

# Tuskegee University and Auburn University and Alabama A&M University Combined Research and Extension Plan of Work 2021-2025

**Status: Final**  
**Date: 06/01/2021**

## **I. Plan Overview**

### **1. Executive Summary**

Alabama A&M University, Auburn University and Tuskegee University Combined Research and Extension Plan of Work  
2021-2025

Status: Final

Date: 3/20/2020

## I. Plan Overview

### 1. Executive Summary

Alabama is unique as being the only state with three land-grant institutions with United States Department of Agriculture (USDA) Research and Cooperative Extension responsibilities. Alabama Agricultural and Mechanical University (AAMU), Auburn University (AU), and Tuskegee University (TU) provide Research and Cooperative Extension programs that meet the needs of the citizens of Alabama and the nation.

The Universities...

AAMU is an 1890 land-grant institution with a comprehensive university Carnegie classification, functioning in the areas of teaching, research, and extension. AAMU is a doctoral degree granting institution with strong graduate programs in the science, technology, engineering, and mathematics (STEM) disciplines. Through dynamic and contemporary research and outreach programs, the institution maintains a strong commitment to academic excellence and community engagement to meet the needs of its students, communities statewide, and nation at-large. AAMU focuses delivery of high-quality outreach and Extension education to Alabama's diverse urban, suburban and nontraditional populations that are designed to make a positive change and improve quality of life for limited-resource, under-served, unserved and hard-to-reach populations. AAMU-affiliated Extension programming is implemented in nine Urban Centers and adjacent counties across the state of Alabama.

AU is an 1862 land-grant institution with high research activity; comprehensive doctoral university Carnegie Research 1 classification. AU's mission is defined by its land-grant traditions of service and access. AU serves the citizens of Alabama through its instructional, research and outreach programs and prepares Alabamians to respond successfully to the challenges of a global economy. The Alabama Agricultural Experiment Station (AAES) was established in 1883 through an act of the Alabama Legislature to conduct scientific research that would advance Alabama's agricultural and forestry industries. AAES researchers conduct translational and applied (mission-oriented) research leading to discovery of knowledge and innovations in agriculture, food, and natural resources for the purpose of improving quality of life and well-being of citizens and communities of Alabama.

The TU mission, historically and today, together with specific acts of the United States Congress and the state of Alabama defines Tuskegee as an 1890 land-grant university with a Master's College and Universities Carnegie classification. The University also confers Doctoral degrees in Integrative areas of Materials Science/Engineering, Biosciences, Pathobiology and Public Policy and Development. Through integrative teaching/learning, research/discovery, and Extension/engagement programs TU addresses contemporary societal problems as opportunities to advance individuals, families, and communities.

#### Research and Cooperative Extension....

Research at each Alabama land-grant institution (LGU) has distinct programs based on clientele needs. Each component of the Alabama Agricultural Research Program works closely and cooperatively to enhance partnerships among the universities in all areas of Research and Extension; with other universities in the region, nationally, and internationally; and with state and federal laboratories and agencies. Alabama's three land-grant universities have played key roles in the development of agricultural enterprises in Alabama. The agricultural research programs of these universities have formed a partnership, the Alabama Agricultural Land-Grant Alliance (AALGA), to better address critical issues in food, agriculture, biosecurity, data science, rural sustainability, environment, bioenergy, and natural resources in the state, region, and nation through multidisciplinary, multi-institutional, science-based teams that focus on the opportunities and the challenges facing farmers, consumers, and agribusinesses. AALGA also seeks to provide quality education that prepares professionals for career opportunities in food, agriculture, environment, and natural resources. Research programs at each of our institutions are closely linked to Extension programs, which seek the largest possible positive social, economic, and environmental impact.

AAMU and AU provide Extension educational outreach as a unified Alabama Cooperative Extension System (ACES). ACES focuses its resources on relevant issues that affect the interdependence of urban, suburban, exurban and rural clientele. ACES employs a highly collaborative program development and delivery process that allows for the integrative and collaborative application to serve and meet the needs of Alabamians in all 67 counties within the state. Agents from the two institutions are jointly located in county Extension offices and function as county Extension teams.

Tuskegee University Cooperative Extension Program (TUCEP), in partnership with the Evans Allen Research Program, Carver Integrative Sustainability Center (USDA 1890 Center of Excellence) and other research, teaching and outreach units, carries out a comprehensive Extension Plan of Work (POW). TUCEP continues to focus its major efforts in Alabama Black Belt and adjacent counties, but also has programs in other counties whose residents may request our expertise and/or experience. Many TUCEP agents share the same facility as ACES agents assigned to that county and cooperate on Extension programs of mutual interest.

The world and our state are facing major challenges with population shifts, food, water, energy, agricultural and environmental sustainability, rural prosperity and resilience, biosecurity, natural resources, climate change, and economic development in all sectors, as well as human health and well-being and related issues. In order to address issues related to these major local, national and international challenges, integrative and collaborative Research and Extension programs have been designed to address most of these challenges. The Alabama Land-Grant Institutions are cognizant of the necessity to continue to address the National Institute of Food and Agriculture (NIFA) priorities. Indeed, those programs are priorities for Alabama residents as well. The FY2021-2025 Combined Alabama A&M University, Auburn University, and Tuskegee University Research and Extension POW is founded on the following planned programs:

Global Food Security and Hunger  
Natural Resources Conservation and Management, Environmental Sustainability and Climate Change  
Food System and Food Safety  
Human Nutrition, Well-being, Health and Obesity  
Sustainable Energy  
Community Development  
Family, Home and 4-H and Youth Development

Alabama, through numerous avenues, conducts extensive needs assessments through a grassroots and grassroots process. Statewide stakeholders and leaders are engaged by all institutions across the disciplines, along with county and community public policy makers, to identify contemporary and emerging Research/Extension issues. This process is complemented with grassroots stakeholder meetings held annually in each county and at each Research-Extension Center to determine local and regional issues and opportunities.

The three land-grant institutions fully integrate these statewide issues into the coordinated initiatives outlined in this POW. Statewide initiatives are interwoven with national USDA priorities in the document. Almost all Research and Extension programming in Alabama involves more than one land-grant institution. Extension programming is an integral component of Alabama's Research planning in that most of the research conducted by the three Agricultural Experiment Stations has a predetermined use and planned Extension delivery phase.

Additionally, the land-grant universities of Alabama engage partner organizations and 1862/1890 universities in neighboring states to capitalize upon combined strengths and optimize impacts. Examples of multi-state cooperation are evident in most of the listed priorities and program initiatives in the 2021-2025 POW.

The Research and Extension educational programs conducted by the LGUs in Alabama were not created in a vacuum. Through listening sessions conducted for Extension and Research, faculty meetings, AALGA joint discussions and planning meetings, focus groups, conferences, field days and selected advisory boards, our programs are planned to address the critical issues of strategic importance to agriculture in Alabama, the nation, and the world. Traditionally, Extension programs in Alabama have had a very comprehensive stakeholder input process. The foundation of this process has been the statewide network of county and state-level program advisory committees. Special outreach efforts are extended to state and county advisory committees in limited-resource and low-asset communities in South-central or Black-Belt Alabama and urban centers.

Alabama's Extension and Research seek to address selected questions that lead to identification of critical issues of strategic importance. These issues include, but are not limited to: (1) enhancing the sustainability, competitiveness,

biosecurity, and profitability of U.S. food and agricultural systems; (2) playing a global leadership role to ensure a safe, secure and abundant food supply for the U.S. and the world; (3) heightening environmental stewardship through the development of sustainable management practices (food/water); and adapting to and mitigating the impacts of climate change on food, feed, fiber, and fuel systems in the U.S.; (4) improving human health, nutrition, and wellbeing of the US population; (5) promoting community development, rural health, prosperity and resilience; (6) building capacity of individuals and families in the context of learning, culture, and community; and (7) supporting energy security and the development of the bio-economy from renewable natural resources in the U.S.

Our programs are planned to be aligned with NIFA's Research and Extension priority areas and with Alabama's agricultural needs as identified by stakeholders. As a result of the alignment, the focus will be on the following programs: (1) Global Food Security and Hunger; (2) Food System and Food Safety; (3) Natural Resources Conservation and Management, Environmental Sustainability and Climate Change; (4) Human Nutrition, Well-being, Health and Obesity; (5) Community Development; (6) Family, Home and 4-H and Youth Development; and (7) Sustainable Energy.

Full-time equivalents (FTEs) are planned in each of the seven programmatic areas. The seven programmatic areas will be used as a guide for distributing funds administered through budget allocation and competitive mechanisms based on merit and evidence of projected impacts. Additional administrative balance will be sought among the seven program areas.

All planned programs contained in the Alabama integrated Extension and Research FY2021-2025 Plan of Work are developed within the context of research and community engagement of relevance to all residents of Alabama who may benefit from the local knowledge base or service. This commitment is without regard to any personal characteristics, to include age, ethnic origin, gender, religion, sexual orientation, or geographic location. Alabama populations are included, as appropriate, in the program development process. As a part of the program development process, each program that was identified and developed for grassroots program delivery, details the intended audience(s) to be served. As a part of the review process, before approval of a given program, project or activity, the respective Assistant/Associate Directors and Administrators are charged with ensuring that the intended audience(s) for each project includes the spectrum of potential recipients of the Alabama population. For example, in recognition of the rapidly increasing Hispanic populations in Alabama, many of the System publications are now available in Spanish while other programs specifically target the Spanish speaking residents. Additionally, the ACES website provides educational content in 65 languages spoken throughout Alabama. To meet the accessibility needs of our audience, the website complies with Web Content Accessibility Guidelines 2.0 Levels A and AA and is mobile-friendly for use on smartphones. All video used on the website is captioned, and online courses are also fully accessible. Other System programs target 'at-risk' youth, low-income urban residents, small and minority farm producers, and the elderly.

Another example is the Alabama Agricultural Land-Grant Alliance (AALGA), an organizational framework created to provide coordinated efforts to address major agricultural issues in Alabama. In particular, AALGA was put in place to facilitate cooperation and collaboration, to minimize duplication of research, and to address the needs of underserved and underrepresented populations, such as the minority farmers, producers, processors, and small-scale producers. In addition, the Extension and Research administrators, as well as faculty and staff, have significant participation in the Southern Association of Agricultural Experiment Station Directors (SAAESD), Association of Southern Region Extension Directors (ASRED), the Association of Research Directors (ARD), the Association of Extension Administrators (AEA), and other regional and national groups that provide platforms for multi-state programming.

The 1890 Land-Grant Institutions' Strategic Plan in particular continues to provide a framework to facilitate increased collaboration in the various states for the specific purpose of assisting diverse audiences, particularly those who have limited social and economic resources, to improve their access to positive opportunities through research and outreach

education. One goal of the Association of Extension Administrators (AEA) and the Association of Research Directors (ARD) is to develop and foster integrative and collaborative relationships to aid in the growth of the 1890 Land-Grant System.

The real impacts and outcomes of the Alabama Land Grant System programming are derived from the performance of the System's program menu offerings. The System utilizes Strategic Program Planning, Extension Team Projects, Integrated Research and Extension Team Projects, Specially Funded Programs and Priority Program Areas as the primary program implementation tools. All such programs are Logic Model based and include clearly defined expectations regarding program outcomes and impacts. The necessity for--and inclusion of--outcome and impact statements for every funded Research and Extension program offering is paramount in the program planning and development process. As such, all programs are inherently capable of producing quantifiable measures of research, education and outreach productivity.

Similar emphasis is placed on many 'specially funded programs', many of which come with their unique measurement tools. These programs include special NIFA funded programs such as McIntire-Stennis Research Program, Hatch/Multistate, Smith-Lever, 1890 Capacity Building grants, 1890 Facilities Grant, SNAP-Ed, EFNEP, IPM, and RREA as well as programs funded partially or in whole by grants, contracts, or other extramural sources of funds.

The ability to answer the question 'So What?' is a driving force in the program planning/planning development process. All levels of Research and Extension administration continually issue the challenge to ensure that expected outcomes and impacts are clearly evident in program design, and that continuous improvement is woven into the program design process. As such, ALL Planned Programs in the FY2021-2025 Plan of Work are expected to produce outcomes and impacts.

Below are some examples:

Global Food Security and Hunger: Methods developed for best agricultural practices; number of farmers/producers informed of the best practices; improved varieties, animal stocks produced, extended, and adopted; agricultural productivity, efficiency, sustainability, and profitability; reduction in minority land loss; reduction of population in hunger in the state, in the nation, and in the world as a result of the research/extension/and educational programs.

Food, Nutrition, Health and Well-being, and Childhood Obesity: Nutrition standards and practices development; extension and outreach to the general population on nutritional information; informed decision of food choices and physical activities; overall reduction of obesity, particularly childhood obesity.

Food Safety and Agricultural Biosecurity: Detection methods and technologies developed for biological contaminations; analytic methods and technologies for abiotic contaminants; training and education of various groups including the general public; decrease in severity and incidence of food-related illness; education on safer food production practices; reduction of economic losses due to contamination; increased national competitiveness because of implementation of food safety standards.

Natural Resources, and Climate Change: Methods and best practices development for agriculture that are related to climate change; maintenance or improvement of water quantity and quality; ecosystem health sustainability; reduction in carbon footprint; development of technologies leading to reduced impact on climate; carbon sequestration; enhanced capacity in climate buffering, etc.

Bioenergy and Bio-based Economy: Development and evaluation of feed stock crops; development and assessment of the best practices for bioenergy crops; development and genetic improvement of bioenergy crops; development of conversion technology; increased bioenergy supply; increased bioeconomy output; reduced dependence on foreign oil.

Reliance on the logic model helps to organize and systemize program planning, management, and evaluation functions. These functions include: Program design and planning, program implementation, program evaluation and strategic reporting. Since the most basic program logic model is a picture of how the program works -- the theory and assumptions underlying the program -- the planned program herein provides structure and directions that help streamline program effectiveness and efficiency in program implementation and outcomes. Also, this model provides accountability by relating inputs, outputs, and outcomes. The use of the logic model helps us focus on fewer program areas, and integrated initiatives, with clear examples of outputs that will lead to expected outcomes. The

logic model supports effectiveness, efficiency, and a more constructive use of time and resources.

Through the critical issues, knowledge gaps in Research and Extension, including emerging opportunities and educational delivery mechanisms, will be identified and addressed. Relative to all activities, programs will be communicated in varying ways to stakeholders so that improvements can be adopted as appropriate.

Competition is a valid way to enhance programmatic effectiveness and efficiency. Hatch/Multistate, Evans-Allen, Smith-Lever, and 1890 Extension funds will be distributed through competitive mechanisms such as the submission of grant proposals that deal with the issues addressed in programmatic areas. Assessments of short- and long-term outputs and outcomes will be conducted. Faculty members and Extension personnel who obtain Research and/or Extension funds will be required to seek additional resources, such that the impact of these funds will be leveraged. Obtaining extramural competitive funds is another indicator of the merits of leveraging Hatch/Multistate, Evans-Allen, Smith-Lever and 1890 Extension funding.

## 2. FTE Estimates

Year	1862 Extension	1890 Extension	1862 Research	1890 Research
2021	364.0	56.0	535.0	68.6
2022	364.0	56.0	535.0	68.6
2023	364.0	56.0	535.0	68.6
2024	364.0	56.0	535.0	68.6
2025	364.0	56.0	535.0	68.6

## II. Merit / Peer Review Process

The Plan of Work Merit Review is an inclusive multi-phase process with Extension and Research at all three land-grant universities in Alabama. Phase I includes Extension and Research teams identifying program and research needs shared by county stakeholders and advisory groups. Annual discussions, surveys and focus groups are held to solicit and gather critical program and research needs from adults and youth in communities. This information sets the stage for Extension and Research program priorities. It is a requirement for all extension programs and research projects to have clear measurable outcomes and the support of federal, state, county and extramural funds. Phase II includes members from each university forming teams representing program areas in the plan. Each plan includes specific objectives that are examined for relevance, usefulness, and potential program impact. This feedback is used to refine program and research plans. Subject matter teams also review the plan for full integration and representation of Extension and Research. A scientific review is conducted to ensure all objectives and goals are measurable and include sound outcome indicators. Scientific review of research programs are based on established protocols by the National Standards for Peer Review. Phase III involves statewide stakeholder groups, including advisory groups, commodity organizations, volunteers, research partners, and state and local funding agencies. These groups are asked to provide feedback regarding objectives, potential impacts, and ways in which the plan will meet their specific needs. Phase IV is both within and outside the university community. Copies of the plan are submitted to university administrators and related agency personnel who function as both present and future partners. These individuals are invited to comment on the objectives identified, areas of collaboration, and potential impacts. University administrators will also provide comment on ways to work across colleges and schools to increase Extension and Research outreach. This multiphase peer review process allows input on several levels to strengthen state plans and encourage collaboration across the state. Feedback is reviewed at all phases of the process. Plans are adjusted as needed based on feedback provided.

## III. Stakeholder Input

### 1. Actions to Seek

#### EXTENSION:

The Alabama Cooperative Extension System and the Tuskegee University Cooperative Extension Program (ACES/TUCEP) utilize a comprehensive grasstops and grassroots needs assessment process. State-level constituent or consensus building groups, non-governmental agencies, community-based organizations, and governmental agencies are encouraged to participate in grasstops needs assessment activities by inviting both traditional and non-traditional stakeholder groups. Individuals representing diverse socio-economic and racial groups, new client groups, networks, youth groups, and potential community partners are encouraged to participate in grassroots needs assessment activities by inviting both traditional and nontraditional stakeholders. Media is used to announce and encourage individuals to participate in various activities.

#### RESEARCH:

College level research advisory committees and advisory boards have been established for all three universities within The Alabama Agricultural Land Grant Alliance (AALGA) to actively seek stakeholders' input and provide advice to Deans and Research Directors of the three colleges of agriculture. Through our Research and Extension faculty, we continue to carry out routine work with various commodity groups and clientele. Semi-annual meetings are organized by the Alabama Farmers Federation (ALFA) where faculty and administrators participate regularly. In addition, there are committees for each of the 17 commodity groups with regular meetings and forums for the relevant groups, and faculty members and administrators regularly participate to learn about the issues, comments, and concerns. In addition to the ALFA groups, the college and experiment station leadership, the department heads, and faculty are working closely with several major commodity organizations outside of ALFA: Alabama Cattlemen Association, Alabama Poultry and Egg Association, Alabama Green Industry leadership, and the Black Belt Small Farmers Cooperative.

AALGA and its partners continue to host "listening sessions" at key locations across the state. These sessions are

advertised in varying ways to reach as broad an audience as possible and are open to the general public. Participants identified several strategic areas which can benefit from additional resources and effort (i.e., Research and Extension). These areas are noted in this plan of work. Regular input is also received from stakeholders through commodity group leaders, from advisory boards, formal and informal surveys, focus groups, field days, conferences and through discussions and feedback from state leaders on agricultural boards. Most Extension faculty have Research appointments, and they work closely with the commodity groups and the public in general to bring back their concerns and feedback.

## **2. Methods to Identify**

### **EXTENSION:**

ACES/TUCEP program leaders lead respective program teams, consisting of Extension Specialists, Agents, Resource Specialists, and Farm Management Specialists to identify state-level constituent or consensus building groups, non-governmental agencies, community-based organizations, and governmental agencies. Methods for identifying these groups included existing advisory committees and interagency directories.

Grassroots stakeholders are identified by Extension coordinators, agents, and resource specialists who lead community conversations in the state's 67 counties. Methods included existing advisory committees, 4-H youth councils, contacts with other agency partners, and staff knowledge of individuals representing diverse socioeconomic and racial groups, new client groups, networks, youth groups, and potential community partners. A grassroots web-based survey is marketed in all 67 counties through the media and directly via ACES/TUCEP Web pages. Citizens are offered the opportunity to participate in the survey via public access computers at County Extension Offices. For the hard-to-reach communities in the Black Belt and with new immigrant populations, special county and state advisory councils have been established for engagement to secure a diversity of stakeholder input. County 4-H Youth Councils are asked for direct input and feedback and to solicit input and feedback from other peer youth groups.

### **RESEARCH:**

Several groups, such as advisory committees, that encompass growers and consumer groups have been established. Surveys are conducted through various Agricultural Experiment Station (AES) newsletters. Other means of seeking input from the general public are employed. Commodity groups are well organized through participation in the Alabama Farmers Federation and other such groups. Needs assessments are conducted through strategic planning, Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis, based on input from the agricultural industries and assessments from the faculty, their department heads, and college and experiment station leaderships.

## **3. Methods to Collect**

### **EXTENSION:**

A comprehensive approach to needs identification is utilized given the complexity and scope of issues facing the citizens of Alabama. For ACES/TUCEP, the comprehensive needs assessment begins with the engagement of key external 'grasstops' stakeholders to determine priority needs affecting Alabamians.

Program leaders and their respective program teams conduct the grasstops needs assessment by engaging groups through direct telephone contacts, focus groups, advisory committees, networking, or short surveys. Each stakeholder group is asked 1) what priority initiatives are included in their strategic plan or plan-of-work, 2) what issues do they envision affecting the economic and physical wellbeing of Alabamians across the state, 3) what priority needs of their clientele connect with ACES/TUCEP's educational programming expertise, and 4) what linkages do they envision that would strengthen the working relationship with ACES/TUCEP's educational programming. Results gleaned from the grass-tops needs assessment activities are summarized to determine what major themes emerge.

The second major component of the comprehensive needs assessment involves engagement of 'grassroots' stakeholders. Extension coordinators, agents, and resource specialists organize grassroots community conversations to confirm, prioritize, or regionalize the grassroots needs assessment results. Objectives are to engage a cross section of citizens, including youth, to 1) discuss and understand the facts regarding significant issues facing the state and the opportunities for positive change and 2) dialogue about significant issues and the potential for local programs that acknowledge and address the current changes in the way citizens think, live, and function in their daily lives, families, communities and businesses. A companion grassroots survey is administered via the ACES/TUCEP homepage.

For limited-resource and low-asset communities, their representation on the special county and state advisory councils in the Black Belt and adjacent service areas are invited and given the opportunity to use regularly scheduled conferences to collect input and feedback. The conferences include: The Annual Farmers Conference, the Booker T. Washington Economic Summit, and the Professional Agricultural Workers Conference.

#### RESEARCH:

A number of stakeholder groups have previously been identified, and input is collected through regular meetings with discussions and feedback. For example, at Auburn, several commodity groups have committees to evaluate ongoing research and new research proposals. Direct feedback to researchers and administration is through the projects that get funding and through discussion about new and emerging issues. At TU, input is also sought from workshops and special sessions during the Professional Agricultural Workers Conference and Farmers Conference that are organized annually. At AAMU, input is sought through workshops, 1890 Association of Research Directors, various departments, conferences, and new research proposals. Influential industry leaders are consulted for their input and feedback.

#### 4. How Considered

##### EXTENSION:

Strategic program initiatives are identified from the comprehensive grassroots and grassroots needs assessment activities. Program leaders collaborate on the development of a logic model for each strategic program initiative focusing on specific objectives, outputs, and outcomes that allow for application across various program areas. Each logic model includes an evaluation plan.

Program leaders assist their respective program teams, consisting of Extension specialists, agents, resource specialists, and farm management specialists, prepare a Plan-Of-Work (POW). Steps include: 1) to determine which strategic program initiatives fit with the team's capabilities and resources and to develop a programmatic response consistent with the objectives, outputs, and outcomes of the respective strategic program initiative logic model, and 2) to complete the program team plan-of-work to include ongoing programs or special funded projects. A quarterly staff conference is used to process stakeholder input from the special and state advisory councils as a special effort on behalf of limited-resource and low-asset communities in the Black Belt.

Team POWs are shared with Extension coordinators, agents, and resource specialists to align program alternatives and to make mutual decisions regarding programs, staff involved, dates, and locations for implementation purposes.

## RESEARCH:

Input from stakeholders is used to set program priorities and for identifying emerging issues relevant to agricultural activities. Their inputs are considered in the long-term plan for hiring faculty members and staff members. Input concerning urgent and serious issues will be used to redirect research funds and used in the budget processes as well. Research priorities identified from stakeholders' input are used as guides for solicitation of research grant applications. Annual Hatch and Evans-Allen-funded internal grants are selected competitively (awards are made based on merit and relevance to the priority areas). Because of the small size of the funding, such research funding has to be considered as seed grants. Leveraging of additional funding is essential to carry the research priorities forward.

## IV. Critical Issues

### 1 Global Food Security and Hunger

#### Description:

#### Description:

The goal is to enhance competitiveness and sustainability of food and agricultural industries in Alabama through development and implementation of best practices or technologies. This critical issue addresses two broadly defined priority areas: i) plant health and production and plant products, including improved cropping systems, plant breeding/genomics, integrated pest management, and alternative specialty crops; and ii) animal health and production and animal products, including improved food-animal systems and stocks, and alternatives to antibiotic use. Other areas of research include organic agriculture and local foods, agricultural economics, and needs of limited resource producers. Of particular interest are projects that present innovative synergies of disciplines and perspectives.

Term: Long

Science Emphasis Areas

Bioeconomy

Sustainable Agricultural Production Systems

Term: Long

#### Science Emphasis Areas

Bioeconomy, Bioenergy, and Bioproducts

Sustainable Agricultural Production Systems

### 2 Natural Resource and Environmental Sustainability

#### Description:

#### Description:

This program plan will generate knowledge to manage agricultural and natural systems in the face of climate

change and facilitate sustainable natural resources. Specific areas include: sustainable agricultural systems, energy conservation and utilization of renewable energy resources; understanding the land-water interface; consequences and solutions of global climate change; water quality and quantity, carbon sequestration, forest land and wildlife management; natural systems restoration, surface and ground water conservation; management of agricultural waste residue; chemical and electronic waste in urban and rural settings; sustainable soil health enhancement; sustainable eco- and agri-tourism; rural-urban interface environmental issues; remote sensing and precision agriculture.

Term: Long

Science Emphasis Areas

Agroclimate Science

Environmental Systems

**Term:** Long

**Science Emphasis Areas**

Agroclimate Science

Environmental Systems

Sustainable Agricultural Production Systems

### **3 Food Systems and Food Safety**

#### **Description:**

Description:

Research and extension integrated activities enhance food systems, food safety and agricultural biosecurity. The goal of this program area is to develop technology and methods to protect the safety of agriculture and food, to enhance food safety, reduce epidemics of food-borne illness, and to develop the knowledge and a methodologies base for rapid detection of threat agents, including existing and emerging diseases of plants and animals, risk assessment, and facility and personnel security. This program area will focus on approaches that educate industry, government and consumers on how to avoid food-borne diseases; safe home food preservation; and educating food handlers and processors on how to ensure safe food products all along the food chain.

Term: Long

Science Emphasis Areas

Food Safety

**Term:** Long

**Science Emphasis Areas**

Food Safety

## 4 Sustainable Energy

### Description:

Description:

Agricultural research in Alabama will contribute to the national goal of energy independence by supporting science to develop biomass used for biofuels, design optimum forest products and crops for bioenergy production, and produce value-added bio-based industrial products. Specific areas of research include, but are not limited to the following: alternative crops for efficient production of bioenergy feedstock; biotechnology of bioenergy crops to enhance production or to enhance its utilization as an energy source; and, technology development for bioenergy conversion. This priority is aligned with the USDA priority area of Sustainable Energy and with the huge domestic energy demands. Extension programs will educate, train, and assist citizens in alternative energy options and related regulations.

Term: Long

Science Emphasis Areas

Bioeconomy, Bioenergy, and Bioproducts

Environmental Systems

Term: Long

### Science Emphasis Areas

Bioeconomy, Bioenergy, and Bioproducts

Environmental Systems

Sustainable Agricultural Production Systems

## 5 Human Nutrition, Well-being, Health and Obesity

### Description:

Description:

Diseases such as obesity, diabetes, high blood pressure, and vascular issues are mostly caused by the lack of nutrients, the lack of exercise, poor lifestyle choices, and stress of the involved individuals. As a result of the growing health concerns for Alabama citizens, there has been a combined effort to educate and motivate citizens throughout the state to make better health decisions. Health disparities/inequities are influenced by the level of knowledge, access to healthcare, and the ability to self-manage. The objectives are to improve the health of Alabamians, targeting limited-resource families, through chronic disease awareness, physical activity, nutrition education, health literacy and access to and consumption of fresh fruits and vegetables.

Term: Long

Science Emphasis Areas

Human Nutrition

Term: Long

**Science Emphasis Areas**

Human Nutrition

**6 Community Development**

**Description:**

Description:

Community Development initiatives will assist in preparing an Alabama workforce comprised of motivated individuals who can successfully navigate employment transitions throughout their lifespan. The contributions to workforce preparation are to connect local, state, and federal agencies, schools, community groups, labor, employers, and others, to further the workforce development of youth and adults. This strategic initiative strives to improve workforce awareness, knowledge, and skills throughout Alabama, with particular emphasis on entrepreneurship, economic resource development, broadband adoption, science, technology, engineering, and mathematics (STEM), career education and planning, and technology applications that support workforce development.

Term: Long

Science Emphasis Areas

Family & Consumer Sciences

Term: Long

**Science Emphasis Areas**

Family & Consumer Sciences

**7 Family, Home, and 4-H and Youth Development**

**Description:**

Description:

This critical issue focuses on strengthening families by teaching members, how to improve the quality of their lives through (a) improving family relationships, (b) financial resource management, (c) identity theft and fraud prevention, (d) citizen and leadership development, (e) Science, Technology, Reading, Engineering, Agriculture, and Math (STREAM) Education, (f) youth gardens, (g) livestock shows, (h) nutrition and health, (i) career development and college readiness (j) life skills development, (k) conflict resolution, (l) school readiness (m) child development and (n) parenting education.

Term: Long

Science Emphasis Areas

Family & Consumer Sciences

Youth Development

**Term:** Long

**Science Emphasis Areas**

Family & Consumer Sciences

Human Nutrition

Youth Development