



Partnerships for Enhanced Engagement in Research

U.S. GLOBAL
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**PARTNERSHIPS FOR ENHANCED
ENGAGEMENT IN RESEARCH
(PEER)**



Students in Bali work on an assignment from a new environmental science curriculum incorporating Bali's traditional Subak heritage devised by Kaler Surata's PEER research award. Photo credit: Dr. Sang Putu Kaler Surata PEER Cycle 1, Project #121 research team

In the last century, the world has seen dramatic improvement to the human condition, made possible by the powerful combination of scientific research and technological innovation.

The rapid diffusion of internet and communications technologies that enabled unprecedented levels of connectivity, commerce, and access to information globally and medical advances that have drastically decreased the world's infant mortality rates are two salient examples of how science, technology, and innovation are transforming communities worldwide.

At USAID, the U.S. Global Development Lab (the Lab) is working to source transformative solutions to some of the world's most complex development challenges that leverage science, technology, innovation, and partnerships as important development catalysts. The Partnerships for Enhanced Engagement in Research (PEER) program – one of the flagship programs in the Lab – is designed to support developing country researchers working in partnership with researchers supported by the United States government's federal science system.

Implemented by the National Academy of Sciences, PEER provides critical research funding to host country researchers to work collaboratively with U.S. researchers and also supports the development of local scientific and technical capacity in USAID priority countries. PEER is also a vehicle for USAID Missions to actively engage with local universities and research institutes, encouraging the development of local solutions to country specific challenges.

In line with objectives under USAID Forward, PEER studies can provide context-specific evidence needed to facilitate improved programming and rapid uptake of innovations. PEER aims to strengthen support for evidence-based policy making and development programming. The PEER program helps to facilitate scientific exchange between researchers globally. These exchanges, whether short term or long represent one of the best tools we have to strengthen diplomatic ties with the United States research community while fostering potentially lifesaving knowledge creation.

Through the Lab, we have an unprecedented opportunity to harness the power of science, technology, and innovation to accelerate achievement of development objectives around the world. Programs like PEER help build and sustain local scientific and technical capacity and capabilities that are essential to fostering new innovations in development while generating a local evidence base needed for understanding and solving global challenges related to water, energy, climate changes and adaptation, food security, health, and other critical challenges.



Jerry O'Brien
Director, Center for Data, Analysis, and Research, U.S. Global Development Lab



Partnerships for Enhanced Engagement in Research

USAID branding
on sensors being
used in Colombia
Photo Credit: PEER
Cycle 1, Project
#31 research team

The United States Agency for International Development (USAID), the National Science Foundation (NSF), the National Institutes of Health (NIH), the National Aeronautics and Space Administration (NASA), the United States Department of Agriculture (USDA), the United States Geological Survey (USGS), and the Smithsonian Institution support research projects across the developing world



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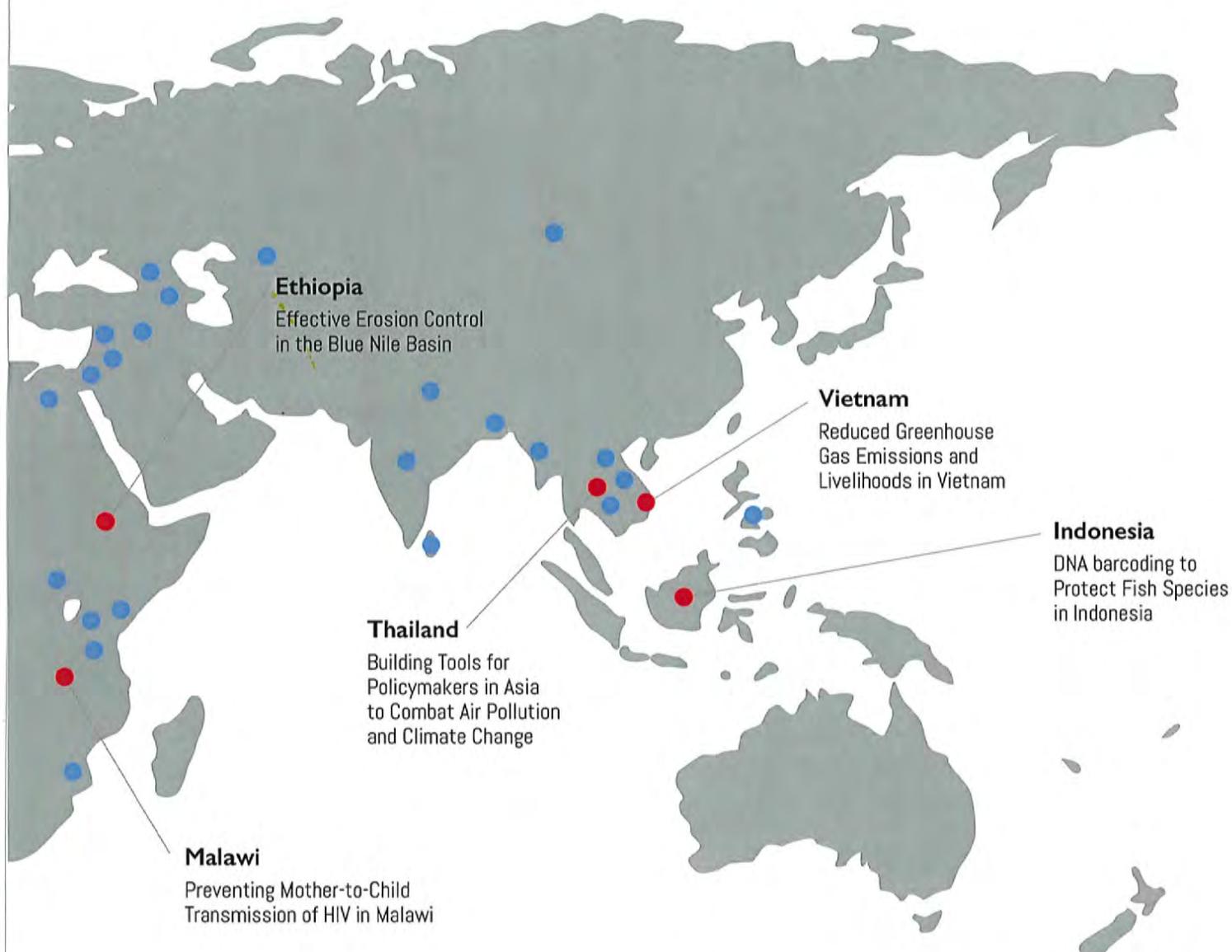
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through a joint initiative designed to foster collaborative global research in critical areas of development. Through the Partnerships for Enhanced Engagement in Research (PEER) program, USAID awards grants to researchers in developing countries who are working collaboratively with U.S. government –funded researchers. The PEER Program is administered by the United States National Academy of Sciences.

A Map of the PEER Awards





● Featured PEER Awards
● All PEER Awards
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Principal Investigator, Kisioki Moitiko, introducing research students from the Community Development Training Institute to solar technology to be introduced in the ICSEE(T) PEER project creating solar-electric micro grids in Maasai bomas. Proto credit: Elise Willer of ICSEE (USA)





We were very pleased to see that our partners' proposal (received) support! This is a huge help to us, not only in meeting our scientific objectives, but also in maintaining our collaboration with our partners as well as the relationships between our partners that are essential for our studies. An important part of our collaboration involves capacity building for our host-country partners. This is not solely altruistic on our part, or designed only to assure our partners' cooperation, but is also necessary to achieve our scientific objectives...The support of the PEER Program is absolutely critical in these respects.

PEER support for Georgia, Azerbaijan, and Armenia will also benefit our other partners on this project that include Turkey, Russia, Arabian Peninsula, and others. We all recognize that understanding the tectonics and associated hazards in each country requires a broader understanding of the tectonics of the full Arabia-Eurasia collision zone. This and all of our interests in basic earth science has formed the basis for a successful collaboration that has persisted for some partners for 25 years, and most for more than 15 years – of course, all possible with the continuous support of (NSF).

–Robert Reilinger, Ph.D.

PEER partner and Principal Research Scientist,
Department of Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology

The United States makes major investments to support U.S. scientists and engineers, many of whom are conducting research in or of relevance to developing countries, including all countries where USAID is present. The PEER program links developing country scientists with U.S.-based scientists so they can build research partnerships, improve their laboratories, purchase equipment and train students by collaboratively engaging in research partnerships with U.S.-supported researchers.

PEER proposals are prepared and submitted by developing country researchers and competitively reviewed by external peer review panels based on the potential development impact of the proposed research. PEER awards are then made directly to the developing country institutions.

PEER collaborations are having an impact across the globe with projects in more than 40 developing countries from Armenia to Vietnam to Mali. For example, in Lebanon, researchers are partnering to create a hazard map of earthquake-induced landslides, in order to prevent damage to critical infrastructure and save lives in the event of natural disaster.



Children wear face masks indoors at an Ulaanbaatar school, December 2012.
Photo Credit: [ubairpollution.org/Saran Selenge](http://ubairpollution.org/)

In Mongolia, researchers are working to measure air pollution mitigation efforts to improve public health. In Indonesia, researchers are improving the resilience of coral reefs and associated habitats to climate stress, while increasing their value by creating "no-take" fishing zones, and in Mozambique, researchers are finding ways to keep babies born to HIV – positive mothers on post-birth anti-retrovirals and the mothers on track with follow-up care for their children.

The PEER awards are also supporting regional collaborations among developing country scientists, such as a project in the Lower Mekong River region of Southeast Asia, which is working not only on mapping critically endangered species in the region, but also on breaking down cultural stereotypes that make it difficult for women to pursue careers in science.

For additional information please visit: www.nationalacademies.org/peer



Building Tools for Policymakers in Asia to Combat Air Pollution and Climate Change

The Challenge

Home to six out of every 10 humans on the planet, Asia is experiencing rapid economic growth that has raised the standard of living dramatically in the last 50 years. However, these gains have come at a high price to the continent's air quality, which has had serious health and climate consequences for the region and the rest of the world.

Certain air pollutants, such as black carbon and ground-level ozone, are emitted from combustion sources, just like the well-known global warming agent carbon dioxide, but both black carbon and ozone stay in the atmosphere for just weeks, as opposed to hundreds of years for carbon dioxide. Reducing the emissions of these short-lived air pollutants can provide immediate benefits for millions of people in terms of health and agriculture, along with fighting climate change on a much faster timescale compared to carbon dioxide. However, there is currently a lack of data to inform smart emission reduction policy.

How PEER Researchers are Tackling the Issue

PEER awardee Dr. Thi Kim Oanh of the Asian Institute of Technology in Thailand explains, "We need more data and analysis on black carbon and ground-level ozone. As yet, no comprehensive study has been conducted to explore links between these air pollutants and climate interactions in the Southeast Asia region."

Through research funded by their PEER award, Dr. Oanh, Dr. Wilip Hopke of Clarkson University in the United States and colleagues in Vietnam and Indonesia are building climate databases and emission models needed by policymakers in Asia to craft effective emission reduction policy. The multi-country team is collecting air quality data across Southeast Asia and then using the data they collect to develop robust emission scenarios. "We are accessing realistic emission reduction scenarios using a modeling tool. The project is creating new knowledge on the interactions among emissions, local and regional air quality, and regional climate as it promotes the development of a strong research network," says Dr. Oanh.

Project Impact

All three institutions in Indonesia, Thailand, and Vietnam collaborating on this project have begun developing action plans for emission reduction policy. According to Dr. Oanh, "Our goal is to take these action plans and discuss them with policymakers so they can develop climate and air policy. These action plans will help save millions of lives and crops, while taking on climate change." Dr. Oanh's team is already engaged with government agencies in all three countries, sharing data and information.

"My partner in Vietnam is working cooperatively with the government's pollution department. My Indonesian partner is working with its Environmental Protection Agency and in Thailand we had a workshop with researchers from universities and government officials to inform them about our results," says Dr. Oanh.

The team has launched a project website: <http://www.peer.ait.asia>.

Project Name

Assessment of Impacts of the Emission Reduction Measures of Short-Lived Climate Forcers on Air Quality and Climate in Southeast Asia

Contact

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Professor Nguyen Thi Kim Oanh (far right, standing) and her students interview a farmer harvesting potatoes at Dong Lao commune, December 2012 Photo credit: PEER Cycle 1, Project #243 research team

Expanding Educational Access for Deaf Students

The Challenge

In Morocco, deaf people are a marginalized segment of society. Eighty-five percent of deaf people in Morocco lack access to education, and those who attend schools for the deaf are taught with materials designed for hearing people.

How PEER Researchers are Tackling the Issue

PEER researcher Dr. Abdelhadi Soudi of Ecole Nationale de l'Industrie Minérale decided to do something about the problem.

Through his PEER grant, Dr. Soudi is building assistive technology for deaf and hard-of-hearing people. The computer technology functions as an instructional tool and as a real-time translation system between Modern Standard Arabic and Moroccan Sign Language. "In Morocco, there is no research whatsoever in the fields of sign language and disability, which is why I built the system," explains Dr. Soudi. "This project fills a gap in deaf education. This technology breaks through social barriers by giving deaf people a chance to improve their education."

Project Impact

The Moroccan government is enthusiastic about Dr. Soudi's work. In October 2013, 350 deaf people and representatives of deaf associations from all regions of Morocco took part in an information day about Dr. Soudi's assistive technology for the deaf at his institution. The day opened with a speech by Mrs. Bassima Haqqaoui, the Minister of Solidarity, Women, Family, and Social Development in Morocco. She expressed her strong support and desire to cooperate with Dr. Soudi's team so that all Moroccan deaf people can use the technology. "We have also heard from both the Ministry of Disability and Ministry of Education that they want to work with us. They have expressed a desire to integrate the computer program into classrooms. They realize the importance of this technology," says Dr. Soudi.

The parents and educators of deaf children are very supportive of integrating Dr. Soudi's technology into classroom practices. They are excited about the possibilities the technology offers. "We pray to God that this project becomes part of the educational system so that all segments of society can benefit from it," says Bouchra Ekhounsi, a parent of a deaf child.

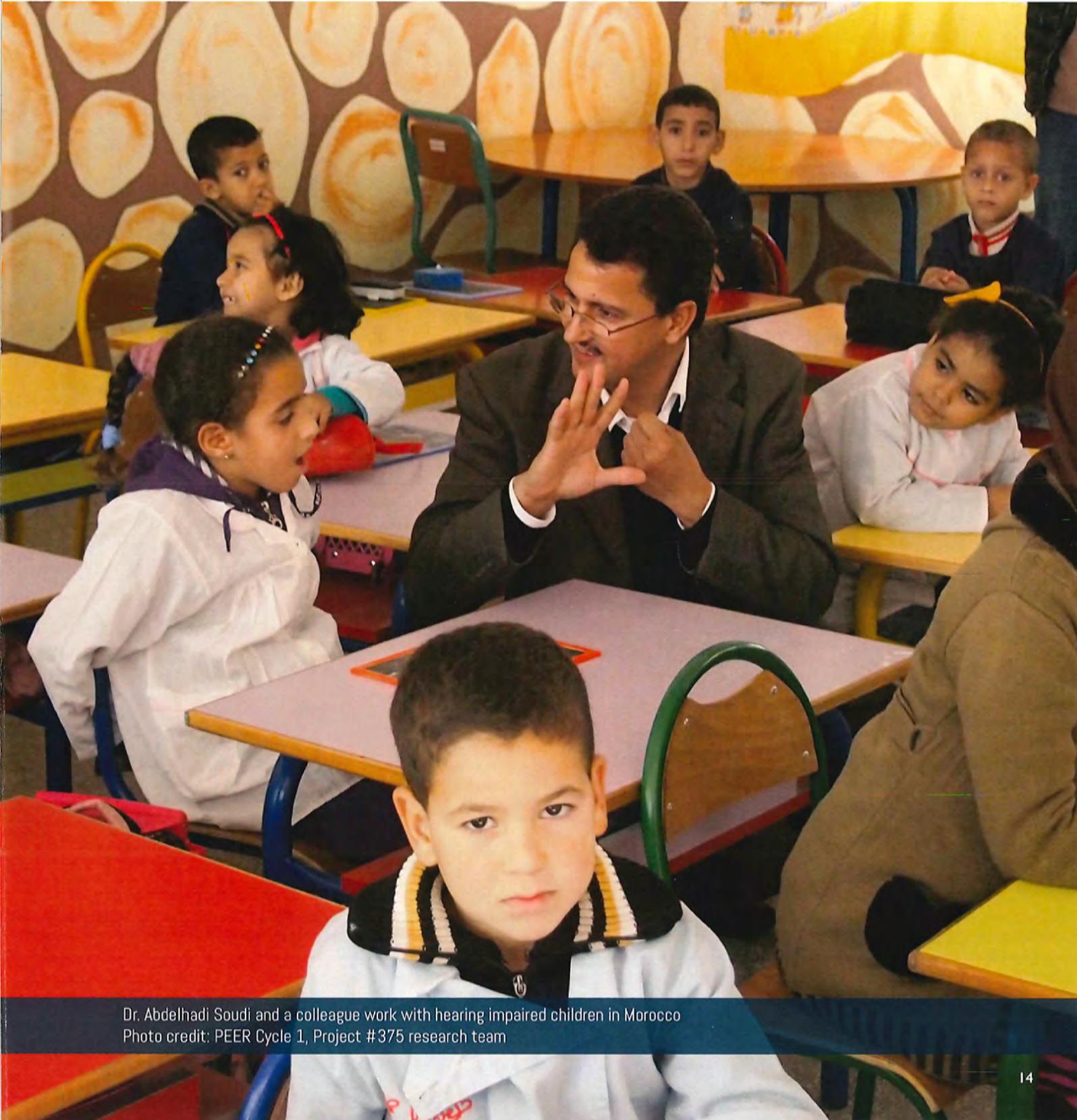
Dr. Soudi has built his PEER partnership with Dr. Corinne Vinopol of the Institute for Disabilities Research and Training (IDRT), a small company located in the U.S. state of Maryland. IDRT has particular expertise in the development of American Sign Language-accessible computer software and other assistive technology products. "Having a business partner like IDRT keeps our research grounded. IDRT has developed more than 70 assistive software products for deaf individuals in North America. The long-term goal of the partnership is to expand our technology to other Arabic-speaking countries," says Dr. Soudi.

Project Name

Assistive Technology for Improving Literacy
among the Deaf and Hard of Hearing

Contact

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Dr. Abdelhadi Soudi and a colleague work with hearing impaired children in Morocco
Photo credit: PEER Cycle 1, Project #375 research team

Mongolia's

capital city, like the other top 10 most smoke and dust-polluted places in the world, is in immediate need of air quality research to inform air pollution mitigation policy, yet it is a completely under-researched topic in the peer-reviewed scientific literature. Prof. Lodoysamba, his research team, and his PEER project have played a fundamental role in connecting policymakers in Mongolia with key scientific data needed for decision-making associated with air pollution issues in Ulaanbaatar. His work sets a precedent in the country, fills a needed data gap for air pollution mitigation policy, and highlights the need in the atmospheric sciences for similar research in other highly polluted but understudied places in the world.

– Christa Hasenkopf, Ph.D.

Former PEER partner and Chief Advisor on Air Pollution to the Medical Director,
U.S. Department of State





Visible air pollution, south of Ulaanbaatar center, December 2011.
Photo credit: ubairpollution.org/Tsevlee Economides



Student interns at the Indonesian Biodiversity Research Center identify tuna for DNA sampling
Photo credit: PEER Cycle 1, Project #102 research team

DNA Barcoding to Protect Fish Species in Indonesia

The Challenge

Indonesia is at the heart of the Coral Triangle, a global epicenter of marine biodiversity that also provides a large economic boost to the region, supporting the livelihoods of more than 120 million people. The link between biodiversity and the economy in the Coral Triangle is a sensitive one; the plentiful and rich types of fish that exist in the region also have been subject to overfishing and poor fishing industry regulation.

How PEER Researchers are Tackling the Issue

Dr. Gusti Ngurah Kade Mahardika of the Universitas Udayana and Indonesian Biodiversity Research Center is part of a team of scientists who are investigating marine biodiversity throughout Indonesia and the Coral Triangle. In partnership with Dr. Kent Carpenter of Old Dominion University in the U.S. state of Virginia, Dr. Mahardika's PEER project is focusing on fish genetics, especially shark and tuna. The goals of the research are to provide the Indonesian government with the information needed to inform fishing industry regulation and endangered fish species protection policies and to build Indonesian research capacity in performing genetics research. His project uses DNA barcoding to identify species based only on a tissue sample, offering a cheap and fast way to identify sharks and tuna.

Project Impact

The team's study of tuna and sharks using state-of-the-art technology will provide scientific data to the government and policymakers. "Already, the Indonesian government is using our data for scientific review of a new regulation of shark fishing," says Dr. Mahardika. "The DNA barcoding we use can provide managers and enforcement agencies an essential tool to monitor shark fisheries and prosecute individuals participating in the sale of prohibited species."

Dr. Mahardika believes his PEER research can help local communities by assisting local fisheries so they can make informed decisions. "We want to transfer knowledge to local communities so they can help preserve marine ecosystems. They might be catching endangered species, which will have a whole cascade effect on the marine ecosystem," says Dr. Mahardika. "What we learn can be used in other countries. We want to help make a global impact on the tuna and shark industry. We want to promote more effective science-based conservation recommendations."

Project Name

Building Indonesian Research Capacity through Genetic Assessment of Commercial Fish Species

Contact

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Impacts of Climate Change on Wetlands in Colombia

The Challenge

Home to nearly 50 million people, Colombia is also home to some of the world's greatest biodiversity and water resources. The way Colombians interact with this unique environment may be dramatically changing due to the impact of climate change.

"We are witnessing the rapid loss of our ice peaks in the span of one generation and we are concerned about the fate of other freshwater bodies, such as lakes and wetlands, and we are still not clear about what the consequences derived from climate variability and human intervention will be. This is a critical issue for many communities that depend on these water sources for their survival," says PEER awardee Dr. Julio Cañón, a Professor at Universidad de Antioquia. His PEER project studies three natural waterbodies in Colombia that represent a range of different "hydro-social" conditions, such as comparing a pristine lake to another that is highly affected by human activities. Dr. Cañón is working on this research with his PEER Partner, Francina Dominguez of the University of Arizona.

How PEER Researchers are Tackling the Issue

The research team is exploring how global and regional climate has historically evolved over these sites by developing models that combine hydrological information with local environmental and social processes. "Our goal is to understand not only the likely impacts of climate on these resources, but also the effects of human activities in different socio-environmental scenarios. We are interested in linking hydrological and climate models with people's choices in response to the model's outcomes. In this way, we will be able to provide valuable insights for adaptation and other policies. We care about the future of communities and want to help them cope better with the expected changes," says Dr. Cañón.

Although climate data are vital to Colombia for planning purposes, the information is seriously limited and not easily accessible. To remedy this situation at the study sites, the project has fostered the development of local technology to measure and retrieve basic information. They have teamed up with a research group in electronics and telecommunications at their university to build and integrate three telemetric weather stations.

Project Impact

The PEER project seeks to have all of the information they gather made freely and publicly available online. "In general, the country's policy is for people to pay for the information, because institutions collect the data and sell it. We plan to offer the collected information from the (weather) stations to create public awareness of the importance of having this kind of information publicly available and to promote support for these initiatives in similar projects in the country," says Dr. Cañón.

To fulfill this objective, the team has set up a website in English and Spanish:
<http://peerlagoscolombia.udea.edu.co>

Project Name

Impacts of Climate Change on Tropical Wetlands:
Tracking the Evolution of Two Andean Lakes and
a Floodplain Ciénaga in Colombia

Contact

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Two members Dr. Canon's research team take measurements in Laguna La Cocha in the Southern Andes, Colombia
Photo credit: PEER Cycle 1, Project #31 research team



The research team meet with local community stakeholders to discuss the benefits of gully rehabilitation in the Blue Nile Basin, Ethiopia. Photo credit: PEER Cycle 1, Project #289 research team

Effective Erosion Control in the Blue Nile Basin

The Challenge

Agriculture is a vital part of the economy in Ethiopia, accounting for more than 50 percent of Ethiopia's gross domestic product, more than 80 percent of its export revenue and 85 percent of its jobs. However, regions of Ethiopia are also prone to extreme soil erosion, which can greatly hamper food production.

How PEER Researchers are Tackling the Issue

Dr. Seifu Tilahun is working on soil erosion issues in Ethiopia through a PEER grant with colleagues at his alma mater, Cornell University. To do this, Dr. Tilahun is combining new approaches that consider the hydrology of the whole landscape and use traditional farmers' knowledge.

Project Impact

The PEER project works directly with the communities in three watersheds, and the researchers have met and planned their projects with community and district leaders. The communities contribute labor and supplies to build the soil erosion protection structures, help regulate animal grazing in their areas, and collect relevant data to evaluate the effectiveness of their erosion-control strategies. "We are helping the communities to rehabilitate gullies (trenches created by running water). We are working together and learning from each other as we try different grasses, reshape gullies, and vegetate the gullies. We are teaching the communities how to measure their environment such as monitoring and measuring stream flow and sediment concentrations. We are even hiring community participants to take these measures" says Dr. Tilahun.

An exciting component of the PEER grant is the establishment of a new Ph.D. program in Integrated Water Management at the School of Civil and Water Resources Engineering at Bahir Dar University. The Ph.D. curriculum, developed by integrating programs from Cornell University and Bahir Dar University, is the university's first program in Integrated Water Management. This new Ph.D. program will help prepare a cadre of future scientists to tackle water and land use issues in Ethiopia—issues that are key to the country's agricultural and economic future.

Project Name

Reducing Soil Loss through Effective Soil and Water Conservation Practices Using Hydrologic Considerations and Farmers' Participation in Blue Nile Basin

Contact

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"PEER projects have played a vital role in maximizing the research and development impact of my NSF funded Partnerships for International Research and Education project by enabling our academic collaborators in Southeast Asia to be full partners. The support provided directly to them allowed them to pursue their own complementary research and our participation helped them to build capacity in advanced genomics research that will enhance marine biodiversity conservation and management in the region."

– Kent Carpenter, Ph.D.

PEER partner and Professor, Department of Biological Sciences, Old Dominion University





PEER PI Dr. Kamarza Mulla of Universitas Indonesia (at left, foreground) speaks with participants during a workshop on Problem Based Learning at Universitas Andalas held November 22 – 23, 2013. Photo credit: PEER Cycle 2, Project #42 research team.

Reduced Greenhouse Gas Emissions and Livelihoods in Vietnam

The Challenge

The United Nations Reduced Emissions from Deforestation and Forest Degradation + (REDD+) program is a framework that implements market and financial incentives to reduce greenhouse gas emissions that result from deforestation and forest degradation. REDD+ supports efforts to conserve forests and manage them sustainably by paying countries for "avoided deforestation" to sequester carbon and mitigate climate change. However, as access and usage rights to forests change under REDD+ implementation, some households and communities may actually be more vulnerable to the effects of climate change.

How PEER Researchers are Tackling the Issue

In order to flesh out the impacts of REDD+ policies in Vietnam, a REDD+ pilot country, Dr. Le Thi Van Hue of the Center for Natural Resources and Environmental Studies at Vietnam National University and colleagues are gathering data at field sites and developing new methodologies and tools for social analysis. They are creating a country-wide index of indicators to assess the likelihood of success of REDD+ at the provincial level.



"Being a REDD+ country is new to Vietnam, so there are issues on how to implement this type of project on the ground. Other projects look at carbon sequestration, but few projects look at the social aspect. We are developing research methodology as well as capacity building among social and environmental scientists within Vietnam," says Dr. Hue. Dr. Hue is conducting this PEER project in partnership with Dr. Pamela McElwee of Rutgers University.

Project Impact

The ultimate objective for this PEER project is to contribute to policy-relevant knowledge on social vulnerability to climate change in Vietnam by providing a baseline to explain variations in the expected performance of possible REDD+ approaches.

"It is important to communicate with policymakers as we want to generate positive development outcomes," says co-investigator Mr. Tran Huu Nghi of the Tropenbos International Vietnam. To do this, the project is working closely with local governments. "In several provinces, we got a signal from local authorities that they are very cooperative in making data available," says Mr. Nguyen Viet Dung of the Center for People and Nature Reconciliation.

The team sees its work going beyond Vietnam to other countries in Southeast Asia. "We are at the early stage of such tool development. Later we will share with other REDD+ partners in the region, such as Indonesia, Cambodia and the Philippines, who are looking for such tools," says Mr. Dung.

Project Name

Research and Capacity Building on REDD+, Livelihoods and Vulnerability in Vietnam:
Developing Tools for Social Analysis of Development Planning

Contact

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Rollout of a Preventative Drug Treatment Regimen for Malaria in Mali

The Challenge

Malaria kills one to two million people a year, most of whom are children under the age of five living in sub-Saharan Africa. Mali is one of the countries supported by the U.S. President's Malaria Initiative. The aim of this initiative is to reduce malaria-related deaths in the most afflicted countries by achieving sweeping coverage of proven preventive and curative interventions (including bed nets, spraying, and preventative drug treatments). Seasonal Malaria Chemotherapy (SMC) is a new intervention policy approved by the World Health Organization (WHO), and Mali is preparing to enact the strategy. Determining the optimal delivery method of SMC will help Mali decrease childhood mortality from malaria and achieve targets for the UN Millennium Development Goals.

How PEER Researchers are Tackling the Issue

In March of 2012, SMC was approved by the WHO as a policy for malaria control in countries with seasonal malaria transmission such as Mali. The strategy is a highly cost-effective approach to reduce childhood death in these areas by giving children staged dosages of anti-malarials before they are exposed to the parasite, hence preventing infection. Despite the huge benefit of the SMC on malaria infection and disease, the optimal approach to deliver SMC remains to be determined, and there are no data on the long-term effect of this strategy on the development of immunity to malaria.

Dr. Alassane Dicko of the Malaria Research and Training Center in Bamako, Mali is leading a PEER project to address some of these knowledge gaps in order to maximize the effectiveness of SMC treatment. The target population is children in a small district in southern Mali. In Year one, children from 40 villages were treated with more or less doses of anti-malarial drugs, distributed door-to-door or from a fixed site. Based on the drug coverage and the health of the children during the first year (whether they become sick, or experience fewer episodes or less severe episodes of malaria), additional villages received the best doses and distribution method of SMC. At the end of the study, health results of children were assessed. An exciting outcome of this study measured whether SMC-protected children develop an immune response that leads to protection against future malaria infections.

A father brings his young children to a follow-up malaria prevention appointment in Mali.
Photo credit: PEER Cycle 1, Project # 85 research team



Project Impact

The anticipated outcome of the study will be a qualified optimal approach to deliver SMC in Mali and expanded understanding of its impact on health outcomes and antimalarial immunity. Based in part on the pivotal studies previously conducted in drug preventative protection, SMC was approved by WHO as a policy for malaria control in countries with seasonal malaria transmission such as Mali. The strategy is a highly cost-effective approach to reduce childhood mortality in these areas. Implementation studies are now urgently needed to identify the most effective and efficient methods to deliver SMC. The optimal strategy will prevent approximately 75 percent of all malaria episodes, and approximately 75 percent of severe malaria episodes each year, resulting in many lives saved.

Project Name

Optimization of SMC Delivery and its Effects on the Acquisition of Malaria Immunity

Contact

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Preventing Mother-to-Child Transmission of HIV in Malawi

The Challenge

HIV is one of the leading causes of mortality in children under the age of five. Prevention of mother-to-child transmission may greatly reduce child mortality; optimal interventions can reduce transmission of HIV during birth. Option B+, a treatment process that gives pregnant mothers antiretroviral therapy to prevent transmission of the virus to their babies at birth and then follows those children with antiretroviral therapy for the first years of their life, is one of the most promising recent developments in HIV management. However, the effect of the new antiretroviral therapy guidelines on the health of mothers and infants is unknown.

How PEER Researchers are Tackling the Issue

To help determine this promising new therapy's effect, a PEER project by Dr. Frank Chimbandira at the Ministry of Health in Malawi in partnership with collaborators at the University of Bern, will evaluate the Option B+ program in Malawi and its impact on child survival. This project will analyze the effects of introducing Option B+ on mother-to-child HIV transmission rates, HIV testing in infants, antiretroviral therapy initiation in children, antiretroviral therapy adherence, and mothers who do not return to health facilities after the birth of their baby.

Project Impact

The Option B+ program is one of the most prominent recent efforts of the Malawian government to address issues associated with improved access to quality health care, promoting treatment and care for people living with HIV/AIDS, combating maternal, neonatal, and child morbidity and mortality and reducing new HIV infections. The aim of the PEER project is to evaluate how effective the Option B+ policy will be and improve its effectiveness by suggesting how the program may adapt to local conditions in Malawi. The project will integrate a vast and decentralized health registry across the health services and generate a central data repository for those seeking HIV treatment in Malawi. The project will also inform the public about the impact of Option B+ as well as future public health, policy, and practice in Malawi.

Project Name

Introducing "Option B+" in Malawi:
Impact on Child Outcomes

Contact

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In Ethiopia, USAID support has trained an "army" of 35,000 female health workers, who, for the first time, have brought basic services within reach of most of the nation's 67 million rural residents. Photo credit: Nena Terrell

PharmaCheck: A Tool to Improve Drug Quality in Indonesia

The Challenge

Appropriate management of childhood illnesses in developing nations, such as Indonesia, depends on availability and quality of essential drugs. Currently, the quality of drugs in primary health centers and district hospitals in Indonesia is rarely monitored due to the complexity and high cost of drug quality testing. Because of this, counterfeit drugs or the wrong dose of drugs are threatening the management of common ailments as well as major diseases.

How PEER Researchers are Tackling the Issue

PharmaCheck, developed by researchers at Boston University, is an extremely user-friendly, reliable, cost-effective technology that screens for substandard drugs using active pharmaceutical ingredient concentration and drug dissolution tests. The technology is of significant value in Indonesia as an affordable, effective tool for local and central health authorities to better safeguard the efficacy of the drugs they are giving to sick patients. How this new technology works, in the field and under non-laboratory conditions, has yet to be assessed. The PEER project will allow PharmaCheck to be tested, while simultaneously giving the people of Indonesia and the Indonesian government information about the safety of drugs being sold in clinics across the country.

Project Impact

Child mortality remains a public health problem in Indonesia, mostly due to pneumonia and diarrhea. Child death from these two diseases could be prevented if they were promptly detected and appropriately managed by trained health providers. Integrated Management of Childhood Illness (IMCI) has been chosen as a method for managing childhood illnesses to provide better early detection and management of the illnesses, and therefore prevent death and disability. The success of IMCI will depend on the quality of its drugs. Unfortunately, the quality of drugs in Indonesia's health care centers is rarely or never checked due to complexity and cost. PharmaCheck is a promising device for routinely testing the quality of drugs in Indonesia and other developing countries. Before it can be widely used, however, it needs to be tested for accuracy, practicability, and cost. This project will demonstrate the prospects of using PharmaCheck in Indonesia and other developing countries to regularly test essential drugs at primary health care centers and hospitals.

Project Name

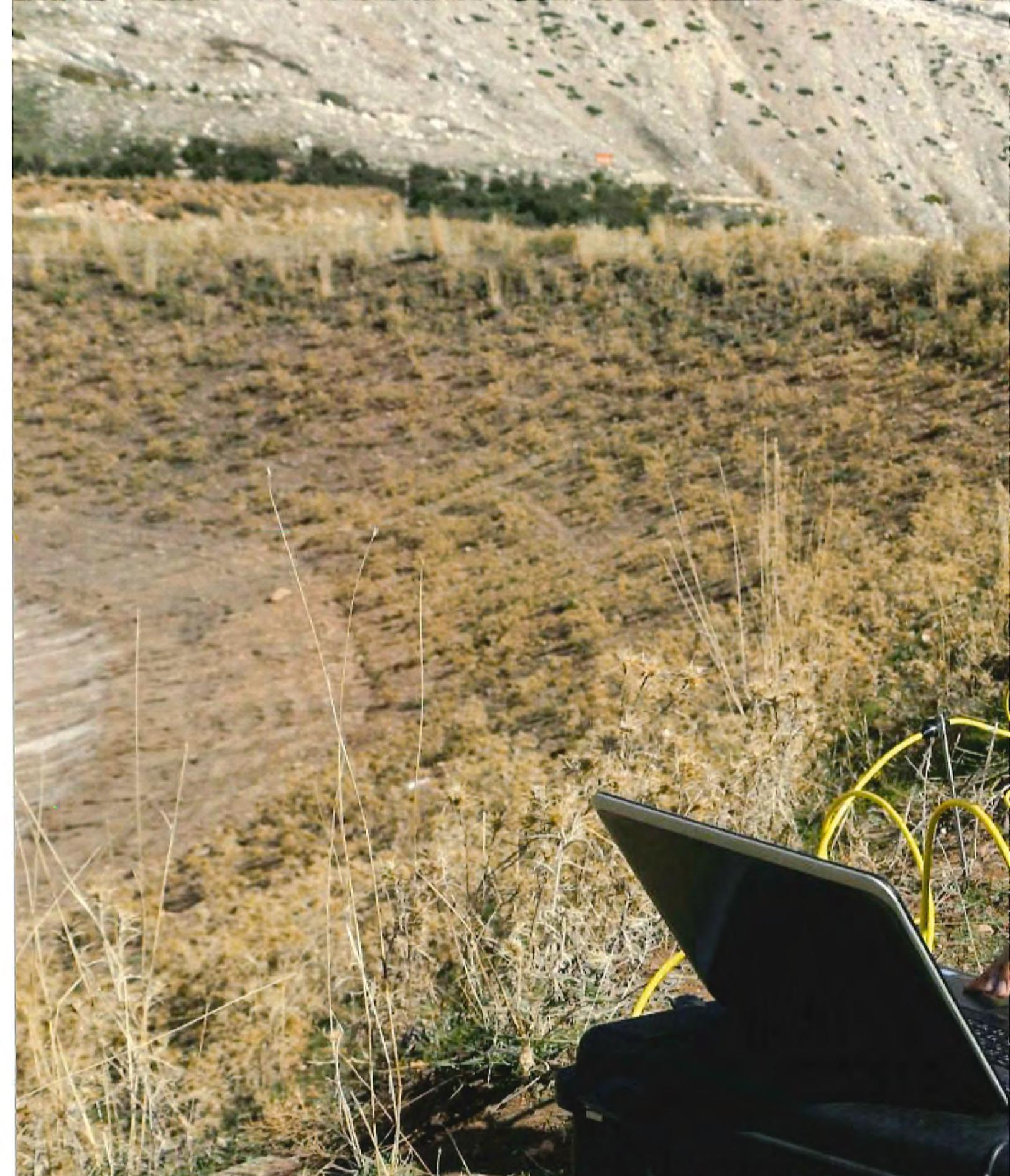
Implementation of PharmaCheck to Assure the Quality of IMCI Drugs in Indonesia

Contact

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A Ghanaian technician in Accra from the U.S. Pharmacopeial Convention's Center for Pharmaceutical Advancement and Training uses PharmaCheck to test malarial drug quality. Photo credit: Darash Desai/Andrea Fernandes



PEER researcher Dr. Naji Khoury monitors progress on a resistivity test as part of his health assessment of earth dams in Lebanon. Photo credit: PEER Cycle 2, Project #514 research team

“Dr. Toderich’s PEER project has demonstrated that agricultural production on salt-affected lands can be increased with cultivation of salt-loving (halophytic) plants. With the PEER project, we were able to use data from her field sites to begin development of computer modeling of plant-soil-water salt dynamics.”

– Laurel Saito, Ph.D.
PEER partner and Professor,
Department of Natural Resources & Environmental Science, University of New Mexico



PEER Awards in Africa

Country	Field	Project Name
Cameroon	Agriculture	Biochar and Compost from Cocoa Pod Husk: Opportunities for Crop Fertilization and Suppression of Black Pod Disease
Ethiopia	Water	Development and Field Testing of High-Performance Aluminium Oxide Based Technologies for Fluoride Removal in the Ethiopian Rift Valley
Ethiopia	Energy	Development of a Microgrid Research Center in Ethiopia to support USAID's Power Africa Program
Ethiopia	Water	Reducing Soil Loss through Effective Soil and Water Conservation Practices using Hydrologic Considerations and Farmers' Participation in the Blue Nile Basin
Ghana	Agriculture	Possible Causes of the Contraction of West Africa's Rainfall Season under Global Warming: Implications for Agriculture
Ghana	Agriculture	Development of Edible and Medicinal Mushrooms as Functional Foods in Ghana
Ghana	Energy	PRESSA: Photovoltaic Reliability Evaluation in Sub-Saharan Africa
Kenya	Agriculture	Unlocking Agricultural Potential in Dry Lands: Enhancing Efficient Utilization of Soil Moisture for Improved Smallholder Farm Productivity in ASALs of Kenya
Kenya	Energy	Development and Implementation of a Solar PV Outreach Training Module for Capacity Building in East Africa
Kenya	Maternal Health & Child Nutrition	Impact of Pronto Training in Emergency Obstetric and Newborn Care on 24 Hour Neonatal Mortality
Kenya	Nutrition	Feasibility and Effectiveness of the Baby Friendly Community Initiative (BFCl) in Kenya: A Pilot Community Trial in a Rural Setting
Kenya	Agriculture / Nutrition	Natural Resources Interacting with Health Outcomes: Understanding Fishery Resource Use and Improving Nutrition in Western Kenya
Kenya	Food security	Strengthening Institutional Capacity for Participatory Action Research in Sustainable Aquaculture
Kenya	Energy	GeoPower Africa
Kenya	Education	Mwangaza Project on Science, Technology, Engineering and Mathematics and Computing Education for Students in Kenya with Vision Loss
Kenya	Biodiversity / Agriculture	Natural Pest and Weed Suppression Functions by Birds as Incentives to Conserve a Globally Threatened Bird Species and Enhance Livelihoods in an Agricultural Landscape
Kenya	Biodiversity	Capacity Building in Fish Biodiversity Discovery in Kenya
Kenya	Food security	Harnessing Genomics of Edible African Solanaceae Plants For Improved Nutritional and Food Security
Kenya	Food security	Derailing Witchweed (Striga) Virulence in Rice to Achieve Durable and Broad-spectrum Resistance
Kenya	Water	Addressing Drinking Water Quality Challenges in Developing Countries: Case Study of Lake Victoria Basin
Malawi	HIV	Introducing "Option B+" in Malawi: Impact on Child Outcomes
Malawi	Food Security	Soil Carbon Distribution and Dynamics in Malawi: A Unique Opportunity to Optimize Sustainable Land Use and Enhance Food Security
Mali	Malaria	Optimization of SMC Delivery and Its Effects on the Acquisition of Malaria Immunity
Mozambique	Environment	Ecosystem Carbon Analytical Laboratory
Mozambique	HIV	Reducing Loss-to-Follow-up among HIV-exposed Infants in Central Mozambique

Principal Investigator	Organization	US Partner	US Institution
Nkengafac, Njukong	Institute of Agricultural Research for Development	Gao, Bin	University of Florida
Beshah, Feleka Zewge	College of Natural Science & Addis Ababa University	Sabatini, David	University of Oklahoma Norman Campus
Gessesse, Belachew	Bahir Dar University	Banerjee, Suman	University of Wisconsin–Madison
Tilahun, Seifu	Bahir Dar University	Barrett, Christopher	Cornell University
Adukpo, David Cudjoe	University of Cape Coast	Gutowksi, Jr., William	Iowa State University
Obodai, Mary	CSIR - Food Research Institute	Schwartz, Steven J.	The Ohio State University
Takyi, Gabriel	Kwame Nkrumah University of Science & Technology	Honsberg, Christiana	University of Arizona
Baaru, Mary	Kenyatta University	Allen, Ethan	Pacific Resources for Education and Learning (PREL)
Da Silva, Izael	Strathmore University	Ruddell, Benjamin L.	Arizona State University-Polytechnic
Gachuno, Onesmus	University of Nairobi	Kiarie, James	University of Nairobi
Kimiywe, Judith	Kenyatta University	McGarvey, Stephen	Brown University
Magerenge, Richard	Organic Health Response–Ekiabo Kiona Center & Kenya Medical Research Institute	Brashares, Justin	University of California Berkeley
Maina, Joyce Gichiku	University of Nairobi	Kimaru, Irene	St. John Fisher College
Mariita, Nicholas	Dedan Kimathi University of Technology	Ebinger, Cynthia	University of Rochester
Mwai, Jane	Kenyatta University	Walker, Bruce N.	Georgia Institute of Technology
Njoroge, Peter	National Museums of Kenya	Johnson, Matthew	Humboldt State University
Nyingi, Dorothy Wanja	National Museums of Kenya	Bart, Jr., Henry	Tulane University, New Orleans
Owino, Willis	Jomo Kenyatta University of Agriculture & Technology	Giovannoni, James	U.S. Department of Agriculture, Cornell University
Runo, Steven	Kenyatta University	Timko, Mike P.	University of Virginia
Wandiga, Shem	University of Nairobi	Mariñas, Benito	University of Illinois Urbana–Champaign
Chimbwandira, Frank	HIV/AIDS Department & Malawi Ministry of Health	Egger, Matthias	University of Bern
Namangale, Jimmy	Chancellor College	Robertson, G. Philip	Michigan State University
Dicko, Alassane	Malaria Research and Training Center, Faculty of Medicine, Pharmacy and Dentistry, University of Bamako	Duffy, Patrick	National Institute of Allergy and Infectious Diseases
Bandeira, Salomao	Universidade Eduardo Mondlane	Feller, Ilka C.	Smithsonian Environmental Research Center
Napúa, Manuel	Beira Operations Research Center (CIOB)	Pfeiffer, James	University of Washington

Nigeria	Agriculture	Improving Yam (<i>Dioscorea</i> spp) Seed Systems through Production of Dormancy-controlled Seed Tubers in Temporary Immersion Bioreactors
Nigeria	Energy	Renewable Energy: Desktop Learning Module for Gasification Processes
Nigeria	Energy	Systems Engineering Prospective on Power Transmission for Nigeria
Senegal	Agriculture	Rhizosphere Biology of Shrub Created Resource Islands of Sahelian Agroecosystems: Optimization and Adaptation to Climate Change
Senegal	Climate	Impact of Climate Change on Freshwater availability for Senegal: Modeling Future Changes in Hydro-climatology of Lake of Guiers
Sierra Leone	Pandemic Influenza & Other Emerging Threats	Lassa fever pathobiology in children and during pregnancy
South Africa	Water	Development of Advanced Composite Materials and Geopolymers for the Removal of Uranium and Toxic Elements from Gold Mine-polluted water
South Africa	Environment	Managing Fire and Grazing to Maximise Carrying Capacity in African Rangelands
South Africa	Water	Application of Cosmic Ray Probes for the Validation of Hydrometeorological and Remote Sensing Models
South Africa	Biodiversity	Climate Change and Arid-zone Birds: Validation of a Behavioural Index for Assessing Species' Relative Vulnerabilities to Rising Temperatures
South Africa	Biodiversity	MammalMAP: The African Mammal Atlas Project
Tanzania	Energy	Waste to Renewable Energy: Biogas Cleanup (upgrading) in Tanzania and Kenya
Tanzania	Social Sciences	Cooperation and Compromise in Developing Rural Communities - Case study: Solar-electric Mini-grids for the Maasai
Tanzania	Agriculture	Characterization of Cassava Mosaic Gemini Viruses and Their Satellites in Cassava at the Cellular Level
Tanzania	Education	Computational Mathematics, Modeling and Analysis of Biological, Bio-inspired and Engineering Systems
Uganda	Agriculture	Sustainable Coffee-Banana Agroforestry Systems to Adapt to Climate Change, Enhance Food Security and Alleviate Poverty in Uganda
Uganda	Tuberculosis	Development and Evaluation of Strategies to Foster Implementation of Guidelines for Diagnosis of Childhood Tuberculosis
Uganda	Malaria	Assessing the Effect of Strengthening the Referral of Children from the Private Health Sector and Its Impact on Child Survival in Uganda

PEER Awards in Asia

Country	Field	Project Name
Bangladesh	Disaster Mitigation	Toward Geohazard Assessment in Bangladesh: Academic Infrastructure and Knowledge Transfer
Bangladesh	Water	Field Assessment of Arsenic-bearing Waste Treatment Options
Bangladesh	Health	Defining the Ecology of the Nipah Virus Outbreaks in Bangladesh: Identifying Additional Potential Foodborne and Livestock Transmission Routes
Bangladesh	Climate	Improving Adaptation against Coastal Vulnerability and Enhancing Flood Forecasting Skill in Bangladesh through a Satellite Data Integrative Modeling Framework in a Changing Climate
Bangladesh	Family Planning	Evidence-based Knowledge into Practice: Extending a Successful Maternal, Neonatal, and Child Health Program in Matlab into the Government Health System in Bangladesh
Bangladesh / Philippines	Food Security	Validation of Salt Tolerance Determinants in Rice (<i>Oryza sativa</i> L. indica) Landrace Horkuch and Its Segregating Population by 2b-RAD Sequencing and RNA-seq Analysis under Stress
Cambodia	Biodiversity	Biodiversity of Cambodian Leaf-and Treehoppers: Scientific Training and Education through Development of Bioindicators and Agricultural Pest Control

Balogun, Morufat	University of Ibadan	Curtis, Wayne	The Pennsylvania State University
Bugaje, Idris	National Research Institute for Chemical Technology (NARICT)	Van Wie, Bernard J.	Washington State University
Melodi, Adegoke	The Federal University of Technology, Akure	Tomsovic, Kevin	University of Tennessee
Ndour, Yacine Badiane	Institut Senegalais de Recherches Agricoles	Dick, Richard P.	Ohio State University
Sylla, Mouhamadou Bamba	Laboratoire de Physique de l'Atmosphere et de l'Ocean, ESP/UCAD	Pal, Jeremy	Loyola Marymount University
Grant, Donald	Lassa Fever Program Kenema Government Hospital	Garry, Robert	Tulane University School of Medicine
Tutu, Hlanganani	University of the Witwatersrand	Rosenberg, Edward	The University of Montana, Missoula
Archibald, Sally	University of the Witwatersrand	Anderson, Todd M.	Wake Forest University
Everson, Colin	University of Kwazulu Natal	Zreda, Marek	University of Arizona, Tuscon
McKechnie, Andrew	University of Pretoria	Wolf, Blair	University of New Mexico
Underhill, Lesley Gordon	University of Cape Town	Jetz, Walter & Robert Guralnik	Yale University & University of Colorado at Boulder
King'onde, Cecil	Nelson Mandela African Institution of Science and Technology	Gao, Puxian	University of Connecticut
Moitiko, Kisioki	The International Collaborative for Science, Education, and the Environment (Tanzania)	Andersson, Krister	University of Colorado
Ndunguru, Joseph	Mikocheni Agricultural Research Institute	Hanley-Bowdoin, Linda	North Carolina State University
Mtambo, Maundo & Burton Mwamila	Nelson Mandela African Institute of Science and Technology	Seshaiyer, Padmanabhan	George Mason University
Kagezi, Godfrey H.	Coffee Research Center (COREC), National Agricultural Organization (NARO)	Perfecto, Ivette	Division of Environmental Biology,
Katamba, Achilles	Makerere University College of Health Sciences	Cattamanchi, Adithya	University of California at San Francisco
Mbonye, Anthony	Makerere University School of Public Health	LaRussa, Phillip	Columbia University

Principal Investigator

Organization

US Partner

US Institution

Akhter, Syed Humayun	University of Dhaka	Steckler, Michael	Columbia University
Kabir, Ahammadul	Asia Arsenic Network	Raskin, Lutgarde	University of Michigan
Khan, Muhammad Salah Uddin	The International Centre for Diarrhoeal Disease Research, Bangladesh	Daszak, Peter	EcoHealth Alliance Inc
Khan, Zahirul	Institute of Water Modeling	Hossain, Faisal	University of Michigan
Rahman, Anisur	The International Centre for Diarrhoeal Disease Research, Bangladesh	Kuhn, Randall	University of Denver
Seraj, Zeba I.	University of Dhaka	Juenger, Thomas	University of Texas at Austin
Phauk, Sophany	Royal University of Phnom Penh	Johnson, Kevin	Illinois Natural History Survey

Cambodia	Maternal Health & Child Nutrition	Newborn Infection Control and Care Initiative for Health Facilities to Accelerate Reduction of Neonatal Mortality (NICCI)
India / Sri Lanka	Agriculture	Fecal sludge and Urine Reuse in Agriculture—Opportunities for addressing Phosphorus needs in India
India	Water	Developing Low-carbon Cities in India: Field Research on Water-energy-carbon Baselines and Low-carbon Strategies in Indian Cities
India	Biodiversity	Evolution, Diversification and Biogeography of Cicadas (Insecta: Hemiptera: Cicadidae) on the Indian Subcontinent
India	Climate	Institutional Dynamics of Adaptation to Climate Change and Urbanization: Analysis of Rain-fed Agricultural-urban Lake Systems in Bangalore, India
India	Water	Effects of Climate Change on Cryosphere-river Linkages: Insights from Seasonal and Inter-annual Variation of Glacial Melt Discharge in the Headwaters of the Ganges River
India	Water	Targeting Low-arsenic and Low-fluoride Groundwater to Reduce Exposure in Rural Punjab, India
Indonesia	Environment	Combating Seagrass Decline: Developing a Restoration Manual for Indonesia and the Coral Triangle
Indonesia	Water	Assessing Degradation of Tropical Peat Domes and Dissolved Organic Carbon (DOC) Export from Belait, Mempawah and Lower Kapuas Rivers in Borneo
Indonesia	Maternal Health & Child Nutrition	Implementation of PharmaCheck to Assure the Quality of IMCI Drugs in Indonesia
Indonesia	Other	Sustainable Conversion of Oil Palm Lignocellulosic Waste into Pentanol using Metabolically Engineered Microbes
Indonesia	Energy	CLEAN Project: Converting Municipal Solid Waste Leachate into Energy
Indonesia	Climate	Tree Isotope Records of Past Rainfall Variability in the Indonesian Maritime Region
Indonesia	Tuberculosis	Epidemiologic and Genotypic Analysis of Active M. Tuberculosis Cases in Indonesia: Understanding the Acquisition and Transmission of Drug-resistant Tuberculosis
Indonesia	Education	Strengthening Research and Teaching Capacity of the Andalas University in Climate Change and Natural Resources Management
Indonesia	Avian Influenza	Development of an Antigen-capture Immunoassay for the Rapid Diagnosis of Acute Leptospirosis.
Indonesia	Climate	Coral Health Surveys in COREMAP: Building Resilience in Climate-impacted Coral Reefs of Indonesia
Indonesia	Education	Incorporating Bali's Subak Heritage into Primary and Secondary Education: Curriculum Development, Teacher Training, and Action Research
Indonesia	Biodiversity	Diversification and Inventory of the Threatened Lowland Herpetofauna of Java and Sumatra
Indonesia	Climate	Exploring the Dynamic of Extreme Weather Events in Indonesia Using Large Scale Meteorological Pattern as the Forecast Guidance (Pilot Study : Indramayu, West Java)
Indonesia	Biodiversity	Building Indonesian Research Capacity Through Genetic Assessment of Commercial Fish Species
Indonesia	Disaster mitigation	Strengthening Research and Teaching Capacity of Brawijaya University in Monitoring & Exploring of Volcanoes (Pilot Study : Ijen Volcano Complex, East Java)
Indonesia	Education	Improving Process-skills of STEM Undergraduate Students in Indonesia through Problem-Based Learning (PBL): Faculty Member Development, Student Assessment, and Curriculum Adjustment
Indonesia	Biodiversity	Connecting Science and Management through Biodiversity Research and Collaboration.
Indonesia	Disaster mitigation	Integrated Local Emergency Response Policy Improvement and Capacity Building for Advance-Early Warning System in the face of Near-Field Tsunami Risk
Indonesia	Tuberculosis	Intensified Antibiotic Treatment Plus Low Dose Aspirin for Tuberculous Meningitis: A Randomized Clinical Trial
Indonesia	Climate	Enhancements of Research for Adaptation of Wetlands in Indonesia to Projected Impacts of Sea Level Rise

Var, Chivorn	National Institute of Public Health (NIPH)	Oberhelman, Richard	Tulane School of Public Health
Drechsel, Pay	International Water Management Institute	Elser, James	Arizona State University
Kumar, Emani & Sachchida Nand Tripathi	International Council for Local Environmental Initiatives and Indian Institute of Technology, Kanpur	Ramaswami, Anu	University of Minnesota
Kunte, Krushnamegh	National Center for Biological Sciences	Simon, Chris	University of Connecticut, Storrs
Nagendra, Harini	Ashoka Trust for Research in Ecology and the Environment (ATREE)	Evans, Tom	Indiana University
Sen, Indra	Indian Institute of Technology Kampur	Peucker-Ehrenbrink, Bernhard	Woods Hole Oceanographic Institution
Sing, Chander Kumar	TERI University	van Geen, Alexander	Lamont–Doherty Earth Observatory of Columbia University
Ambo–Rappe, Rohani	Hasanuddin University	Stachowicz, John J.	University of California, Davis
Anshari, Gusti Z.	Universitas Tanjungpura	Harvey, Charles F.	Massachusetts Institute of Technology
Ariawan, Iwan	Universitas Indonesia	Zaman, Muhammad	Boston University
Arifin, Yalun	Surya University	Pfleger, Brian	University of Wisconsin, Madison
Budhijanto, Wiratni	Universitas Gadjah Mada	Angenent, Lergus T.	Cornell University
Cahyarini, Sri Yudawati	Indonesian Institute of Science (Lembaga Ilmu Pengetahuan Indonesia)	Evans, Mike	University of Maryland–College Park
Eka Putra, Andani	Andalas University	Murray, Megan	Harvard Medical School
Febriamansyah, Rudi	Andalas University	Buckley, Brendan	Lamont–Doherty Earth Observatory of Columbia University
Handayani, Farida	Institute for Vector Reservoir Control Research and Development, NIHRD – MoH Republic of Indonesia	AuCoin, David	University of Nevada, Reno
Jompa, Jamaluddin	Hasanuddin University	Harvell, C. Drew	Cornell University
Kaler Surata, Sang Putu	Mahasaraswati University	Lansing, John Stephen	University of Arizona Tucson
Kurniawan, Nia	Brawijaya University	Smith, Eric N.	University of Texas at Arlington
Kuswanto, Heri	Institut Teknologi Sepuluh Nopember	Grotjahn, Richard	University of California, Davis
Manhardika, I Gusti Ngurah Kade	Universitas Udayana	Carpenter, Kent	Old Dominion University
Maryanto, Sukir	Brawijaya University	Foster, James	University of Hawaii
Mulia, Kamarza	Universitas Indonesia	Hunter, Lisa	University of California, Santa Cruz
Pharmawati, Made	Universitas Udayana	Rohwer, Forest & Paul H. Barber	San Diego State University & University of California at Los Angeles
Rahayu, Harkunti Pertiwi	Bandung Institute of Technology (ITB)	Comfort, Louise K.	University of Pittsburgh
Ruslami, Rovina	Universitas Padjadjaran	Lane, H. Clifford	NIAID
Sidik, Frida	Institute for Marine Research and Observation, Ministry of Marine Affairs and Fisheries	Feller, Ilka	Smithsonian Institution

Indonesia	Water	Sediment Transport Evaluation on Bengawan Solo River (downstream and estuary) to Minimize Sedimentation and Flood Combining Effect on Nearby Infrastructure
Indonesia	Climate	Study of Climate Change and Air Quality Impact From Short-lived Climate Forcers (SLCFs) Reduction in Indonesia
Indonesia	Environment	Tsunami Waves Impacts on Coastal Morphological Changes Based on Sediment Transport Numerical Simulations
Indonesia	Biodiversity	Marine Biodiversity of Raja Ampat Islands: The ARMS, Morphology, and Genetic Approaches for Inventorying and Monitoring Patterns of Marine Biodiversity
Indonesia	Avian Influenza	Mosquito-borne Arboviral Surveys in Indonesia with a Focus on Dengue Vectors
Indonesia	Biodiversity	Citizen Science Solutions for National Biodiversity Data Needs: Developing a Plant Checklist for West Kalimantan, Indonesia
Mongolia	Climate	Impacts of Climate Change on Freshwater and Fisheries Resources of the Lake Hovsgol Watershed
Mongolia	Environment	Determining Sources and Health Impacts of Particulate Matter in Ulaanbaatar City to Aid and Assess Current Air Pollution Mitigation Efforts
Mongolia	Environment	Building Research and Teaching Capacity to Aid Climate Change and Natural Resource Management at the National University of Mongolia
Nepal	Climate	Establishing a Collaborative Assessment of the Impacts of Climate Change on the Hydrological Regime of the Langtang River Basin, Central Nepal
Nepal	Maternal Health & Child Nutrition	Investigation of the Effectiveness of National Clean Cookstoves Program in Nepal in Reducing Acute Respiratory Tract Infection in ≤ 5 children
Philippines	Environment	Enhancement of Philippines' Research Capability in Understanding the Role of Mangrove Ecosystem Health in the Adaptation and Mitigation against Natural Disasters
Philippines	Biodiversity	Enhancing Marine Natural Resource and Biodiversity Management in the Philippines by Extending Population Connectivity Research
Philippines	Education	A Glass of the Sea: An Immersive, Interactive, Visual Exhibition on the Apex of the Earth's Marine Life
Philippines	Disaster mitigation	Early Detection of Volcano Flank Failure Using InSAR
Philippines	Biodiversity	Pathways for Indigenous Knowledge Engagement on Marine Biodiversity Conservation
Philippines	Environment	Lake Taal: Sustaining Native Biodiversity in the Face of Aquaculture, Climate Change and Non-native Species
Sri Lanka	Climate	Developing Monitoring Tools for Managing Drought Risk and addressing the Riddle of Increased Drought Tendency amidst the Wetter Climate Change Projections for Sri Lanka and Maldives
Sri Lanka	Climate	Intra-seasonal Climate Predictions for Sri Lanka and Maldives for Water Resources Management
Thailand / Laos / Vietnam	Biodiversity	Biodiversity and Conservation in the Lower Mekong: Empowering Female Herpetologists through Capacity Building and Regional Networking
Thailand / Burma	Climate	Analysis of Historical Forest Carbon Changes in Myanmar and Thailand and the Contribution of Climate Variability and Extreme Weather Events
Uzbekistan	Climate	The Impact of Atmospheric Black Carbon and Dust Particles on the Surface Albedo of the Glaciers in Tashkent Region, Uzbekistan
Uzbekistan	Energy	Utilization of Low Quality Water for Halophytic Forage and Renewable Energy Production
Vietnam	Biodiversity	Conservation Genetics for Improved Biodiversity and Resource Management in a Changing Mekong Delta
Vietnam	Social Studies	Research and Capacity Building on REDD+, Livelihoods, and Vulnerability in Vietnam: Developing Tools for Social Analysis of Development Planning
Vietnam	Biodiversity	Biodiversity Conservation in Indochina: Integrating Research and Training to Enhance Wildlife Trade Management
Vietnam	Biodiversity	Building a Mekong River Genetic Biodiversity Research Network

Soemitro, Ria Asih Aryani	Institute Teknologi Sepuluh Nopember (ITS)	Ma, Gangfeng	Old Dominion University
Sofyan, Asep	Institut Teknologi Bandung	Carmichael, Gregory R.	University of Iowa
Syamsidik	Tsunami and Disaster Mitigation Research Center, Syiah Kuala University	Liu, Philip L.-F.	Cornell University
Toha, Abdul-Hamid	State University of Papua	Carpenter, Kent	Old Dominion University
Wahid, Isra	Universitas Hasanuddin	Severson, David	University of Notre Dame
Wiryana, I Made	Universitas Gunadarma	Webb, Campbell	Arnold Arboretum of Harvard University
Bud, Mendsaikhan	Mongol Ecology Center	Jensen, Olaf	Rutgers University
Lodoysemba, Sereeter	National University of Mongolia	Hasenkopf, Christa	University of Colorado
Nachin, Baatarbileg	National University of Mongolia	Hessl, Amy	West Virginia University
Kayastha, Rijan Bhakta	Kathmandu University	Williams, Mark W.	University of Colorado
Verma, Sharat	National Tuberculosis Center	Smith, Kirk	University of California, Berkeley
Severino III, Salmo	Ateneo de Manila University	Feller, Ilka	Smithsonian Institution
Ablan Lagman, Maria Carmen	De La Salle University	Carpenter, Kent	Old Dominion University
Garcia, Maria Isabel	The Mind Museum (of the Bonifacio Art Foundation, Inc)	Gosliner, Terrence	California Academy of Sciences
Lagmay, Alfredo Mahar Francisco	University of the Philippines, National Institute of Geological Sciences	Amelung, Falk	University of Miami
Pajaro, Marivic G.	Haribon Foundation for the Conservation of Natural Resources, Inc.	Medin, Douglas	Northwestern University
Papa, Rey Donne	University of Santo Tomas	Gosliner, Terrence	California Academy of Sciences
Yahiya, Zeenas Samsudeen	Foundation for Environment, Climate and Technology	Lyon, Bradfield	Lamont-Doherty Earth Observatory of Columbia University
Zubair, Lareef	Foundation for Environment, Climate and Technology, Mahawell Authority of Sri Lanka	Sobel, Adam H.	Columbia University
Aowphol, Anchalee	Kasetsart University	Stuart, Bryan L.	North Carolina Museum of Natural Sciences
Chidthaisong, Amnat	The Joint Graduate School of Energy and Environment	Alber, Merryl & Monique Y. LeClerc	University of Georgia Athens
Narbayev, Narali	Tashkent State Agrarian University	Schauer, James & Michael Bergin	University of Wisconsin-Madison, Georgia Institute of Technology
Toderich, Kristina	International Center for Biosaline Agriculture/Samarkand Division of the Academy of Sciences	Saito, Laurel	University of Nevada
Binh, Dang Thuy	Nha Trang University	Carpenter, Kent E.	Old Dominion University
Hue, Le Thi Van	Vietnam National University; Center for Natural Resources & Environmental Studies	McElwee, Pamela	Rutgers University
Le, Minh	Centre for Natural Resources and Environmental Studies (CRES)	Blair, Mary	The American Museum of Natural History
Ngoc, Ut Vu	Can Tho University	Carpenter, Kent	Old Dominion University

Vietnam	Social Sciences	Water Governance of Minority Communities in the Mekong Delta
Vietnam	Energy	Technical Development and Field-testing of a Self-contained, Inexpensive Wave Energy Converter Device
Vietnam	Climate	Assessment of Impacts of the Emission Reduction Measures of Short-lived Climate Forcers on Air Quality and Climate in Southeast Asia
Vietnam	Water	Evaluating the Sustainability of Ground Water Resources: Academic and Scientific Gaps

PEER Awards in Europe and Eurasia

Country	Field	Project Name
Armenia	Disaster mitigation	Volcanic Hazard Assessment of Ararat Valley, Armenia
Georgia	Disaster mitigation	Discovering Potential Seismic Sources in the Caucasus Using Virtual-Reality-based Data Analysis and Development of a Cyber-enabled Geosciences Workforce in Georgia
Georgia	Disaster mitigation	Active Geodynamics of the Caucasus Region

PEER Awards in Latin America & Caribbean

Country	Field	Project Name
Bolivia	Water	The Fate of Enteric Pathogens in Fluids, Fields, and Food Products: On-farm Solutions for the Safe Reclamation of Water and Nutrients from Sewage
Brazil	Biodiversity	Biodiversity and Climate Change in the "Arc of Deforestation" of Brazilian Amazon
Brazil	Biodiversity	Biodiversity Conservation and Scientific Capacity Development in the Brazilian Amazon using Ants as Bioindicators and Ecosystem Health Indicators
Brazil	Biodiversity	Mycota Associated to Native Hevea spp. in the Brazilian Amazon Region
Brazil	Biodiversity	Biodiversity and Socio-economic Impacts of Palm Oil Bioenergy Development in the Brazilian Amazon
Brazil	Biodiversity	Biodiversity and Adaptations of CYP Enzymes in the Amazon Loricariidae Fish
Brazil	Environment	Epiphyllic Communities on Leaves at Tropical Forests: Causes and Consequences for Leaf Functioning at Different Scales
Colombia	Climate	Impacts of Climate Change on Tropical Wetlands: Tracking the Evolution of Two Andean Lakes and a Floodplain Ciénaga in Columbia
Colombia	Disaster Mitigation	Integrated Humanitarian Logistics System for Developing Countries
Colombia	Environment	Ecosystem Response to Climate Change in the mountain wetlands
Dominican Republic	Energy	Temperature Profile of the Ocean Seabed, from the City of Puerto Plata, Dominican Republic, and Preliminary Design for a Commercial Exploitation of Cold Water to Supply for a Central Air Conditioning System.
Ecuador	Climate	Long-term sustainability of water resources and biodiversity under scenarios of climate change in the Napo watershed, Ecuador
Ecuador	Social Studies	REDD based forest expansion, food consumption, and reduced emissions agricultural policies (REAP) in the Ecuadorian Amazon
El Salvador	Disaster Mitigation	Demonstrating the integration of ground-based monitoring and satellite remote sensing for forecasting landslides and flooding hazards in volcanic terrains
Mexico	Energy	Sustainability evaluation of jatropha oil production in Yucatan, Mexico
Mexico	Social Sciences	Poverty and Climate Change in Mexico: the implication of mitigation policy, climate impacts and development pathways for household welfare

Nguyen, Van Kien	Research Centre for Rural Development – An Giang University	Song, Carol Xiaohui	Purdue University
Nguyen, Tho H.	Tan Tao University	Bingham, Brian	University of Hawaii
Oanh, Nguyen Thi Kim	Asian Institute of Technology	Hopke, Philip	Clarkson University
Trang, Pham T.K.	Hanoi University of Science	Bostick, Benjamin Carlos	Columbia University

Principal Investigator	Organization	US Partner	US Institution
Meliksetian, Khachatur	Institute of Geological Sciences, Armenian National Academy of Sciences	Connor, Charles	University of South Florida
Elashvili, Mikheil	Ilia State University	Kellogg, Louise	University of California Davis
Godoladze, Tea	Ilia State University	Reilinger, Robert	Massachusetts Institute of Technology

Principal Investigator	Organization	US Partner	US Institution
Iriarte Puña, Maria de la Mercedes	Center for Water and Environmental Sanitation, Universidad Mayor de San Simon (UMSS)	Mihelcic, James	University of South Florida
Colli, Guarino	Universidade de Brasilia	Sinervo, Barry Raymond	University of California, Santa Cruz
Feitosa, Rodrigo	Universidade Federal do Paraná	Ross, Kenneth G.	University of Georgia, Athens
Góes-Neto, Aristóteles	CEBio / FIOCRUZ–MG (Center of Excellence of Bioinformatics)	Chevarri, Priscila	University of Maryland
Medeiros, Rodrigo	Conservation International do Brasil	Halvorsen, Kathleen E.	Michigan Technological University
Parente, Thiago	Fundação Oswaldo Cruz (Fiocruz)	Hahn, Mark	Woods Hole Oceanographic Institution
Pimentel Rosado, Bruno Henrique	Centro de Gestão de Pesquisa, Desenvolvimento e Inovação (CG-PDI)	Saleska, Scott	University of Arizona
Cañón Berriga, Julio Eduardo	Universidad de Antioquia	Dominguez, Francina	University of Arizona
Castaño, Victor	Fundacion Universidad del Norte	Holguin-Yeras, Jose	Rensselaer Polytechnic Institute
Castano, Juan	Universidad Tecnologica de Pereira	Martin, Jay	The Ohio State University
Sagredo Robles, Eduardo David	Universidad Tecnologica Santiago	Rishe, Naphtali David	Florida International University
Guyasamin, Juan Manuel & Andrea Encalada	Universidad Tecnológica Indoamérica & Universidad San Francisco de Quito	Poff, LeRoy	Colorado State University
Mena, Carlos	Universidad San Francisco de Quito (USFQ)	Rudel, Thomas	Rutgers University
Cruz, José Fredy	Universidad de El Salvador	Gierke, John S.	Michigan Technological University
Sacramento-Rivero, Julio	Yucatan Autonomous University	Halvorsen, Kathy	Michigan Technological University
Sanchez, Landy	El Colegio de Mexico	O'Neill, Brian	National Center for Atmospheric Research

Nicaragua	Biodiversity	Marine Biodiversity Initiative for Central America. International Partnership for Research and Training on Marine Biodiversity and Genomics
Peru	Climate	Building Peruvian Capacity for Monitoring and Modeling the Effects of Climate Change on the Coropuna Glacier and Associated Watersheds in Arequipa, Peru
Peru	Water	Glacier Retreat and Water Resource Sustainability in the Peruvian Andes: Informing Adaptation Strategies through Collaborative Science
Peru	Climate	Impact of Transboundary Biomass Burning Pollution Transport over the Central Andes of Peru
Peru	Water	Strengthening Resilience of Andean River–Basin Headwaters Facing Global Change

PEER Awards in Middle East

Country	Field	Project Name
Egypt	Climate	The Impact of Biogenic and Anthropogenic Atmospheric Aerosols to Climate in Egypt
Egypt	Agriculture	Spectral Soil Mapping for Agricultural Land Development in El–Gallaba Plain, Western Desert, Egypt
Iraq	Water	Soil Water Retention Technology to Improve Vegetable Production among Highly Permeable Soils under Water Scarcity and Dry Climate Conditions In Iraq
Iraq	Water	PEER Research Experiences for Undergraduates (REU): Freshwater Science and Policy in the Human–Dominated Tigris River Basin
Jordan	Social Sciences	Three Circles of Alemat: Creating Collaborative Multicultural Networks for Women in the Sciences
Jordan	Water	Evaluating Climate Change Impacts on the Arid Lands and Water Resources in Jordan
Jordan	Water	Optimizing Water Usage of Irrigation systems using Wireless Sensor Networks in Jordan
Jordan	Water	Floodwave Propagation and Infiltration in Desert Regions: The Azraq Basin, Jordan
Jordan	Water	Enhancing Water Education at the University Level in Jordan by Incorporating an Innovative Multi–Agent Modeling and Analysis Tool
Lebanon	Disaster Mitigation	Earthquake–generated Landslide Hazard in Lebanon
Lebanon	Climate	Assessment of the Tropospheric HONO Budget: Instrumental Development and Field Measurements
Lebanon	Water	Assessment of Real Evapotranspiration and Recharge Processes on Two Karst Pilot Groundwater Catchments (Lebanon) Using an Integrated Spatially Distributed Numerical Model: Applications for Water Resources Management Purposes
Lebanon	Water	A Collaborative Approach towards Integrated Water Resources Management in the Litani River Basin: Opportunities for Climate Change Adaptation and Socioeconomic Growth
Lebanon	Water	Investigation into Persulfate/Peroxymonosulfate Oxidation of Micro–contaminants towards Water Sustainability: Mechanism, Kinetics, and Implementation
Lebanon	Disaster mitigation	Health Assessment of Earth Dams in Lebanon: Towards Sustainable Development
Lebanon	Biodiversity	Towards a Better Assessment and Management of Wildfire Risk in the Wildland–urban Interface in Lebanon: Gaining from US ELANxperience
Morocco	Social Studies	Assistive Technology for Improving Literacy among the Deaf and Hard of Hearing
Morocco	Education	Tools and Resources to Improve Deaf Educational Access to Science, Technology, Engineering and Mathematics
Tunisia	Disaster mitigation	Contribution to Drought Identification and Alert in Northern Tunisia
West Bank-Gaza	Water	Rainwater Harvesting Analysis Using Water Harvesting Evaluation Tool (WHEAT)

Zegarra Balcazar, Roberto & Felio Carderon La Torre	Universidad Centroamericana	Polz, Martin	Massachusetts Institute of Technology
Kraft, Karen and Julio F. Alegria	Asociacion Especializada para el Desarrollo Sostenible (AEDES)	Schaefer, Joerg	Columbia University
Lagos, Cirilo	Instituto Geofisico del Peru	Mark, Bryan G.	The Ohio State University
Suarez, Luis	Universidad Continental	Helmig, Detlev	University of Colorado at Boulder
Willems, Bram Leo	Universidad Nacional Mayor de San Marcos	Scott, Christopher	The University of Arizona

Principal Investigator	Organization	US Partner	US Institution
Ibrahim, Alaa	American University in Cairo	Steiner, Allison	University of Michigan
Zaghloul, El Sayed Abbas	National Authority for Remote Sensing and Space Sciences	Koch, Magaly	Boston University
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Geraci, Christy Jo	The American University of Iraq, Sulaimani	Rypstra, Ann (PI)	Miami University of Ohio
Dajani, Rana	Jordan Society for Scientific Research	Bowser, Gillian	Colorado State University
Jararweh, Yaser	Jordan University of Science and Technology	Jenerette, George	University of California, Riverside
Samarah, Samer	Yarmouk University	can Vuran, Mehmet	University of Nebraska—Lincoln
Shawaqfah, Mo'ayyad	Al al-Bayt University	Stone, Mark	University of New Mexico
Talazi, Samer	Jordan University of Science and Technology	Gorelick, Steven M.	Stanford University
Abou-Jaoude, Grace	Lebanese American University	Wartman, Joseph	University of Washington
Afif, Charbel	Université Saint Joseph de Beyrouth	Dusanter, Sebastian	University of Indiana
Doummar, Joanna	American University of Beirut	Gurdak, Jason	San Francisco State University
El Fadel, Mutasem	American University Beirut	Smith, James	Princeton University
Ghauch, Antoine	American University of Beirut	Luthy, Richard	Stanford University
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Mitri, George	University of Balamand	McWethy, David B.	Montana State University
Soudi, Abdelhadi	Ecole National de l'Industrie Minérale	Vinopol, Corinne	Institute for Disabilities Research and Training, Inc.
Soudi, Abdelhadi	Ecole Nationale de l'Industrie Minérale	Vinopol, Corinne	Institute for Disabilities Research and Training, Inc.
Bargaoui, Zoubeida Kebaili	Ecole National d'Ingénieurs de Tunis (ENIT)	Caylor, Kelly	Princeton University
Al-Khatib, Issam A.	Birzeit University	Apul, Defne S. & Steve Burian	University of Toledo and University of Utah



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Front cover: the research team installs sensors in Laguna La Cocha in the Southern Andes, Colombia. Photo credit: PEER Cycle 1, Project #31 research team

Back cover: Udayana University student Asa picks through coral rubble looking for marine invertebrates. Photo credit: USAID