



# A FRESH APPROACH TO NORTH-SOUTH COLLABORATION

PEER, A NEW PROGRAMME FROM THE US AGENCY FOR INTERNATIONAL DEVELOPMENT, OFFERS A COMPELLING MODEL FOR BILATERAL SCIENCE AND HEALTH RESEARCH WITH REAL-WORLD IMPACT

Imagine walking through a city on your way to the market to purchase vegetables for your family. You hear the car horns squawking, mopeds buzzing through rows of stalled vehicles, voices calling for tuk-tuks to stop. But you cannot see the shapes behind the sounds. Air quality is so poor that an opaque, white sheet blankets the city.

For many people in developing countries, this is not a mental exercise – it is daily life. The air quality in Ulaanbaatar, the capital city of Mongolia, is among the worst in the world, with particulate matter levels 17 to 35 times those recommended by the World Health Organization. Much of that pollution is linked to the extensive use of traditional stoves to heat poorly insulated tent-dwellings; in the sub-Arctic climate, the coal-burning stoves are in heavy use nearly nine months of the year.



Now put yourself in the position of Sereeter Lodoysamba, a researcher from the National University of Mongolia. In hopes of protecting the health of your fellow Mongolians, you want to monitor the particulates and how levels have risen over time. You want to make an impact

on the morbidity and mortality related to air pollution. And you want to convey this information to local and national agencies that might be able to do something about the pollution.

Lodoysamba turned this dream to reality through PEER – Partnerships for Enhanced Engagement in Research – a new programme from the US Agency for International Development (USAID). PEER is investing in game-changing ideas with the potential to solve long-standing development challenges, specifically through the power of research. PEER brings research



*Air pollution in the Mongolian capital Ulaanbataar often cloaks the city in an unhealthy white haze.*



from different nations together to help developing countries increase their utilization of science and technology (S&T).

Major challenges facing the world today run the gamut from food security and clean water to infectious diseases, from reducing biodiversity loss and addressing climate change to employing green technology for sustainable urban development. All of these challenges require transformational and innovative solutions.

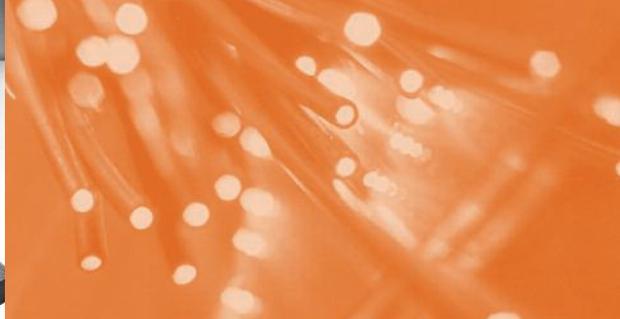
Significant advances in international development over the past half-century, such as vaccines and mobile technologies, have changed dramatically the trajectory of developing countries for the better. These powerful solutions, based on science, have helped to transcend traditional development barriers and spark revolutionary change. They improved the human condition through their growth potential, and benefited not just a country, but entire regions, and in some cases, the globe. Moreover, these inventions provided long-term improvement, not just quick fixes, and mirrored the developing country's culture and politics. Equally important is the potential to enhance S&T capacity to drive economic growth and help societies move beyond the need for foreign aid.

***PEER builds scientific and economic capacity in developing countries by directly funding the local investigators.***

PEER was designed for this role. Launched in 2011 with the US National Science Foundation and administered by the US National Academy of Sciences (NAS), PEER complements two longstanding collaborative research programmes between the United States and Pakistan and the United States and Egypt. It addresses global development challenges through collaborative science research partnerships.

It builds scientific and economic capacity in developing countries by directly funding the local investigators working with US scientists who have also been funded by the US federal government.

The research has the potential to transform development in many ways, such as producing evidence that drives policy decisions, developing models for improving community programmes, or creating technologies with commercialization potential. Faculty and students are involved in these research collaborations, and engage beyond the laboratory and field to attend professional development workshops and scientific conferences. In addition, PEER promotes bilateral and regional cooperation between US federally funded scientists and developing country investigators that ideally will endure past the life of the research grant.



*Researchers at Texas A&M and Bogor Agricultural University (IPB) are developing new teaching and research tools which focus on conserving Indonesia's plant biodiversity and commercializing species with potential market value. Support for this project is through the USAID/Indonesia University Partnerships Program.*

### **PEER POWER FOR NATIONS IN TRANSITION**

Two programmes are part of the PEER model: PEER Science and PEER Health. Both are highly competitive grants that invite scientists and engineers in developing countries to apply for funds to support research and capacity-building activities conducted in partnership with collaborators funded by NSF or the US National Institutes of Health (NIH). NAS sends funding from USAID for PEER awards directly to research institutions in developing countries. Applications are peer-reviewed primarily for the scientific feasibility and development impact of their proposed project as well as the strength of the collaboration between the developing country research and the US-funded researcher. The in-country USAID field office then reviews the top-ranked applications that emerge from peer review; finalists are chosen based primarily on the results of these two reviews.

PEER is at the forefront of US diplomatic and development efforts. This year, for instance, USAID extended PEER Science eligibility to include Burma, Tunisia, and Libya – all countries that have recently undergone tumultuous changes or are still in the midst of such

***PEER awardees will be future S&T leaders and have voice and visibility to influence policy.***

changes. Programme eligibility also continues to expand in countries that are emergent, including many Caribbean Islands where S&T can assist in the transition of a country from a foreign assistance recipient to a partner that can robustly address global challenges together with the United States.

PEER Science, a partnership between USAID's Office of Science and Technology and NSF, supports bilateral and regional research partnerships in 87 eligible countries worldwide. In the first round of PEER Science, the programme received almost 500 applications from 63 countries. The 42 grants awarded leveraged USD46 million of NSF funds with USD5.5 million of USAID funds across 25 countries. Together, researchers in the US and developing countries are collaborating to address a wide range of critical development challenges, including food security, climate change, water, biodiversity, disaster mitigation, and renewable energy.

Lodoysamba, the Mongolian researcher, is one of the 42 scientists funded under the programme. He is partnering with Christa Hasenkopf from the University of Colorado on an effort to address air quality in Mongolia.

*Undergraduate students from Universitas Mahasaraswati Denpasar conducting field research with farmers about the practices of the traditional Balinese Subak irrigation system (Credit: Surata Kaler)*



PEER Science is now reviewing over 250 proposals received in its second call for proposals, which was issued in September 2012. New areas of special funding for the second call based on USAID mission requests are critical development challenges in Indonesia, natural resource management in the Philippines, water issues in the Middle East and North Africa, biodiversity in Brazil and the Lower Mekong region of Southeast Asia, and climate change adaptation in the Maldives. Decisions are expected in spring 2013. A third call for proposals is anticipated in September 2013. Scientists connected to these 87 countries are encouraged to apply with an NSF-funded investigator.

### **BUILDING RESEARCH, SAVING LIVES**

In 2012, USAID's Office of Science and Technology and the Global Health Bureau, together with the NIH, created PEER Health. PEER Health provides support for researchers in 33 eligible countries on implementation science projects within country-specific health priorities. This programme is designed to provide resources to developing country researchers that leverage the knowledge and resources of NIH-funded colleagues. The first call for proposals, with applications currently under review, focuses on child survival related specifically to HIV/AIDS, malaria, tuberculosis, maternal

health, child and neonatal health, nutrition, family planning, and neglected tropical diseases. Many of these 33 countries were chosen due to their significant contribution (80%) to the global mortality rate of children under 5 years old. The impact of the PEER Health research will be significant. Not only will it develop local S&T capacity, the data will feedback into measures to save children's lives.

In this first call for proposals, PEER Health received 170 preliminary submissions from 28 countries; over 80 were invited to submit a full application. Decisions are anticipated in spring 2013, with a second call later in 2013 focused on a different area of health research.

### **SUCCESS BREEDING SUCCESS**

The PEER programme is still in its infancy, but the immediate impact is striking. PEER is also supporting female researchers in developing countries. For example, some 31% of the PEER Health applicants invited to submit a full proposal are women.

In January 2013, *The New York Times* featured the PEER Science grant measuring coral health in the coastal reefs of Indonesia. This research is being led by Jamaluddin Jompa from Hasanudding University in Indonesia and C. Drew Harvell of Cornell University. Shem Wandiga of the University of Nairobi and Mark Shannon of the University of Illinois Urbana-Champaign have partnered to address drinking-water quality issues in the Lake Victoria Basin of Kenya. Their goal is to improve water quality using new methodologies and novel purification systems. And in Lebanon, Grace Abou-Jaoude of the Lebanese American University and Joseph Wartman from the University of Washington are collaborating to map earthquake and landslide risk.

In the future, the PEER model may include partnerships with private entities that provide training and equipment to PEER grantees (the first such partnership recently was launched between PEER Science and National Instruments), or grant cycles focused on specific topics, such as water or agriculture. There could be a broad call for innovative ideas to development challenges, or a conference to showcase PEER research in conjunction with USAID missions.

The relevance of the research projects to USAID's local development objectives and engagement of local communities and government with USAID missions



that already has occurred gives confidence that positive outcomes will manifest through these sustained, transnational, global partnerships. Moreover, PEER awardees will be future S&T leaders and contribute equally to the international research community with their developed-country colleagues. They will have the voice and recognition to influence the policy world – locally, regionally and internationally. Increasing the global S&T research community will create a powerful force well-equipped to grow in-country S&T capacity and solve the major S&T challenges of tomorrow.

Back in Ulaanbataar, research focused on air pollution is winning international recognition. The US Ambassador to Mongolia, Piper Anne Wind Campbell, visited this PEER Science research group in December 2012 with her team for an introduction to the project. Lodoysamba and Hasenkopf are expanding public awareness of and involvement in air quality.

Last autumn, the PEER Science team began tweeting and creating a Facebook page that reports the sole source of Ulaanbaatar air particulate measurements. This is the first and only social media source where the Ulaanbaatar public can find daily air-quality data along with simple infographics explaining the information.

The researchers have met with local leaders concerned about local air quality, and have been featured in international and local media (e.g., the *UB Post*, *Nation-*

*al Geographic-Mongolia*, *Bloomberg Mongolia*, and the *Huffington Post*) to explain the importance of transparent public air quality data and monitoring infrastructure in assisting mitigation efforts. They even received a grant of nearly USD60,000 to install and run their own air-quality monitoring instrument at the National University of Mongolia. The instrument will automatically tweet the readings and post them to Facebook.

It is evident that PEER-funded research is relevant not only to USAID’s local development objectives, but engages local communities with governments, both domestic and foreign, in novel ways. The transformative outcomes early in this programme foreshadow the positive outcomes that will result through these sustained, transnational global partnerships. ■

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*For more information: [www.nationalacademies.org/peer](http://www.nationalacademies.org/peer)*