

# Oklahoma State University and Langston University Combined Research and Extension Plan of Work 2022-2026

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## **I. Plan Overview**

### **1. Executive Summary**

This plan of work is a joint plan for the Oklahoma Agricultural Experiment Station (OAES) at Oklahoma State University, the Oklahoma Cooperative Extension Service (OCES) at Oklahoma State University, and the Research and Cooperative Extension Programs at Langston University (LU).

Oklahoma contains a broad array of natural resources, agricultural production regions, commodities produced, communities, families, businesses, and industries. The state ranks 5th nationally in the number of farms and 8th in farm acreage. Vast forage production areas, the ability to graze winter wheat, and the sub climate of the high plains have made cattle production an enormous industry in Oklahoma, ranking 4th nationally in cattle and calves. Wheat, poultry, hay for sale, cotton, nursery crops, forest products, oilseed crops, nuts and vegetables all play an important role in the broad agricultural economy. The level of value added to raw products in the state is low and needs to improve to continue to help diversify rural economies.

Huge fluctuations in weather from recurring statewide drought to periodic flooding present challenges for both research and extension and will continue to have significant implications on agriculture and natural resources in the state. Management of natural resources is significantly affected by ecosystem degradation and loss of services, land use changes and habitat fragmentation, water availability, and climate change. These challenges summarize a global phenomenon in which human activities, both directly and indirectly, influence the management of natural resources. Considerable untapped opportunity exists for the improved use of natural resources for recreation and the development of bio-based industries with an emphasis on sustainable energy.

Human health issues are major economic and social concerns as Oklahoma often ranks high in risk factors such as child and adult obesity and diseases such as heart disease and diabetes. Rapidly changing communities ranging in population from rural to urban also exist within the state's boundaries. Programs must be adapted for the broad and rich ethnic, cultural and social diversity within the state. Issues, challenges, and opportunities with respect to agricultural production, the environment and natural resources, communities and markets, scientific discovery, economic downturn, and technology development exist within Oklahoma, the region, and the nation.

### **Langston University Research and Cooperative Extension Program Goals**

Langston University Research and Cooperative Extension Programs are dedicated to serving all citizens of Oklahoma. However, programs and methods of delivery are often designed to address the needs of under-served and under-represented diverse populations of the state; especially small farmers and limited resource consumers. Langston University Cooperative Extension and Outreach efforts are designed to serve as vehicles to take scholarly, peer-reviewed and stakeholder-driven research findings, demonstrations, and education activities to the citizens of Oklahoma; many of whom still dwell on the other side of the great digital divide. This Plan of Work (POW) includes goals and expected outcomes and impacts. Projected outcomes and impacts will include providing deliverables that contribute to enhancing the economic status, health and quality of life for the citizens of Oklahoma; and to make them more competitive as viable producers and consumers in niche markets and in the broader global marketplace.

### **OAES and OCES Planning Process**

OAES and OCES identified a set of "drivers" as highly influential in shaping many of the issues expected to be important

to Oklahoma citizens, agriculture, natural resources, families, businesses, and communities, as well as, scientific inquiry in the future. These drivers continue to influence planning by OAES and OCES.

- Climate Variability
- Consumer and Public Preferences and Expectations
- Energy
- Land Use and Natural Resources
- Market Volatility
- Pests and Invasive Species
- Population and Demographics
- Public Policy & Government Regulation
- Quality of Life
- Water
- Technology

Goals are reviewed annually based on the drivers and the input from the broad-based advisory groups accessed by the Division. During the spring of 2016, OSU Division of Agricultural Sciences and Natural Resources (DASNR) undertook a process to identify future priorities for the Division. A multi-round, consensus seeking approach, commonly known as the Delphi method, was employed to gather input from stakeholders. The process collected data utilizing a series of questionnaires administered to a panel of experts. The panel was identified by DASNR administrators with a goal to include persons representing the diversity of the Division and its clientele. The first round of the process was open-ended, calling for panelists to list what they believe to be future priorities for the Division, from their perspective. Those responses were used to create items used in the second round. Here, panelists rated each item using closed-ended, scaled responses. As consensus was formed around particular items, additional rounds were used to reach and affirm agreement about priorities. A total of 22 priorities were identified for the teaching, research, and Extension responsibilities of the Division of Agricultural Sciences and Natural Resources.

## OAES GOALS

Develop systems that add value to and increase efficiency, safety and sustainability of animal and plant production systems.

Research efforts will seek to: 1) increase nutritive value, improve food safety, and reduce risk associated with climate variability and increased competition for water; 2) develop systems capable of maintaining economically sustainable levels of production, and identify economically and environmentally sustainable methods of control for pests and invasive species that threaten Oklahoma's agriculture, environment, economy and population to include pests affecting agricultural production (animal and plant), turf, ornamentals, human health, food safety, conservation and natural resources (e.g. forests, lakes, streams, rangeland, wildlife); and 3) develop new products that are derived from agricultural products grown in Oklahoma.

Develop renewable sources of energy.

Researchers will develop knowledge and technology and integrate into systems that can provide new potential sources of income for Oklahoma. Research efforts will seek to identify agricultural production systems and best management practices to help conserve energy (renewable or nonrenewable) and reduce the cost of production.

Evaluate existing and new marketing and economic development systems and public policies.

Research programs will be developed to evaluate marketing systems and government policies that affect the lives of Oklahoma's agricultural producers and consumers. Researchers will provide recommendations to producers and government officials to aid in their decision-making process to help ensure marketing and policy systems are economically sustainable.

Develop best management practices to help conserve Oklahoma's vast natural resources.

Oklahoma's land, air and water resources and wildlife (i.e. forests, wild animal and plant populations, rangeland, soils, lakes and streams) provide benefits for all Oklahomans. Research will be conducted to design and develop management methods to use natural resources in a sustainable, economically and environmentally sound manner.

Develop effective management practices and efficient systems that sustain and conserve water resources.

Oklahoma's water resources provide benefits for all Oklahomans. Research will be conducted to develop the best management practices to sustain water resources and to use water in the most efficient, effective, environmentally sound and equitable manner for all citizens and segments of the economy and in support of our other natural resources.

## OCES GOALS

Provide educational opportunities to help improve the quality of life for all Oklahomans.

Achieving this goal will require expanding the diversity of the audiences we serve and the delivery of educational and service programs that improve the vitality and sustainability of Oklahoma's families, businesses, and rural and urban communities. Through these programs, OCES will address identified issues and needs such as those related to health, family resiliency, understanding of food and fiber production, personal finances, nutrition, food safety and security, housing, economic development, recreation, land and resource use, human capital, and youth competencies in science, life skills and critical thinking.

Educate and inform crop and livestock producers and landowners of appropriate new technologies, changing production methods and economic conditions that impact their businesses.

Examples include changes resulting from higher energy costs and the potential use of forages for energy production. Both will lead to changes in cropping systems and livestock feed sources. The drivers identified indicate there will be increased competition for water that will call for less irrigation and/or more efficiency in plant water use (drought-resistant plants, etc.). Other factors include climate variability, rising input costs, evolving markets, food safety issues, and changing government policies and regulations.

Increase natural resource conservation and environmental educational programming.

Chief among these educational programs will be programs on best management practices for the conservation of energy and water resources. Other conservation education efforts include (but are not limited to) soil and wildlife conservation, management of pests and invasive species, and environmental protection. These efforts will include programming for many audiences in the general population, as well as agricultural producers.

Develop and conduct enhanced risk management educational programs.

Agricultural and natural resource managers have always faced substantial risks from weather and changing markets. But recent events (drought, record-level commodity and input prices) and a number of leading drivers identified as influencing

Oklahoma's agriculture (climate variability, energy, market variability, water, pests and invasive species, and government policies and regulations), indicate higher levels of risk in the future. These programs should help managers design organization, production, marketing and management systems that improve sustainability in the face of increased risk levels.

Make a positive difference in the lives of more Oklahoma 4-H members with emphasis on 4-H programs to attract more minority and urban youth.

The goal of 4-H is to provide youth with life skills that contribute to them being better citizens and more resilient individuals. National research has shown the advantages of 4-H participation include higher educational accomplishment and higher motivation for future education. In addition, youth in 4-H are more civically active and make more community and civic contributions than youth in other out-of-school activities. These accomplishments and impacts are because of the positive youth development provided by state Extension specialists and the supportive families, caring volunteers and dedicated county educators who work with youth.

### Summary

The OAES and OCES missions provide direction to address the issues, challenges and opportunities related to the areas discussed above. As part of the Land Grant System, the OAES and OCES provide a continuum from the generation of knowledge and technologies to the transfer of the knowledge and technologies and their practical applications to the final users. The OAES deals with research problems and needs that are identified throughout the agricultural, food and natural resource systems and within the scientific community. OCES concentrates on the delivery of research-based education, technology, and information for agricultural producers, food and agricultural businesses, families and youth, and communities. Much of the needs assessment occurs at the grassroots level through the OCES, as well as, through industry, commodity groups, community organizations, advisory boards, professional associations, agencies and governmental entities. Most of the issues and challenges identified are diverse and complex. In recognition of this reality, the OAES and OCES have organized much of their efforts into multi-disciplinary, issued-based teams. In addition, most teams have members representing research and extension programming efforts. The programming presented in this plan of work was largely developed by many of these teams.

This plan of work represents only a portion of the total effort of the OAES and OCES. However, it does represent the breadth of work to be done and addresses many of the high priority issues identified by stakeholders. Just as the teams are integrated from a research and extension standpoint and among disciplines, they are integrated with respect to funding sources. This plan includes more effort than that which could be accomplished by the federal appropriations and the required match alone. Each program is likely to employ federal funding, state and/or local funding as well as grant and contract resources.

The overall goal of this plan developed by the OAES and OCES is to use scientific knowledge and related technologies and information to help Oklahoma (as well as the region and nation) use its agricultural, natural resource, and human base to foster economic development, improve the environment and its management, and the quality of life of its citizens. The impacts of these efforts include economically successful and competitive agricultural and natural resource producers, an adequate supply of healthy food, a healthy and well-nourished population, a balanced and thriving ecosystem with environmentally- sustainable industries, and enhanced economic opportunity and quality of life for all of Oklahoma's residents. OCES and OAES programs also reach beyond the state, region and nation as programs improving grain and food storage, fertilizer use, horticulture crop production, food processing and many more touching developing countries around the world and helping to improve stability and security.

### Langston University School of Agriculture and Applied Sciences (LU-SAAS) Research Goals and Initiatives

Create Greater Short-Term and Long-Term impact to people and communities by strengthening and expanding research in food, agriculture, and consumer issues.

The following research initiatives are being undertaken:

Enhance research activities by establishing new facilities and improving existing facilities. Create research spaces that are

attractive to students and young budding research scientists.  
Maintain the good research output of small ruminant scientists and encourage greater research production from scientists in other disciplines.  
Encourage interdisciplinary research among faculty and staff within the SAAS, from other Langston University Departments (e.g. biology, chemistry, education, sociology, etc.), and other institutions.  
With the creation of the Master of Science degree program in the SAAS, invest in high quality graduate training program that prepare students to be successful leaders in their unique fields.  
Establish a structured system for proposal development and grantsmanship.  
Increase internal funding of 1890 funded (Evans Allen) research to at least six uniquely different projects in each funding cycle.  
Promote faculty/staff professional development and networking opportunities to increase grants developments, funding opportunity, international collaboration, and student/staff recruitment.  
Elevate the quantity and quality of research conducted by building greater commitment and relationship with the communities with which SAAS personnel work.  
Effectively monitor, evaluate, and encourage the dissemination of research findings for efficient resource utilization to improve people's quality of life and to promote economic development.

### LU-SAAS Extension Goals

Langston University, as an 1890 Land Grant specifically, works specifically to focus on underserved communities throughout the State. That is our mandate. The goal of LU-SAAS Extension is to engage communities across Oklahoma and beyond through vibrant extension and outreach programs to help individuals and groups identify and meet local needs through research based educational program that positively impact economic well-being and community development.

The following extension and outreach initiatives are being undertaken:

Create multidisciplinary, innovative programs that address issues relevant to local residents and the broader Oklahoma population.  
Utilize wide-ranging and appropriate communication and extension delivery systems tailored to specific audiences.  
Locate small limited-resource households; conduct needs assessment; and empower them by providing necessary services that will help to improve their quality of life.  
Empower small-scale producers to develop and practice economically efficient and sustainable farming and other business operations.  
Inform and educate rural and urban consumers about the importance of modern agriculture and food production systems.  
Promote and enhance health, wellness, and good nutritional practices in ways that embrace the holistic concept of human wellbeing.  
Promote youth development programs, such as 4-H and other programs, that inculcate a sense of self-confidence empowering them to become the next generation of leaders.  
Increase community engagement, expand rural-urban outreach and education, and cultivate civic, institutional, and corporate partnerships.  
Develop activities designed to positively impact income, education, and life experiences of local communities.  
Keep extension/outreach staff up to date on the use of new technology for more effective outreach and field activities.

LU-SAAS COEP works closely with Oklahoma State University in our concerted effort to meet the needs of underserved communities throughout the state of Oklahoma. Receiving the full state match will allow Langston University to build the capacity necessary to reach and improve the economic and social well-being of underserved communities, producers and consumers throughout the State. LU-SAAS also works closely with the 1994 Land Grant institution in the Oklahoma. The 1994 Land Grant is the College of Muscogee Nation in Okmulgee. LU-SAAS COEP focuses on African-American populations, Hispanic, Native American, and Hmong populations, and small land-holding producers and householders throughout the State. This focus helps ensure that through the efforts of all three Land Grant institutions there is a equitable opportunities for all Oklahomans, no matter their socioeconomic status, ethnicity, financial resources, community location, or scale of production.

LU-SAAS Cooperative Extension & Outreach and Research Programs focus on four main areas in order to meet the needs of stakeholders throughout the state. These four areas are:

Production Agriculture: Crops and Animals  
Management and Sustainability  
Nutrition, Food Security and Food Safety  
4H & Youth Development

Production Agriculture: Crops and Animals

LU SAAS COEP will be able to better meet the needs of small land-holding farmers throughout the state for both crop production and animal production.

Management and Sustainability

Increased capacity will be focused upon Rural Economic Development. LU-SAAS works closely with OSU rural development except that LU-SAAS places much emphasis and resources on the thirteen traditional Black Towns from statehood, Native American Tribal nations, and Hispanic communities in southwest Oklahoma. This also includes work in Oklahoma City and Tulsa with these similar populations.

Nutrition, Food Security and Food Safety

Additional work will focus on improving nutrition programming among urban populations. Intervention measures will seek to reduce food insecurity and alleviate other related food problems such as food deserts throughout the state.

4H & Youth Development

Very few African-American, Hispanic, and Native American children are involved in Oklahoma 4-H programming. Langston University SAAS seeks to significantly increase outreach to these children. The programs will significantly serve to strengthen overall 4-H programming throughout the Oklahoma.

## ACTIONS

Extension and outreach programs in the SAAS synergistically link Langston University to communities throughout Oklahoma and beyond. A strong Cooperative Extension program is central to the mission of a Land Grant University. The aim of extension and outreach Programs is to disseminate research-based educational information in response to the needs of producers and consumers. The limited resource household/small-scale beginner farmers/ranchers and small businesses are the School's natural base. All available resources will be devoted to ensuring that this base benefits from the work undertaken by the SAAS. Small-scale producers and businesses will be empowered to improve their production systems, accounting, record keeping, and marketing systems to increase profitability and economic sustainability. Partnerships will be built with local communities, producer groups, and other organizations to assist them in finding and applying for development grants and other means of support. The partnerships will also create backward and forward linkages that will foster further research, student recruitment, and more effective engagements with the SAAS. Youth, community and family development will be streamlined to be efficient, impactful and reflect holistic programming that cuts across multiple disciplines.

New efforts will be made to raise the awareness of the LU SAAS Extension program and its resources as well as its impact and effectiveness. The School will utilize the breadth of media to communicate information and raise awareness (e.g., print, radio, TV, and web-based, including social media platforms).

As extension continues to be about people and communities, the SAAS is committed to continue to build a brand that is defined by compassion for people and the desire to improve livelihoods and empower people to succeed and strengthen socioeconomic conditions of communities.

LU-SAAS works to integrate collaboration between research and extension activities. LU-SAAS sees to diversify and expand the LU-SAAS portfolio of research and extension activities. Initiatives undertaken include the following:

Introduce modern innovative horticultural practices and ensure that SAAS has a clear footprint in scientific crop production operations.

Strengthen agribusiness and economics to reflect application to small ruminant production, small farming, food insecurity issues as well as to small business development and sustainability.

Increase collaboration with other Universities and agencies to strengthen plant biotechnology.

Establish a product development center that will add enormous value to the American Institute for Goat Research, and be of service to local communities to promote "made in Oklahoma products." It will also serve as an incubator for small business development and support.

## ACTIONS

The SAAS American Institute for Goat Research (AIGR) has grown tremendously and is among the foremost goat research facilities in the world. As AIGR continues to grow, new avenues will be sought to diversify its expansion in order to maintain its competitive edge as well as increase its economic contribution to local communities. Also, the demand for value-added products from goats has increased; efforts will, therefore, be made to introduce a Product Development Center to complement the AIGR. Feasibility analysis will be done and bold steps will be taken to ensure that this concept becomes a reality.

High technology greenhouses, hoop houses, plasticulture, aquaponics, and other facilities are being introduced into research and extension offerings. Collaboration will also be sought with the USDA and other agencies to reboot plant biotechnology research and extension programs and, indeed, create an integral link with the forthcoming horticulture program.

Understanding economic rationale and feasibility of all components of production agriculture and consumer decision-making is important. Efforts will be made to strengthen agribusiness and economic analyses in research and several areas of extension operations.

The following three areas are especially important for increasing LU-SAAS ability to implement Research and Extension impact throughout the State of Oklahoma.

### Product Development (Center)

For over 30 years, Langston University School of Agriculture and Applied Sciences has developed its Goat Research and Extension program (Kika De La Garza American Institute for Goat Research – AIGR) into one of the most respected expansive centers in the world. It continues to make profound contributions to domestic as well as to international goat production systems. The time has now come for the AIGR to diversify its scope into other avenues that will add greater value to Langston University, to students, researchers, and importantly to the local communities and people. The Small Ruminant Product Development Center will broaden the scope of research into the lucrative area of goat by-products, and the consumer demand side of any operational outfit. The Center will utilize animal products that are produced from the AIGR, it will provide training for students; serve as an invaluable incubator for local businesses and eventually will promote pecuniary activities in the economically depressed regions of Logan and neighboring counties. Although Oklahoma is one of the largest goat producers in the United States, the by-products are consumed mainly by ethnic communities. The Product Development Center at Langston University will also start to amend this situation and inform local populations of

the nutritional benefits and attributes of the goat by-products.

## Food Insecurity

Rural and urban inner-city areas have undoubtedly played a crucial role in national economic development; yet, many of those communities continue to stagnate as they face inevitable socioeconomic changes. Many areas are challenged by severe problems of poverty and food insecurity. Many rural and urban inner-city families across Oklahoma and the United States confront a diverse and extensive range of barriers in their procurement of food, including increasingly expansive areas of food deserts. Food security means that food is safe and available at all times; that all persons have means of access to it; that it is nutritionally adequate in terms of quantity, quality and variety and that it is acceptable with the given culture (US Census Bureau, 2017).

Nearly 1 in 4 children in Oklahoma and in the United States live in households that do not have access to enough nutritious food to support good health (Feeding America, 2016). Indeed, countless numbers of rural and urban inner-city communities are severely food insecure. Fifty four of seventy-seven (54/77) counties and 17.5 percent of Oklahoma households experience food insecurity and 1 in 6 people experience hunger (US Census Bureau, 2018). Many Central Oklahoma counties are also socio-economically depressed, where significant numbers of children and families are at risk for food insecurity and often depend on feeding programs. Poverty in many of these areas exceed 25 percent, and educational attainment in many rural and inner-city areas is below the national average.

## Economic and Community Development

Rural Community development is by no means a new concept for research, extension or policy makers. Great effort has been made in the United States and in other parts of the world to improve the conditions of peoples and reduce the incidence of poverty, yet, the unbearable conditions of people and communities continue to persist. It is unmistakable that more, and not fewer practitioners, researchers and administrators should focus attention on the indecency of poverty and low economic well-being while becoming advocates for those who are least able to help themselves.

Expenditure on education, nutrition/health/health care, and supportive social services essential to high quality human capital development are fundamental to an adequate rural response to economic changes. People should be empowered to help themselves. Governments and organizations should be the facilitators in this process. This endeavor will give broad insight into and a better understanding of the relationship between human capital investments, civic engagement and better leadership in promoting development in Central Oklahoma.

LU-SAAS has developed several objectives that will allow for better engagement in improving economic and community development among traditionally disadvantaged stakeholders in the State.

Examine the nature of business development, business management/innovation, and job creation in the region;  
Identify persistent barriers to economic success and analyze factors that have constrained financially viable opportunities and the quality of life in Central Oklahoma;  
Determine the challenges of human resource development in selected areas of rural Central Oklahoma and identify the main factors of influence on residents;  
Develop models and formulate policy recommendations that will enhance long term economic opportunities, civic engagement and improve the quality of life for limited resource householders, farmers and others small businesses in Central Oklahoma;  
Disseminate results to all relevant communities to ensure lasting and positive effects; collaboration with the Extension Department/Community Resource Development will play a crucial role in this regard.  
Evaluate the impact of policy recommendations and outreach intervention on selected communities and on identified groups within communities.

## 2. FTE Estimates



Year	1862 Extension	1890 Extension	1862 Research	1890 Research
2022	220.0	31.0	80.0	23.0
2023	215.0	34.0	80.0	24.0
2024	215.0	35.0	80.0	24.0
2025	215.0	35.0	80.0	24.0
2026	215.0	35.0	80.0	24.0

## II. Merit / Peer Review Process

Oklahoma Experiment Station projects, whether supported by Hatch or McIntire-Stennis funds, are peer reviewed prior to submission. It should be noted that stakeholder input into the research areas to be pursued by the scientists could be considered as the initial step in the review process. This valuable input helps in the merit and relevancy of our projects; it is a continual practice during the decision process to direct research efforts to high priority needs. Each department in OAES is required to have three reviews for a project, with one of those reviews being external to the department. The external reviewer will be from another department in the Division, another College at OSU, or another state with expertise in the area. The reviews are approved at both the departmental and OAES Directorate levels before submission to NIFA. The principal investigator is required to respond to the comments provided by the reviewers before final approval is granted. All individual OCES plans of work are reviewed for quality and relevance by at least two individuals with program and/or administrative responsibility pertinent to the individual's program area. The reviewers assess the merit of the program plans of work with respect to issues, needs, and the problems identified through stakeholder input, quantity of effort planned in relation to appointment, and plans to evaluate and report program quality and impact.

Langston University School of Agriculture and Applied Sciences (LU-SAAS) requires an internal review of Research and Extension project proposals for Evans-Allen Research Grants, 1890 Capacity grants and other related grants. This internal review process requires researchers to prepare a proposal and this is submitted to the Director of Research for review. The Director of Research reviews the Evans-Allen proposal to ensure that the proposal is following the strategic research plan and in line with the summary of stakeholder input. A Scientific Review Committee then assesses methodology, scientific merit, feasibility of the research, and industry impact. The principal investigator is required to make any recommended revisions before the committee approves the proposal. Once the proposal is approved it is forwarded to the Director of 1890 Land Grant Programs for final compliance checks and then approval. LU-SAAS Extension teams, under the guidance of the Extension Administrator, develop annual work plans for implementation of the four Extension Focus Areas. Since LU-SAAS Cooperative Extension Programming is community-based, programming is developed in response to the stakeholder input from clusters of both urban and rural communities. Annual work plans are reviewed by the extension leadership team representing all focus areas. The extension administrator reviews the work plans and if revisions are required the extension teams must make the recommended revisions. These annual work plans are then submitted to the Director of 1890 Land Grant Programs for final compliance checks and then approval. This process helps LU-SAAS Administrators guide the research and extension teams in appropriate resource allocation and programming decisions.

## III. Stakeholder Input

### 1. Actions to Seek

- ? Use of media to announce public meetings and listening sessions
- ? Targeted invitation to traditional stakeholder groups
- ? Targeted invitation to non-traditional stakeholder groups
- ? Targeted invitation to traditional stakeholder individuals
- ? Targeted invitation to non-traditional stakeholder individuals

- ? Targeted invitation to selected individuals from general public
- ? Survey of traditional stakeholder groups
- ? Survey of traditional stakeholder individuals
- ? Survey of the general public
- ? Survey specifically with non-traditional individuals
- ? Survey of selected individuals from the general public
- ? Other (Professional journals, meetings, etc.)

Collecting, analyzing, and communicating stakeholder input is a continuous and broad-based process within the Oklahoma Cooperative Extension Service (OCES) and the Oklahoma Agricultural Experiment Station (OAES). The Division of Agricultural Sciences and Natural Resources (DASNR) has a broad-based advisory council representing industry, agencies and communities. A multi-round, consensus seeking approach, commonly known as the Delphi method, was employed to gather input from stakeholders. The process collects data utilizing a series of questionnaires administered to a panel of experts. In addition, all the DASNR units have one or more advisory committees. A set of "drivers" and goals helps guide priorities and direction to decisions. In spring and summer 2019, OSU Extension hosted community forums at sites across the state of Oklahoma. The forums sought to ensure that a wide range of community members were engaged so that their opinions and perspectives on important issues would be represented in OSU Extension's strategic planning. OAES and OCES use OSU and DASNR media resources to seek input from traditional and new stakeholders. Other strategies include attending meetings with commodity groups, feedback from grantors, advisory committees and boards, feedback at professional meetings, grower contacts, attending regional research and extension committees, feedback on journal manuscript submissions, feedback on grant proposals, RFPs for grants, attending scientific society meetings, and direct contacts with producers, growers, processors, manufacturers, community leaders. Seeking stakeholder input will also include targeting agencies, governmental and non-governmental entities. OCES continues to seek input to improve programming for Native American tribes and tribal members. Meetings include numerous tribal leaders and span programming from youth to natural resources. These meetings have resulted in programming efforts and we expect them to lead to more jointly directed programming and further grass-roots input. LU-SAAS uses a process of engaging leadership from a network of community based organizations in order to get stakeholder participation. Process is ongoing throughout the year and includes quarterly meetings with stakeholders and advisory committees. LU-SAAS research and extension teams utilize major events to gather stakeholder input about important issues and barriers to their continued production. Surveys and focus group discussions will be utilized.

## **2. Methods to Identify**

The OCES has a well-defined program advisory committee system that provides grass roots input for program planning. Once or twice a year, county extension staff seek input from program advisory committee (PAC) members on program needs related to OCES/OAES strategic program priority areas. Advisory committee members are selected to represent various geographic areas of each county. They are representative of agricultural interests, youth, families, community and government leaders, and the general public. Committee members also represent the ethnic diversity of the county, as well as different socioeconomic groups.

Priority issues identified by county PACs are compiled by District Extension Program Specialists. The District Specialists summarize the issues within each strategic program priority, and make them available to District Directors and the state office. District priority issues are reviewed and compiled at the state office and provided on the OCES website. These needs are given special attention in the development of individual plans of work. They also provide direction for major extension and research programs.

Another formal means of acquiring stakeholder input comes through the development and revision of the Division of Agriculture and Natural Resources strategic plan. In that process considerable effort is made to acquire input both internal and external to OSU and the Division's research and extension efforts. Drafts of the strategic plan are widely distributed with input coming directly to the VP Agricultural Programs.

Input on research directions from stakeholders is solicited through many ways in addition to the traditional communication with departments. Each department prepares its own strategic plan in concert with that of the Division. Faculty and staff input is actively sought in standing and ad hoc committees, and faculty teams may jointly prepare "white papers" on specific issues of concern. External stakeholder input is also received from many different sources. Information, review, listening and update sessions are held periodically with user groups to identify needs and share results of research. Each of these organizations is composed of members spanning the state's ethnic and socioeconomic groups. OAES/OCES also initiate communication with under-served and/or under-represented citizens including Oklahoma's Native American nations, the African-American community, Oklahoma City latino community, and other minority groups or underserved groups. Additionally, there is frequent interaction with commodity-based organizations, the American Farmers and Ranchers organization and the Oklahoma Farm Bureau. Other opportunities for face-to-face interactions with our constituents are provided at numerous field days and community programs.

OAES/OCES continue to seek input from agencies and associations that represent the state's businesses and communities, such as the Oklahoma Small Business Bureau. State agricultural representatives in the Oklahoma Department of Agriculture are in frequent communication, as are Oklahoma legislative and administrative groups and Federal agencies.

LU-SAAS has a growing network of producers, consumers and other and stakeholders who specifically seek out interaction with LU-SAAS programming. This is predominately among African-American, Hispanic, Native American, Hmong American populations and among goat raisers throughout the State and the region. Events such as LU Goat Field Day and the LU Annual Small Farm conference among others, have been utilized to develop a network of individuals and community-based organizations that help identify additional participants to add to the network. Close coordination and joint projects with OCES allows for joint sharing of input from new stakeholders.

### **3. Methods to Collect**

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)
- Survey of the general public
- Meeting specifically with non-traditional groups
- Survey specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public
- Other (Peer reviews, grant proposal reviews, telephone surveys)

Stakeholder information is obtained from surveys and session evaluations during demonstrations, seminars, workshops and field days.

Additional direction and input is collected through the DASNR Initiative Teams' planning and budget request process. Each year, all DASNR program teams are asked to make a special effort to scan the environment, revisit their plans of work in light of the "drivers" identified in the DASNR planning process explained in the "Plan Overview" section. Teams revise their situation, goals, activities, as well as, outputs and outcomes. OCES is currently conducting community engagement sessions to gather input from stakeholders regarding priority programs that can impact their communities.

LU-SAAS uses standard methods to collect stakeholder input including meetings, surveys, open forums, focus group discussions with traditional disadvantaged groups, and discussions gathered from quarterly partnership meetings and agricultural field days. This information is gathered by research and extension teams and regularly reviewed to assess progress of reaching goals and overall objectives of the research and extension programs.

### **4. How Considered**

Stakeholder input is considered in all of the above situations. It is very important in working with our state legislature in securing new recurring and special funding. In addition, it plays a strong role in identifying the faculty and other professional position priorities in the hiring process. In addition to these tactical moves, it also can play a very large role in strategic changes. For example, stakeholder input was important in the development and hiring of a new forage research

and Extension cluster within the Division. Grassroots stakeholder input is the driving force in development of county educator and area specialist individual 5-year plans of work and annual planning efforts. Stakeholder input and the development of it is part of the extension field staff career ladder criteria. Many of our research programs and extension programs work closely with commodity groups and their related research/education foundations to develop a joint set of priorities for applied research and extension projects in the state. Food processing and quality research is often strongly influenced by an advisory committee as well as the individual manufacturers and entrepreneurs with whom the Food and Agricultural Products Center works. Federal initiatives and grant opportunities also provide input that helps mold and direct some efforts. Specific listening opportunities and advisory groups often bring about significant programming changes such as a strong emphasis on research in wheat quality and performance or need for education in diet and nutrition. Last year advisory group input resulted in the filling/opening of positions Food Safety, poultry production and waste management, animal nutrition, climatic impacts on cropping systems, and oilseeds/cropping systems to strengthen identified high priority program areas. The Oklahoma extension service and agricultural experiment station have 25 active teams working on issues important to the people of Oklahoma, the region and the nation.

LU-SAAS utilizes stakeholder input to guide development of new grant initiatives and in making decisions about how to increase extension staffing and filling new research positions. With traditionally disadvantaged population segments that LU-SAAS works with, it is vital for community engagement that stakeholders have a strong sense that their contributions are valued and acted upon.

## **IV. Critical Issues**

### **1 Youth Development**

#### **Description:**

4-H uses the principles of positive youth development to create learning experiences, develop relationships between youth and adults, create safe environments; and provide opportunities for positive risk taking.

4-H promotes healthy youth development by helping young people develop the skills necessary to become responsible citizens and drivers of community change. By understanding the complex experiences that youth face and through the promotion of high quality youth leadership development, 4-H helps youth meet the challenges of adolescence and transition to adulthood. Using youth-adult partnerships, 4-H connects youth and adults to their communities, preparing them for work and life. The 4-H program engages youth and adults in intentional, experiential, and inquiry-based learning while providing emerging research to highlight positive youth development.

**Term:** Long

#### **Science Emphasis Areas**

Youth Development

### **2 Family and Child Resilience**

#### **Description:**

Children in Oklahoma are twice as likely (45%) as the national average (22%) to experience three or more adverse events (e.g., abuse, neglect, violence). Family dysfunction increases these numbers to at least 300,000 children per birth cohort. Not surprisingly, Oklahoma has some of the worst rates of female incarceration, obesity, teen pregnancy, drug use, mental illness, divorce, school dropout, foster children, and premature death. Inadequate elder care means 600,000 Oklahomans look after an aging family member, with 84% requesting information or training. Education and access to services are critical to improving these caregivers' well-being. Improving parenting skills, family breakdown, and youth ability to overcome adversity are critical to Oklahoma's children and adolescents.

**Term:** Intermediate

#### **Science Emphasis Areas**

### **3 Human Health and Hunger**

#### **Description:**

Poor diet and physical inactivity increase the risk of obesity, which in turn increases the risk of diabetes and cardiovascular disease. In Oklahoma, 15,500 lives could be saved annually through better prevention and treatment of chronic disease. The state's above average poverty rate has led to high levels of hunger and food insecurity, which is associated with chronic disease. Food insecurity is linked to lower reading and math scores, and lower high-school graduation rates for youth. For the adult population, food insecurity decreases educational attainment, increases healthcare costs, and weakens the labor force. Poor food resource management skills and a lack of food preparation and food safety skills are detrimental to the health and welfare of Oklahomans.

**Term:** Intermediate

#### **Science Emphasis Areas**

Family & Consumer Sciences  
Food Safety  
Human Nutrition  
Youth Development

### **4 Personal Finances and Job Readiness**

#### **Description:**

Oklahoma is 43rd in the nation in unbanked and 37th in the nation in underbanked households, families without saving accounts, and consumers with subprime credit. The state ranks 48th nationally in number of high cost mortgage loans and 47th in the number of uninsured. Oklahoma has one of the highest student loan default rates in the nation, at 39th. Oklahoma is 33rd in the nation in ID theft. The percentage of Oklahomans in low-wage jobs is 30%, which is 38th nationally. The number of Oklahomans working after the age of 65 has doubled since 2001. Irresponsible use of social media can eliminate a job applicant from consideration for employment. Ten percent of 16-34 year olds are not hired because of inappropriate social media activities.

**Term:** Intermediate

#### **Science Emphasis Areas**

Family & Consumer Sciences  
Youth Development

### **5 Environment and Natural Resources**

#### **Description:**

Oklahoma contains a vast array of ecosystems due the variability in soil types, climatic conditions, altitude, and land use. Management of natural resources is significantly affected by ecosystem degradation and loss of services, land use changes and habitat fragmentation, and climate variability. Oklahoma has always suffered from weather extremes, resulting in increased risks to human safety, agricultural production, and shifts in natural communities of plants and animals. The recent number and severity of floods, droughts, extreme temperatures, storms and wildfires in Oklahoma will pose a challenge to human health and to native populations of plants and animals, as well as create habitat conditions more conducive to invasive species.

**Term:** Long

#### **Science Emphasis Areas**

Agroclimate Science  
Environmental Systems

## 6 Animal Production Enterprises

### Description:

Animal enterprises, including cattle, sheep, goats, swine, poultry, and aquaculture, represent a large segment of Oklahoma's rural and agricultural economy. Consequently, Oklahoma's economic well-being is directly tied to factors that influence the ability of animal enterprises to remain profitable in a sustainable fashion. Volatility in input prices for items such as fertilizer and feed and the value of animal products have increased economic risk. Variable climate patterns have introduced new production challenges. Land prices continue to increase as well, which may create a barrier to entry for the increasing number of small acreage producers and affect commodities produced. Consumers are increasingly concerned about the sustainability and ethics of methods used to raise food animals.

**Term:** Intermediate

### Science Emphasis Areas

Agroclimate Science  
Environmental Systems  
Food Safety  
Sustainable Agricultural Production Systems

## 7 Plant Systems

### Description:

The resilience of the continuous wheat production system has made it a staple of Oklahoma agriculture, but overreliance on a single production system and a lack of crop diversity have reduced soil health in the region and created weed, insect, and disease problems that must be addressed through systems-based approaches that includes a reduction in tillage and crop rotation. Additionally, biotic and abiotic stresses including viruses, insects, pathogens, and environmental stresses including temperature, water (drought), and oxidative stresses create a challenging environment for crops, gardens, and turf. Turf is the largest intensively managed plant system in the U.S. based on acreage. There is an increasing demand from non-traditional producers technical support for horticultural crops ranging from vegetable to fiber crops. The demand is for an agricultural systems approach.

**Term:** Intermediate

### Science Emphasis Areas

Agroclimate Science  
Education and Multicultural Alliances  
Environmental Systems  
Sustainable Agricultural Production Systems

## 8 Economic Development and Poverty Alleviation

### Description:

Oklahoma has many small towns and rural communities that are declining in population because of lack of opportunity for young people and early to middle age working age people. This outmigration leaves an aging population with diminished municipal revenue to support infrastructure and maintain vibrancy in these communities. There is a similar dynamic occurring in resource poor urban neighborhoods. This is especially true among predominately Native American, African-American, and Hispanic neighborhoods and towns. Traditional social networks and that supported civic engagement, economic well-being, social safety net, and economic productivity have weakened and need strengthening to allow for vibrant economies and communities. Poverty factors limit the strategies families and individuals can utilize. Individuals struggle to increase income that allows for family life and for investing in their communities.

**Term:** Intermediate

**Science Emphasis Areas**

Family & Consumer Sciences  
Youth Development

**9 Food Safety and Food Insecurity**

**Description:**

An increasing number of producers are looking to increase production of food items for local and regional markets and see this as the best option to make small acreage crop and animal production viable. They face concerns about producing, packaging and providing a safe product to consumers. Food Nearly 1 in 4 children in Oklahoma and in the United States live in households that do not have access to enough nutritious food to support good health (Feeding America, 2016). Fifty-four of seventy-seven (54/77) counties and 17.5 percent of Oklahoma households experience food insecurity and 1 in 6 people experience hunger (US Census Bureau, 2018). In many Oklahoma counties significant numbers of children and families are at risk for food insecurity and often depend on feeding programs. Poverty in many of these areas exceed 25 percent, and educational attainment in many rural and inner-city areas is below the national average.

**Term:** Intermediate

**Science Emphasis Areas**

Education and Multicultural Alliances  
Family & Consumer Sciences  
Food Safety  
Human Nutrition  
Sustainable Agricultural Production Systems  
Youth Development