GLOBAL FOOD SECURITY AND DEFENSE QUARTERLY

THE 1890 UNIVERSITIES CENTER OF EXCELLENCE FOR GLOBAL FOOD SECURITY AND DEFENSE

SPRING 2026

IN THIS ISSUE

1 What We Do

2 The Center s Partners

2 Message from the Director

3 Where We Work

3 From Classroom to Community: FAMU Students Take Service Learning to Kenya

5 UMES Faculty Lead Food Safety Training in the DRC

7 TSU Shares Legume Research in Colombia

8 Jamaica-U.S. Research Helps Farm Animals Beat the Heat

10 CEGFSD Convenes Special Sessions at 2026 ARD Research Symposium



WHAT WE DO

The **Center of Excellence for Global Food Security and Defense (CEGFSD),** established in 2020, leverages the collective capacity of all nineteen 1890 land-grant universities across 18 states to carry out work that supports the U.S. national priorities. This includes boosting U.S. agricultural trade, improving economic growth and prosperity of rural communities through increased agricultural exports and expansion of rural employment, safeguarding the U.S. against pests and diseases, while fulfilling the nation's needs for a globally competent workforce. CEGFSD supports projects that address the Center's four broad goals:

- Strengthening U.S. agricultural prosperity
- Addressing new and emerging animal and plant pests and diseases that cross borders
- Building strong food systems
- Fulfilling the nation's needs for a globally competent workforce

Hosted at the University of Maryland Eastern Shore, CEGFSD is one of six Centers of Excellence at 1890 universities identified in the 2018 Farm Bill. The Center aspires to be a national model for advancing the long-term prosperity of the U.S. through global food security and defense initiatives in collaboration with the nineteen 1890 land-grant universities, the 1890 Universities Foundation, and international public and private sector partners by addressing five interlinked priorities:

- Improvement of agricultural productivity
- Enhancement of global food supply chains
- Improvement of food safety
- Application of emerging technologies to support the food systems
- Analysis of the impacts of trade on food availability, access, use and stability

THE CENTERS PARTNERS

1890 Universities Foundation

USDA National Institute of Food and Agriculture
U.S. Department of Agriculture

Alabama A&M University
Alcorn State University
Central State University
DSU
FAMU
Fort Valley State University
Kentucky State University
Langston University
Lincoln University Missouri
North Carolina Agricultural and Technical State University
Prairie View A&M University
SC State University
Southern University and Agricultural & Mechanical College
Tennessee State University
Tuskegee University
University of Arkansas at Pine Bluff
University of Maryland Eastern Shore
Virginia State University
West Virginia State University

MESSAGE FROM THE DIRECTOR



Dear Stakeholders,

We are pleased to share updates on several recent activities of the Center of Excellence for Global Food Security and Defense (CEGFSD). As the saying goes, "food security is national security," and this principle continues to guide the Center's work as we address critical challenges and opportunities in agriculture, food systems and global development.

While advancing its core mission, the Center supports initiatives that also demonstrate significant value to U.S. agriculture. For example, the project led by Florida A&M University is preparing the next generation of professionals to fill critical roles in the global agricultural workforce. Tennessee State University's initiative focuses on developing legume germplasm with anticipated benefits for both the United States and partner countries. Similarly, Langston University's work on small ruminant production in Jamaica contributes to strengthening agricultural systems and fostering international collaboration.

We invite you to learn more about these and other activities highlighted in this update. We value your engagement and look forward to receiving your feedback.

– Moses T. Kairo, Ph.D., DIC

WHERE WE WORK

The CEGFSD engages faculty in teaching, research, extension and integrated projects designed to address global food security and defense challenges. Supporting economic growth and stability overseas, especially in some of the fastest-growing economies, will lead to the creation of markets for U.S. agricultural products along the value chains, with the potential to impact rural prosperity in the United States. Domestic and international scientists will strengthen collaborative research and extension activities and address transboundary challenges. This will strengthen the capacity of both domestic and international institutions, including universities, research centers and governmental organizations. All nineteen 1890 universities participate in the Center's activities.



FROM CLASSROOM TO COMMUNITY: FAMU STUDENTS TAKE SERVICE LEARNING TO KENYA



The College of Agriculture and Food Sciences (CAFS) at Florida A&M University (FAMU) continues to lead in global agricultural education through innovative, student-centered programming that integrates academics, service and international engagement. At the center of this effort is AGG 4952: Service Learning in International Agriculture, a signature course led by Harriett A. Paul, director of the Office of Global Agriculture Programs and co-principal investigator on both the USDA 1890 Universities CEGFSD and USDA NIFA NextGen programs. In Spring 2026, 15 CAFS students participated in this immersive course, combining rigorous classroom preparation with a transformative international experience in Kenya.

Before traveling, students were grounded in global agriculture, food systems, best practices, biotechnology and international development through contributions from CAFS faculty Drs. Satyanarayan Dev, Anamika Sharma and Mehboob Sheikh, as well as Dr. Stephan Tubene of the University of Maryland Eastern Shore. UMES is a key consortium partner in both programs. This interdisciplinary preparation ensured students were not only ready to travel but to analyze, engage and contribute.

Once in Kenya, classroom theory became lived experience. At the **U.S. Embassy in Nairobi,** students gained firsthand insight into how agriculture intersects with diplomacy, trade and food security.

"Visiting the Embassy helped me see how agriculture connects to policy and global development. Agricultural careers can also exist in diplomacy and international service," said Brielle Elliott, a graduating senior in Agribusiness.

At **Egerton University,** students participated in the Biennial Symposium, the Agricultural Technology and Innovation Trade Fair, and laboratory and farm visits.



Members of the FAMU delegation and collaborating partners from Egerton University pose during an official visit to the U.S. Embassy in Nairobi, Kenya.

"While our environments are different, many of the challenges we face in agriculture are similar," said Dillon Ford, a second-year master's student, who noted Egerton's hydroponics and aquaponics research directly informed his own graduate work.

At **Kilimo High School,** students served as both learners and mentors, engaging younger students through field demonstrations and knowledge-sharing activities.



The FAMU delegation, along with students and teachers of Kilimo High School, are pictured during a visit to the school.

"It reminded me of the importance of applied education in shaping future agricultural leaders," said Adrienne Jones, a third-year Agribusiness major.

At Kilimo High School, students worked alongside smallholder farmers and community development initiatives.

"It's not just about production; it's about supporting livelihoods and empowering people," said Jakia Dickson, a senior in Plant and Animal Sciences.

Throughout the program, students developed greater global awareness, intercultural competence and practical insights into viable food systems.

"This experience changed how I see agriculture. It made it more real, more connected and more impactful," said Kaleb Paul, a third-year Food Sciences major.



The FAMU delegation poses with staff and trainees of the AIC Cheptebo Rural Development Center during a visit to the center.

"The Kenya Service Learning experience stands as a model for how teaching, service and global engagement can come together to create meaningful and lasting impact," said Dr. Anthony Ananga, interim associate dean of Academic Programs.

"AGG 4952 is more than a course; it is a defining experience that shapes students' perspectives, strengthens their skills and prepares them to lead in a global agricultural landscape," said Dean Garlen Dale Wesson.

As CAFS continues to expand its global footprint, programs like AGG 4952 reaffirm the College's commitment to developing globally engaged leaders prepared to address the complex challenges of agriculture, food security and development both at home and around the world. ///

UMES FACULTY LEAD FOOD SAFETY TRAINING IN THE DRC



Food safety remains a global concern with millions of people falling ill and thousands dying each year due to the consumption of contaminated food. Understanding microbiological hazards associated with food and their environments is critical. Equally important is the detection and identification of food- and waterborne pathogens within food systems to prevent and control related illnesses.

To address these challenges, Dr. Salina Parveen conducted an intensive two-day training program in the Democratic Republic of the Congo (DRC). Parveen is a professor in the Department of Agriculture, Food and Resource Sciences and acting associate vice president for research at the University of Maryland Eastern Shore (UMES). The program brought together more than 42 participants, including students, faculty, scientists and farmers.

The training featured both lectures and hands-on laboratory sessions focusing on the ecology, persistence, sources, detection, characterization and control of foodborne pathogens in food systems. Parveen also addressed current and emerging threats to crops, including biological, chemical, environmental and extreme weather-driven risks. Additional topics included agricultural practices and systemic risks, post-harvest and supply chain vulnerabilities, and emerging and future food safety concerns. She emphasized effective mitigation requires integrated farm-to-fork approaches, strengthened surveillance systems and science-based policies.



Dr. Salina Parveen, seated at left, and Dr. Stephan Tubene, seated at right, pose with trainees following the two-day food safety training program at the University of Kinshasa, DRC.



From left, Dr. Stephan Tubene, Dr. Salina Parveen, Professor Lyna Mukwa and Dr. Simon Zebelo speak during a hands-on laboratory session at PCi in Kinshasa.

Participants received training in both traditional and molecular methods for pathogen detection across various food systems. During practical sessions, Parveen worked with students, faculty and scientists to detect foodborne pathogens and indicator bacteria in ready-to-eat foods and potable water. In collaboration with Professor Lyna Mukwa of Plant Clinic International (PCi) in Kinshasa, Parveen is also supporting the establishment of a Biosafety Level 2 (BSL-2) laboratory at PCi. This facility will enable the detection and enumeration of foodborne pathogens using both conventional and molecular approaches.

Additionally, Parveen and Dr. Stephan Tubene, professor and chair of the Department of Agriculture, Food and Resource Sciences at UMES, visited local farms and the University of Kinshasa to train farmers and students on comprehensive food safety practices. Their training covered Good Agricultural Practices; soil, water and manure management; safe use of fertilizers and pesticides; worker hygiene; on-farm sanitation; pre-harvest contamination risks and consumer food safety.

To conclude the training, Parveen and Tubene had a working meeting with Professor Jean-Marie Kayembe Ntumba, president of the University of Kinshasa, in his office. UMES and UNIKIN have signed a Memorandum of Understanding, which engages both institutions in teaching, research and outreach activities. ///

TSU SHARES LEGUME RESEARCH IN COLOMBIA

As part of efforts to strengthen agricultural development abroad and in America, Ph.D. student Josh Relyea traveled to Colombia for a partner visit with Servicio Nacional de Aprendizaje (SENA, National Learning Service) from April 12-19, 2026. His advisor, Dr. Matthew Blair, is the PI for the project titled, "Building on Cowpeas for Colombia: Legume Systems for Nutritional Security and Monitoring Emerging Pathogens for Food Security and Defense."

The trip was centered on gaining experience in agricultural sector topics, including multiple sub-tropical and tropical crops in a set of SENA locations, as well as transmitting information about Tennessee State University (TSU) research on the grain legumes to a Colombian audience. The purpose of the trip was to observe how SENA is expanding its role in agricultural education, applied research, technical training, facility development and community outreach.

The trip also aimed to provide a window for SENA faculty and students on how TSU has advanced its research portfolio of grain legumes beyond the common bean. For example, the initial grain legume that TSU has worked on is cowpea, a favorite element of the cuisine and agricultural production of Southern states from Tennessee to Florida and Texas. SENA has worked with TSU to develop a new set of cowpea varieties in various seed colors for the mid-altitude valleys of the Andean region, under two CEGFSD projects.

The second grain legume TSU has conducted research under the CEGFSD-funded project is the mung bean. Originally from Asia, mung bean is currently not widely grown in America. Relyea is conducting his Ph.D. research on the physiological adaptation of this crop species to the southeastern United States. Mung bean has wide potential across the Southern and Midwestern states, with partnerships and seed exchange between TSU and universities in Iowa, Oklahoma, South Carolina and Virginia.



Ph.D. student Josh Relyea gives his presentation at AgroSENA.



Cowpeas
(Vigna unguiculata)

Photo: Adobe Stock



Participants pause for a photo during a visit to an urban agriculture site in Cali, Colombia.

Yet neither cowpea nor mung bean is well known in Colombia. Still, both could be popular pulse legumes for importation from the United States and for food security in the rest of Latin America. Cowpea is a major crop in Venezuela and spills over into coastal regions, but mung bean is only produced in a small region of Peru.

The trip included a presentation by Relyea on grain legume productivity with professors and students from SENA attending, followed by presentations by their staff on new entomology innovations, electric motors and potential in agricultural equipment, as well as practicing renewable strategies for coffee bean packaging. The presentations introduced current research activities and future goals for SENA's agricultural programs. These reports showed how SENA is connecting crop protection, optimal mechanization, technology and hands-on instruction to prepare students and producers for modern agricultural systems.



The NGO team visited a local hillside horticulture project.



Mung bean (Vigna radiata)
Photo: Adobe Stock

The trip included visits to farms and community-based projects that collaborate with SENA, including Ecogranja Urbana El Colibrí and Jóvenes Cultivando Futuro. At the latter, Relyea observed the full horticultural production process useful for vegetables and legumes, from seedling germination to plant care, packaging, transportation, sale and final consumption. Overall, the Colombia trip showed Relyea how SENA has built a practical agricultural education and research system connecting students, producers, farms, schools and communities. It updated the SENA partners on the TSU work for grain legumes, which is important for food security in the United States and Latin America. Regarding future collaboration, SENA continues to support innovation by introducing and evaluating new crops (such as cowpeas and mung beans) with advice from TSU within its agricultural programs. ///

JAMAICA-U.S. RESEARCH HELPS FARM ANIMALS BEAT THE HEAT

As heat waves intensify and extreme storms become more frequent, farmers around the world are facing a pressing challenge: how to protect livestock as the weather itself continues to change. Led by Dr. Ryszard Puchala at Langston University, in collaboration with Tuskegee University, this project is conducted under Phase 4 of the 1890 Center of Excellence for Global Security and Defense (CEGFSD). The project's overall goal is to mitigate the effects of stress in Caribbean animal production, offering practical, science-based solutions that benefit farmers, improve animal welfare and strengthen food security across the Caribbean region and beyond. The project, carried out in collaboration with several Jamaican agricultural partners, focuses on reducing heat stress in livestock, a growing problem directly affecting animal health, farm productivity and the strength of local food systems. A finding of the project could benefit the U.S. production system.



Devastating effects of Hurricane Melissa, Jamaica 2025. Photo and Illustration: Adobe Stock

When Shade Disappears, Heat Stress Rises Post Hurricane

The urgency of this work became clearer following deadly Hurricane Melissa, a Category 5 storm that struck Jamaica in 2025. Melissa is the strongest recorded hurricane to make landfall in Jamaica, according to NOAA. In addition to widespread damage to buildings and infrastructure, the hurricane caused extensive loss of trees.

Leaf stripping and the destruction of tree canopies eliminated much of the natural shade that grazing animals depend on to stay cool. With shade suddenly gone, goats were exposed to intense direct sunlight and a much higher heat load. For many farmers, the loss of natural shade proved to be one of the most serious and unexpected consequences of the storm.

Simple, Affordable Solutions

Rather than relying on costly infrastructure, the research team partnered directly with farmers to develop and test practical, affordable solutions that can be implemented in almost any setting. These innovations included heat-resilient shelters built from readily available commercial wood pallets, solar-powered fans to enhance airflow, and portable tools for rapid assessment of body temperature and respiration rates. The approach also incorporated noninvasive thermal imaging to detect heat stress without handling animals, along with low-cost ultrasound technology for efficient pregnancy monitoring.

Training and demonstrations were a vital part of the project. In addition to farmers and extension personnel, students from the Caribbean and United States participated in research on natural remedies to combat heat stress and gained hands-on experience to help prepare them to become the next generation of agricultural professionals. By combining classroom learning with on-farm demonstrations, participants developed skills they could use immediately.

Comparing Heat Stress in Jamaica and Southern United States

Although conditions in the southern United States are generally less severe than in the Caribbean, the risks remain significant. In Jamaica, the heat load index, a measure of cumulative heat stress experienced by animals, remains very high for up to eight months of the year. In contrast, similar conditions typically occur in the southern United States for only about two months annually. By working with Caribbean partners who face prolonged heat stress, U.S. researchers and producers can better develop and refine mitigation techniques needed to protect livestock as temperatures continue to rise. These new mitigation techniques could also be used by farmers in the southern United States.



Data is collected in the newly constructed shelter in St. Thomas parish.

LANGSTON UNIVERSITY



Langston University students evaluate the efficiency of low-cost pregnancy ultrasound device.

Benefits That Reach Beyond Jamaica

Jamaica's extreme tropical climate provided a real-world testing ground for heat mitigation strategies that are becoming increasingly relevant to warmer regions of the U.S., particularly the Southern states. One important finding of the project was that Boer goat breeding stock imported from the U.S. showed better adaptation to summer heat than goats maintained under Oklahoma conditions. Building on these findings, molecular and physiological studies are now underway to better understand how animals adapt to heat. This knowledge will support the development of endurance in goat herds capable of maintaining health and productivity under increasing thermal stress in both Caribbean and U.S. production systems.

An important part of this project is providing support for U.S. breeding stock and encouraging future U.S.-Caribbean breeding imports, which directly support U.S. farmers while strengthening hardy livestock systems. ///

CEGFSD CONVENES SPECIAL SESSION AT 2026 ARD RESEARCH SYMPOSIUM

The 1890 Universities Center of Excellence for Global Food Security and Defense (CEGFSD), one of six centers of excellence at 1890 universities identified in the 2018 Farm Bill, organized and led a special session at the 2026 Association of Research Directors (ARD) Research Symposium, held in New Orleans from March 28-31, 2026. Convened biennially since 1976, the ARD Research Symposium is the flagship gathering of the Association of 1890 Research Directors, the federation of the 19 autonomous 1890 land-grant universities, bringing together scientists, faculty and students to present research and build partnerships across the food and agricultural sciences. Now in its 22nd edition, the symposium drew more than 1,500 participants.

Convened under the symposium theme "Innovations in Food, Health & Agriculture: Technological Advancements, Ecological Resilience, & Economic Sustainability," the two-and-a-half-hour workshop titled, "Innovations and Technical Advancements for Improved Global Food and Nutritional Security," explored how emerging technologies, ecological stewardship and inclusive economic strategies are reshaping food systems in the face of extreme weather volatility, resource scarcity and economic instability. The session was organized and moderated by CEGFSD director, Dr. Moses T. Kairo, and associate director, Dr. Stephan L. Tubene, both of the University of Maryland Eastern Shore (UMES).

The first part of the session, "Global Food and Nutrition Security in 2026," featured a keynote speaker and a panel discussion examining the current state of innovation in food, health and agriculture, as well as the significant role of collaborative partnerships. Moderated by Kairo, the panel drew leaders from international, public and private-sector institutions, including Dr. Eugenia Saini, executive secretary of FONTAGRO; Dr. John M. Ulimwengu, senior research fellow at the International Food Policy Research Institute (IFPRI); Dr. Anuoluwapo Samuel Frank-Lawale, Livestock Genetics, Nutrition and Feed Resources Program leader at the International Livestock Research Institute (ILRI), Nairobi; and Dr. Bianca Datta, scientific partnerships manager at The Good Food Institute.



Panelists engage in discussion during the first part of the CEGFSD special session, "Global Food and Nutrition Security in 2026", at the ARD conference.



Panelists engage in discussion during the second part of the CEGFSD special session, "CEGFSD in Action: Impacts, Lessons Learned Challenges and Opportunities," at the 2026 ARD conference.

The second part, "CEGFSD in Action: Impacts, Lessons Learned, Challenges, and Opportunities," showcased the Center's work over the past five years through short presentations and a panel discussion centered on technological advancements, ecological strength and economics. Moderated by Tubene, presenters included Dr. Ryszard Puchala of Langston University, Dr. Buddhi Raj Gyawali of Kentucky State University, Dr. Jessica Epple-Farmer of Lincoln University, Dr. Brou Kouakou of Fort Valley State University and Dr. Purushothaman Natarajan of UMES. Together, their presentations highlighted innovations in precision agriculture, regenerative practices and community-based food systems across the Center's partner institutions.

The timely session attracted more than 80 participants. By fostering interdisciplinary collaboration and spotlighting transformative initiatives and partnerships, the session strengthened the role of 1890 universities in advancing global food endurance and supporting communities both in the Unites States and abroad. The session also placed emphasis on student engagement, offering attendees a range of opportunities and academic advancement in global food and agriculture and reinforcing the Center's commitment to building a workforce of the future. ///

USDA U.S. DEPARTMENT OF AGRICULTURE

Non-discrimination statement

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotape, American Sign Language, etc.) should contact the State or local Agency that administers the program or contact USDA through the Telecommunications Relay Service at 711 (voice and TTY). Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at How to File a Program Discrimination Complaint and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1) mail: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Mail Stop 9410, Washington, D.C. 20250-9410; (2) fax: (202) 690-7442; or (3) email: program.intake@usda.gov.

USDA is an equal opportunity provider, employer, and lender.

UNIVERSITY OF MARYLAND EASTERN SHORE

CEGFSD STAFF



Director
Moses T. Kairo, Ph.D. DIC
Professor and Dean



Associate Director
Stephan Tubene, Ph.D.
Professor and Chair



Assistant Director
Maricelle Saullo, MBA, M.Ed.



Program Coordinator
Carlos Cruz, BA



Data Analyst
Mahsa Sheikhi Karizaki, M.S.



Food Security Research Assistant
Tseganesh T. Sete, M.S.

Contact us:
email: cegfsd@umes.edu
Trigg Hall, Suite 1122
University Blvd. S.
Princess Anne, Md. 21853
ph: 410-651-6740
www.umes.edu/sans/ncoe/cegfsd/

This work is supported by the USDA National Institute of Food and Agriculture, Centers of Excellence at 1890 Institutions. CEIED Award # 2021-38427-34838, CEIED Award # 2024-38427-43458, and CEGFSD Award: 2025-38427-45221.

If you require a reasonable accommodation or need materials in another formation, please contact: ADA@umes.edu or call 410-651-6135.

The CEGFSD Newsletter is published by the Office of Agricultural Communications. agcomm@umes.edu | 410-651-6084