Bechtel Jr. Foundation through the MIT Energy Initiative.

<http://bit.ly/2pSAvSw>



### **Evaluating approaches to agricultural development**

Involving local people in figuring out how to improve their farming and fishing methods provides more lasting and widespread benefits than just introducing new technologies or methods, researchers from WorldFish and MIT showed. The findings are described in *Agricultural Systems*, in a paper by Boru Douthwaite of the research funding agency WorldFish, and Elizabeth Hoffecker of the International Development Innovation Network, based at the MIT D-Lab.

Considerable research over the last few decades has shown that bringing about improvements in agricultural systems is a highly complex challenge. Douthwaite says he has often observed a disconnect between the measures agencies use to decide whether a program is working, versus the real effects he saw in some of the communities involved.

For this study, fishing in Zambia was one example the researchers focused on to illustrate these disparities. In Zambia, nearly one-third of the fish caught is lost to spoilage before it reaches the market. Reducing such spoilage could both provide financial benefits for the economically struggling fishing community and help alleviate food shortages for consumers.

The Zambian fisheries were facing two related issues, Hoffecker says: “The narrow challenge was to come up with a way to prevent fish from spoiling.” But in addressing that challenge, it became apparent that “there was a much bigger challenge, which was overfishing.”

The overall process led to four significant outcomes, Douthwaite says—none of which had been planned or anticipated initially and thus might have been missed in an evaluation based just on meeting initial, stated goals. The four outcomes consisted of developing a locally sourced fish-processing method (salting), developing a value chain for the salted fish from harvest to market, creating working groups that could continue to evaluate and improve innovations in the fishery, and improving relationships among the different groups involved, from the fishermen to the government agencies to the traders and buyers. In the end, this led to a growing consensus about the need for measures to prevent overfishing.

<http://bit.ly/2sWUSnG>

### **Researchers identify opportunities to improve quality, reduce cost of global food assistance delivery**

Food assistance delivered to the right people at the right time and in the right place can save lives. In 2016 alone, the U.S. Agency for International Development (USAID) delivered over 1.7 million metric tons of food assistance to over 30 million people in 50 countries around the world. However, USAID estimates that over \$10 million of that food never made it to the plates of people in need due to spoilage and infestation.

Proper food assistance packaging can be a major contributing factor toward preventing spoilage and infestation. The right kind of packaging can also reduce the need for costly fumigation and diversify the types of commodities that can be shipped to communities in need, improving recipient satisfaction and nutrition.

MIT researchers have released a report, “New Packaging Types as Innovative International Food Assistance Instruments.” It details the study design and findings of the latest experimental evaluation implemented by the Comprehensive Initiative on Technology Evaluation (CITE), a program supported by the USAID and led by a multidisciplinary team of faculty, staff, and students at MIT.

Food assistance was shipped in eight different types of packaging, then carefully tracked, monitored, and inspected to determine effectiveness of the packaging. In addition, lessons were documented regarding supply chains and processes along the way.

“This procurement produced generalizable data on the cost, effectiveness, and feasibility of using new packaging types in the food assistance supply chain,” says Mark Brennan, PhD student and CITE researcher leading the project.

At the close of the study, MIT researchers made a number of recommendations for USAID and USDA to consider based on key findings, demonstrating potential for cost savings and quality improvement along the supply chain.

<http://bit.ly/2y6aCDE>

