



Virginia Tech President Tim Sands speaks with (from right) CIREDC Executive Director Van Crowder, Former CIREDC Director S.K. De Datta, Integrated Pest Management Innovation Lab Director Muni Muniappan, and Virginia Tech Graduate Student Ben Garber at the GAP launch.

## CIRED spotlighted at 2019 GAP Report Launch

CIRED was pleased to join Virginia Tech President Tim Sands, the College of Agriculture and Life Sciences (CALS), and a host of global agricultural partners for the 2019 Global Agricultural Productivity (GAP) Report launch in Des Moines, Iowa.

Each year, the report examines strategies to produce food, feed, fiber, and biofuel in a sustainable manner to meet the demands and needs of a growing world. The 2019 report, prepared by CALS, noted that through agricultural productivity growth, attention to ecosystem services, and reduction of waste and loss, global nutritional and environmental goals can be achieved, without eliminating nutrient-dense foods that consumers need and want.

President Sands, featured speaker at the launch, recognized the Integrated Pest Management Innovation Lab (IPM IL) for sharing “practices that make it possible for some of the world’s poorest farmers to fight invasive pests.” His remarks were followed by a panel of global experts, including: Miguel Garcia Winder, undersecretary of agriculture in Mexico; Rose Mwonya, vice

chancellor of Egerton University in Kenya; and Alan Grant, dean of CALS.

Two CIRED-managed programs are featured in the GAP Report: [IPM IL’s efforts to model and manage invasive species](#) and the [Virginia Tech, U.S. Agency for International Development partnership on the Catalyzing Afghan Agricultural Innovation \(CAAI\) project](#).

CIRED Executive Director Van Crowder, IPM IL Director Muni Muniappan, CIRED Communications Director April Raphiou, and IPM IL Communications Specialist Sara Hendery represented CIRED at the event. CIRED also hosted an informational booth at the launch.

Since it was first published in 2010, the GAP Report has developed a global audience, with compelling insights for national and international policymakers, agribusinesses, U.N. agencies, universities, researchers, and nongovernmental organizations.

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# From the Executive Director

Happy 2020 to all our friends and partners!

2019 was a busy year for CIRED. We continued to work hard to seek partnerships and external funding in support of Virginia Tech's global land-grant mission. Our projects drew on the university's knowledge and applied it through multi-disciplinary and multi-institutional partnerships to raise standards of living in developing countries. Our projects and activities provided opportunities for VT faculty and students to be involved in the research, teaching, and development of innovative solutions to problems beyond our boundaries, resulting in benefits not only to the university, but to the Commonwealth of Virginia, the nation, and the world. We can all feel proud of this work.

CIRED has traditionally been funded by grants from the U.S. Agency for International Development (USAID), many of which have been agriculture-focused. While this continues, CIRED has recently received grants from new donors, and we continue to look for ways to diversify the project portfolio. This includes working with the Millennium Challenge Corporation (MCC) in Morocco on tourism development and with UNICEF to establish the African Drone and Data Academy.

Partnerships, internal and external, are key to CIRED's success and the Center strives to develop and strengthen global partnerships in support of Virginia Tech's international engagement. Global partnerships with other universities, governments, and NGOs, among others, are key to being successful in seeking and obtaining external funding. CIRED continues to expand its partnerships, including with new partners such as EARTH University in Costa Rica, GOPA (a German NGO), FHI 360, Winrock International, and Cambridge Education.

The **USAID-funded Integrated Pest Management Innovation Lab (IPM/IL)**, which CIRED has managed since 1993, recently received an associate award to work on fall armyworm in Nepal. The Center continues to implement the **USAID/Senegal Youth in Agriculture Project** and the **USAID Catalyzing Afghan Agricultural Innovation Project**. The **USAID InnovATE Armenia Project** with the International Center for Agribusiness Research and Education (ICARE) closed out in October 2019. It was a highly successful project, and we are seeking new funding opportunities there, and in the neighboring Republic of Georgia.

As we move into 2020, we will continue to build partnerships and seek funding opportunities that will help Virginia Tech fulfill its *Ut Prosim* (That I May Serve) mission globally. If you have ideas about how we can do that better and want to work with us doing it, please reach out to me.



Warm regards,

Van Crowder  
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## PROFILE

# Kevin Kochersberger: Helping Virginia Tech soar to new heights in Malawi

When you talk with Kevin Kochersberger, associate professor of Mechanical Engineering and director of the Unmanned Systems Lab at Virginia Tech, it becomes clear that he enjoys flying – whether piloting a 40-foot long Cessna plane or operating a drone smaller than a toy car.

Since joining Virginia Tech as a faculty member nearly 20 years ago, Kochersberger has shared his expertise in drone design and technologies with Virginia Tech students. Now, he is taking his aviation skills to higher heights and educating a new generation of drone specialists thousands of miles away in the southeast African nation of Malawi.

Working with CIRED, Kochersberger helped the university land a UNICEF-funded contract to launch the African Drone and Data Academy (ADDA) in Lilongwe, Malawi. The academy will develop expertise in the use of drones for humanitarian, development, and commercial purposes across the continent through a 12-week course. By 2021, it plans to train approximately 150 students to build and pilot drones. Virginia

Tech developed the curriculum that combines theoretical and practical methods for making, testing, and flying drones.

By 2022, the academy will run a two-year master's degree program in drone technology in conjunction with the Malawi University of Science and Technology (MUST). It will deliver a curriculum that will build local capacity and a favorable ecosystem for the emergence of sustainable business models for using drones and data for development.

Kochersberger said, "The academy reflects Virginia Tech's ongoing commitment to the innovative application of drone technology and education in Malawi and the Africa region. Drones are very beneficial in Sub-Saharan Africa. Where you have transportation systems that aren't functional, aerial imagery helps communities after weather events such as flooding."

Kochersberger first learned about opportunities to do drone research in Malawi thanks to an invitation from a colleague. He explained, "It all began when a professor in my department asked me to accompany three of her Senior Design students to Malawi as part of their capstone projects. The three students worked on an intravenous drop project in collaboration with three Malawian hospitals. After that trip, I went back to Malawi with students enrolled in my senior design course to complete three water, sanitation, and hygiene [WASH] capstone projects."

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Students in the inaugural class of the African Drone and Data Academy are pictured with UNICEF and Virginia Tech representatives.



Kevin Kochersberger, associate professor of mechanical engineering, standing, provides an overview of the course curriculum at the opening of the African Drone and Data Academy in Malawi; at left is Babatunde Ogunkunle, a member of the inaugural class from Nigeria.



James Donnelly, a Virginia Tech graduate student in mechanical engineering, demonstrates the EcoSoar wing fabrication technique during a workshop held in 2019. Kochersberger is at center; at right is alum Zack Standridge, who helped supervise drone fabrication as a graduate student in aerospace and ocean engineering.

Virginia Tech Engineering students are required to complete a senior design course in which they work in teams to apply learned skills to a real-world problem.

"While I was in Malawi, I learned about the drone corridor in Kasunga, Malawi, an 80-kilometer corridor sponsored by UNICEF that was used for flying and testing drones. So, I approached UNICEF and asked if I could test in their corridor," added Kochersberger.

UNICEF agreed to let Kochersberger and two of his graduate students test drones in the corridor. Subsequently, Kochersberger and the students hosted a workshop for 13 Malawian students attending Malawi University of Science and Technology (MUST). The students helped build an unmanned aircraft called EcoSoar that carried a simulated package of dried blood samples to the Kasunga Airport. At \$350, the aircraft costs a fraction of what a typical remote sensing and delivery drone costs, making it a truly sustainable aircraft design for Malawi and other African countries.

According to Kochersberger, "These international opportunities are beneficial for students who get a chance to work in environments where there may be environmental or cultural challenges. In addition, students must develop innovative solutions to address problems that occur in developing countries such as lack of resources."

Kochersberger is also a member of TEAM Malawi, a group of Virginia Tech professors, students, and community partners from multiple disciplines that addresses community health and quality of life challenges in Malawi through technology, education, advocacy, and medicine (TEAM).

Kochersberger will lead the drone academy project, which will be managed by CIRED. He added, "I couldn't have done it without CIRED. I began working with CIRED once there were calls for proposals, and they provided tremendous support on writing the proposal."

## IMPACT

# Virginia Tech researchers begin project to help improve Morocco's hospitality and tourism management sector

With Millennium Challenge Corporation (MCC) funding, Virginia Tech will support the Government of Morocco in implementing a public-private partnership that helps improve hospitality and tourism through private sector engagement in the governance, financing, and academic relevance of vocational training. Specifically, Virginia Tech will work with a pilot program at the Institute of Hotel and Tourist Applied Technology in Ouarzazate.

As part of the project, Virginia Tech will provide technical assistance in curriculum development and implementation, advancement of continuing professional education, and support for gender and social inclusion, among other related areas. In addition to the innovative new governance structure, Virginia Tech will assist with development of new programs in cultural heritage tourism, ecotourism,

restaurant and culinary management, renewable energy, and entrepreneurship. Through the program, VT will assist tourism and hospitality education providers by creating a model that meets the growing demand for tourism professionals within Morocco, with a special focus on gender and disadvantaged youth.

In January, Kristin Lamoureux, visiting professor of Hospitality and Tourism Management at Virginia Tech, accompanied by Philippe Duverger, hospitality and marketing expert, University of Maryland, and Youseuf Samihi, finance and business consultant, traveled to Morocco to begin the curriculum analysis required for this program. The team met with representatives of both the Ministry of Tourism and the tourism private sector as well as local faculty members, students, and industry professionals. As a result of these meetings, VT will formulate a plan for curriculum development that is aligned with the needs of the local tourism sector.

The Institute of Hotel and Tourist Applied Technology is the leading vocational education program for hospitality and tourism in the Ouarzazate region. The public-private partnership that is emerging through this project represents an innovative, more flexible model of education and training, which paired with the technical assistance of the VT team, can have a long-term impact on workforce development for the region and Morocco.



The Virginia Tech team leads a focus group discussion with students attending the Institute of Hotel and Applied Tourism Technology.



Virginia Tech team members (from left) Kristin Lamoureux, Philippe Duverger, and Youseuf Samihi are joined by the institute's director and two of the institute's faculty members.



*Dimocarpus longan*, or longan, is the third most cultivated and second most exported fruit crop in Vietnam. In 2017, the tropical fruit's export value was \$62.13 million, a significant contribution to Vietnam's economy.

## IMPACT

# New guide details pest-management practices for Longan

Dragons are known to have copious enemies who threaten their territory; longan, translated to mean “dragon eye,” is no different.

Circular, gelatinous, and with a shell that can be cracked like a hard-cooked egg, *Dimocarpus longan*, or longan, is the third most cultivated and second most exported fruit crop in Vietnam. In 2017, the tropical fruit's export value was \$62.13 million, a significant contribution to Vietnam's economy. However, longan pests and diseases can cause up to 100 percent crop loss. Shipments of longan from Vietnam, in fact, have been intercepted in U.S. ports due to the presence of crop threats like *Drepanococcus chiton*, a pest that leaves mold behind.

In an article published in the open-access *Journal of Integrated Pest Management*, researchers profiled longan's most aggressive pests and diseases in Vietnam. The article is one of the first to outline comprehensive data on the fruit outside of the South Asian context.

“Longan is not a well-known fruit and there is not a lot of literature available on it in the U.S.,” says Muni Muniappan, director of the Feed the Future Innovation Lab for Integrated Pest Management (IPM) and one of the article's authors. “Since longan mostly grows in Vietnam, China, Taiwan, and Thailand, the literature available is written for those contexts and languages.”

In recent years, longan's popularity has risen in U.S. and European markets. This emergence underpins a collaboration between the IPM Innovation Lab and the Southern Horticultural Research Institute (SOFRI) in Vietnam to improve the export of certain high-value tropical fruits, longan included.

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In the article, authors from various institutions—the IPM Innovation Lab, SOFRI, West Virginia University, Washington State University, University of California Davis, and University of California Cooperative Extension—cover 10 pests and three diseases that threaten longan.

Some of the pests profiled in the article include moths such as *Conopomorpha sinensis* or the oriental fruit fly (*Bactrocera dorsalis*), but chiefly highlighted is a crop affliction SOFRI and the IPM Innovation Lab have long worked to resolve: longan witches' broom (LgWB).

After many years assuming the causative organism of LgWB was phytoplasma or a virus, the two teams uncovered it was in fact a small white mite, *Eriophyes dimocarpis*. The mite's saliva, toxic to the tree's shoots, causes the curled, malformed leaves harkened in the witches' broom name.

In Vietnam, the Mekong Delta region is a vital economic center that produces nearly half of the country's tropical fruits. With the mite now identified, SOFRI and the IPM Innovation Lab are working to develop IPM strategies for controlling its spread, predicting to cut damage by 50 percent.

The article highlights several IPM methods, like fruit bagging, to combat longan threats. Longan bagging not only abates fruit borers, but it also limits the need for synthetic chemicals that can threaten natural enemies beneficial to crop health.

“Failing to control longan witches’ broom in the Mekong Delta region could spread it to rambutan, another important tropical fruit,” says Hanh Tran, a co-author on the study whose work was also instrumental in identifying the mite.



Hanh Tran (standing) speaks to a group of longan farmers in Vietnam about integrated pest management techniques for the fruit. They were joined by Muni Muniappan (right), director of the Feed the Future Innovation Lab for Integrated Pest Management.



Peace Corps Recruiter Anne Patterson (center) and campus ambassador Jessica Ammon (right) share information about Peace Corps with a Virginia Tech student during the Global Education Office's Fall Resource Fair.

## PROFILE

# CIREd welcomes new Peace Corps Recruiter

CIREd is pleased to welcome Anne Patterson, the new Peace Corps Recruiter.

A first-year master's student in Virginia Tech's Mental Health Counseling graduate program, Anne brings to the position first-hand experience in Peace Corps service. She previously served as a Peace Corps volunteer in Ethiopia where she educated rural communities on water, sanitation, and hygiene (WASH). After returning to the U.S., she worked as a child, youth, and family case manager at Blue Ridge Behavioral Healthcare.

Anne said, "As the Peace Corps representative, I get to share my Peace Corps service with others and encourage them

to consider changing their lives and those of others for good. I really enjoy being a resource for students as they are considering their next steps."

In her new role, Anne is responsible for recruiting in Southwest Virginia.

Virginia Tech ranks among the top 20 large schools that produce the highest number of Peace Corps volunteers. For information about Peace Corps, contact Anne at [peacecorps@vt.edu](mailto:peacecorps@vt.edu).



CAAI and Virginia Tech attendees at the Capacity Development for Agricultural Innovation Systems training.

## PROJECT UPDATE

# CAAI Project holds second training in India on Capacity Development for Agricultural Innovation Systems

A year ago, Virginia Tech faculty and staff working on the USAID Catalyzing Afghan Agricultural Innovation (CAAI) project met in India to begin building a community of practice to encourage dialogue and resource sharing and to develop strategies for improving teaching and other skills. Recently, project teams from Virginia Tech and Afghanistan returned to India for another round of trainings focused on forming and sustaining relationships with stakeholders and planning for performance-based programs.

The training provided an opportunity for instructors and faculty members at agricultural education institutions in Afghanistan to come together and learn about new trends, methodologies, and modules to further enhance Afghanistan's agricultural education and training system. Four modules were taught, including pedagogy, value chain, positive youth development, and distance learning. Thirty male and female participants from Afghanistan participated, including deans and the heads of Agricultural

and Veterinary Institutes (AVIs) in Balkh, Kandahar, Kabul, Nangarhar and Herat, and faculty members and curriculum development staff of the Technical Vocational Education and Training in Afghanistan (TVET-A) and the National Agriculture Education College (NAEC). Faculty members attending from Virginia Tech included: Jeremy Johnson, Professional Lecturer, State 4-H Leader; Tom Archibald, Assistant Professor and Extension Specialist, Department of Agricultural, Leadership, and Community Education; Pavli Mykerezi, Director, Agricultural Technology Program; Mike Shumate, Curriculum and Instruction; Dale Pike, Executive Director, Technology-enhanced Learning and Online Strategies (TLOS); Quinn Warnick, Senior Director of Innovation and Outreach, John Ignosh, Advanced Extension Specialist; Lance Matheson, Associate Professor of Information Technology, Pamplin College of Business.

**"The training provided me with the tools to further enhance and develop the curricula that we teach at the Agricultural Institutes"**

**Abdul Rahimzai, head of Kabul AVI**

The workshop was organized around themes selected for their relevance to the promotion of agricultural innovation. Each work session involved an exchange of knowledge, information, ideas, and practices among the provincial site teams (PSTs), project management unit (PMU), VT mentors, and collaborating partners. Each session was facilitated by two VT mentors and featured experiential learning approaches for contextualized learning. A lesson plan to allow workshop participants to convey knowledge and skills was the output for each work session.

## PROJECT UPDATE

# CIREd delivers training for high school teachers in Guatemala

Efforts to strengthen Guatemala's agricultural education system continue through the Education for Agriculture, Forestry and Agroindustry project in Guatemala. Recently, Virginia Tech researcher Henry Quesada collaborated with professors Julieta Mazzola and Daniel Sherard from EARTH University (Costa Rica) to design and deliver a training on concepts, best practices, insights, and experiences on the integration of experiential learning into the agriculture and forestry curriculum.

A total of 146 high school teachers from the 18 agriculture Technical and Vocational Education Training (TVET) high schools in Guatemala attended the training, which followed a practical approach so that attendees were able to integrate theory and practice.

The primary goal of the project is to redesign and create new curricula in agriculture, forestry, and agroindustry for high school education in the Central American nation. The improvement of curricula in agriculture and forestry is critical to fighting poverty and providing more opportunities to rural areas.

EARTH University's model of learning-by-doing has become a benchmark in agriculture international education. Combined with Virginia Tech's expertise integrating experiential learning activities into classroom settings, the result was a training experience that was well received by participants. The next training, scheduled for November, will include Luis Escobar, a Fish and Wildlife Conservation professor at Virginia Tech.

The project is funded by the Millennium Challenge Corporation (MCC), an independent U.S. organization that focuses on providing foreign technical assistance to mitigate poverty in developing countries. The German non-governmental organization GOPA leads the project and has partnered with EARTH University and Virginia Tech to implement it. Both higher education institutions and GOPA bring extensive experience and expertise in the country and the Central American region.



Julieta Mazzola from EARTH University leads a class discussion with the attendees.



Henry Quesada answering questions during the training.



Attendees of the training session at the National School of Agriculture in Guatemala.

## PROJECT UPDATE

# IPM Innovation Lab team visits Tanzania and Ethiopia

At the end of September, the IPM Innovation Lab (IPM IL) team traveled to Tanzania and Ethiopia to attend the annual Technical Advisory Committee (TAC) meeting and assess project progress in both countries. Allan Hruska, leader of the Fall Armyworm Taskforce for the Food and Agriculture Organization (FAO), joined as the newest TAC member. In Tanzania, the meeting participants visited a biocontrol center that has begun mass-producing and releasing two natural enemies of the fall armyworm, an initiative directed by IPM IL that the team hopes to replicate throughout East Africa. The fall armyworm ravages maize, a staple crop, and

many other plant species throughout Asia and Africa. The pest has built resistance to most chemical pesticides and there are currently no fall armyworm-resistant maize varieties available, so the implementation of natural enemies against the pest remains an ecological, practical, and economical solution. The IPM IL also visited local villages to hear first-hand from farmers their concerns surrounding the fall armyworm and other emerging crop issues. In Ethiopia, IPM IL visited fields in Arba Minch, where collaborators have been releasing two natural enemies against the invasive weed *Parthenium hysterophorus*. The natural enemies have now established and the weed is demonstrating major defoliation. This progress is a significant win for the IPM IL, as the weed causes human and animal health issues, in addition to wiping out native vegetation throughout East Africa.

## EVENT

# Lead researcher on Honduran youth and migration study to speak at WGD Series



Rebecca Williams

As part of its monthly discussion series, the Women and Gender in International Development (WGD) program welcomes Rebecca Williams who will speak on “Gendered performances, masculinities, and (dis)empowerment through the intersection of food insecurity, migration, and violence in rural Honduras.” The talk will be held at Virginia Tech in the Newman Library on Thursday, February 13, 2020, at 12:30 p.m.

Williams currently serves as principal investigator on the USAID-funded Rural Livelihoods and Violence Study, a one-year project managed by CIRED that examines how Honduran youth respond to violence such as the choice to migrate rather than pursue a job or a career in agriculture. Information gained from the study is expected to inform the design of programs for youth.

Williams is an assistant research scientist in the Human and Institutional Capacity Development Office for Global Research Engagement & Livestock Systems Innovation Laboratory at the University of Florida.

For more information about the WGD Discussion Series, visit <https://bit.ly/2PJxgg5>.



At a biocontrol center in Tanzania, a researcher gives instructions on how to release natural enemies in the field to protect crops from the fall armyworm.

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