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Testimony of
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“A Review of Title VII: University Perspectives on Research and Extension Programs”

Introduction

Chairman Baird, Ranking Member Spanberger, and members of the Committee, on behalf of Dr. Paul Jones, Chair of the 1890 Council of Presidents and President of Fort Valley State University in Georgia, Dr. Heidi M. Anderson, President, University of Maryland Eastern Shore, my Fellow 1890 Agriculture Deans, Research Directors, Extension Administrators, and the entire 1890 land-grant community, I would like to thank you for this opportunity to speak about programs under Title VII of the Farm Bill many of which are critically important for 1890 land-grant universities.

I am Moses T. Kairo, and I have the privilege of serving as a Professor and Dean for the School of Agricultural and Natural Sciences at the University of Maryland Eastern Shore (UMES). I have been committed to the mission of 1890 land-grant universities for over 18 years during which time I have been fortunate to serve two of these fine institutions in various leadership capacities.

UMES was founded on September 13, 1886, as the Delaware Conference Academy. For the last 137 years, UMES has distinguished itself for delivering on the land-grant mission. Today, UMES is a Carnegie II Doctoral Research University offering innovative programs in agriculture, health care, and STEM areas.

Some of our undergraduate majors include: Agriculture, Agribusiness, Environmental Science and Human Ecology; and graduate programs at the masters and doctorate level in Food and Agricultural Sciences, Marine, Estuarine and Environmental Sciences and Human Ecology. However, today I am honored to appear on behalf of the entire 1890 community.

Title VII of the Farm Bill provides critical resources to support the three core mission components of research, extension and workforce development at UMES, and the other eighteen 1890 land-grant universities. The resources provide the fundamental capacity that allows the universities to implement programs. The universities also leverage this support to obtain additional resources

from the public and private sectors in furtherance of these mission components and deliver services to clientele.

I would now like to provide a brief explanation as to why Section VII of the Farm Bill is so important to 1890 land-grant universities. But, before I do that, I would like to thank the Congress, the Biden-Harris Administration and previous Administrations for their support and efforts on behalf of the 1890 land-grant universities.

Agricultural Research (Evans-Allen, Section 1445) and 1890 Extension (Section 1444) at 1890 Land-Grant Colleges, including Tuskegee university

At UMES, the funds underpin the Agricultural Experiment Station and 1890 Extension which together implement programs focusing on: food security; natural resources and environmental health; and human health and development. Our work within these themes focus on critical issues that address local, regional, national or even global dimensions. Let me highlight a few examples to illustrate why this is so important to our integrated activities.

Food Security - Supporting a Critical Regional Industry

The poultry industry is the major economic driver on the Delmarva Peninsula. According to the Delmarva Chicken Association, it generated \$5 billion in wholesale value in 2022 supporting approximately 1,300 farm families raising chickens and 18,300 chicken company employees. One of the biggest challenges for the industry is attracting new employees. UMES plays a critical role in training and exposing students to careers in the industry. B.S., M.S. and Ph.D. graduates from UMES are employed by the industry. UMES faculty work closely with industry partners such as Merck, Perdue, Mountaire, Zoetis, Micronutrients, etc., to conduct critical applied poultry research. UMES faculty partner with our land-grant partners, University of Maryland College Park, and University of Delaware faculty to conduct extension educational workshops for chicken growers on Delmarva. These workshops are held every other month and cover critical topics in poultry production. Average grower attendance at these meetings is about 30-40.

Protection of the Chesapeake Bay

The Chesapeake watershed encompasses no less than six states and the District of Columbia. It is a major economic driver for the region with a footprint of \$18 billion dollars. Therefore, its protection is a priority for all. Using Evans-Allen dollars, UMES in cooperation with the USDA Agricultural Research Service (ARS) has for over 20 years conducted monitoring of ground water for nitrogen and phosphorus to determine lateral movement of nutrients into ditches hence into the waters of the Chesapeake. As part of this effort, we are working on methods to control nutrients using curtains filled with gypsum to prevent phosphorus from moving into ditches. This method has been shown to reduce 95% of all phosphorus from moving into ditches and has been deployed at several farms in the region. Since gypsum as flue gas desulfurization gypsum is a by-product of coal burning plants, use of this material serves to advantages providing a useful method and using a waste product to do it. The gypsum is approved by EPA for this use. Also,

in cooperation with ARS, two techniques for reducing nitrogen runoff have been examined. While each are in the early stages of their development, they show in principal the promise to reduce nitrogen runoff by injecting dry poultry liter into the soil and break nitrates down to nitrogen gas which is returned to the atmosphere using in-ditch reactors that act on the nitrates. Work is ongoing to examine the source of urea in waters which at one time was thought to be due to agricultural activities, it is now clear that it is formed through natural processes and use of urea as an alternative source of nitrogen by farmers does not result in nutrient enrichment of the bay. This is part of our commitment to an environmentally responsible sustainable agriculture.

Advancing Digital Agriculture: Leveraging Precision Techniques, Robotics and Artificial Intelligence, Multispectral Drone Imagery, and Variable Rate Technologies

Overcoming fundamental challenges in digital agriculture at the frontiers of computing, engineering, agriculture, and the environment has a vast potential for transformative innovations that can pave the way toward a more sustainable and climate-resilient food production system. Digital agriculture and smart farming approaches are being explored at UMES at two different scales and scopes. The focus of our work is to optimize production agriculture practices by harnessing the power of subsurface drip irrigation, wireless soil moisture sensors, drones with multispectral cameras, automated grid sampling, variable rate seeding, and variable rate fertilizer application, to optimize resource allocation, enhance crop health, improve yield, enhance profit, and promote environmental stewardship for corn, soybean, and wheat rotation crops. The ‘smart’ agriculture team is also working on developing intelligent GPS and digital compass-guided robotic platforms in water and agricultural fields that collect geo-located water quality data and agronomic field data at user-specified waypoints. A critical component of this work is that it also provides opportunities for experiential training of students.

A Focus on Underserved Farmers and Communities

The 1890 land-grant universities have a specific mission to reach underserved farmers and communities many of whom are small, socially disadvantaged, and limited-resource farmers who are faced with many constraints that prevent them from capitalizing on available opportunities. Thus, the 1890 universities have implemented a range of research and extension programs that specifically target these clientele with the goal of removing constraints. These constraints include technical support, certifications/regulation issues, competition in the marketplace, inability/inconsistency to produce large volume to satisfy a market, lack infrastructure (cold storage and hauling capacity of produce to reach long-distance markets) and difficulty in sourcing planting materials for certain specialty crops. In response, the UMES Small Farm Program has established the “Around the Bay Farmers’ Alliance Inc.,” which now has a membership of 52 small farmers across the Eastern Shore. The program has provided farmers with a safe place where farmers can work together and get solutions to their problems. UMES conducts individual on-farm training on crop production practices, harvesting, storage, packaging, marketing, record keeping, and grant writing assistance with a focus on crop diversification. Fifty percent of the farmers have obtained GAP training and are getting ready to be audited this year to become GAP certified producers. Furthermore, over 50% of the farmers have registered as local certified growers with the Maryland Department of Agriculture and are

in the process of getting their nutrient management plan which will enable them to operate as certified local growers. Forty percent of small farmers are connected to new markets, food hubs and the Maryland Food Bank. UMES extension agents have worked with these farmers to mobilize resources for the establishment of an aggregation center equipped with cold storage, and refrigerated truck, selling over 10,000 lbs. of produce weekly. Over 50 specialty crops and herbs are grown on the UMES Demonstration Farm to provide small farmers with research-based information and educational workshops annually.

We respectfully request Congress to Reauthorize:

Agricultural Research (Section 1445, Evans Allen) at 1890 Land-Grant Colleges, including Tuskegee University and increase the authorization to the equivalent of 40 percent of Hatch appropriations; allow Evans-Allen funds to be used for graduate students' tuition and fees.

Extension at 1890 Land-Grant Colleges, including Tuskegee University and increase the authorization to the equivalent of 40 percent of total Smith-Lever 3(b) and 3(c) appropriations.

Capacity Building Grants Program for 1890 institutions – Building Research, Extension and Teaching Capacity

The 1890 Capacity Building Grants Program has played a critical role in helping 1890 land-grant universities to develop capacity in research, extension and teaching. The program allows 1890 universities to attract and retain high quality faculty and enables them to establish high quality programs which are responsive to stakeholder needs. Let me illustrate the impact of the program by highlighting the work of two faculty:

Dr. Salina Parveen has been at UMES for the last 15 years. During this time she has leveraged funds from this program to develop a thriving and impactful internationally recognized research and education program in food safety and water quality, with collaborators from academia, industry, state and federal agencies. She has leveraged more than \$20 million to support her work. She has trained 13 Ph.D. and five M.S. students as well as many B.S. graduates who now work for the federal government, in industry and other universities. Results from her work have been used by the scientific community, regulatory agencies and industry to address food safety challenges for seafood and poultry. For example, methods developed through her work to control vibrios in oysters and *salmonella* in poultry are being applied in the field. Her research has generated many scientific publications in nationally and internationally recognized peer-reviewed journals. She has written many book chapters, technical reports, conference abstracts and presentations across the globe. She has/is serving on multiple regional, national and international committees.

Dr. Simon Zebelo, a relatively new faculty member, has been with UMES for 8 years. He, has leveraged funds from this program to establish a thriving research and education program which has now grown to receive more than \$7.5 million dollars in grant support. He has trained four Ph.D. and six M.S. students and multiple B.S graduates who are working for industry and academia or pursuing advanced degrees. He has published 11 papers and more than 50 abstracts with his students. Dr. Zebelo has established a Center for Integrated Pest Management at UMES. He also currently provides leadership for the Northeast Regional Component for the USDA-NIFA funded Inter-Regional Research program (IR4) which provides pest management solutions for minor crops. IR4 is another critical program under Title VII which is celebrating its 60th anniversary this year. This program serves many farmers in the region. Under the program, Dr. Zebelo collaborates with 23 researchers from 13 states and the District of Columbia.

We therefore respectfully request Congress to Reauthorize the Capacity Building Grants Program for 1890 institutions.

Scholarships for Students at 1890 Institutions - Training the next generation of food and agricultural workers

America has been a global leader in agricultural research and innovation driven by the availability of sharp minds many of whom are trained at land-grant universities. Over the last four years, the Scholarships for Students at 1890 Institutions have made a significant contribution in supporting a growing number of scholars across the 1890 universities. Since 2020, UMES has accepted 105 students into the program including our incoming class. The students accepted into the program join a special community of land-grant scholars who receive advising and mentoring, and professional development to ensure their success inside the university and beyond. All the funds appropriated have been encumbered. This year we have had to turn away 470 qualified students who wanted to join the program.

Chairman Baird and members of the committee, the investment of resources to provide scholarships to students is a game-changer. Not only do the resources allow us to recruit and retain highly competitive students, but also they ensure that recipients can graduate with minimal or non-existent loan burden. Investment in the future is a smart investment that will bear dividends for many years to come by ensuring that there is a skilled workforce to fill the many critical jobs that will bolster the US economy. This program is truly making a difference.

With therefore respectfully request support for the reauthorization of the Scholarships for Students at 1890 Institutions and that this program and funding be made permanent.

Centers of Excellence at 1890 Institutions

The 2018 Farm Bill provided resources for the establishment of at least three strategic Centers of Excellence at 1890 universities. With the support of Congress and USDA, we have been able to stand up six Centers. The primary purpose was to provide the universities with an opportunity to work collaboratively and synergistically to address critical issues of relevance to stakeholders. A critical pillar of these Centers was to maximize on the competitive capability in multi-disciplinary expertise while concurrently mobilizing competitive funding resources to expand activities. A primary goal of the Centers was to substantially increase diversity in the STEM pipeline, increase profitability and jobs in underserved farming communities and enhance talent preparation related to global food security. UMES coordinates one of the centers - the Center of Excellence for Global Food Security and Defense (CEGFSD). This Center supports teaching, research, extension, and integrated projects designed to supply the country with a globally educated workforce and addresses critical needs in the area of global food security and defense. The Center brings together all 19 universities with activities being focused in eight priority areas including agricultural productivity; reduction of global poverty; enhancement of global food supply chains; improving food safety; impacts of trade on food availability, access, use and stability; advancement of long-term prosperity of the U.S. through global food security and defense initiatives; global climate change; and emerging technologies. Projects are implemented in four sub-regions: West/Central Africa, East/Southern Africa, Latin America, and the Caribbean. The Center received its first award in 2020 but while the COVID-19 pandemic slowed initial startup, rapid progress is being achieved. To date, about 126 students have participated in experiential learning activities; 11 new or enhanced courses or curricula were developed and offered to students; 33 new technologies and/or processes were developed and introduced to address global food and nutritional security challenges; 88 training or professional development workshops were offered to stakeholders; and approximately 932 farmers were engaged in effective production practices with market accessibility.

We therefore, respectfully request that Congress reauthorize the existing 1890 Centers of Excellence, that the number of Centers be increased from six to ten and request annual appropriations of \$5 million per center. Proposed titles for the new centers are: Climate Change/Climate Smart Agriculture; Forestry Resilience & Forestry Conservation; Food Safety/Bioprocessing/Product Development; and Transdisciplinary Social Science Research for Food and Agriculture.

1890 Facilities Improvement Program - Research and Education Infrastructure

While the School of Agricultural and Natural Sciences has continued to deliver impactful outcomes to clientele, there is a dire need to update and modernize its facilities. This is imperative, if we are to continue to be effective in attracting faculty, training students and researching and delivering knowledge solutions. Many of the support facilities at UMES and across the 1890 universities communities are among the oldest on campuses, and years of limited resource

support means that they require major upgrades to allow the delivery of 21st century research and education programs. UMES has strategically used resources received under the 1890 Capacity Building Program to maintain or develop some limited facilities. For instance, the university acquired and is operationalizing a new 382-acre research and education farm. However, activities under the program take a long time to implement because of the resource disbursement process. Specifically the limited size of the program, means that it can often take years for a university to implement a construction project. For instance, it has taken 10 years for UMES to accumulate \$9 million dollars in order to break ground for the construction of a 25,000 square foot research and education building. During this time, construction prices have tripled and now \$31 million is required to implement the same project.

In addition, the United States faces a serious challenge due to the current and projected shortage of veterinarians. According to the United States Department of Agriculture, 500 counties in 46 states reported a critical shortage of veterinarians in 2022. The demand for veterinarians to serve the pet industry in the highly urbanized metropolitan areas is expected to continue to grow. A similar high demand exists in rural farming communities where there is an acute shortage of large animal veterinarians as many are aging out of the profession. There also is a critical need to diversify the veterinary workforce in the nation. White Americans make up over 87% of the profession, with minorities being a small proportion and blacks less than 2% of the total. There are only 33 veterinary colleges in the United States, which admit only about 10-15% of the applicants for the DVM degree. Therefore, the demand for a DVM Programs is expected to be high. Only one 1890 land-grant university has a veterinary school, Tuskegee University. The need to establish another Veterinary Medicine Program at an 1890 campus is imperative. UMES is exploring the establishment of such a school with the goal of collaborating with other universities to expand opportunities for African-American and other minority students to join the profession.

1890 universities have an immediate need to improve their academic, research and Extension physical facilities. One hundred years of very limited resources for agricultural infrastructure and maintenance at the 1890 institutions and inflationary impacts have taken their toll. There is need for infrastructure support for new programs that address critical needs such as Veterinary Science workforce needs.

With therefore respectfully request support for the reauthorization of the 1890 Facilities Improvement Program with an increase from \$30 million to \$100 million.

We also support H.R. 8803, the IGNITE HBCU, TCU, and MSI Excellence Act introduced by Representative Alma Adams in the 116th Congress which would establish a grant program to support infrastructure improvements of historically Black colleges and universities (HBCUs), tribal colleges and universities (TCUs), and other minority-serving institutions (MSIs), including Hispanic-Serving Institutions (HSIs) and Asian American and Native American Pacific Islander-Serving Institutions (AANAPISIs).

Conclusions

The 1890 Land-Grant universities are making an indispensable contribution at the local, regional and national level to ensure that the nation is supplied with a diverse, skilled workforce to fill critical positions in the food and agriculture industry. Research and extension programs underpin the development of vibrant rural communities. They are generating innovations and solutions to address critical national challenges, create jobs, safeguard and sustain our food supply, and facilitate the utilization and protection of our natural resources. These programs are making significant impacts on the youth, families, producers and communities served by 1890 universities.

We are very grateful to you for your past support under Title VII of the 2018 Farm Bill and we seek your commitments to the following 1890 universities priorities under Title VII of the 2023 Farm Bill:

- Reauthorization of the Evans-Allen (Research and Education Programs) with the percentage share of Hatch funds be increased from 30% to 40%.
 - Tuition and fees for graduate students will be an allowable expense for Evans Allen.
- Reauthorization of 1890 Extension Program with the percentage share of Smith Lever funds be increased from 20% to 40%.
- Reauthorization of the 1890 Capacity Building Grants Program.
- Reauthorization of the 1890 Facilities Improvement Program
- Reauthorization of the Centers of Excellence and request an allocation of \$5 million per year per center.
 - Increase the number of number of Centers of Excellence from six to ten—each at \$5 million per year per center: Proposed titles: (1) Climate Change/Climate Smart Agriculture; (2) Forestry Resiliency & Forestry Conservation; (3) Food Safety/Bioprocessing/Product Development; and (4) Transdisciplinary Social Science Research (specific to the food and agriculture sector).
- Reauthorization of the Scholarships for Students at 1890 Institutions.

I am deeply grateful for the opportunity to give this testimony and to share perspectives from UMES. I have no doubt that given the opportunity, my fellow deans from each of the 19 universities would share similar perspectives from their locales. Therefore on behalf of the faculty, staff, students and clientele that we serve across the 1890 land-grant system, we thank you for your continuous support of our institutions and agriculture. I look forward to answering any questions you may have for me today. Thank you.