



## USAID's PEER Program fosters economic development through basic science

<http://sites.nationalacademies.org/PGA/PEER/index.htm>

The United States Agency for International Development (USAID), which has been providing aid to non-US countries in order to promote social and economic development since 1961, is an agency that materials researchers have likely never needed to look up. But through a recently established entity called the Global Development Lab, the agency now funds basic materials research that could impact many lives in developing nations.

"USAID aims to ultimately end extreme poverty globally and promote resilient democratic societies," says Clare Muhoro, science partnerships advisor in the Center for Data Analysis and Research and the Global Development Lab at USAID.

Scientific innovation is a critical instrument for this mission. "Science and technology are a mechanism of identifying real solutions to the most intractable challenges of economic development," Muhoro says. "Science is often the missing piece in solving problems that people have faced for generations. The role of

science and technology is to apply tools that can be implemented cheaply, efficiently, and reliably in a developing country context."

The USAID's Global Development Lab was established in 2011 to bring together a diverse set of partners to discover, test, and scale breakthrough solutions. The Lab centralizes the basic science research efforts of several USAID offices such as the global health bureau, the climate change office, and the water office.

It also runs the Partnerships for Enhanced Engagement in Research (PEER) Program, a competitive grant program that provides research dollars to scientists from developing countries partnered with US government-supported collaborators "to conduct research that is scientifically meritorious and has a development question at its core," Muhoro says.

Besides fostering innovation to achieve development objectives, PEER promises to strengthen the research capacity of the research communities in countries where

USAID works, in turn strengthening ties with the United States. The program is jointly supported by USAID and six US government-supported agencies: NASA, the National Institutes of Health, the National Science Foundation, the National Oceanic and Atmospheric Administration, the US Department of Agriculture, the US Geological Survey, and the Smithsonian Institution. Two private sector partners, the General Electric John F. Welch Technology Center in Bangalore, India, and the Austin, Texas-based National Instruments Corporation, also support the program.

To qualify, scientists applying for funds have to be citizens of one of 88 USAID eligible countries. They also need to identify a research partner who is supported by one of the six US government-supported agencies.

PEER has invested USD\$28 million to support more than 160 projects in 40 countries since it was launched. Renewable energy and water resources have been areas of focus, and PEER has funded several materials science and engineering projects in these areas.

In a project that started in 2014, a team of materials researchers from Nelson Mandela African Institution of Science and Technology, South Eastern Kenya University, and the University of Connecticut have developed manganese oxide and water hyacinth-derived carbon nanomaterials for catalytic and adsorptive removal of harmful hydrogen sulfide and organic sulfur compounds from biogas. The use of biogas made from waste is on the rise in Africa for cooking and electricity, but there is no affordable technology to strip contaminants from the gas before use. The prototype filters are now undergoing pilot testing and will then move on to large-scale tests.

Another project funded from 2013 to 2016 involves researchers from Addis Ababa University in Ethiopia and The University of Oklahoma, who are working toward an affordable,



Graduate student Teshome Yami tests fluoride concentration in water in a makeshift laboratory in Ethiopia. His work is part of a USAID project where researchers from Addis Ababa University and The University of Oklahoma are developing affordable aluminum-based materials to remove fluoride from potable water. Credit: Teshome Yami.

high-performance material to remove fluoride from groundwater in the Ethiopian Rift Valley. “Technologies used in developed nations, like reverse osmosis, activated alumina beds, and synthetic resins are expensive technologies and require high maintenance,” Muhoro explains. The researchers have made beds of layered aluminum oxide material infused with calcium that can reduce fluoride levels and completely

remove phosphates, sulfates, and nitrates from groundwater.

The ambitious three-year CLEAN Project that started in 2014, meanwhile, is a partnership between scientists at the Universitas Gadjah Mada in Indonesia and Cornell University, who aim to convert a large land fill site near Jakarta, Indonesia, into an environmentally friendly renewable energy plant. The site handles 5000–6000 tons of municipal solid waste per day,

with leachate volume reaching 100–1000 m<sup>3</sup>. If treated appropriately, the waste and leachate could potentially produce enough biogas to generate 200 megawatt-hours of electricity every day.

The deadline for this year’s cycle of PEER projects passed in January 2016. The next call for proposals is expected to be announced on the PEER website near October 1.

**Prachi Patel**

### Report finds underrepresentation of women in world science

[www.assaf.org.za](http://www.assaf.org.za)

Despite efforts to promote the role of women in science, a recent study reveals little representation and participation of women in national science academies globally.

The first comprehensive survey of member academies of the Inter Academy Partnership (IAP): The Global Network of Science Academies finds that the average share of women members across 69 national science academies is 12%. In just under one-half, 30 academies of the 69 that responded, the share of women members was either 10% or less.

The report *Women for Science: Inclusion and Participation in Academies of Science* was supported by the IAP and published by the Academy

of Science of South Africa (ASSAf). It documents the results of two surveys undertaken by the Inter-American Network of Academies of Sciences (IANAS) and ASSAf, targeting member countries of the IAP. Other partners were the Organization for Women in Science for the Developing World (OWSD) and the Network of African Science Academies (NASAC).

The report points out that while “great strides have been made in enrolling more women in undergraduate courses, especially in the biological and chemical sciences (success has been more limited in the areas of physics, mathematics and engineering), there remain significant challenges in ensuring that women

scientists are able to have fulfilling careers with increasing levels of responsibility, eventually taking up leadership and decision-making positions.”

Women are “best” represented in the social sciences, humanities, and arts (16% of all members in this discipline, across all science academies, are women), followed by the biological sciences (15%), and the medical and health sciences (14%). Women’s representation as academy members is least in the mathematical sciences (6%) and engineering sciences (5%).

Findings for the three global science academies—Islamic World Academy of Sciences (IAS), the World Academy of Art & Science (WAAS), and The World Academy of Sciences (TWAS)—show a similar picture: women are “best” represented among academy members in the social sciences and humanities.

### EU seeks views regarding its transition to a sustainable economy

[http://ec.europa.eu/research/consultations/euric/consultation\\_en.htm](http://ec.europa.eu/research/consultations/euric/consultation_en.htm)

The European Commission has launched a public consultation on the development of an Integrated Research, Innovation, and Competitiveness Strategy aimed at facilitating the European Union’s (EU) transition to a sustainable, competitive, energy-efficient, and low-carbon economy.

The strategy is linked to the implementation of the Energy Union Communication, which called for more research and innovation to ensure that

the energy transition happens through modern, user-friendly, safe, sustainable, and secure solutions to the benefit of EU citizens and businesses. Commitments taken at the COP21 International Climate Conference in Paris in December 2015 reinforce the need to step up efforts for reaching agreed climate targets.

The Commission is inviting all stakeholders and interested parties, including EU citizens, and private and public

organizations to share their views on how to achieve the EU’s energy and climate targets, as well as sector-specific research, development, and innovation goals needed for the transformation. The consultation will also look into the competitiveness of EU economic factors and new business opportunities, and examine how transport—one of the main energy users in the EU—can contribute to achieving the overall climate and energy goals.

The consultation will run through May 31, 2016, and its findings will feed into the integrated Research, Innovation, and Competitiveness strategy to be presented at the end of 2016. □