bold TRANSFORMATIONS 2025

1890 RESEARCH: AN INDISPENSABLE INVESTMENT

Strategic Agenda for 1890 Research and Innovation in the Food, Agricultural and Environmental Sciences

2019-2025

ARD'S call to arms:

Photo courtesy of N.C. A&T State University.

"Since new developments are the products of a **creative mind**, we must therefore stimulate and encourage that type of mind in every way possible." **GEORGE WASHINGTON CARVER**

chair's MESSAGE

Moses Thairu Kairo

Bold Transformations 2025. This strategic plan presents a thoughtful and innovative approach to transforming the research enterprises in the food, agricultural and environmental sciences at the 19, 1890 land-grant universities into an impactful, laser-focused and high-profile research network – the Association of 1890 Research Directors, Inc. (ARD).

In the spring of 2017, at the 18th Biennial Research Symposium, a broad constituency began a forward-looking and engaging process directed toward creating the future for these historic universities. In this undertaking, the major challenges related to global food and nutrition security were considered relative to the needs of our internal and external stakeholders in the 1890 region and the requirements necessary to enhance transformational research in the food, agricultural and environmental sciences.

Higher education, including the food, agricultural and environmental sciences, is facing significant social, economic, technological and global challenges. Our research scientists, along with the stakeholders, were asked to think boldly, insure system-wide participation, identify the pressing problems, study the facts/data, set priorities and maintain a regional/national/global-wide perspective. These actions are essential to facilitate continuity in the strategic visioning process in light of the recent publications, Agriculture and Rural Prosperity Task Force report, the Challenge of Change report, Science Breakthroughs 2030 report, and the 2018 Farm Bill, "Agriculture Improvement Act of 2018."

The result of their efforts is ***Bold Transformations 2025***, which reflects the bold and cohesive vision for ARD's preferred future and outlines the priority areas, goals and thrust areas that it will collectively take as we begin our journey toward the next decade – a journey that insures we are a regional research association that prepares tomorrow leaders, invest in our communities and meet global challenges in the food and agricultural sector. Because of the complex nature and magnitude of the pressing problems in the food, agricultural and sciences, transdisciplinary approaches must be an important part of the ARD's discovery and learning portfolio.

By implementing ***Bold Transformations 2025***, ARD will become a leading research association by making the strategic choices necessary to transform itself and achieve its vision. The ARD faculty and staff at the 19 member universities are committed to carrying out this agenda, and they are committed to the 1890 mission of providing access and enhancing opportunities.

Sincerely,
Moses Thairu Kairo, *Chair (2016 – 2018)*
Association of 1890 Research Directors, Inc.

purpose
of the Strategic Research Agenda

Bold Transformations 2025 builds on everything that has been previously accomplished by the 1890 research scientists and recognizes the hard work and dedication of the incredible talents of many people who positioned the 1890 institutions for the next giant leap. This strategic research agenda is a living framework that allows for a "call for action."

Bold Transformations 2025 is an assertive and progressive roadmap for the Association of 1890 Research Directors, Inc. (ARD) for the next five years. It articulates our vision, mission, passion, core values and research priorities for ARD's administrators and research scientists to follow to achieve those ends. Our overall funding strategy is to support a broad-spectrum of stakeholder-based and investigator-initiated research in fundamental and applied science in the food and agricultural sector. As such, this research agenda offers the opportunity to engage a community of scholars toward research excellence in the food, agricultural and environmental sciences and to pass a legacy of research to the next generation through:

- Viable research programs focused on society's most pressing needs.
- Domestic and global food and nutrition security.
- An improved quality of life for all rural and urban residents, but especially those with limited resources, from underserved communities, or those who are marginalized.
- Cleaner air and water and better protection of the natural resource base and wildlife.
- Increased diversity and inclusion within the human resource capital, which is essential to this nation's vitality and productivity.

The Association of 1890 Research Directors (ARD), INC

The Association of 1890 Research Directors, Inc. (ARD) is the official representative body of the agricultural research administrators of the 19, 1890 land-grant universities. ARD is considered one of the five regions of the national land-grant university system's Experiment Station Section (ESS) of the Board on Agriculture Assembly (BAA) of the Association of Public and Land-grant Universities (APLU). ARD's 'raison d etre' is to strengthen the research capacity within the 1890 system and to conduct and support research that builds knowledge in ways that respect and benefit the people in the 1890 region. ARD's research mission is the central thread that bring together the teaching and Extension mission areas and is core to their successes. ARD improves communities through research and education, recognizing that the food and agriculture sector is the source of present and future prosperity, just as U.S. Senator Justin Morrill envisioned when he helped create the land-grant system. ARD's 19 universities are elevated to a higher level, yet still accessible to all, no less so to the magnificent sons and daughters of toil.

ARD Mission, Vision and Passion Statements

MISSION
Provide visionary and enlightened leadership to member institutions as they continually address issues impacting their ability to provide innovative solutions to the food and agricultural research challenges facing the state, region, nation and world-at-large.

VISION
The ARD envisions a region and a world with a safe and plentiful supply of food, fiber and water for all, where natural resources and businesses are managed in ways that are sustainable, serve public good and provide innovative solutions to global challenges.

OUR PASSION
ARD's passion is to support our individuals, families, businesses in rural and urban communities, particularly those who are low income, underserved or marginalized.

Core Values

- **COLLABORATE** Seek opportunities to build partnerships at the local, regional, national and international levels. We work with our partners and forge alliances to advance shared priorities, exchange ideas and optimize resources.
- **DISCOVER AND INNOVATE** Strive to be an association of learning and discovery, where creativity and innovation are encouraged and supported. Critical and transformative thinking, inquiry-based learning, forward-looking approaches, scientific knowledge and practical application are hallmarks of ARD's work, programs and initiatives.
- **INTEGRITY/HONESTY** Value trust, trustworthiness, honesty and ethical behavior. ARD deeds will be consistent with our work.
- **INCLUSIVE EXCELLENCE** Value and understand that diversity and inclusion are catalysts for institutional and educational excellence, and are to be encouraged and integrated into the very core of the research enterprise. ARD is committed to protecting and advancing the interest of diverse populations and cultures and acceptance of others without biases based on differences of any kind.
- **ACCOUNTABILITY** Value the ability of our directors, faculty and staff to honor our commitments. ARD is committed to taking responsibility for our work, focusing on finding solutions and achieving results and making what is wrong right to the greatest extent possible. ARD is committed to adhering to general accounting procedures and other policies, procedures and guidelines at the local, state and national levels.
- **COMMUNICATION** Seek opportunities to effectively communicate the process, outcomes and impact of research, and encourage others to do the same.
- **LEGACY** Understand, embrace and support the land-grant mission and foster a growth mind-set and work ethic consistent with that mission.

Strategic approaches

In addition to the sound scientific methods that ARD directors, faculty, staff and students are using, ***Bold Transformations 2025*** will incorporate the transdisciplinary, systems thinking and the design-thinking approaches that, we believe, are critical to driving significant advances for critical societal challenges.

The transdisciplinary approach is holistic in its thinking, crossing the boundaries of two or more disciplines. It also is considered authentic in that it looks at problems and issues that are relevant to the real world and meshes the expertise from several different and related professional disciplines.

In the Breakthrough 2030 report, the authors state that: "Food and agricultural research needs to be broadened to harness advances in data science, materials science and information technology. Furthermore, integrating the social sciences (such as behavioral and economic sciences) to correctly frame problems and their solution space is essential, as the food and agricultural system is as much a human system as a biophysical one."

A transdisciplinary approach focuses on the needs of the end-user, is not additive in perspective, is synergistic and has no boundaries in its mode of operation.

The systems approach means you consider all the different parts of a system and how they are related to each other. For example, a researcher works with a farmer to help increase yield, suggests adding fertilizer, yield increase and the problem solved. That's a component approach. But if that same researcher considers the additional impact that fertilizer might have on water downstream, or the soil or any animals or humans consuming the product, that's a more systems approach. The systems approach addresses real-world situations by assuming that when one variable is changed, all other variables may be affected by that variable and all ensuing interactions.

The systems approach considers effects across sets of variables and call for dynamic modeling with the expectation that changes will be non-linear and discontinuous.

Because the systems approach is holistic, in that it encompasses all relevant factors in its analyses, it is useful in gaining insights that permit imaginative and illuminating syntheses, as this is a "both-and" rather than an "either-or" world. This requires synthesis in developing an understanding that strict disciplinary thinking can impede this process, as disciplines are based more on analysis than synthesis. A systems approach to contributing to solutions in the food and agricultural sciences, therefore, call for transdisciplinary cooperation and coordination.

Our final approach is design thinking which is also holistic and non-linear. One model shows the five steps of design thinking – empathize, define, ideate, prototype and test. You go from working with the people who have the problem, to further defining the issue, to thinking about how to design a solution, to developing a prototype and then to testing that prototype.

A design mindset is not problem-focused, but solutions-focused and action-oriented. It draws upon logic, imagination, intuition and systemic reasoning, to explore possibilities to what could be – to create desired outcomes that benefit the end user.

The design-thinking approach differs from the scientific method, which begins by thoroughly defining all parameters of a problem to create a solution. Design thinking identifies and investigates the known and ambiguous aspects of the current situation to discover hidden parameters and open alternative paths that may lead to the solution. Because design thinking is iterative, intermediate solutions are also potential starting points of alternative paths, including redefining of the initial problem.

Within these five steps, problems can be framed, the right questions can be asked, more ideas can be created and the best answers can be chosen. Again, the steps are not linear, can occur simultaneously and can be repeated.

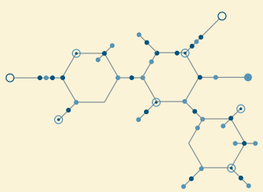
Transdisciplinary, systems and design-thinking approaches will allow ARD's cadre of researchers to refined some existing approaches and strategies that will be useful in executing ***Bold Transformations 2025.***

bold TRANSFORMATIONS 2025

PRIORITY AREAS

Bold Transformations 2025 includes seven 1890 Research Priorities. They are:

1. Empower individuals, families and communities by increasing the knowledge and skill base, and developing behaviors to address the daily quality of life issues.
2. Improve health, nutrition and wellness issues confronting local and global communities.
3. Ensure local and global food and nutrition security.
4. Ensure the viability, sustainability, competitiveness and profitability of small- and medium-scale agriculture.
5. Assist rural communities to create prosperity and promote economic development.
6. Advance innovations at the nexus of food, energy and water.
7. Protect the environment and natural resources.



Keeping youth involved in STEM activities, like these at Tuskegee University, helps ensure we have a globally prepared workforce for the 22nd century.

priority area 1:

Improving Quality of Life

Empower individuals, families and communities by increasing the knowledge and the skill base, and developing behaviors to address the daily quality of life issues.

These issues relate to financial management, parenting and child development, aging, health and wellness, food and nutrition security, leadership development, personal safety, changing employment prospects and community resiliency planning. It also involves the strengthening of the community infrastructure including high-speed internet connectivity, quality educational facilities, utility and transportation infrastructure, affordable housing and social and economic development. Most of the 1890s have audiences where these issues are major concerns and where intervention is necessary.

RESEARCH THRUST AREAS:

- 4-H youth development.
- Leadership development and civic engagement.
- Financial management.
- Poverty and income distribution.
- Health and nutrition.
- Workforce development.
- Entrepreneurship and economic development.

18 USC 707

Dairy product specialist, Dr. Steve Zeng, chair of the Department of Agriculture & Natural Resources at Langston University, conducting a consumer goat cheese sensory evaluation.

priority area 2:

Improve health, nutrition and wellness issues confronting local and global worldwide communities.

Disparities in health status and access to healthy foods and health care among low-income and minority populations are public health concerns. Nationally, minority populations, particularly African-Americans, suffer higher rates of morbidity and mortality. Changes in medical technology, lifestyle adjustments, healthy foods and environmental protections have not produced equal benefits in racial and ethnic populations. Differences among socioeconomic classes in environmental and occupational exposures are thought to play a key role in health disparities. There is also a disproportionate placement of pollution-intensive industries and hazardous waste sites in low-income and minority communities.

RESEARCH THRUST AREAS:

- Food science and nutrition.
- Undernutrition and obesity.
- Health and education interventions.
- Health disparities.
- Food deserts.
- Health promotion and disease prevention.
- Public, minority and environmental health.

Dr. Arthur Allen, University of Maryland Eastern Shore, regularly tests the effectiveness of a gypsum curtain as a barrier comprised of flue gas desulfurization fly ash (FGD) gypsum, a by-product of coal-fired power generation that will be used to precipitate soluble phosphorus (P) and thereby reduce P concentrations in groundwater before it enters drainage ditches.

priority area 3:

Ensure local and global food and nutrition security.

The world has a food and nutrition problem. The Food and Agriculture Organization (FAO) of the United Nations estimates 795 million people, 11 percent of the global population, were unable to meet their dietary energy requirements in 2014-16. Globally, about one in eight people do not have enough food for an active and healthy life. With an additional 2.6 billion expected to inhabit the world by 2050, FAO estimates there is a need to increase food production by 60 percent to meet the challenge. The search for sustainable food and nutrition security solutions will grow even more complicated, particularly with the backdrop of limited access to clean water, finite land for agricultural production, climate change and evolving diets that demand more high-value food products.

Food insecurity varies in its nature and severity, but is not confined to the low-income nations. For example, the USDA reports that 12.7 percent of U.S. households were food insecure in 2015, representing 42.2 million people. Food insecurity exists in every county in the United States, ranging from a low of 4 percent in Loudoun County, Va. to a high of 38 percent in Jefferson County, Miss.

RESEARCH THRUST AREAS:

- Nutritious, safe and secure food supply that improves public health.
- Functional and health-promoting foods.
- Food loss, waste and food distribution systems.
- Availability, access and use of food and fiber.
- Inclusive and equitable food systems.
- Human, social and behavioral dimensions of food that influence personal and family dietary and health decision-making.

Research conducted at Fort Valley State University starts with the charge of helping people. As a member of that effort, Dr. Brou Kouakou directs the state-of-the art Georgia Small Ruminant Research and Extension Center on campus.

priority area 4:

Ensure the viability, sustainability, competitiveness and profitability of small- and medium-scale agriculture.

More than 90 percent of the farms in the U.S. are small (grossing less than $250,000 annually in farm sales), and these farms account for 51 percent of the land operated by farmers. Forty-one percent of small-family households earned less than the median U.S. household income of $59,039. Small farms are much more likely than large farms to have an operating profit margin (OPM) of less than 10 percent, an indication of high-financial risk. Between one-half and three-fourths of small farms have an OPM that are low compared with 31 to 45 percent of mid-size and large-scale farms. Households operating small farms often receive substantial off-farm income to support their farms and living expenses. Surviving as a small farmer comes with many perils. In addition to small farmers, the financial success of and diversity of agricultural products in rural America depends on young (age 35 or less) and beginning (10 years or less of farming experience) farmers. In-depth knowledge of, and research on this population of young, beginning, small- and medium-scale farmers and issues they face are crucial to ARD.

RESEARCH THRUST AREAS:

- Develop and manage farm/ranch/landowner clusters.
- Marketing.
- Risk management in agriculture and food production.
- Small lot and free-range small ruminants and swine.
- Specialty crops/animals.
- Animal genetics, production and health.
- Plant breeding and production.
- Precision agriculture.
- Smart agriculture/emerging technologies.

Fields days, like this one at North Carolina A&T State University, provide farmers with new techniques and practices that can help them generate profits and support their local communities.

priority area 5:

Assist rural communities to create prosperity and promote economic development.

In support of the USDA's Rural Prosperity initiative, the 1890 land-grant system will work to create thriving communities where people want to live and raise families and where children have a bright future. Infusing rural areas with stronger businesses and agricultural economies empowers America. Expanding funding options to increase the productivity of farmers and ranchers, including small- and medium-sized farmers, will lead to enhanced viability and competitiveness in rural America. By providing innovative and farm technologies, recreation, agritourism and sustainable forest management, communities will be empowered to leverage the bounties of rural America. The focus will also be on leveraging capital markets to increase the government's investment in rural America and promoting the expansion of the bioeconomy by supporting the development, production and consumption of energy and bio-based products.

RESEARCH THRUST AREAS:

- Technological innovations, including expanding broadband capacity.
- Deployment of new crop and animal production and protection technologies and management systems.
- Increased crop yields and improved crop quality.
- Market accessibility.
- Sustainable farm productivity.
- Rural income levels and persistent poverty.
- Renewable energy, bio-based products and energy security.
- Innovations in manufacturing and other non-agricultural industries.

Aquaculture research at West Virginia State University is increasing production efficiency of trout and catfish while providing hands-on learning opportunities for students.

priority area 6:

Advance innovations at the nexus of food, energy and water.

Growth of the U.S. and global population has placed an ever-increasing stress on three key and interconnected resources: food, energy and water. There is a compelling and urgent need to understand, model, design and manage the interconnected food-energy-water (FEW) system, which incorporates natural, social and human-built systems. It is becoming imperative that we determine how society can best integrate across the natural and built environments to provide for a growing demand for food, water and energy, while maintaining appropriate ecosystem services. The overarching goal of the food, energy and water nexus is to catalyze the well-integrated interdisciplinary research efforts to transform scientific understanding of the FEW nexus in order to improve system function and management, address system stress, increase resilience and ensure sustainability.

RESEARCH THRUST AREAS:

- Production, resilience, safety and security of food, energy and water resources.
- The risks of local and global climate change in food, fiber, water and fuel production.
- Crop and animal production.
- Crop and animal health.
- Crop and animal genetics.
- Genomics.
- Soil and water quality research and outreach.
- Sustainable bioenergy and bio-based products.

Nursery invasive insect research at Tennessee State University, Jim Moysenko USDAARS (L) Dr. Jason Oliver (R).

priority area 7:

Protect the environment and natural resources.

Agriculture, beyond growing crops and producing foods, also means conserving scare natural resources and preserving the environment. Farmers and citizens in the 1890 region are faced with issues like ground- and surface-water contamination, soil contamination and erosion, substantial soil health decline and environmental degradation. ARD must respond to the need for developing profitable agricultural systems that protect the environment, harness new ways to conserve renewable resources and enhance our rural and urban communities.

RESEARCH THRUST AREAS:

- Soil health management.
- Sustainable agroforestry.
- Water quality and quantity.
- Renewable energy.
- Sustainable food production/management practices.
- Biodiversity.
- Ecosystem services.

cross-cutting areas

With the changing ecosystem for the food, agricultural and environmental sciences, each of the priority areas has evolved. Along with specific changes in these priority areas, several cross-cutting areas have emerged that are relevant to each of the priority areas. These cross-cutting areas include:

- Big data and analytics.
- Animal, soil and plant microbiomes.
- Sensing technologies.
- Nanotechnology.

These cross-cutting issues provide bridges and links between the seven priority areas, build on the synergies of these priorities and address critical gaps in finding solutions to these vexing problems. Further, these cross-cutting areas will improve our understanding of the complexity of the seven priority areas and ultimately improve the quality of life of the persons in the 1890 region and beyond.

1890 CENTERS OF EXCELLENCE

These seven intersecting research priorities and the four cross-cutting areas enable us to draw from diverse areas of expertise to build transdisciplinary research strengths and capacities. Going forward, ARD will seek ways to strategically invest in supporting research that addresses the increasingly complex and interrelated set of challenges identified in these priorities.

In the process of addressing these problem areas, we are concurrently developing particular strengths that will lead to the development of six interdisciplinary centers of excellence that span the three land-grant mission areas of research, academic and Cooperative Extension. These centers of excellence provide platforms that enable a consortium of researchers among the 1890 institutions, partner universities and private sector organizations to tackle large crosscutting challenges in the food, agricultural sciences and natural resources. A strong core of teaching faculty, research scientists and Cooperative Extension specialists from diverse disciplines who use innovative approaches and methods will drive the impactful outcomes emanating from these centers.

STUDENT SUCCESS AND WORKFORCE DEVELOPMENT

This center will strengthen workforce pipeline diversity in the food and agricultural sciences and ensure that first-generation college students develop disciplinary and job readiness skills to succeed in college and the workplace. This center will serve as the nexus for the creation of Workforce Pipeline Centers, Ag-STEM academies and leadership academies.

Additionally, ARD will continue to invest in the future of science through the holistic undergraduate and graduate training of students through the research symposia. The goal of all 1890 research symposia is "to provide a forum for interactions, knowledge sharing, building networks for expanded partnerships and to showcase the talents and achievements of the 1890 community." ARD's research symposia not only display cutting-edge programs, but they also promote a convocation of experts that create programs that focus on a broad-based research agenda targeting the needs of society, particularly those who are socio-economically disadvantaged. Not only do the symposia promote excellence in student learning, experiences and outcomes, the sessions and workshops help cultivate their potential to assume roles as both scientists and leaders of an evolving knowledge-based, global, digitally-powered economy. Ben Franklin said it best: "Tell me and I forget. Teach me and I remember. Involve me and I learn."

HEALTH WELLNESS AND QUALITY OF LIFE *{Priority Area 1: Improving the quality of life; Priority Area 2: Improve health, nutrition and wellness issues confronting local and global communities.}*

This center will focus on research, academic and Cooperative Extension programs in health promotion, disease prevention, wellness, health disparities, diabetes prevention, obesity, cancer, cardiovascular diseases, sensorimotor defects, human performance, lifestyle choices and allied and public health.

The center institutions will conduct research, Cooperative Extension and education programs that will help in our efforts to reduce the incidences of preventable diseases, create access to healthy foods, curtail escalating healthcare expenditures and adopt strategies to assist people of limited resources in rural and urban settings.

FARMING SYSTEM, RURAL PROSPERITY AND ECONOMIC SUSTAINABILITY *{Priority Area 4: Ensure the viability, sustainability, competitiveness and profitability of small- and medium-scale agriculture; Priority Area 5: Assist rural communities to create prosperity and promote economic development}*

This center will assist small farmers and rural communities in improving their quality of life and expand their income potential by adopting and using the best practices and lessons learned from the generation of engineered systems, products, processes and technologies having impact on agricultural production and marketing.

The focus will be on ensuring resilient rural communities, reducing food deserts, enabling new uses of by-products from traditional and non-traditional crops, animals, and natural resources and efficient water management.

This center will include priorities funded previously within the Center of Innovative and Sustainable Small Farms, Ranches and Forest Lands. We are confident that America's farms, ranches and forests will be the forefront of resolving food system, energy, environmental and climate challenges and achieving global sustainable development goals.

GLOBAL FOOD SECURITY AND DEFENSE *{Priority Area 3: Ensure local and global food and nutrition security}*

The center will actively participate in implementing The Food Safety and Modernization Act (FSMA) by training tomorrow's human capital, undertaking proof of concept research and assisting in public education and Cooperative Extension activities. The center also will promote synergistic collaborative partnerships among 1890 universities, external agencies, developing county governments and civil societies.

The center will engage in and implement initiatives that will promote the prosperity and stability of developing countries while ensuring national security. Universities will engage in transboundary research and education issues, such as phytosanitary concerns, conservation of biodiversity and control of new and emerging diseases. The 1890 universities will become more engaged in disaster recovery, poverty reduction and alleviating starvation and malnutrition. Activities also will include priorities identified by the Center for International Engagement.

NATURAL RESOURCES, ENERGY AND THE ENVIRONMENT *{Priority Area 6: Advance innovations at the nexus of food, energy and water; Priority Area 7: Protect the environment and natural resources}*

This center will support research, academic and Cooperative Extension programs that enhance and do not degrade the natural resource base and other production systems. Faculty will engage in agroecological, sustainable systems and the complex interactions among physical, chemical and biological processes. The center's activities will include research and education programs in the harnessing, management and use of our water and other natural resources and their impact on ensuring a sustainable food supply.

EMERGING TECHNOLOGIES *{Priority Area 4: Ensure the viability, sustainability, competitiveness and profitability of small- and medium-scale agriculture}*

The center will facilitate engagement of the 1890 universities in research, academic and Cooperative Extension programs in emerging technologies that will increase agricultural productivity, enhance small-farm economic viability and re-energize small, rural communities.

The center's activities will include satellite imaging, neutral networks, pervasive automation, biosensors, livestock biometrics, genetically designed and invitro foods. The outcomes of this work will increase the speed and frequency in which small farmers can access and use data. The center will provide training programs for small farmers and farming communities in their access, collection and use of data.

Taken together, these centers of excellence epitomize how interdisciplinary, agility, partnerships and data can seamlessly merge across all three mission areas for maximum impact.

Expanding this approach will not only continue to build critical mass among the 1890 institutions, but also provide an important platform to develop, strengthen and diversify the 1890s' existing strategic strengths. Over the next five years, ARD will build on the seven priority areas to support and strengthen these centers of excellence to attract the greatest minds to push the boundaries of fundamental, applied and translational science. As this takes place, the scientists in 19 research programs at the 1890 universities will work collaboratively with the academic faculty and Cooperative Extension specialists to solve society's most pressing challenges.

EXTERNAL FACTORS IMPACTING PLANNING

Examples of specific external factors impacting research planning at the 1890 universities include, but are not limited to:

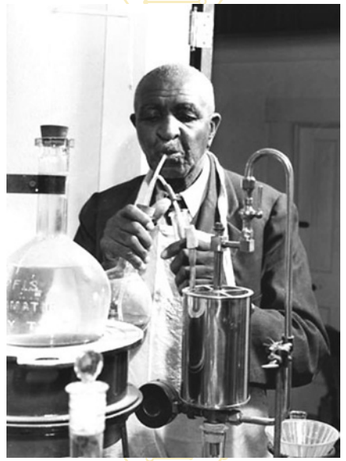
- Public and private funding support.
- Global and national economic, geopolitical circumstances and policies impacting a safe, secure and nutritious food supply.
- Changing requirements of accountability, planning and performance reporting at the state and national levels.
- Responsibilities as the fifth region designation of the State Agricultural Experiment Station (SAES) System.
- Institutional infrastructure issues facing our universities.
- Maintenance of a research portfolio relevant to contemporary and global food system issues and concerns.

THE FEDERAL-STATE PARTNERSHIP

The framework of ARD's strategic planning efforts is linked to the seven strategic goals identified by the USDA's Research, Education and Economics (REE) action plan framework, the National Institute of Food and Agriculture (NIFA) and the State Agricultural Experiment Station (SAES) System. The federal-state partnership in agricultural research has proven to be an invaluable coalition.

"No amount of technologies or external assistance can feed a nation that does not itself **prioritize** food security and agriculture."

NORMAN BORLAUG



George Washington Carver working in his lab.

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United States Department of Agriculture Strategic Plan: FY 2014-2018. 2014. Washington, D.C.

These reports and plans challenge land-grant universities to think and plan boldly and collaboratively in defining their preferred future; to develop appropriate implementation plans; and to mature as 21st century leaning organizations that are more responsive to the needs and issues of the global food system and public accountable.

STAKEHOLDERS' INPUT

The ARD welcomes comments, recommendations, and opportunities for collaboration.
Please contact Dr. Alton Thompson, ARD executive director,
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THE 1890 LAND-GRANT UNIVERSITIES

Alabama Agricultural and Mechanical University, 1875
Alcorn State University, Mississippi, 1871
Central State University, Ohio, 1887
Delaware State University, 1891
Florida Agricultural and Mechanical University, 1887
Fort Valley State University, Georgia, 1895
Kentucky State University, 1886
Langston University, Oklahoma, 1897
Lincoln University, Missouri, 1866
North Carolina Agricultural and Technical State University, 1891
Prairie View Agricultural and Mechanical University, Texas, 1876
South Carolina State University, 1872
Southern University and Agricultural and Mechanical College, Louisiana, 1880
Tennessee State University, 1912
Tuskegee University, Alabama, 1881
University of Arkansas Pine Bluff, 1873
University of Maryland Eastern Shore, 1886
Virginia State University, 1882
West Virginia State University, 1891

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LEADING RESEARCH AND INNOVATION
ASSOCIATION OF 1890 RESEARCH DIRECTORS, INC.