

2017 University of Arkansas and University of Arkansas at Pine Bluff Combined Research and Extension Plan of Work

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I. Plan Overview

1. Brief Summary about Plan Of Work

The Integrated Plan of Work of the University of Arkansas System Division of Agriculture (Div. of Ag.) and the University of Arkansas at Pine Bluff (UAPB) School of Agriculture, Fisheries and Human Sciences will continue to address many of the issues facing citizens of Arkansas, the United States and the world through concentrated efforts in both research and Extension education.

The Arkansas Combined Research and Extension 2017-2021 Plan of Work has been crafted to incorporate the programs and projects that will address the needs of and issues facing Arkansans.

The University of Arkansas at Pine Bluff (UAPB), School of Agriculture, Fisheries and Human Sciences is composed of three academic departments, the 1890 research and Extension programs, the Aquaculture/Fisheries Center of Excellence and the Regulatory Science Center of Excellence. Research faculty members are integrated into the academic units in agriculture and human sciences, while Extension personnel are under the direct supervision of associate Extension administrators. The Department of Aquaculture/Fisheries and the Aquaculture/Fisheries Center of Excellence are administered by a department head/center director supervised by the dean/director. Under this structure, academic, research and/or Extension responsibilities are integrated. The primary clientele served by the University of Arkansas at Pine Bluff are limited resource farmers and rural families as well as the Aquaculture industry and the Arkansas Game and Fish Commission.

Many of the UAPB research scientists have both an academic appointment and a 5% Extension assignment to facilitate the dissemination of information to students and clientele in eastern Arkansas and southwest Arkansas. Extension appointments are intended to assist small and limited-resource farmers with risk management, record keeping and developing the needed knowledge base for completing loan applications and participation in conservation programs. The Horticulture Program works with many of the same clientele, introducing on-farm research and demonstrations with horticultural crops. The Sweetpotato Foundation Seed Program (SFSP) is responsible for supplying virus-indexed slips to certified farmers for multiplication and distribution in Arkansas. The Water Management Center located at Lonoke is also utilized in these outreach activities.

The University of Arkansas System Division of Agriculture develops and conducts fundamental and applied research and educational activities and programs through the Agricultural Experiment Station and the Cooperative Extension Service to address the needs of Arkansas citizens in the emphasis areas of agriculture production and processing, environment and energy, safe and nutritious food, families and youth, and economic and community development. The Division of Agriculture conducts the 1862 land-grant functions of research and Extension education through five regional Research and Extension Centers, six research stations, two Extension centers, five associated Research and Extension units and the Experiment Station headquarters on the University of Arkansas at Fayetteville campus and the Cooperative Extension Service and Division of Agriculture headquarters in Little Rock. The Division of Agriculture also has two Centers of Excellence, the Arkansas Forest Resource Center at the University of Arkansas at Monticello and the Center of Excellence for Poultry Science on the U of A at Fayetteville

campus. Nine additional Centers and Institutes within the Division of Agriculture are: the Arkansas Discovery Farms Program, the Arkansas Procurement Assistance Program, the Arkansas Water Resources Center, the Center for Agricultural and Rural Sustainability, the Center for Food Animal Wellbeing, the Center for Food Safety and Engineering, the Public Policy Center, the Southern Risk Management Center and the National Agricultural Law Center. The Division of Agriculture has faculty and staff with research appointments, Extension appointments or split research/Extension appointments in departments of the U of A at Fayetteville's Dale Bumpers College of Agriculture, Food and Life Sciences, the Extension state headquarters in Little Rock, the U of A at Monticello and Arkansas State University. The Division is able to identify local needs and then deliver research-based educational programs through county Extension agents and staff located in each of Arkansas's 75 counties.

This combined plan of work includes major initiative areas based on issues and needs identified through stakeholder input, strategic planning and expert analysis of environmental scanning data by Extension and research faculty and staff from both institutions to identify major trends that are expected to impact Arkansas, the nation and the world.

Arkansas is a rich state in terms of natural resources. Agriculture is one of the largest Arkansas industries having an annual value-added economic impact of over \$20 billion and contributes 17.7% of Arkansas's economy. Agriculture accounts for about one in six jobs in the state (280,959 jobs) and an annual labor income of \$11.5 billion (17% of the state's total labor income). Agriculture in Arkansas consists of agronomic and horticultural crops, animal agriculture and forestry. In terms of agricultural cash receipts, in 2012, Arkansas ranked 16th, with a value of \$9.8 billion. Over one-half of Arkansas is in forests, much of which is owned by private landowners. Agriculture (13.8 million ac) and forestry (19 million ac) are critical as they occupy more than 90% of the total state land base. Arkansans and visitors greatly benefit from these land's diversity and ecology. Nationally, Arkansas ranks 1st in rice, baitfish, and sport fish production; 2nd in broilers; 3rd in ornamental fish and catfish; 4th in cotton and turkeys; 5th in grain sorghum and rabbits; 6th in sweet potatoes; 9th in soybean; and in the top 25 in another 21 commodities. The diversity of Arkansas agriculture also includes fruits, vegetables, nuts, beef, corn, wheat, oats, hay and forage and many other crops. The state also ranks fourth nationally in saw-log timber production. This diversity is a major asset in helping the state's agriculture sector to weather downturns in a specific commodity. Food processing also adds much value to the commodities grown in the state.

Our natural resources attract about \$6 billion per year in tourism dollars. ANR science and education contribute strongly to productivity, efficiency, preservation of natural resources, and sustainability. Arkansas Extension educators and researchers develop Extension programs to address the production, environmental and economic sustainability of Arkansas agriculture, aquaculture, forestry, farm families and allied agricultural industries that depend on agriculture production and associated jobs. Arkansas, though a major agriculture state, has issues similar to that of the remainder of the U.S. Arkansas must address issues, such as: rapid growth in some areas of the state and declining populations and economies in other areas; health and nutrition issues, including obesity in children and adults; food insecurity for limited-resource individuals and families; food safety issues from production through consumption; unemployment; the impacts of higher energy costs on all aspects of daily life; environmental issues that both impact and are impacted by agricultural production; and many other economic and societal challenges facing Arkansas agricultural producers, families, youth and communities.

To successfully employ strategy regarding adaptation and mitigation to environmental stresses for agriculture of the University of Arkansas System Division of Agriculture (Div. of Ag.) and the University of Arkansas at Pine Bluff (UAPB) School of Agriculture, Fisheries and Human Sciences depends on increasing knowledge of fundamental biological and environmental systems. Arkansas research and Extension faculty are committed to finding answers to basic and applied questions in plant and animal genetics, plant and animal physiology, soil and water conservation, nutrient management and other relevant systems.

With the dramatic changes in oil prices, the focus on biofuels is quickly waning among Arkansas stakeholders. The average price of a barrel of oil at this writing is around \$30. The biofuel industry in Arkansas has not materialized as anticipated. However, should demand for alternative fuels revive, Arkansas is well positioned for bioenergy production with large areas of cropland and forest and an

innovative processing industry for agricultural and forest products. Reduced funding opportunities has dictated that research and extension efforts be reduced in the biofuels/bioenergy area. Scientists in Arkansas will stay engaged in the investigation of feasibility of sustainable energy, including biodiesel fuel, biomass crop production, and potential crop and fast-growing tree species that show potential for bioenergy production. Reaching the sustainable energy goals outlined by the Federal government involves policy analysis, issue education, and understanding public perceptions about sustainable energy. Faculty will work across several disciplines to investigate the potential impacts of biomass production and biofuel use on water quality, forest sustainability, soil nutrients, and other environmental concerns to help Arkansans understand the benefits and costs of biofuel production.

Arkansas will not only face competing demands for water quantity and quality, but forest stewardship and health, wildlife habitat management, air quality and ecosystem services are also critically important to the economic well-being of the State. Nutrient sensitive areas have been declared by the state. Farmers and farm service providers in the identified areas require assistance, planning support and nutrient management education beyond anything traditionally provided by Extension educators.

Land managers require updated information relevant to natural resource management issues such as: carbon trading and credits; nutrient trading and credits; water quality regulations; best management practices for the range of agriculture production management situations; Spill Prevention Control and Countermeasures (SPCC) rules for agriculture; pesticide application permit rules; animal manure and mortality management rules, etc. The issues impact the health of the natural environment and the health of all Arkansas citizens.

The Division of Agriculture's Center for Agricultural and Rural Sustainability (CARS) addresses important regulatory issues in agriculture, environmental biology, plant biotechnology and agricultural risk analysis through education and research in the regulatory sciences and risk analysis. The Center uses the experience of university faculty and Federal agencies in conducting research, outreach and education that advances understanding of and compliance with Federal, state and local government statutes.

Arkansas has the third highest poverty rate in the nation, with one in four children living in poverty. Food security is defined as access at all times to enough nutritional foods for an active and healthy lifestyle. Arkansans in many areas of the state have limited access to nutritious and affordable food. The Division of Agriculture's and UAPB's Supplemental Nutrition Assistance Programs (SNAPEd) and FF News and the Expanded Food and Nutrition Education Programs (EFNEP) will teach families with limited resources to select, prepare healthy foods and stretch food dollars.

The Division of Agriculture's Cooperative Extension Service and UAPB's Cooperative Extension Program also provides science-based information and educational programs to help families, communities and schools develop gardens and practice good food resource management.

Obesity is another significant and growing public health problem in Arkansas, ranking highest in adult obesity in the United States. Obesity-associated complications such as diabetes, heart disease, asthma, sleep disorders and social and emotional problems are increasingly seen in adolescents. Early intervention to prevent obesity will be crucial for the health of future generations. While many factors contribute to obesity, achieving a balance between calories we consume and calories we burn is the overall key to healthy weight. Nutritious food is essential for well-being.

Through implementation of this plan, the U of A System Division of Agriculture and U of A at Pine Bluff will: expand its nutrition education programs to targeting the reduction of childhood and adult obesity; improve consumer nutrition literacy and cooking skills in preparing and consuming healthy foods; assist with Policy, Systems and Environment (PSE) approaches that support healthy lifestyles; promote farmers' markets and other venues for locally grown foods; conduct research on obesity, energy balance, nutrient density, behavior modification and food choices including acceptability of low sodium foods; increase food security in Arkansas by teaching consumers how to locate, select and prepare economical and nutritious foods; increase awareness among low-income households of available nutrition assistance programs; work with schools and communities to help develop home, school and community gardens; and inform decision makers about best practices for increasing community food security.

The long-term growth of the food industry in Arkansas is dependent upon the industry's ability to innovate, to respond to consumers' taste and expectations, to employ a quality workforce and to minimize

environmental impacts and the use of natural resources while maintaining economic viability. New products that meet individual consumer's nutritional needs, deliver health benefits and satisfy the desire for natural ingredients will be in demand.

The U of A System Division of Agriculture and U of A at Pine Bluff will also: educate consumers about the value of foods that promote optimal health, foods and nutrients to increase, and foods and nutrients to decrease and the safety of ingredients in food products and the impact of emerging food technologies; train a qualified workforce for the food processing industry; improve existing, and develop new, processing technologies to produce healthy, high quality foods and reduce environmental impact; continue partnerships with industry to facilitate technology development and implementation; assist new food business entrepreneurs; and conduct research to enhance the nutritional value and consumer acceptance of foods, the efficiency of food processes and the use of food byproducts.

The Centers for Disease Control estimate that foodborne pathogens are responsible each year in the United States for millions of cases of illness. Division of Agriculture programs will educate food producers, retailers, processors and consumers about food safety.

The U of A System Division of Agriculture and U of A at Pine Bluff will: conduct research to control foodborne pathogens and toxins in the food supply; educate Arkansans about how to minimize risks of agroterrorism; develop innovative methods to detect, identify and control foodborne pathogens, toxins and contaminants in agricultural production and processing; educate food producers, retailers, processors and consumers about food safety; investigate economical, practical and naturally occurring antimicrobials and other compounds that target food pathogens; develop postharvest technologies to improve the safety of fruits and vegetables; and provide consistent support of science-based information to USDA-FSIS regarding the Inspection Program for Siluriformes Fish and Fish Products.

Arkansans face many challenges, such as Arkansas' poverty rate of 19.7%, low child well-being rate, sedentary lifestyles among state residents, financially vulnerable consumers, a continually growing population of residents age 65+ and a need to prepare students for the future.

The University of Arkansas System Division of Agriculture and the University of Arkansas at Pine Bluff will focus on the human dimensions of food and agriculture through programs in the areas of health and aging, strengthening families, family resource management, and 4-H youth development. The University of Arkansas at Pine Bluff's initiative areas will include the "Arkansas AG Awareness Adventures" program and 4-H Youth Development.

The Division of Agriculture will conduct programs on how aging, caregiving, and use of health care services affect individuals and families. Health issues that accompany growing older - chronic disease, disability, and dependence are of particular importance. Programs efforts, "Aging in Place," "Acknowledging Aging" and "Keys to Successful Aging," help older adults extend productivity and independence.

Arkansas continues to rank 49th in the nation in overall health outcomes. Programs like "Extension Get Fit" and Wellness Ambassadors help young and old Arkansans increase physical activity, improve health, and improve quality of life. Low levels of health literacy, health insurance and medication literacy contribute to poor health outcomes and will be address through "Smart Choices" and "How to Talk to Your Doctor."

The Division of Agriculture's research-based programs address societal issues faced by families. Programs through the Division are designed to increase personal well-being, strengthen couple relationships, and empower effective parenting. A variety of training opportunities and resources are made available to prepare child care professionals in Arkansas.

Much of Arkansas's population is economically vulnerable. Many counties are primarily rural, with limited access to educational resources. The Division of Agriculture's Extension programs help give Arkansans the knowledge and skills they need to build financial stability. Educational outreach is designed to increase financial security and help families gain skills to build wealth.

Arkansas youth also face many challenges, as do youth across the nation. The teaching of life skills, including effective communication, leadership and decision making, helps youth become productive adults. The need for science, technology, engineering and math (STEM) education is at an all-time high. Both 1862 and 1890 institutions are uniquely positioned to teach and demonstrate scientific exploration. The UAPB "Arkansas AG Awareness Adventures" program (1890) will aid in youth having a better

understanding of the STEM aspects of agriculture, its industry and communities. Adult volunteers will continue to be recruited, trained, and utilized as key resources in the youth programming of both the Division of Agriculture and UAPB

With a local presence in every county, the University of Arkansas System Division of Agriculture strives to strengthen Arkansas communities and businesses through research and educational outreach. The University of Arkansas at Pine Bluff (UAPB) serves farmers, families and communities with limited resources, primarily in south and eastern Arkansas. Economic and community development efforts are focused in five areas: Economic Viability and Sustainability; Rural Infrastructure; Leadership Development and Community Involvement; Quality of Life; and Population Composition and Change.

While most urban areas in Arkansas have recovered from the Great Recession, many rural areas have not rebounded and are still losing jobs and people. Agriculture, natural resources and manufacturing remain critical to the state's economy, but the service sector accounts for the largest source of employment in both urban and rural areas. The ability of residents, businesses and communities to adapt to meet the current and future needs of industry is the key to a strong economy. Economic and community development programs to support value added agriculture, local foods system development, identification and access to new market opportunities, and develop strategies to be successful in the 21st century economy are available to help support economic viability and sustainability.

There is increasing concern about how aging physical infrastructure may limit future economic growth and sustainability in Arkansas. The challenge of how to fund roads, public utilities and other facilities needed to maintain community viability and long term quality of life continues to be an issue. Increasing access to advanced telecommunications, high-speed Internet, and broadband connectivity is also important. The University of Arkansas System Division of Agriculture offers research and Extension programs to help communities and regions better understand these issues and develop strategies to address infrastructure needs.

Effective and inclusive leaders are critical at the local, regional and state levels. Similarly, informed and engaged citizens play an important role in ensuring a successful future. Arkansas Extension's programs in this area focus on encouraging citizen engagement, educating residents about public issues and policy, creating a local environment that encourages collaboration and innovation, and leadership skill development.

Ensuring a high quality of life is a major factor in attracting and retaining families, retirees, workers and businesses. Research suggests that leveraging local and regional assets is an important key in creating positive change in those communities and regions. Leadership and strategic planning programs will focus on showing local leaders how to be proactive in leverage their unique assets to build a sense of identity and create a high quality of place and life.

The Division of Agriculture and UAPB are conducting research and analysis about demographics changes occurring in Arkansas and providing educational outreach to help individuals and communities address challenges and identify and take advantage of opportunities created as a result of these trends.

Arkansas Extension and research administration, faculty and staff will continue to commit time and resources from federal, state, county, city and private sources to address these many issues. The issues are challenging and broad and so are the planned programs. The approach will be through careful planning and the involvement of partners, volunteers, constituents, and local, state and national leaders. This combined Plan of Work includes discovery and applied research and educational activities and programs that will result in: efficient and sustainable agricultural production and increased capacity of both large-scale and limited resource agricultural producers in order to meet growing food demands and in addressing food security issues; reduction in the incidences of childhood obesity; conservation and protection of Arkansas's natural resources; the development of processes and technology to help agricultural producers remain viable in the face of climatic variability; a more safe and secure food supply for all; developing leaders, sustaining communities, workforce preparation, financial management, parenting skills, health promotion, youth development and many more.

Five programs are submitted in this combined 2017-2021 Plan of Work from the University of Arkansas System Division of Agriculture (Div. of Ag.) and the University of Arkansas at Pine Bluff (UAPB) School of Agriculture, Fisheries and Human Sciences. The Plan of Work programs are:

- Agricultural Production and Processing
- Environment, Energy and Climate
- Access to Safe and Nutritious Food
- Increasing Opportunities for Families and Youth
- Economic and Community Development

Estimated Number of Professional FTEs/SYs total in the State.

Year	Extension		Research	
	1862	1890	1862	1890
2017	328.4	22.1	465.5	27.2
2018	328.4	22.1	464.1	27.2
2019	328.4	22.1	460.8	27.2
2020	328.4	22.1	460.0	27.2
2021	328.4	22.1	460.0	27.2

II. Merit Review Process

1. The Merit Review Process that will be Employed during the 5-Year POW Cycle

- Internal University Panel
- External University Panel
- External Non-University Panel
- Combined External and Internal University Panel
- Expert Peer Review

2. Brief Explanation

University of Arkansas System Division of Agriculture programs are reviewed using a three-tiered review process:

1. Stakeholder program identification and review (described in Section IV.)
2. Internal or Administrative approval and review
3. External review

Internal or Administrative Approval and Review

Identified planned Extension and research programs are reviewed and approved internally by administrators, through a performance appraisal system that assures adherence to goals and the specific needs identified by stakeholder groups. Smith-Lever, Hatch, McIntire-Stennis, Evan-Allen, 1890 Extension funds, Animal Health and regional research projects are reviewed and approved by the subject matter department head and the appropriate administrator.

External Review

Merit reviews are conducted as part of the University of Arkansas System Division of Agriculture (Div. of Ag.) and the University of Arkansas at Pine Bluff (UAPB) School of Agriculture, Fisheries and Human Sciences on-going program review processes. The reviews may be departmental or programmatic and cut across departments. Reviews are scheduled on a five-to-seven year cycle and conducted concurrently for research, Extension and instruction. All reviews are conducted by a team of recognized outside research, Extension and teaching professionals, balanced to reflect programmatic needs and diversity. All reviews often include one or more stakeholders. The actual review process involves a period of self-study, followed by program assessment and benchmarking.

III. Evaluation of Multis & Joint Activities

1. How will the planned programs address the critical issues of strategic importance, including those identified by the stakeholders?

The University of Arkansas System Division of Agriculture (Div. of Ag.) and the University of Arkansas at Pine Bluff (UAPB) School of Agriculture, Fisheries and Human Sciences utilize both formal and informal mechanisms for ensuring the planned program areas address areas of strategic importance to the state. The Combined Plan of Work reflects the priority issues identified by stakeholders from around the state. Priority programmatic areas were identified based on stakeholder needs identified through a variety of input methods, previously described, that will provide direction for research and Extension efforts over the five years of the Plan of Work. Stakeholders of specific programs include a range of individuals including: community and economic development groups; 4-H members and other youth; commodity groups; farmers/producers; state agencies; parents; among others. Research and Extension faculty and staff use this information and also assist in identification of emerging issues that can be addressed by research and Extension efforts. In many cases, those who help in identifying issues are also able to provide partial funding support for those efforts. Members of advisory committees often partner with the University in implementing critical programs

2. How will the planned programs address the needs of under-served and under-represented populations of the State(s)?

University of Arkansas System Division of Agriculture and the University of Arkansas at Pine Bluff (UAPB) research and Extension programs are developed and implemented to address the diverse needs of Arkansas citizens. The primary target audience of most 1890 Extension and research programs is under-served and under-represented populations. Advisory committees, task forces and other planning groups include clientele representing the under-served and under-represented population to ensure that programs are planned for effective delivery and targeted in the areas of most critical need. Examples of these programs include: **4-H Afterschool Programs** provide educational opportunities for youth, many in urban environments who don't have other enrichment opportunities. Division of Agriculture and UAPB work collaboratively to reach limited resource audiences through the Expanded Foods Nutrition Education Program (EFNEP) in Phillips County. EFNEP is also conducted in 13 additional counties by the Division of Agriculture.

The **4-H Mentoring Program** targets youth and their families and reaches at-risk youth with 4-H programs and is funded through a grant to the National 4-H Council from the Department of Justice, Office of Juvenile Justice and Delinquency Prevention.

SNAP-Ed - Conducted in 75 counties by Division of Agriculture Extension educators. SNAP-ED focuses on families that receive supplemental nutrition resources.

Entrepreneurial Development Targeting Rural Hispanic Immigrants is a research and Extension effort to examine entrepreneurial readiness and constraints among Hispanic migrants in rural and urban areas and through educational outreach programs designed to facilitate and support entrepreneurial activity among targeted rural Hispanic populations.

Extension faculty from the University of Arkansas and University of Arkansas at Pine Bluff partnered together to offer six **Farmers Market Local Foods Promotion Program** grant writing workshops around the state to raise awareness about this USDA program and help applicants develop high quality proposals. Workshops were held around the state to ensure accessibility for minority and economically vulnerable populations. Fifty-one percent of Arkansas attendees reported themselves as being minority.

3. How will the planned programs describe the expected outcomes and impacts?

Through the development of program logic models, planned programs have identified specific outputs and short, medium and long-term outcomes for the life of the programs. Program planning and accountability data will be entered by all Division of Agriculture Extension faculty through the Arkansas Information Management System (AIMS), a Web-based data management system, and aggregated to identify the state-wide outcomes and impacts. Qualitative data and case studies will likewise be entered into the AIMS system in order to produce a comprehensive understanding of the program outcomes.

UAPB Extension and research produces a report document bi-annually for distribution to all stakeholders. The University of Arkansas at Pine Bluff submits program impacts to the NIFA National Database and produces multiple publications on Extension and research outcomes. Outcomes and impacts are always communicated in a manner that clarifies the value of programs to current and future stakeholders.

Research-based outputs and outcomes will also be documented using annual departmental faculty performance reviews that include research progress, outcomes, patents, and refereed publications and presentations.

4. How will the planned programs result in improved program effectiveness and/or

Through the use of program logic models, planned programs have identified target audiences, program methods, and output and outcome measures prior to program initiation. The use of the planned program (input) elements and the faculty planning process allows state specialists/faculty to identify which audiences, methods, curriculum, etc. county faculty have identified as the focus of their work each October (at the beginning of each fiscal year). This planning information allows specialists to better focus their program support efforts by understanding the scope of work for each planned program, allowing increased and timely responsiveness to specific county needs. Through the use of output and outcome indicators, uniform data collection methods, including standardized reporting forms and a live online database, process improvements are possible throughout the fiscal year due to the compilation of program specific data. Identification of best practices, innovative approaches, and emerging issues over the life of the program can both inform research and provide guidance for other educational resource investments.

IV. Stakeholder Input

1. Actions taken to seek stakeholder input that encourages their participation

- 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
- Survey of traditional stakeholder individuals
- Survey specifically with non-traditional groups
- Survey specifically with non-traditional individuals

- Survey of selected individuals from the general public
- Other (County Extension Council and program advisory committee planning meetings.)

Brief explanation.

Stakeholder input into program identification and review is derived from both formal and informal means for all program areas. Public comment on current and future research programs is obtained from county and community meetings, commodity and community associations, commodity check-off boards, state legislative committees and open public forums concerning specific issues. Open public meetings, field days and county and regional production meetings provide forums for stakeholder input open to under-served or under-represented individuals, groups or organizations. Extension, County Councils and program advisory groups meet annually, at a minimum, to provide: input into emerging county-specific needs; input, feedback and/or review of current program implementation; feedback for evaluation of existing programs and modification or redirection of programming. Members of these groups are invited to participate in programs, field days, special tours, workshops and conferences throughout the year and for the duration of the program. All reviews of research and Extension programs include stakeholder members or members of the community or industry most influenced by the program area. Open public forums are held to address specific issues of importance to the stakeholder community or industry. In addition to the standard methods of obtaining stakeholder input described above, key informant interviews and surveys are conducted to collect time-sensitive information from specific stakeholder groups to provide guidance in response to emerging issues.

Input and interaction from stakeholders and the UAPB Aquaculture/Fisheries Center (AFC) occurs on an almost daily basis. For aquaculture, individual farmers, representatives of trade associations, and board members interact frequently with Center researchers and Extension specialists. The interaction often is initiated with a request by farmers for some specific information, with follow-up discussion through which additional research needs become readily apparent. For fisheries research, the primary stakeholder is the Arkansas Game and Fish Commission (AGFC). The increased interaction with the Arkansas Game and Fish Commission in recent years has facilitated greater communications. Formal input is obtained through the representation of the Arkansas Game and Fish Commission on UAPB's National Aquaculture/Fisheries Advisory Council. Additional opportunities for interaction and input are available at the state and national meetings of the American Fisheries Society (AFS).

2(A). A brief statement of the process that will be used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups
- Needs Assessments
- Use Surveys

Brief explanation.

Stakeholder input is a core component of Arkansas research and Extension programs. Means for acquiring input varies depending upon the nature of the research or Extension program and diversity of relevant stakeholders. These include local and state agencies, community groups, producers and other targeted audiences, as well as business and industry groups. Producer meetings, advisory groups, conferences, and focus group discussions are major means for gaining input. Stakeholder input processes are structured individually by departments/schools to represent the differences in audiences served. This

approach is taken because the clientele's needs for research and Extension assistance in programs are often broad in scope and local in nature.

Stakeholder participation on county-level advisory councils and committees is open to interested citizens. Stakeholder members are recruited to ensure that the councils and committees are representative of the communities in which they live. The composition and level of activity and input from advisory councils and committees is a major component of annual county Extension reviews conducted by district administrators. Participants in the Division of Agriculture's strategic planning process were identified by a team from the major units of the Division. Individuals who served on County Extension Councils and other stakeholder organizations and agencies were identified and asked to participate in the strategic planning process. Additional individuals were identified and recruited to participate in the process to ensure that the individuals who would be participating would be representative of county demographics. These individuals provided feedback to the process through an online strategic planning survey.

Both research and Extension programs in Agriculture, Aquaculture/Fisheries and Family and Consumer Sciences utilize an advisory committee structure as a major component of the stakeholder input process. Advisory councils/committees specializing in specific areas include: The Agriculture Research and Extension Advisory Council formally meets once a year. Council members provide a broadened perspective of challenges facing producers and promotes partnerships to address them. The Aquaculture/Fisheries Center of Excellence Advisory Council provides feedback and input into the UAPB Aquaculture/Fisheries Program. It includes representation from catfish, baitfish, and sport fish farms, feed mills, Arkansas Game and Fish Commission, and the U.S. Fish and Wildlife Service. Members include representatives of the baitfish, catfish, and hatchery segments of aquaculture, officials with the Arkansas Game and Fish Commission, UAPB alumni, and scientists from other universities. The Young Scholars Advisory Committee includes children and parents enrolled in the program and oversees planning, implementation and evaluation of the program. Membership also includes representatives of partnering agencies, government officials and state legislators.

2(B). A brief statement of the process that will be used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- 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
- Survey of selected individuals from the general public
- Other (Meeting with regulatory groups, state agencies, & commodity prom)

Brief explanation.

Much of the Division of Agriculture external stakeholder input is collected through formal county-level extension councils and program advisory committees. Members of these groups assist local Extension staff in identifying local issues and problems that can be

addressed through Agricultural Experiment Station research and Extension educational programs. Membership on these groups is open to any individual and is on a rotational basis to encourage new members becoming a part of these advisory groups on a regular basis. Input to guide research efforts is also collected through contacts, both formal and non-formal, with other state agency personnel, commodity group representatives and other organizations working in areas related to Division of Agriculture projects and programs.

The University of Arkansas System Division of Agriculture is in the process of developing their new 2017-2021 Strategic Plan. The process will include utilize each of the 75 County Extension Councils to identify key programmatic areas and important issues the Division of Agriculture can assist in addressing. Research & Extension Center directors and department heads will identify key stakeholders for Extension and research areas. The stakeholders will assist in identifying major issues that the Division of Agriculture can address through an online survey. Information gathered from the County Extension Councils and the online survey will be compiled to identify the major Extension and research efforts the Division of Agriculture will address going forward.

Stakeholder input for UAPB Extension and research programs is more program-oriented, with input directed toward specific issues and needs of the stakeholders. Means for acquiring input varies depending upon the nature of the UAPB research or Extension program and the diversity of relevant stakeholders. These may include local and state agencies, community groups, producers and other targeted audiences, as well as business and industry groups. Producer meetings, advisory groups, conferences, and focus group discussions are major means for gaining input. Our initial stakeholder input plan required each program to develop its own input mechanism depending upon the nature of the program and the targeted clients. An annual process is established to garner stakeholder input into the continued implementation of all ongoing research and Extension programs. This second stakeholder input requirement speaks to the importance of the advisory committee structure in the UAPB School of Agriculture, Fisheries and Human Sciences.

3. A statement of how the input will be considered

- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Action Plans
- To Set Priorities
- Other (Strategic Planning)

Brief explanation.

Stakeholder input is utilized at all levels of Arkansas Extension and research programming in identifying priority issues and in planning and conducting research activities and Extension educational programs that address those issues.

At the county level, Division of Agriculture annual plans of work are developed based on the feedback from local stakeholders about the priority issues that can be addressed through the dissemination and/or application of research-based knowledge and practices through Extension education programs. Additional input to guide program direction is collected through formal and non-formal collaborations with other agencies and organizations working in Extension-related areas.

Each year, the Extension program plan of work is updated to reflect the needs of clientele at the local and state level through a formal review and revision process. Research efforts are guided through feedback from external stakeholders, including

advisory groups, agriculture commodity production groups, other collaborating local, state and federal agencies and other agriculture-related organizations, such as Farm Bureau. Feedback from local stakeholders through Extension advisory committees and local demonstrations can also provide guidance for new directions in research activities.

Arkansas Extension and research faculty members also serve on advisory committees and work regularly with diverse stakeholder groups, including Farm Bureau, commodity promotion boards, state agency and regulatory groups, and program specific advisory groups to assist in the evaluation of current efforts and to provide feedback related to Arkansas' changing needs. Meetings are likewise conducted with internal stakeholders including county and state-level faculty, district administrators, and Experiment Station scientists to identify stakeholders and facilitate linkages between local needs and research priorities.

Examples of input from a structured committee currently being implemented are the UAPB Foundation Seed program for sweet potatoes and the baseline research for labeling herbicides for use on Arkansas sweet potato farms. The input from the sessions were incorporated into outreach efforts (more extensive efforts with sweet potatoes, enhanced technical support for value-added processing, and expansion of the role and geographic scope of the Small-Farm Program).

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Agricultural Production & Processing
2	Environment, Energy & Climate
3	Access to Safe & Nutritious Food
4	Increasing Opportunities for Families & Youth
5	Economic & Community Development

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Agricultural Production & Processing

2. Brief summary about Planned Program

Arkansas has diverse and sustainable large, small and limited resource producers. UA System Division of Agriculture (1862) and University of Arkansas at Pine Bluff School of Agriculture Fisheries and Human Sciences (1890) personnel conduct research and extension to improve agriculture - worth over \$20 billion to Arkansas each year and 1 in 6 jobs. Agriculture (13.8 million ac) and forestry (19 million ac) are critical as they occupy more than 90% of the total state land base. Arkansans and visitors greatly benefit from these land's diversity and ecology. Nationally, Arkansas ranks 1st in rice, baitfish, and sport fish production; 2nd in broilers; 3rd in ornamental fish and catfish; 4th in cotton and turkeys; 5th in grain sorghum and rabbits; 6th in sweet potatoes; 9th in soybean; and in the top 25 in another 21 commodities. Our natural resources attract about \$6 billion per year in tourism dollars. ANR science and education contribute strongly to productivity, efficiency, preservation of natural resources, and sustainability.

Production efficiency is a key and our personnel work to improve this through science. One example is the new nitrogen (N) soil test, N-STaR, that optimizes rice yield while minimizing N waste. Poultry scientists have greatly increased feed conversion, while aquaculture scientists improved catfish and baitfish efficiency with new "split-pond" systems. Other critical challenges remain including adequate water, soil health, resistant pests, climate, environmental concerns, energy, rising costs, new immigrant farm populations, and new emphasis on food safety. The 1862 and 1890 programs remain committed to cutting-edge diagnostic and testing services for crops, soils, manures, water, food safety, diseases, etc. Our scientists continue to adopt more biotechnology research methods to address these issues in spite of objections from some members of society.

Growers selling traditional and specialty products rely on objective research and extension in identifying existing and emerging market supply chains. Producers and processors must adjust to evolving markets, new requirements, regulations, and consumer demands. The 1862 and 1890 agriculture programs address new farmer's markets, marketing outlooks, global rice market modeling, the U.S. Catfish Model, farm bill analysis, producer/buyer connections, assistance to small and socially disadvantaged farmers, and policy education.

Many consumers continue to be isolated from food production and the complexity of modern agriculture and science. This isolation and a dramatic increase in web information lead to misunderstandings. While technology has raised our standard of living, substantial distrust about biotechnology, pesticides, "corporate" farms and the environment has increased. We educate youth, the public, industry and policymakers on modern agriculture, science, technology, and future careers thru classrooms, online courses, publications, websites, social media, and field days. During the past year, with local support, we have even developed two online courses to explain biotechnology facts to the public.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	13%	0%	15%	0%
111	Conservation and Efficient Use of Water	4%	0%	5%	0%
112	Watershed Protection and Management	4%	0%	5%	0%
201	Plant Genome, Genetics, and Genetic Mechanisms	4%	0%	5%	0%
204	Plant Product Quality and Utility (Preharvest)	6%	17%	9%	8%
205	Plant Management Systems	10%	27%	13%	15%
206	Basic Plant Biology	10%	0%	0%	0%
211	Insects, Mites, and Other Arthropods Affecting Plants	1%	0%	1%	0%
212	Diseases and Nematodes Affecting Plants	1%	0%	1%	0%
213	Weeds Affecting Plants	7%	0%	8%	0%
216	Integrated Pest Management Systems	20%	0%	0%	0%
301	Reproductive Performance of Animals	2%	0%	4%	0%
302	Nutrient Utilization in Animals	2%	0%	4%	8%
303	Genetic Improvement of Animals	2%	0%	4%	0%
306	Environmental Stress in Animals	4%	0%	8%	0%
307	Animal Management Systems	2%	37%	5%	44%
311	Animal Diseases	4%	16%	7%	5%
601	Economics of Agricultural Production and Farm Management	4%	2%	6%	9%
603	Market Economics	0%	1%	0%	8%
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	0%	0%	0%	3%
	Total	100%	100%	100%	100%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Production agriculture is a large and diverse industry in Arkansas with \$9.8 billion in Ag cash receipts in 2013, 16th in the nation. Public research and extension programs are crucial to keep Arkansas competitive. Row crop production is valued at almost \$5 billion, and employs more than 60,000. Arkansas

has a growing horticulture industry to support local foods interest, with the state ranked in the top 25 in 17 horticultural commodities. This industry offers employment to small and socially disadvantaged growers and larger commercial interests. Major issues in crop agriculture include evolving best management practices, sustainability, environmental safety, costs, regulations, food safety, water quality and quantity, and new pests.

The Arkansas poultry and livestock industry is a major source of jobs and revenue, with poultry production worth \$3 billion per year and livestock about \$500 million. Arkansas produces 6 billion lbs. of broilers, 3 billion eggs, and 500 million lbs. of fresh beef per year. Higher feed costs, unpredictable markets, climate, energy costs, health perceptions, biosecurity, and nutrient management are major concerns.

Arkansas is 2nd largest in aquaculture and largest in baitfish and sport fish. Variable feed costs complicate efficiency and profit, creating a strong need for more efficient production systems. Greater attention is needed to optimize production from split- and intensively-aerated fish ponds. The local foods movement has spawned interest in aquaponics - indoor fish culture with soil-less plant production - an interest that is growing dramatically. Gardeners and hobbyists are attracted to this all-natural production system. However, there is little research-based guidance available on the most appropriate culture systems and risks.

While Arkansas has abundant rainfall, groundwater continues to dwindle in production areas and droughts have caused major damage. A new state water plan is now being implemented and will require new research and extension on nutrient management, water conservation, and surface water storage.

Sustainability of crops, livestock and forests has been increasingly threatened by the development of resistant weeds, pathogens and insects and invasion of exotic pests. Monitoring and modern diagnostics and management options have to be continual and effective to prevent the interruption of production and economic devastation. Currently, herbicide-resistant weeds in row crops constitute major new constraints while fungicide-resistant pathogens and resistant insects loom. The spotted-winged Drosophila is an example of a newly introduced fruit pest from Asia that is currently threatening our fruit industry. An introduced pathogen in aquaculture is that of "hot" motile *Aeromonas septicemia* in catfish. This pathogen is most closely related to a strain in China and has resulted in serious mortalities of catfish in Alabama.

Intensive biosecurity is needed to contain its spread. There is also increasing concern about honeybee health with recent publicity about colony-collapse disorder.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Some primary assumptions that are made related to this program include:

- Arkansas producers will continue to face profit and sustainability challenges
- Diversity in economic, cultural and immigrant status will continue among producers and consumers

- Cooperative efforts with stakeholders will continue and provide grounded feedback
- On-farm research and extension will continue to guide recommendations for development
- New and existing ag production and processing industries will value public research and extension
- Demand for agricultural products will continue to increase as population and prosperity increase
- Water and energy will continue to be the major limiting resources of the future
- Environmental concerns will continue or increase
- Economic survival of producers will be dependent on meeting existing and new regulations
- Interest in local foods will increase
- Strong row crop, livestock, fish-farming, and poultry industries will remain vital to Arkansas
- Nutrient management and water quality issues with other states will remain important
- Global travel and biosecurity will remain important issues
- The need for public diagnostics and testing will continue to be supported by stakeholders
- The Internet and real-time electronic communication will continue to be the driving information delivery system with ongoing challenges of supplying quality information to clientele using these methods
 - There will be continued cooperation between 1862 and 1890 universities to serve Arkansans.

2. Ultimate goal(s) of this Program

Through integrated UA System Division of Agriculture and UAPB research and education programs, the goals of the Agricultural Production & Processing planned area include:

- Better prediction of production and threats to agriculture
- Increasing yields in the face of erratic climate
- Better connections of food consumers and producers
- Improved connections and assistance to underserved producers and ag communities
- Development of environmentally sustainable and economically viable production systems
- Improved collaboration with industry, government and allied stakeholders and partners
- Improving specialty and niche crop, aquaculture, and livestock production and markets
- Increase and sustain global competitiveness of aquaculture, crops, poultry and livestock
- Improving monitoring, early warning, detection and prediction of biosecurity threats to fish farming, poultry, livestock and crop operations
 - Sustaining or improving food safety
 - Optimizing new and more efficient aquaculture, horticulture, row crop, poultry, livestock and forestry production systems
 - Sustaining and improving forest and other watersheds
 - Improving understanding of forest, wildlife, and agro-ecosystems
 - Maintaining or upgrading needed diagnostic and testing facilities and services
 - Increasing biofuel opportunities through forest and crop research.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	110.3	17.0	263.0	20.0
2018	110.3	17.0	261.0	20.0
2019	110.3	17.0	259.0	20.0
2020	110.3	17.0	258.0	20.0

2021	110.3	17.0	258.0	20.0
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V(F). Planned Program (Activity)

1. Activity for the Program

Efficient Production & Processing

- Develop and deliver efficient, sustainable best management practices.
- Discover and promote adoption of breakthrough science-based technologies.
- Analyze and explain issues affecting agricultural production and processing.

Competitive Marketing

- Analyze global and local market opportunities and constraints.
- Identify and address the needs of diverse producers related to marketing supply chains.
- Analyze and explain issues affecting plant and animal product markets.
- Help all producers and processors take advantage of market opportunities.

Public Appreciation and Understanding of Agriculture

- Increase public awareness of Arkansas agriculture
- Explain agricultural science to the public.
- Recruit and retain agricultural and forestry professionals and leaders.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> • Education Class • Workshop • Group Discussion • One-on-One Intervention • Demonstrations • Other 1 (Diagnostic Testing) 	<ul style="list-style-type: none"> • Public Service Announcement • Newsletters • TV Media Programs • eXtension web sites • Web sites other than eXtension • Other 1 (Mass Media) • Other 2 (Social Media, Blogs)

3. Description of targeted audience

Target audiences for Agricultural Production & Processing include:
 Small and Socially Disadvantaged Farmers (SSDF)
 Agricultural food crop growers/producers
 Livestock producers

Non-traditional and small flock poultry producers
Commercial poultry producers
Commercial poultry company personnel
Aquaculture and aquaponics producers/consultants
Beekeepers
Local, niche producers
Farm Pond Owners
Non-farm private landowners
Agricultural consultants
Agribusiness/allied Industry personnel
Horticulture production and service business personnel
Local, state and federal agency personnel
Master gardeners
Community leaders
Policy and decision makers
Low-income families with children
Low-income older adults
Hispanic/Latino families
African-American families
Female producers
Veterans
First responder emergency personnel
Research funders
General Public
Policy makers
Water and Natural Resource personnel
Supply chain managers
Processors
Biotech industry
Value-added industry
Community Based Organizations

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
 - Number of patents submitted
 - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- # of agricultural production education meetings related to food, fiber and non-food plant and animal production
 - # of demonstrations/on-farm research related to food, fiber and non-food plant and animal production
 - # of farm visits related to food, fiber and non-food plant and animal production
 - # of field days related to food, fiber and non-food plant and animal production
 - # of educational materials distributed related to food, fiber and non-food plant and animal production
 - # of website visitors and downloads related to food, fiber and non-food plant and animal production
 - # of diagnostic samples related to food, fiber and non-food plant and animal production
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	# of clientele using improved crop best management practices.
2	# of clientele using improved fish farming best management practices
3	# of livestock producers using best management practices.
4	# of poultry producers using best management practices.
5	# of crop varieties or germplasm lines released.
6	# of producers using improved biosecurity practices
7	# of diagnostic plant health and nematode samples submitted.
8	# of fish samples submitted for disease testing.
9	# of fish samples submitted for disease-free certification.
10	# of samples submitted for exotic animal or poultry disease testing.
11	# of small and socially disadvantaged farmers reporting increased profitability
12	# of clientele who initiated specialty food-related enterprises
13	# of producers adopting herbicide resistance best management practices.
14	# of pesticide applicator training participants certified or re-certified
15	# of small or socially disadvantaged farmers adopting crop best management practices
16	# of Master Gardener participants trained, certified and re-certified.
17	# of small or socially disadvantaged farmers adopting more diverse crops
18	# of small or socially disadvantaged farmers adopting livestock best management practices
19	# of new ideas/concepts for textile structures/end products from bio-fibers
20	# of acres using improved crop best management practices.
21	# of clientele adopting non-food plant best management practices

Outcome # 1

1. Outcome Target

of clientele using improved crop best management practices.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 2

1. Outcome Target

of clientele using improved fish farming best management practices

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 3

1. Outcome Target

of livestock producers using best management practices.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 205 - Plant Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 4

1. Outcome Target

of poultry producers using best management practices.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 301 - Reproductive Performance of Animals

- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 5

1. Outcome Target

of crop varieties or germplasm lines released.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 212 - Diseases and Nematodes Affecting Plants
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 6

1. Outcome Target

of producers using improved biosecurity practices

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 603 - Market Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 7

1. Outcome Target

of diagnostic plant health and nematode samples submitted.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 212 - Diseases and Nematodes Affecting Plants

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 8

1. Outcome Target

of fish samples submitted for disease testing.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems

- 311 - Animal Diseases

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 9

1. Outcome Target

of fish samples submitted for disease-free certification.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 311 - Animal Diseases
- 601 - Economics of Agricultural Production and Farm Management
- 603 - Market Economics

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 10

1. Outcome Target

of samples submitted for exotic animal or poultry disease testing.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 311 - Animal Diseases
- 601 - Economics of Agricultural Production and Farm Management
- 603 - Market Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 11

1. Outcome Target

of small and socially disadvantaged farmers reporting increased profitability

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 12

1. Outcome Target

of clientele who initiated specialty food-related enterprises

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 601 - Economics of Agricultural Production and Farm Management
- 603 - Market Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 13

1. Outcome Target

of producers adopting herbicide resistance best management practices.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 14

1. Outcome Target

of pesticide applicator training participants certified or re-certified

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 216 - Integrated Pest Management Systems
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 15

1. Outcome Target

of small or socially disadvantaged farmers adopting crop best management practices

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 216 - Integrated Pest Management Systems
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 16

1. Outcome Target

of Master Gardener participants trained, certified and re-certified.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 17

1. Outcome Target

of small or socially disadvantaged farmers adopting more diverse crops

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 18

1. Outcome Target

of small or socially disadvantaged farmers adopting livestock best management practices

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 19

1. Outcome Target

of new ideas/concepts for textile structures/end products from bio-fibers

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems

- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 20

1. Outcome Target

of acres using improved crop best management practices.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 21

1. Outcome Target

of clientele adopting non-food plant best management practices

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Animal or plant disease outbreak)

Description

External factors that may impact outcomes within Agricultural Production & Processing include the following: 1) economic changes that impact costs of inputs and ag product prices; 2) climate variability; 3) appropriations at the state and federal level or availability of grants that impact funding; 4) changes in public policy that impact commodity prices, input costs, export markets and related; 5) changes in governmental regulations that impact producer income, increase operating costs, or make production methods impractical; 6) competition for public resources based on changing priorities; 7) competition among programs for limited personnel, facility or financial resources; 8) changes in population groups from immigration or economic changes that affect economic status of various groups; 9) unanticipated problems associated with globalization or exotic animal or plant health disease or related outbreaks.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Comprehensive program and departmental evaluation reviews to determine the quality and efficacy of research and Extension programs are conducted on a five to ten year cycle using accepted research-based evaluation methods and external review teams. Evaluation studies within individual Extension programs that are delivered to target audiences will be conducted using accepted program evaluation methodology and tools to determine changes in knowledge, skills, attitudes, behaviors, practices, and any social, environmental or economic condition changes that occur as a result of the programs.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Environment, Energy & Climate

2. Brief summary about Planned Program

To successfully employ strategy regarding adaptation and mitigation to environmental stresses for agriculture, the University of Arkansas System Division of Agriculture (Div of Ag) and the University of Arkansas at Pine Bluff (UAPB) School of Agriculture, Fisheries and Human Sciences rely on increasing knowledge of fundamental biological and environmental systems. Arkansas research and Extension faculty are committed to finding answers to basic and applied questions in plant and animal genetics, plant and animal physiology, soil and water conservation, nutrient management and other relevant systems.

Arkansas is facing critical water resource issues including: 1) critical groundwater decline in Eastern Arkansas due to high use for irrigation for row crops, 2) increasing rural water demands as livestock industry expands, 2) water quality issues in livestock producing areas derived from excess nutrients generated in confined animal operations, 3) growing concern of nutrient and sediment losses and delivery from row crop agriculture in Eastern Arkansas to the Gulf of Mexico, 4) and growing concerns on how to respond and manage extreme weather patterns due to climate change including prolonged drought and historical flooding events often in the same geographical areas. In response the State of Arkansas recently completed its update of the State Water Plan.

Arkansas will not only face competing demands for water quantity and quality, but forest stewardship and health, wildlife habitat management, air quality and ecosystem services are also critically important to the economic well-being of the State. Nutrient sensitive areas have been declared by the state. Farmers and farm service providers in the identified areas require assistance, planning support and nutrient management education beyond anything traditionally provided by Extension educators.

Land managers require updated information relevant to natural resource management issues such as: carbon trading and credits; nutrient trading and credits; water quality regulations; best management practices for the range of agriculture production management situations; Spill Prevention Control and Countermeasures (SPCC) rules for agriculture; pesticide application permit rules; animal manure and mortality management rules, etc. The issues impact the health of the natural environment and the health of all Arkansas citizens.

With the dramatic changes in oil prices, the focus on biofuels is quickly waning among Arkansas Stakeholders. The average price of a barrel of oil at this writing is around \$30. The biofuel industry in Arkansas has not materialized as anticipated. However, should demand for alternative fuels revive, Arkansas is well positioned for bioenergy production with large areas of cropland and forest and an innovative processing industry for agricultural and forest products. Reduced funding opportunities has dictated that research and extension efforts be reduced. Scientists in Arkansas will stay engaged in the investigation of feasibility of sustainable energy, including biodiesel fuel, biomass crop production, and potential crop and fast-growing tree species that show potential for bioenergy production. In addition to dispersed individual faculty efforts, formal program efforts to address these issues described below. The Center for Agricultural and Rural Sustainability (CARS) was formed in 2007 in order to better coordinate, integrate, and motivate innovation in sustainability research, outreach, and education. The CERS addresses important regulatory issues in agriculture, environmental biology, plant biotechnology and agricultural risk analysis. The Center's mission is to support education, research and understanding in the regulatory sciences and risk analysis. The Center uses the experience of university faculty and Federal agencies in conducting research, outreach and education that advances understanding of and compliance with Federal, state and local government statutes. The goals of the Program are to provide

broad based knowledge and understanding of legislative and judicial powers delegated to Federal/state/local agencies and increase the pool of minority and female applicants for positions with Federal/state/local agencies and private industry. CARS has initiated projects to measure and reduce greenhouse gas (GHG) emissions from agricultural production, processing, and distribution practices. CARS has pioneered use of life cycle analyses (LCAs) in US agriculture using high spatial resolution data. Three major projects are: 1. Dairy LCA for liquid milk; 2. Cotton LCA for GHG emissions; 3. Pork production LCA. These projects provide the most comprehensive and geographically explicit LCAs for US agriculture ever conducted, and will support innovations in reductions of GHG emissions across agricultural production practices. Additional efforts on direct quantification of GHG emissions from rice; assessments of soil carbon storage and sequestration; and impacts of various production practices on production agriculture in Arkansas. These efforts are focused on knowledge of agricultural systems that maintain high productivity in the face of climate change, reduce greenhouse gas emissions, and helping producers make decisions in adapting to changing environments. Sustaining economic vitality and taking advantage of emerging economic opportunities offered by climate change mitigation technologies are subjects of extensive effort.

Nutrient Management and Soil Testing- Rice in Arkansas is a major consumer of water and nitrogen. Arkansas soil scientists have developed a novel soil test for rice producers called N-STaR, a prediction model of nitrogen needs of rice grown on silt loam soils in Arkansas. As N-STaR is adopted by rice producers, nitrogen use efficiency will increase in many fields and nitrogen rates will be reduced on many fields. N-STaR for clay soils for rice, for corn production and for wheat production are under investigation and will be implemented.

The Center of Excellence for Regulatory Science (CERS) was created in 1995 to work with agricultural and environmental regulatory issues. The CERS addresses important regulatory issues in agriculture, environmental biology, plant biotechnology and agricultural risk analysis. The Center's mission is to support education, research and understanding in the regulatory sciences and risk analysis. The Center uses the experience of university faculty and Federal agencies in conducting research, outreach and education that advances understanding of and compliance with Federal, state and local government statutes. The goals of the Program are to provide broad based knowledge and understanding of legislative and judicial powers delegated to Federal/state/local agencies and increase the pool of minority and female applicants for positions with Federal/state/local agencies and private industry. Research in the CERS includes reducing lignin in rice and big bluestem through biotechnology methods, improving water quality in runoff from row cropping and from animal production systems, and improving water quantity. More than 300,000 private ponds in Arkansas are used for recreation, irrigation, livestock watering, and for wildlife viewing. Educational programs of the Aquaculture/Fisheries Center provide pond owners with the knowledge to enhance both their quality of life and the environmental benefits of farm ponds through proper management techniques. Arkansas is home to a variety of aquatic resources that include the Arkansas and Mississippi Rivers, their tributaries, and a large number of reservoirs. Good stewardship and management of these important resources requires research and extension support that is provided by the Aquaculture/Fisheries Center.

Arkansas Discovery Farms are nine working farms that voluntarily have allowed the monitoring and documentation of water resource parameters related to environmental issues including edge-of-field monitoring of runoff quality and quantity and irrigation water use. Discovery Farms is a long-term monitoring, demonstration and educational effort that allows Division scientists to evaluate the effectiveness of conservation practices under real farm conditions. The Discovery Farm Program in Arkansas is farmer-led and stakeholder-driven and empowers agricultural producers to become an integral part of the solution in resolving environmental issues such as water quality. To date, the program has received nearly \$2 million in funding from 14 different funding sources with over half coming from competitive grants.

The Big Creek Research and Extension Team (BCRET), an interdisciplinary team of water and nutrient management experts, began monitoring nutrient and bacterial concentrations in a near pristine and sensitive watershed adjoin the Buffalo River, America's first National River. The BCRET received special

state appropriations to conduct the monitoring. The BCRET submits quarterly reports of its findings to the Director of the Arkansas Department of Environmental Quality and the Governor's office. BCRET aims to conduct the research for 5 years or more, if funding is available.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	10%	0%	5%	0%
102	Soil, Plant, Water, Nutrient Relationships	10%	0%	14%	0%
111	Conservation and Efficient Use of Water	5%	25%	3%	20%
112	Watershed Protection and Management	9%	25%	11%	15%
123	Management and Sustainability of Forest Resources	15%	0%	15%	0%
133	Pollution Prevention and Mitigation	8%	25%	12%	15%
134	Outdoor Recreation	0%	10%	0%	10%
136	Conservation of Biological Diversity	2%	0%	2%	0%
141	Air Resource Protection and Management	2%	0%	2%	0%
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	5%	10%
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%	0%	4%	0%
204	Plant Product Quality and Utility (Preharvest)	5%	0%	5%	10%
402	Engineering Systems and Equipment	5%	0%	3%	0%
403	Waste Disposal, Recycling, and Reuse	5%	15%	1%	20%
511	New and Improved Non-Food Products and Processes	5%	0%	5%	0%
601	Economics of Agricultural Production and Farm Management	9%	0%	5%	0%
605	Natural Resource and Environmental Economics	5%	0%	5%	0%
610	Domestic Policy Analysis	5%	0%	3%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Agriculture is commonly cited as a major source of Green House Gases (GHGs). However, agricultural production practices can reduce GHGs emissions. In some cases agricultural practices may be converted into a net sink for carbon. Demand for food, feed, fiber, and fuel from agricultural production systems is predicted to increase by 50 to 100 percent in the next 40 years to meet the global food needs of the projected 9.25 billion people in 2050. This increase in demand places pressure on non-developed lands, especially the most biologically diverse landscapes on Earth: rainforests, wetlands, and prairies. Increasing production without increasing the land base means increasing yield from current agricultural lands. The complexity of global food production will require broad and detailed knowledge across supply chains.

Arkansas' economic well-being is constantly affected by the marketplace and by weather. Moderating commodity prices and continued low forest products values equates to low margins and requires that producers make strategic choices. The Arkansas climate can be harsh. Arkansas receives significant precipitation in all twelve months, but flood and drought conditions commonly occur within the same growing season. Freeze injury to crops and livestock can occur within months of extreme heat stress. The changing market and weather conditions combined with high input and equipment costs means a low tolerance for error. The farmer population is both aging and declining. The 2007 Census of Agriculture depicts the average age of the Arkansas farmer as 57 years. The total farm operations in 2007 numbered 49,346, down from the 49,493 farms of record in 1997.

Natural resource concerns continue. Water quantity and quality, forest stewardship and health, wildlife habitat management, life cycle analysis and ecosystem services are all issues that challenge the institutions in Arkansas. The state is completing a State Water Plan that will require interpretation and analysis by Arkansas research and Extension professionals. Nutrient sensitive areas have been declared by the state. Farmers and farm service providers in the identified areas require assistance, planning support and nutrient management education beyond anything traditionally provided by Extension educators.

There is growing interest among many producers in soil and water conservation practices as a means to reduce input costs and maintain sustainability. The Div of Ag. and UAPB will continue research and extension education to support the use of conservation practices such as cover crops. Irrigation water management, nutrient management, etc. Both the Div of Ag and UAPB are members of the Arkansas Conservation Partnership with State and Federal Conservation Agencies as well as Conservation Districts. Land managers are seeking answers to changing policy questions related to natural resource management issues such as: carbon trading and credits; nutrient trading and credits; water quality regulations; best management practices for the range of agriculture production management situations; Spill Prevention Control and Countermeasures (SPCC) rules for agriculture; pesticide application permit rules; animal manure and mortality management rules, etc.

Arkansas has abundant feedstock for production of biofuels. Exploiting those resources and producing biofuels must be balanced with maintaining the existing agricultural infrastructure, land use and long-term environmental considerations. The State of Arkansas and its resources are positioned to meet market demands and to respond to market incentives. Research efforts on bioenergy programs will continue, but demand for research and Extension efforts in the biofuels area has been rather sluggish in recent years. Increased need for biofuels research and Extension programs will likely occur only with a concomitant global change in the energy dynamic. Arkansas must plan building a sustainable bioenergy program that serves Arkansas and needs little external support.

Resources devoted to bioenergy production must be accompanied by Best Practices, including management of water, fertilizers and pesticides. Adherence to Best Practices can mitigate environmental quality issues including water pollution, declining soil fertility, and introduction of invasive species. The ability to assess impacts of new technologies and practices of bio-feedstock

production on water quality, distribution of biomass crops, spatial location of potential markets and other data in production decisions is critical, especially given emerging technologies and evolving needs. There is also a need to assess the impact of bioenergy products on the environment and local economy.

Building sustainable bioenergy depends on educating producers, stakeholders, consumers, and policy makers. Thus, educating all stakeholders on sustainable bioenergy production and applications will be essential for building a sustainable energy economy.

Energy issues may affect investment in crops grown specifically for the fiber, oil and ethanol markets, primarily outside the state of Arkansas. There is currently little interest among farmers in miscanthus, switchgrass and big bluestem. Arkansas farmers can make adjustments to exploit biofuels alternatives, but it will require sustained market demand to entice much production in the state. Biofuels crops will add to the demand for inputs, including irrigation, and compete directly for an already compromised water supply. Angling occurs in the more than 300,000 farm ponds in Arkansas, in the Arkansas River and its tributaries and in the many reservoirs in the state. Climate change can potentially affect these important aquatic resources as well as the economic benefits from their use in a variety of ways. Understanding the biotic effects of changing temperature regimens and of hydrologic patterns is necessary to adapt management strategies to conserve these important resources.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

The Div of Ag and UAPB will continue to seek financial support in our effort to address the key issues mentioned above and it is assumed that funding will be available. Both entities will continue to produce timely educational products.

Cooperative relationships with grower groups, commodity boards, regulatory agencies, and other organizations is the best available system for providing information needed to design education programs suited to the needs of the audience.

On-farm research provides necessary and trusted data from which defensible management recommendations can be derived.

Best Practices designed to protect water quality and support broad sustainability objectives must be a component of the continuing research and extension agenda.

Local County Extension Counsels provide a strong connection to the needs and priorities of local businesses, agriculture enterprises and communities.

The Aquaculture/Fisheries Center will continue research and extension into important fishery resources in natural waters of the state and into most effective management of farm ponds.

Regional Research and Extension networks will continue to be encouraged and supported by both state and USDA NIFA organizations.

The Div of Ag and UAPB will continue to encourage and support multi-disciplinary teams of faculty in targeted natural resource management research, Extension and education projects.

The Div of Ag and UAPB will continue to seek and obtain the funding necessary to support on-going research and Extension efforts associated with natural resource management and sustainability.

The program assumes that demand for agricultural products will continue to increase over the next 40 years. This increase in demand will be driven by increasing populations and increasing prosperity. The rate of population growth has never been greater. The rate of increase in prosperity, especially in Asia, has never been higher, as a percent or total numbers. The program assumes demand for high quality food will continue expanding rapidly. Concurrent with this expansion, the biofuels revolution is well under way. Demand for biofuels will increase as petrochemical prices continue to climb. The program assumes that the result of these and other pressures on the landscape is a dramatic loss in biodiversity, as forests, wetlands and prairies are converted to urban and agricultural systems. The program assumes that demand for forest products like paper, lumber, biofuels feedstocks will increase in the long term, but will remain relatively stable in the next five years.

The Div of Ag and UAPB assumes that creating efficiency (whether by reducing inputs without sacrificing yield, by increasing yields without increased inputs, or by increasing yields by superior management of inputs) is creating Climate Change mitigation. The program does not assume that all Climate Change mitigation can be profitably adopted, rather that some Climate Change mitigating practices will be adopted slowly or not at all due to increased risk or loss of profitability.

Renewable alternative fuels have already had a major impact on Arkansas agriculture. Increased demand for corn, soybeans and other oilseeds used for bio-fuel has resulted in higher prices and larger acreages of those crops in the state. The next generation of bio-fuel technology is expected to use non-food, cellulosic bio-mass, such as the fast-growing grass, rice straw and certain tree species being lab or field tested by Arkansas scientists.

We cannot assume that federal and state incentives for biofuel production and use will continue. Consistent with the falling price of oil and the lower demand for alternative fuels, we cannot shift large amounts of production capacity from food to energy. Increases in production of biofeedstocks must come largely from non-food input sources and through increased efficiencies in production practices. University of Arkansas scientists will continue research and education into developing biomass crop and forestry systems for sustainable energy production. Both laboratory and field tests will be conducted on University research locations and in fields of cooperating farmers. Interdisciplinary teams in research and extension are necessary to address critical issues in sustainable bioenergy. Faculty will work across disciplines and departments to investigate sustainable energy projects, issues, and policies through the integrated missions of research, education, and Extension outreach - Evidence: The UA Environmental Task Force charged with inventorying existing research and extension activities, setting priorities and, where needed, initiating new programs. The Task Force will continue to work across departments on critical sustainable energy issues, including water quality issues on sensitive streams in the state.

2. Ultimate goal(s) of this Program

For Climate Change: 1) Provide quantitatively rigorous analyses of crop production practices on GHG emissions and carbon footprints, provide strategies that seek to mitigate GHG emissions from crop and forestry production, and production strategies which allow adaptation to Climate Change which do not

compromise yield and profitability, and 2) Demonstrate that science-based Best Practices for mitigating GHG emissions can be implemented on a farm-wide basis without sacrificing yield or profitability, and 3) To monitor and document changes in water temperature patterns in ponds across the state.

For the Environment: 1) Identify and assist in the adoption of new technologies and practices that enhance profitability and manage risk, while protecting the environment and ensuring long term sustainability, and 2) Position policy decision-makers at all levels to understand and use the policy tools important to community, regional, and state-wide economic viability, and 3) Help Arkansas to achieve a high degree of competitiveness in a global economy, and 4) Continue to support strategic partnerships that create value-added benefits for Arkansas' environment and citizens, and 5) Remain vigilant and adaptive, responsive to locally identified environmental and natural resource concerns as they emerge, 5) Conserve habitat and water resources at the agriculture/environmental//urban interface, and 6) Increase the knowledge of community and business leaders regarding bioenergy and biofuel production and processing systems, and 7) Enhance the quality of life of farm pond owners, to ensure that pond owners have research-based information to meet their particular needs; that pond owners develop and use year-round control plans to anticipate problems, and that pond owners are aware of the environmental benefits of farm ponds, and 8) To enable Arkansas Game and Fish Commission to refine stocking strategies and better prioritize future stockings, with focus placed on waters that have better prospects for success

For renewable energy: Respond to stakeholder demand for: 1) renewable bio-based energy research , and 2) research and education on the use of fast growing woody biomass for bioenergy production, and 3) Research and education on energy from biomass sources while maintaining and sustaining a viable food and fiber supply, and 4) Evaluate the impact of biomass production on water quality and ecosystem health. In all areas, we plan to provide law and policy research to stakeholders and decision makers.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	18.3	1.3	128.3	2.9
2018	18.3	1.3	127.3	2.9
2019	18.3	1.3	127.0	2.9
2020	18.3	1.3	127.0	2.9
2021	18.3	1.3	127.0	2.9

V(F). Planned Program (Activity)

1. Activity for the Program

In the area of Conserving Water Resources, the Div of Ag and UAPB will:

- Improve efficient use and conservation of water resources through research and education.
- Educate Arkansans about competing demands for water quantity and quality for agricultural, residential, recreational, wildlife, industrial and municipal needs.
- Inform decision makers with science--based information on water quantity and quality.
- Collaborate with state and federal agencies to sustain water resources.

- Provide the science--based information needed to understand changing environmental regulations.
- Develop research-based Best Practices and assist landowners with implementing these practices for managing soil nutrients and animal manures.

In the area of Alternative Energy & Conservation, the Div of Ag and UAPB will:

- Develop sustainable and regionally appropriate bio-energy production systems.
 - Evaluate and demonstrate energy efficiency and conservation for agricultural and residential applications.
 - Provide science--based information to guide public understanding of alternative energy sources.
- Collaborate with state and federal agencies on assessing alternative energy options and measuring impacts.
 - Conduct research on the impact of energy -based resource extraction on natural ecosystems and communities.

In the area of Natural Resource Sustainability, the Div of Ag and UAPB will:

- Determine the effects of urbanization and changing rural ownership patterns on natural resources.
- Develop natural resource management strategies, balancing socioeconomic development and environmental protection.
- Provide science--based information to reduce negative impacts of invasive species.
- Provide consumers information to make educated decisions regarding "green" choices.

In the area of Climate Variations and Policy, the Div of Ag and UAPB will:

- Help Arkansas's communities and agricultural sector adapt to climate variations and extreme weather or climate--related events.
 - Analyze and explain local impact of national and international climate policies.
 - Provide unbiased information about the science behind the climate debate.
 - Evaluate agricultural production practices to reduce greenhouse gas emissions and sequester carbon.
- Update annually the aquatic herbicide section of the cooperative extension publication MP44, Recommended Chemicals for Weed and Brush Control, old annual weed and pond in-service for cooperative extension agents.
 - Develop and provide research-based information to the public through county extension faculty and direct contacts, and through newsletter articles, extension materials, and presentations at meetings and workshops.
 - Assess populations of important fisheries in Arkansas as well as the contribution of hatchery fish stocked into various aquatic systems.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
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<ul style="list-style-type: none">● Education Class● Workshop● Group Discussion● One-on-One Intervention● Demonstrations● Other 1 (Online Class)	<ul style="list-style-type: none">● Public Service Announcement● Newsletters● TV Media Programs● eXtension web sites● Web sites other than eXtension● Other 1 (Podcasts)● Other 2 (Radio Programs)
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3. Description of targeted audience

- Youth
- Agri Business
- Row Crop Agricultural Producers
- Small and limited-resource Farmers
- Consultants
- Forest Landowner Groups
- Forest Industry
- Loggers
- Natural Resource Professionals
- Geologists, US Geological Survey
- Landowners
- Educators
- Agency personnel
- Livestock producers
- Watershed and other Not-for-profit organizations
- General public
- Researchers
- Policy makers
- Research funding personnel and agencies
- Pond Owners
- Fisheries Biologists with Arkansas Game & Fish Commission

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of educational programs and events held related to Environment, Energy & Climate.
- Number of field days related to Environment, Energy & Climate.
- Number of educational materials, curricula, newsletters, web-based modules and fact sheets developed, produced and delivered related to Environment, Energy & Climate.
- Number of research-based, non-refereed publications published related to Environment, Energy & Climate.
- Number of research-based scientific presentations at scientific or professional meetings related to Environment, Energy & Climate.
- Number of research projects on biomass crops conducted in Arkansas.
- Number of research projects on biofuels performance and emissions conducted in Arkansas.
- Funded research amounts (in dollars) related to Environment, Energy & Climate.
- Number of current year Environment, Energy & Climate relevant research programs.
- Number of current year Environment, Energy & Climate relevant educational programs.
- Number of research projects on populations of important fisheries in Arkansas.

- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Life cycle inventory methodology and data for row crops for greenhouse gases.
2	Number of N-StaR samples processed.
3	Number of new assessment and management tools developed, including models and measurements of greenhouse gas emmissions
4	Number of current year citations of climate related publications.
5	Number of program participants who indicate a change in behavior, based on lessons learned during Environment, Energy & Climate programs.
6	Number of participants (both youth and adult) indicating new knowledge gained as a result of Environment, Energy & Climate programs.
7	Number of program participants indicating new knowledge of water quality and conservation best management practices
8	Number of producers who changed or adopted new production and/or conservation management practices or technologies
9	Number of program participants indicating the adoption or implementation of new water quality and conservation best management practices.
10	Number of farm pond owners who indicate new knowledge of pond management
11	Number of fisheries biologists indicating new knowledge of populations of important Arkansas fisheries

Outcome # 1

1. Outcome Target

Life cycle inventory methodology and data for row crops for greenhouse gases.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 112 - Watershed Protection and Management
- 136 - Conservation of Biological Diversity
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Research

Outcome # 2

1. Outcome Target

Number of N-StaR samples processed.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 3

1. Outcome Target

Number of new assessment and management tools developed, including models and measurements of greenhouse gas emissions

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Research

Outcome # 4

1. Outcome Target

Number of current year citations of climate related publications.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 123 - Management and Sustainability of Forest Resources
- 133 - Pollution Prevention and Mitigation
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 5

1. Outcome Target

Number of program participants who indicate a change in behavior, based on lessons learned during Environment, Energy & Climate programs.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 123 - Management and Sustainability of Forest Resources
- 133 - Pollution Prevention and Mitigation
- 136 - Conservation of Biological Diversity
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 6

1. Outcome Target

Number of participants (both youth and adult) indicating new knowledge gained as a result of Environment, Energy & Climate programs.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 112 - Watershed Protection and Management
- 123 - Management and Sustainability of Forest Resources
- 133 - Pollution Prevention and Mitigation
- 136 - Conservation of Biological Diversity
- 204 - Plant Product Quality and Utility (Preharvest)
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 511 - New and Improved Non-Food Products and Processes
- 601 - Economics of Agricultural Production and Farm Management
- 605 - Natural Resource and Environmental Economics
- 610 - Domestic Policy Analysis

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 7

1. Outcome Target

Number of program participants indicating new knowledge of water quality and conservation best management practices

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation
- 511 - New and Improved Non-Food Products and Processes

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 8

1. Outcome Target

Number of producers who changed or adopted new production and/or conservation management practices or technologies

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 123 - Management and Sustainability of Forest Resources
- 133 - Pollution Prevention and Mitigation
- 136 - Conservation of Biological Diversity

- 403 - Waste Disposal, Recycling, and Reuse
- 511 - New and Improved Non-Food Products and Processes
- 601 - Economics of Agricultural Production and Farm Management
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 9

1. Outcome Target

Number of program participants indicating the adoption or implementation of new water quality and conservation best management practices.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation
- 403 - Waste Disposal, Recycling, and Reuse
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 10

1. Outcome Target

Number of farm pond owners who indicate new knowledge of pond management

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships

- 111 - Conservation and Efficient Use of Water
- 134 - Outdoor Recreation
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension
- 1890 Research

Outcome # 11

1. Outcome Target

Number of fisheries biologists indicating new knowledge of populations of important Arkansas fisheries

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 111 - Conservation and Efficient Use of Water
- 134 - Outdoor Recreation
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Description

Arkansas' economic well-being is constantly affected by the marketplace and by weather. Compared to recent years, commodity prices have moderated considerably while beef prices have increased substantially. Demand and prices for forest products continues to be weak.

The Arkansas climate can be harsh and unpredictable. While Arkansas receives significant precipitation in all twelve months, it is not uncommon for flood and drought to occur within the same growing season. Freeze injury to crops can occur within months of extreme heat stress. Livestock producers must contend with weather extremes, traditional and exotic diseases, and high inputs.

The 2012 USDA Census of Agriculture depicts the average age of the Arkansas farmer as 58.3 years. The total farm operations shrank from 49,346 in 2007 to 45,071 in 2012. During the same period irrigated acreage in Arkansas increased from 4.5 million to over 4.8 million. If this trend in irrigation continues, there will be increased demand for irrigation technology and water conservation practices. The Division of Agriculture anticipates increased competition among agricultural interests and non-agricultural sectors for the existing water resources.

Changes in the Arkansas Water Plan and pending court cases regarding the Federal Clean Water Act can greatly affect the water and nutrient management practices in Arkansas. The Division's National Agricultural Law Center is monitoring the legal landscape to provide our stakeholders with the latest information regarding water law and regulations.

Programs in sustainable energy will be largely driven by the global energy markets. While early research and demonstrations indicate that production of bioenergy sources in Arkansas is feasible, the economic sustainability of bioenergy production is questionable.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Development and implementation of greenhouse gas (GHG) estimates from agricultural supply chains requires a retrospective assessment of the activities associated with production of an agricultural product, inventorying current activities, and analysis of case studies for validation of the analyses. Innovations for reducing GHG emissions require comparisons by regions.

Adoption of N-STaR can be predicted and quantified by the number of soil samples submitted for N-STaR analysis.

Several strategies will be initiated and used for collecting program assessment information to determine program results, outcomes and impacts. Extension educators will use a variety of recommended methods to gather needed information. Collection methodology and assessment tools will be programmatic and audience centered. Programs focusing on physical activity will use skill-based assessments, before-after program assessments, behavioral changes, observation, and questionnaires. Nutrition and health related activities will use anecdotal information, pre-test assessments and self-report of practice change. Unobtrusive means (request for additional information, purchase of videos and materials, increased participation and observation) will also be used to capture information.

Comprehensive program and departmental evaluation reviews for Research, Extension and Teaching Programs are conducted on a five to seven year cycle by various research based evaluation methods. Data relevant to shifts in production methods, acreage, cropping systems, and enrollment will be compared to historic levels and trends.

Longitudinal evaluation will be conducted by subcomponents of this program through various research based methods. Data will be collected from producers, consultants, and other agricultural practitioners, through telephone and mail surveys and questionnaires at producer meetings and other on-site visits and observations made by Extension faculty. NASS will continue to be a dependable source of indirect data. Electronic audience response (clickers) will be increasingly available and useful in broad based audience participation. Methodologies and survey content is being explored and tested in the current

fiscal year.

Programs in sustainable energy are relatively new therefore the evaluation process is in its early stages. Currently, there is little demand for development of bioenergy through biomass sources. If market conditions warrant, we will evaluate economic viability of bioenergy production. Such evaluations may include: benefit/cost analyses, participant surveys of knowledge gained, and adoption of recommended practices.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Access to Safe & Nutritious Food

2. Brief summary about Planned Program

Recent studies have found more than 75 percent of American consumers want to know where and how their food is grown and processed. However, when making choices, most consumers consider taste and hunger satisfaction over questions about the health benefits of food consumed. Science-based information gained through research focused on food production, processing and consumption plays a vital role in the health of Arkansans.

Healthy Food Choices

Obesity is a significant and growing public health problem. Arkansas is disproportionately burdened with obesity especially in the Delta area, having the highest obesity rate among adults at 34.5 percent, and seventh highest obesity rate among children at 20 percent. U.S. health officials estimate obesity costs the health care system approximately \$147 billion annually in 2008 dollars-- nearly 10 percent of all health care expenditures. Obesity-associated complications such as diabetes, heart disease, asthma, sleep disorders and social and emotional problems are increasingly seen in adolescents. Early intervention to prevent obesity is crucial for the health of future generations. While many factors contribute to obesity, achieving a balance between calories we consume and calories we burn is the overall key to healthy weight. Nutritious food is also essential for well-being. Fruits, vegetables, whole grains and certain vegetable oils contain bioactive substances that provide benefits beyond basic nutrition and should be part of a healthy diet.

THE U OF A SYSTEM DIVISION OF AGRICULTURE AND U OF A AT PINE BLUFF will:

- Expand its nutrition education programs in all counties in which our programs are conducted targeting the reduction of childhood and adult obesity.
- Improve consumer nutrition literacy and cooking skills in preparing and consuming healthy foods.
- Assist with Policy, Systems and Environment (PSE) approaches that support healthy lifestyles.
- Promote farmers' markets and other venues for locally grown foods.
- Conduct research on obesity, energy balance, nutrient density, behavior modification and food preferences and choices.

Food Security

Arkansas has the second highest food insecurity rate in the nation. Food security is defined as access at all times to enough nutritional foods for an active and healthy lifestyle. Arkansans in many areas of the state have limited access to nutritious and affordable food.

The Division of Agriculture's and UAPB's Supplemental Nutrition Assistance Program (SNAPed) and FF News and the Expanded Food and Nutrition Education Program (EFNEP) of both institutions teach families with limited resources to select, prepare healthy foods and stretch food dollars.

The Division of Agriculture's Cooperative Extension Service and UAPB's Cooperative Extension Program provides science based information and educational programs to help families, communities and schools develop gardens and practice good food resource management.

THE U OF A SYSTEM DIVISION OF AGRICULTURE AND U OF A AT PINE BLUFF WILL:

- Increase food security in Arkansas by teaching consumers how to locate, select and prepare economical and nutritious foods.
- Increase awareness among low-income households of available nutrition assistance programs.

- Work with schools and communities to help develop home, school and community gardens.
- Inform decision makers about best practices for increasing community food security.

Food Industry Innovation

The long-term growth of the food industry in Arkansas is dependent upon the industry's ability to innovate, to respond to consumers' taste and expectations, to employ a quality workforce and to minimize environmental impacts and the use of natural resources while maintaining economic viability. New products that meet individual consumer's nutritional needs, deliver health benefits and satisfy the desire for natural ingredients will be in demand.

THE U OF A SYSTEM DIVISION OF AGRICULTURE AND U OF A AT PINE BLUFF WILL:

- Educate consumers about the value of foods that promote optimal health, foods and nutrients to increase, and foods and nutrients to decrease and the safety of ingredients in food products and the impact of emerging food technologies.
 - Train a qualified workforce for the food processing industry.
 - Improve existing, and develop new, processing technologies to produce healthy, high quality foods and reduce environmental impact.
 - Continue partnerships with industry to facilitate technology development and implementation.
 - Assist new food business entrepreneurs.
 - Conduct research to enhance the nutritional value and consumer acceptance of foods, the efficiency of food processes and the use of food byproducts.

Safe Food Supply

The Centers for Disease Control estimate that foodborne pathogens are responsible each year in the United States for millions of cases of illness. For example, incidents stemming from Campylobacter, Salmonella, Listeria, E. coli O157:H7 and Shigella account for nearly 4 million cases annually. A viral foodborne pathogen such as Norwalk-like virus is estimated to account for almost 10 million illnesses annually. The estimate of total costs of these cases of foodborne illness approaches \$50 billion. Division programs educate food producers, retailers, processors and consumers about food safety.

THE U OF A SYSTEM DIVISION OF AGRICULTURE AND U OF A AT PINE BLUFF WILL:

- Educate food producers, retailers, processors, youth and consumers about food safety.
- Conduct research to control foodborne pathogens and toxins in the food supply.
- Educate Arkansans how to minimize risks of agroterrorism.
- Develop innovative methods to detect, identify and control foodborne pathogens, toxins and contaminants in agricultural production and processing.
 - Investigate economical, practical and naturally occurring antimicrobials and other compounds that target food pathogens.
 - Develop postharvest technologies to improve the safety of fruits and vegetables.
 - Provide a consistent support of science-based information to USDA-FSIS regarding the Inspection Program for Siluriformes Fish and Fish Products.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
501	New and Improved Food Processing Technologies	5%	0%	20%	15%
502	New and Improved Food Products	0%	0%	10%	15%
503	Quality Maintenance in Storing and Marketing Food Products	0%	0%	10%	15%
504	Home and Commercial Food Service	10%	0%	0%	0%
701	Nutrient Composition of Food	0%	0%	10%	0%
702	Requirements and Function of Nutrients and Other Food Components	10%	40%	20%	5%
703	Nutrition Education and Behavior	25%	10%	10%	25%
704	Nutrition and Hunger in the Population	15%	0%	0%	0%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	10%	50%	20%	25%
724	Healthy Lifestyle	15%	0%	0%	0%
806	Youth Development	10%	0%	0%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Unhealthy lifestyles, including poor diet and physical inactivity, cost Arkansas taxpayers millions of dollars each year in health care costs and lost productivity. Lifestyle changes can prevent at least 20 percent of annual deaths from heart disease, cancer, stroke and diabetes while lowering lifetime medical costs.

Obese adults are at increased risk for many serious health conditions including coronary heart disease, hypertension, stroke, type 2 diabetes, certain types of cancer, and premature death. Adult obesity also is associated with reduced quality of life, social stigmatization, and discrimination.

Obese persons have estimated medical costs that are annually \$1,429 higher than persons of healthy weight (Finkelstein 2009).

Sixty-nine percent of adults and 38 percent of youth in grades K-12 are overweight or obese. Lifestyles are directly related to these diseases. Less than half of Arkansas' adults and youth get the recommended amount of daily moderate physical activity. About one half of adolescents are trying to lose weight and more than 10% are using unhealthy practices to decrease weight. One fourth of children in Arkansas are at risk for hunger which has been linked to an increase in obesity in adults.

The Extension Food and Nutrition programs focus on: adoption and maintenance of healthy lifestyles for chronic disease prevention including regular physical activity and healthy eating. The food and nutrition program identifies and promotes evidence-based policies and practices that will reduce the incidence of chronic disease. The nutrition education program responds to the nutritional issues and needs of Arkansans across the lifespan and socioeconomic spectrum. Participants gain knowledge and skills that

will help them adopt appropriate behaviors to prevent or delay lifestyle-related chronic diseases. Food production and processing is a large business in Arkansas. Approximately 25% of all manufacturing in Arkansas is food processing, representing an \$11 billion per year business. There are 195 food processing corporations in Arkansas directly employing over 47,000 people. The Centers for Disease Control has estimated that 46 million persons in the United States are affected by food borne illness. The costs for persons infected include those associated with health care for afflicted individuals, costs related to caring for those who are ill, absenteeism from work and school, as well as travel costs to seek medical care.

For these reasons, it is paramount that the University of Arkansas maintains a viable and active research and extension program in food safety. These programs include postharvest technologies to improve the quality and safety of fruits, vegetables and processed foods. The success of our food safety programs is due to our excellent research and extension functions and their work across department and college lines. The Extension/Research integration and proximity of Extension and Experiment Station faculty/staff who work on food safety and food processing technologies which are disseminated in Extension workshops, newsletters, roundtables, etc. contributes to this success. The quarterly HACCP Roundtables serve not only state companies but are regional in scope and serve as a model at the national level as an example of food companies cooperating along with USDA through the University of Arkansas to address food safety issues.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Our Extension education process is a straight-forward approach to Arkansas health issues. Arkansans will choose to be active participants in the decisions that affect their health. Evidence-based education can enable rural individuals and families to better maintain healthy lifestyles and manage physical health. Nutrition education is based on the belief that: 1) Participants have access to and consume specific foods, 2) Targeted audiences are willing and able to participate in nutrition education programs, 3) Knowledge change can lead to behavior change, 4) People will be motivated to learn/change and 5) Targeted audiences are willing and able to make healthy food choices.

Research activities in food chemistry, food processing, food safety, postharvest technologies and nutrition is dependent on grant funding and the extent of the research depends on extramural funding.

The Better Process Control School is a nationally-mandated program, and other food safety programs are at the request of food processing companies, entrepreneurs, retail establishments, and consumers. Since the programs are clientele-driven, it is believed that they represent the concerns and needs of the food processing industry. It is also assumed that the Experiment Station scientists will continue to secure grant funding to assist in developing new information and technologies and to assist the

delivery of outreach programs. Finally, it is assumed that by working with food scientists and agricultural economists, entrepreneurs will continue to be identified and assisted to ultimately establish more successful food industry programs.

The Inspection Program for Siluriformes Fish and Fish Products has been included in the 2014 Farm Bill. It is assumed that the USDA-FSIS will move expeditiously to meet the congressional direction, timeline and milestones for the inspection of domestic and imported Siluriformes fish and fish products.

2. Ultimate goal(s) of this Program

Healthy Food Choices

- Educate and encourage individuals and families to adopt nutrition behaviors and lifestyles that promote health and prevent disease.
- Reduce risk factors for lifestyle-related chronic diseases.
- Assist individuals in achieving healthier weight.
- Develop knowledge through basic and applied research to better understand the relationship between food, diet and human health.
- Increase the knowledge and improve behavioral practices of youth and families/caregivers to engage in healthy food consumption practices based on the US Dietary Guidelines for Americans.
- Influence Policy, Systems and Environment (PSE) changes that support healthy lifestyles.

Food Security

- Increase food security in Arkansas by teaching consumers how to locate, select, and prepare economical and nutritious foods.
- Increase awareness among low-income households of available nutrition assistance programs.
- Engage volunteers to help develop home, school and community gardens.
- Inform decision makers about best practices for increasing community food security.

Food Industry Innovation

- Educate consumers about the value of foods that promote optimal health, the safety of ingredients in food products and the impact of emerging food technologies.
- Train a qualified workforce for the food processing industry.
- Improve existing, and develop new, processing technologies to produce healthy, high quality foods and reduce environmental impact.
- Continue partnerships with industry to facilitate technology development and implementation.
- Assist new food business entrepreneurs.
- Conduct research to enhance the nutritional value and consumer acceptance of foods, the efficiency of food processes and the use of food byproducts.

Food Safety

- Reduce the incidence of foodborne illness.
- Increase the number of viable technologies to improve food safety.
- Increase the adoption of recommended safe food handling practices of adults and youth at the individual, family, community, production, and supply system level.
- Increase the understanding of the ecology of threats to food safety from microbial and chemical sources.
- Improve the food processing/safety aspects of manufacturing to foster growth of food manufacturers and entrepreneurs in Arkansas.
- Improve the efficiency and competitiveness of Arkansas and U.S. food industries through improvements in food safety and quality control programs.
- Provide USDA-FSIS with a consistent supply of science-based information related to catfish farming, processing, risks, food defense, and vulnerability of imported catfish to contamination and adulteration.

The second goal is to provide training and guidance to assist U.S. growers and processors to adapt to and meet the new inspection standards.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	51.1	0.5	80.0	4.3
2018	51.1	0.5	80.0	4.3
2019	51.1	0.5	80.0	4.3
2020	51.1	0.5	78.0	4.3
2021	51.1	0.5	78.0	4.3

V(F). Planned Program (Activity)

1. Activity for the Program

Division of Agriculture and UAPB faculty will develop, evaluate, and disseminate education programs and curricula, incorporating new research and emphasizing healthy lifestyles to prevent and/or reduce adult and childhood obesity and other diet related diseases. Programs include but are not limited to:

- Supplemental Nutrition Assistance Program Education (SNAP- Ed and FFNews) Adults and Youth
- Expanded Food and Nutrition Education Program (EFNEP) Adults and Youth
- Healthy weight programs
- Arkansas Farm to You
- USDA Eat Healthy, Be Active Workshops
- Living Well with Diabetes
- Cooking schools

Division of Agriculture and UAPB faculty will conduct novel research to determine the impact of diet and food composition and functional food components on body weight and health.

The Division of Agriculture and UAPB faculty and staff will develop, evaluate and disseminate education and curricula incorporating research and teaching for food safety and processing. Programs include:

- Quarterly HACCP Roundtable meeting
 - HACCP workshops
 - Food safety and preservation workshops for consumers
 - Better Process Control School.
 - ServSafe workshops
 - Culinary arts training for food industry personnel
 - Online distance education in food safety and manufacturing
 - Assistance to small food companies and entrepreneurs in the form of services, workshops, and consulting.
 - Provide science-based information on catfish production, processing and economics to USDA-FSIS to assist with development of the new food safety inspection.
- Research activities in food safety include work to better understand the ecology of food pathogens,

improve food processing systems to minimize food pathogens and to improve detection systems for Listeria, Salmonella, E. Coli and other major food pathogens.

Research activities in food chemistry and food processing include work to (1) improve the quality of rice and improve rice processes, (2) expand the utilization of soybeans and its co-products, (3) assess the health benefits associated with fish, vegetables and other processed foods, and (4) improve the sensory quality of processed foods.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations ● Other 1 (On-line classes) ● Other 2 (Fact sheets) 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● Web sites other than eXtension ● Other 1 (Podcast & Online Education)

3. Description of targeted audience

- Youth
- School personnel
- Parents
- Adults
- Child Care Providers
- Researchers
- Food Manufacturers
- Farmer's Markets
- Farmers
- Limited resource farmers
- Entrepreneurs and Restaurants
- Food Service Employees and/or Food Handlers
- Employers & Employees
- Health Professionals
- Consumers
- State & federal agencies
- College Students
- Catfish farmers and processors

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
 - Number of patents submitted
 - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of 4-H/Youth Food, Nutrition and Physical activity programs delivered related to eating healthy, being active, and safe food handling
- Number of youth contacts in youth Food, Nutrition, and Physical Activity programs related to eating healthy, being active, and safe food handling

- Number of adult contacts from educational events (educational classes, workshops, group discussions, one-on-one interventions, demonstrations and other educational activities) related to eating healthy, being active, and safe food handling

- Number of Online Master of Agriculture (Food Safety Emphasis) students enrolled in courses

- Total competitive federal Grant \$ for program area

- Total non-federal competitive grant \$ for program area

- Number of participants in educational programs leading to graduation from the Better Process Control School
- Number of participants in educational programs leading to ServSafe certification for managers

- Number of participants in quarterly HACCP roundtables

- Number of culinary workshops for food technologists

- Number of participants in culinary workshops for food technologists leading to certification as Certified Culinary Scientist
- Number of culinary workshop participants completing 120 hours of required contact time for the Certified Culinary Scientist recognition

- Number of food processing laboratory services provided

- Number of nutritional labels developed

- Number of food processing approvals developed (2541a)

- Number of adult nutritional programs delivered related to eating healthy and being active

- Number of briefings to catfish farmers and catfish processors

- Number of presentations to catfish farmers and processors

- Number of emails, phone calls, and conference calls to catfish farmers and processors

- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of participants receiving certification in Better Process Control
2	Number of participants receiving certification in ServSafe
3	Number of participants in other workshops related to Food Safety including HACCP, food safety, food defense, food labeling, and food microbiology workshops receiving attendance certification
4	Number of growers and producers receiving GAP certification or equivalent (gaining access to new markets)
5	Number of youth demonstrating improved knowledge of food safety or hand washing
6	Number of Online Master in Food Safety graduates employed in the food industry
7	Number of viable technologies developed or modified for the detection and characterization of foodborne pathogens
8	Number of viable prevention, control and intervention strategies for foodborne threats in the food system
9	Number of culinary workshop participants passing the examination to become a Certified Culinary Scientist
10	Number of viable technologies developed or modified for improving food processing systems
11	Number of viable technologies developed or modified to improve the nutritive quality of foods
12	Number of small businesses started as a result of the food entrepreneur assistance program
13	Number of children that reported eating more of healthy foods.
14	Number of children who increase physical activity
15	Number of adults who improve food preparation skills
16	Number of adults who decrease sodium intake
17	Number of adult participants who increase consumption of foods recommended by the Dietary Guidelines for Americans
18	Number of adult participants who decrease consumption of foods recommended by the Dietary Guidelines for Americans
19	Number of public agencies personnel, aquaculture industry personnel, and general public individuals with increased understanding of food security and safety issues related to fish consumption in imported catfish and catfish-like products as compared to U.S. farm-raised catfish
20	Number of adults who report improved food security after participating in a nutrition education class

Outcome # 1

1. Outcome Target

Number of participants receiving certification in Better Process Control

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

Number of participants receiving certification in ServSafe

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 504 - Home and Commercial Food Service
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Number of participants in other workshops related to Food Safety including HACCP, food safety, food defense, food labeling, and food microbiology workshops receiving attendance certification

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 504 - Home and Commercial Food Service

- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 4

1. Outcome Target

Number of growers and producers receiving GAP certification or equivalent (gaining access to new markets)

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 503 - Quality Maintenance in Storing and Marketing Food Products
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

Number of youth demonstrating improved knowledge of food safety or hand washing

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
- 724 - Healthy Lifestyle
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

- 1890 Research

Outcome # 6

1. Outcome Target

Number of Online Master in Food Safety graduates employed in the food industry

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 7

1. Outcome Target

Number of viable technologies developed or modified for the detection and characterization of foodborne pathogens

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1862 Research
- 1890 Research

Outcome # 8

1. Outcome Target

Number of viable prevention, control and intervention strategies for foodborne threats in the food system

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Research

Outcome # 9

1. Outcome Target

Number of culinary workshop participants passing the examination to become a Certified Culinary Scientist

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 504 - Home and Commercial Food Service

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 10

1. Outcome Target

Number of viable technologies developed or modified for improving food processing systems

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products

4. Associated Institute Type(s)

- 1862 Research
- 1890 Research

Outcome # 11

1. Outcome Target

Number of viable technologies developed or modified to improve the nutritive quality of foods

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components

4. Associated Institute Type(s)

- 1862 Research
- 1890 Research

Outcome # 12

1. Outcome Target

Number of small businesses started as a result of the food entrepreneur assistance program

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 504 - Home and Commercial Food Service

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 13

1. Outcome Target

Number of children that reported eating more of healthy foods.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 14

1. Outcome Target

Number of children who increase physical activity

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 15

1. Outcome Target

Number of adults who improve food preparation skills

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 16

1. Outcome Target

Number of adults who decrease sodium intake

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 17

1. Outcome Target

Number of adult participants who increase consumption of foods recommended by the Dietary Guidelines for Americans

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 18

1. Outcome Target

Number of adult participants who decrease consumption of foods recommended by the Dietary Guidelines for Americans

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 19

1. Outcome Target

Number of public agencies personnel, aquaculture industry personnel, and general public individuals with increased understanding of food security and safety issues related to fish consumption in imported catfish and catfish-like products as compared to U.S. farm-raised catfish

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 20

1. Outcome Target

Number of adults who report improved food security after participating in a nutrition education class

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

The University of Arkansas Division of Agriculture and UofA at Pine Bluff are positioned to respond proactively through educational and research activities to policy, regulatory, economic and demographic changes that affect the quality of life for Arkansans and assist farmers and food processors to improve their economic position.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Several strategies will be initiated and utilized for collecting program assessment information to determine program results, outcomes and impacts. Extension educators will use a variety of recommended methods to gather needed information. Collection methodology and assessment tools will be programmatic- and audience- centered.

Nutrition and health-related activities will use anecdotal information; pre-test, post-test assessments; and self-reports of practice change. The SNAP-Ed youth program has evaluation instruments specific to curricula used. Most instruments are paper-based pre- and posttests, however, some instruments have been adapted for handheld electronic audience response devices. Pre-posttests measure changes in eating and activity practices or intent to change eating and activity practices as a result of nutrition education. Youth programs are also evaluated using post-surveys sent home to parents/caregivers. These surveys provide insight into nutrition and physical activity information youth share with parents/caregivers and reveal whether parents have made positive changes to food and activity practices of the household. The parent survey has provided valuable information on the benefits of school-based nutrition education programs for several years. UA Division of Agriculture is in the process of validating the survey via focus groups with parents around the state.

Adult EFNEP programs and SNAP-Ed participants in a series of lessons are evaluated using the EFNEP Behavior Checklist or an adaptation of that instrument. This is a self-report pre- and post-survey that

assesses behavior change in nutrition, resource management and food safety practices. Follow-up surveys measure sustainability of changed behavior.

Adult healthy weight programs utilize a self-report retrospective pre-posttest to capture changes in eating practices; and changes in weight, waist circumference, blood pressure, blood lipid and blood glucose levels as a result of weight loss and/or adoption of healthier eating and activity practices.

Programs focusing on physical activity will use skill-based change assessments, before-after program assessments, behavioral changes, surveys, observation, and questionnaires.

Unobtrusive means (requests for additional information, purchase of videos and materials, increased participation and observation) will also be used to capture information.

Evaluation studies for all research studies will be conducted before, after and during the projects.

Comparisons will include against non-participating groups or commodities to evaluate improvement in health indicators.

Short-term evaluation of this program involves monitoring the progress of developing the FSIS Inspection Program for Siluriformes Fish and Fish Products, and other parallel, regulatory issues.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Increasing Opportunities for Families & Youth

2. Brief summary about Planned Program

The University of Arkansas System Division of Agriculture (1862) and the University of Arkansas at Pine Bluff are uniquely positioned to extend research-based information to the 2,978,204 residents of Arkansas. Arkansans face many challenges, such as Arkansas' poverty rate of 19.2%, low child well-being rate, sedentary lifestyles among state residents, financially vulnerable consumers, a continually growing population of residents age 65+ and a need to prepare students for the future.

The University of Arkansas System Division of Agriculture (1862) and University of Arkansas at Pine Bluff (1890) are a part of the land grant system that focuses on the human dimensions of food and agriculture through programs in the areas of Health and Aging, Strengthening Families, Family Resource Management, and 4-H Youth Development. The University of Arkansas at Pine Bluff's initiative areas will include the Arkansas AG Awareness Adventures Program and 4-H Youth Development.

Health & Aging: The Division conducts programs on how aging, caregiving, and use of health care services affect individuals and families. The population of older adults in the US continues to increase. Health issues that accompany growing older - chronic disease, disability, and dependence are of particular importance. Programs efforts in the area of Aging in Place, Acknowledging Aging and Keys to Successful Aging help older adults extend productivity and independence.

Arkansas continues to rank 49th in the nation in overall health outcomes. Programs like Extension Get Fit and Wellness Ambassadors help young and old Arkansans increase physical activity, improve health, and improve quality of life. Low levels of health literacy and lack of knowledge about health insurance contribute to poor health outcomes and will be address through Smart Choices and How to Talk to Your Doctor.

Strengthening Families: The Division's research-based programs address societal issues faced by families. Programs through the Division are designed to increase personal well-being, strengthen couple relationships, and empower effective parenting. Training opportunities and resources are made available to prepare child care professionals in Arkansas.

Family Resource Management: Much of Arkansas's population is economically vulnerable. Many counties are primarily rural, with limited access to educational resources. The Division's Extension programs help give Arkansans the knowledge and skills they need to build financial stability. Educational outreach is designed to increase financial security and help families gain skills to build wealth.

Empowering Youth: Arkansas youth face many challenges, as do youth across the nation. The teaching of life skills, like effective communication, leadership training and decision making, helps youth become productivity adults. The need for science, technology, engineering and math education is at an all-time high. Both 1862 and 1890 institutions are uniquely positioned to teach and demonstrate scientific exploration. The Arkansas AG Awareness Adventures programs (1890) will aid in youth having a better understanding of agriculture, its industry and communities.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
607	Consumer Economics	0%	0%	30%	0%
724	Healthy Lifestyle	20%	0%	0%	0%
801	Individual and Family Resource Management	20%	0%	0%	0%
802	Human Development and Family Well-Being	20%	45%	29%	0%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	0%	0%	3%	0%
806	Youth Development	40%	55%	3%	0%
902	Administration of Projects and Programs	0%	0%	2%	0%
903	Communication, Education, and Information Delivery	0%	0%	33%	0%
	Total	100%	100%	100%	0%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

- Arkansas is home to more than 714,769 youth under the age of eighteen. Approximately 194 thousand children under age 18 live in poverty, 30 percent of children within the population live in low-income working families, 29 percent of 18 and under are in single parent families, and 283,760 children receive food stamps. Growing up in a safe and supportive environment is critical for youth and adolescents to thrive.

- The need for science, technology, engineering and math education is essential in today's environment. Coupled with additional national priorities, healthy lifestyles and citizenship/leadership life skills are essential to helping young people become responsible and healthy adults.

- Today less than 3 percent of the population is directly involved in agricultural production. Today's youth need an opportunity to better understand agriculture and the diverse careers within the field.

- Arkansas ranks near the bottom at 47th nationally in a state-by-state study on the well-being of America's children. These circumstances, compounded by the current economic state and limited job prospects, leaves little in the way of family based resources available to nurture and support children. These beleaguered parents and guardians gain markedly from programs designed to strengthen their parenting and relationship building skills.

- Child care professionals are increasingly called to be a major contributor to the mentoring and

nurturing needs of children. These professionals need on-going opportunities to update knowledge, skills and other aspects of their professional development.

- Human well-being also comes into play as a part of this initiative. Sixty-seven percent of adults and slightly more than 39 percent of Arkansas children are overweight or obese. Childhood obesity rates for Arkansas are higher than the national average. Lifestyles are directly related to chronic diseases. Less than half of the state's adults and youth get the recommended amount of daily moderate physical activity. Twenty percent of youth and adults smoke and twenty-two percent of Arkansas teens have abused prescription drugs by the time they reach their senior year in high school. Medical experts estimate that more than two-thirds of our elderly population cannot adequately understand health related material they encounter. Half of the U.S. population is at risk of misunderstanding medical instructions.

- Many Arkansas consumers are financially vulnerable. Twenty percent reported that their household spent more than their income. Many consumers lack adequate emergency savings. Many people have difficulty making payments to their lenders for their credit cards, car loans, medical bills or other debt.

- The Increasing Opportunities for Families & Youth planned program (1862 and 1890) efforts are prioritized into four main categories: Health and Aging Well, Strengthening Families, Family Resource Management, and Empowering Youth.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

- Childcare training will continue to be needed because of state licensing requirements and the nature of families and the workforce.
- Arkansas has significant potential to better the lives of individuals and families through improved diets, healthy lifestyles and better managed physical health. A core piece of this effort is health education.
- Arkansas will continue to have one of the highest percentages of senior adult populations in the country while, at the same time, the general population will remain one of the unhealthiest states, therefore, the need for health and aging programs continues.
- Extension Wellness Ambassadors graduates will deliver programs.
- Research shows the vast majority of people in this country are uncomfortable, overwhelmed and intimidated when it comes to making decisions about health insurance coverage.
- Cooperative Extension Service educators value collaboration and volunteerism and will partner with others to deliver the Extension Wellness Ambassadors program.
- The theory of Positive Youth Development guides program development for the Arkansas 4-H Program and University of Arkansas at Pine Bluff.
- The Youth Development programs will engage communities in being supportive of youth and the families that live there.
- Participants enrolled in the Arkansas Ag Adventures and Awareness Programs are expected to develop awareness of the importance of agriculture in the state and the diverse career opportunities associated with it.
- Consumers want to gain control of their finances.
- Adequate external funding availability will facilitate the implementation of the mentoring program.
- The University of Arkansas System Division of Agriculture and University of Arkansas at Pine Bluff will

continue to seek and support efforts to obtain the funding necessary to support on-going research and extension efforts associated with Increasing Opportunities for Families & Youth.

2. Ultimate goal(s) of this Program

- Quality parenting that leads to socially competent children. Individuals, teens and adults achieve personal well-being through skill development, attitude change and adoption of effective practices.
 - Improved quality care for Arkansas' children.
 - Improved social and economic well-being for Arkansas communities of interest through research based educational programming that increases knowledge, skills and participation in creating a desired future.
 - Implement research-based programs that provide insight into the strengths and needs of at-risk individuals, families and communities.
 - Implement health literacy and insurance programs
 - Educate and encourage adoption of healthy lifestyles, thus reducing long term health care cost.
 - Through education, information and referral help senior adults live productive lives for as long as possible.
 - Educate and increase consumers' awareness as to ways to stay financially stable during tough economic times.
 - Increase access to healthy lifestyle programs through training volunteer lay leaders.
- Increased understanding of agriculture and ultimately encourage more youth to seek careers in the field of agriculture, math, engineering and technology.
 - Increased opportunities for youth to become engaged in programs that increase lifeskills and prepare youth for the twenty-first century.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	132.2	3.3	1.8	0.0
2018	132.2	3.3	1.8	0.0
2019	132.2	3.3	1.8	0.0
2020	132.2	3.3	1.0	0.0
2021	132.2	3.3	1.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

In the area of **Health and Aging**, the University of Arkansas System Division of Agriculture will:

- Provide programs that improve functional fitness.

- Provide educational resources that enable older persons to live long, healthy and independent lives.

In the area of **Strengthening Families**, the University of Arkansas System Division of Agriculture will:

- Provide practical science-based knowledge to help people form and sustain healthy relationships, manage stress, and increase their well-being.
- Equip adults with practical science-based practices to raise resilient and caring children.
- Teach early childhood professionals practical science-based knowledge to help them provide care and education for children.

In the area of **Family Resource Management**, the University of Arkansas System Division of Agriculture will:

- Provide practical, research-based information to Arkansans to increase financial well-being.
- Equip adults and youth with the skills needed to build financial stability.
- Explore strategies that can be used to help Arkansans improve personal finance and consumer practices.

In the area of **Empowering Youth**, the University of Arkansas System Division of Agriculture and the University of Arkansas at Pine Bluff will:

- Expand access to quality 4-H programming in Arkansas.
 - Teach life skills to prepare youth for adulthood.
 - Help youth explore career and entrepreneurship possibilities.
 - Provide programs that involve youth in science, technology, engineering and math.
 - Provide programs that encourage healthy living for Arkansas youth.
 - Provide programs that engage youth in citizenship and leadership development.
- Raise awareness of the connections between food, agriculture and the natural world.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> • Education Class • Workshop • Group Discussion • One-on-One Intervention • Demonstrations • Other 1 (Online Class) 	<ul style="list-style-type: none"> • Public Service Announcement • Newsletters • TV Media Programs • eXtension web sites • Web sites other than eXtension • Other 1 (Grant Development) • Other 2 (Social Media)

3. Description of targeted audience

Employers and Employees
 Consumers
 Health Professionals
 School personnel

Child Care Providers

Adults

Youth

Jr Master Gardeners, Extension Homemakers (Councils)

Homeowners

State and Federal Agency Personnel

General Public

Project and program funding organizations

Public Health Officials

Policy Decision-makers

Civic leaders and organizations

Married couples or those considering marriage

Business leaders

Parents, Grandparents, caregivers, volunteers, 4-H members

Low income youth

Minority youth and families

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of organized 4-H clubs and other youth groups supported by Division of Agriculture Research and Extension and 1890 Extension resources.
- Number of volunteers working with organized 4-H and other youth groups
- Number of organized adult clubs and other groups supported by Division of Agriculture Research and Extension and 1890 Extension resources.
- Number of volunteers working with organized adult and other groups
- Number of grant dollars generated by grant and contract development efforts
- Number of unique visitors to Health and Living webpage
- Number of unique visitors to 4-H Youth Development webpage
- Number of Health & Aging programs delivered
- Number of participants in Health & Aging programs
- Number of youth participating in 4-H Healthy Living learning opportunities
- Number of youth participating in science, engineering and technology program and activities
- Number of youth participating in Citizenship/Leadership programs
- Number of youth participating in UAPB 1890 educational programs (4-H Science, Arkansas Ag Awareness Adventures Program and Aquaculture programs)
- Number of youth participating in 4-H mentoring programs
- Number of volunteers participating in 4-H mentoring programs
- Number of high schools with UAPB 1890 fishing teams
- Number of students participating in Arkansas Collegiate Series fishing tournaments
- Number of Extension Wellness Ambassadors graduates
- Number of participants in an Extension Wellness Ambassador programs and projects
- Number of participants trained in family life programs (personal well-being, couples relationship and parenting)
- Number of child care providers trained

- Number of participants in a Family Resource Management program
- Number of Individual and Family Resource Management programs delivered.
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Estimated dollar value of program support volunteers provide to the organization and communities (includes: EHC; 4-H, Jr. Master Gardeners).
2	Number of mentoring program participants who increase their knowledge about agriscience and STEM related topics (1890)
3	Number of youth engaged in Citizenship/Leadership opportunities
4	Number of youth adopting behaviors to prevent injury prevention behaviors such as: seatbelt use, helmet use, distraction-free driving, ATV use, bicycle, shooting sports safety, etc.
5	Number of youth indicating healthy physical activity habits
6	Number of youth that practiced positive communication skills
7	Number of youth that increased their understanding of the consequences of risk behaviors
8	Number of youth that express interest and engage in sciences related activities, 4-H Science, Arkansas Ag Awareness program and Aquaculture programs
9	Number of Extension Wellness participants who report conducting programs or accepting new leadership roles as a result of the program
10	Number of participants who changed at least one personal well-being, couple or parenting practice as a result of participating in family life programs
11	Number of child care provider training program participants who changed at least one behavior/practice (Best Care, 4-H Afterschool).
12	Number of participants who intended to change at least one well-being, couple or parenting practice as a result of participating in family life programs.
13	Number of child care professionals who increased their knowledge as a result of child care professional programs (Best Care, Best Care Connected, Guiding Children Successfully, 4-H After-School)
14	Number of participants improving functional fitness after participating in Extension Exercise program
15	Number of participants reporting an increase in physical activity after completing an Extension Exercise and/or health education program
16	Number of youth adopting behaviors to reduce sedentary activity
17	Number of mentoring program participants who increase their social competencies through leadership, community service or group projects.
18	Number of participants who report increased knowledge as a result of participating in Individual and Family Resource Management programs.
19	Number of participants who report intended behavior change as a result of participating in Cooperative Extension Service Individual and Family Resource Management programs.

Outcome # 1

1. Outcome Target

Estimated dollar value of program support volunteers provide to the organization and communities (includes: EHC; 4-H, Jr. Master Gardeners).

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 2

1. Outcome Target

Number of mentoring program participants who increase their knowledge about agriscience and STEM related topics (1890)

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1890 Extension

Outcome # 3

1. Outcome Target

Number of youth engaged in Citizenship/Leadership opportunities

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Number of youth adopting behaviors to prevent injury prevention behaviors such as: seatbelt use, helmet use, distraction-free driving, ATV use, bicycle, shooting sports safety, etc.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

Number of youth indicating healthy physical activity habits

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 6

1. Outcome Target

Number of youth that practiced positive communication skills

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 7

1. Outcome Target

Number of youth that increased their understanding of the consequences of risk behaviors

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 8

1. Outcome Target

Number of youth that express interest and engage in sciences related activities, 4-H Science, Arkansas Ag Awareness program and Aquaculture programs

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 9

1. Outcome Target

Number of Extension Wellness participants who report conducting programs or accepting new leadership roles as a result of the program

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 10

1. Outcome Target

Number of participants who changed at least one personal well-being, couple or parenting practice as a result of participating in family life programs

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 11

1. Outcome Target

Number of child care provider training program participants who changed at least one behavior/practice (Best Care,4-H Afterschool).

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 12

1. Outcome Target

Number of participants who intended to change at least one well-being, couple or parenting practice as a result of participating in family life programs.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 13

1. Outcome Target

Number of child care professionals who increased their knowledge as a result of child care professional programs (Best Care, Best Care Connected, Guiding Children Successfully, 4-H After-School)

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 14

1. Outcome Target

Number of participants improving functional fitness after participating in Extension Exercise program

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 15

1. Outcome Target

Number of participants reporting an increase in physical activity after completing an Extension Exercise and/or health education program

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 16

1. Outcome Target

Number of youth adopting behaviors to reduce sedentary activity

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 17

1. Outcome Target

Number of mentoring program participants who increase their social competencies through leadership, community service or group projects.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 18

1. Outcome Target

Number of participants who report increased knowledge as a result of participating in Individual and Family Resource Management programs.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 19

1. Outcome Target

Number of participants who report intended behavior change as a result of participating in Cooperative Extension Service Individual and Family Resource Management programs.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (NASS data availability)

Description

Plan implementation processes must constantly adapt to the circumstance of time and place: the economic condition within and surrounding Arkansas; the public policy landscape; program leadership; staffing; clientele interest and capacity; environmental circumstance; natural disaster; and other unforeseen changes in the community of constituents we serve, provides a challenging and fluid basis for the success of everything planned. Fortunately, the University of Arkansas System Division of Agriculture's and University of Arkansas at Pine Buff faculty and staff are well positioned and have the experience necessary to serve and adapt as the circumstance warrants. The leadership within the two institutions has the proven intent to keep the organizations constituent grounded, agile, appropriately staffed, and adequately financed to meet the needs of each new program situation.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Several strategies will be initiated and utilized for collecting program assessment information to determine program results, outcomes and impacts. Extension educators will use a variety of recommended methods to gather needed information. Collection methodology and assessment tools will be programmatic and audience centered. Programs focusing on physical activity will use skill-based assessments, before-after program assessments, behavioral changes, observation, and questionnaires. Health and Aging related activities will use anecdotal information, pre-test assessments and self-report of practice change. Unobtrusive means (request for additional information, purchase of videos and materials, increased participation and observation) will also be used to capture information.

Each of the Marriage, Parenting, and Family Life core program areas (i.e., Personal Well-being, Couple Relationships, Parenting, and Child Care Provider Training) has a brief evaluation instrument. These instruments are administered to program participants immediately at the end of a given program. The instruments allow county agents to gather data about the number of program participants, whether their knowledge increased, whether they intend to make a change as a result of their program participation, and if so, what they plan or hope to do. Participant contact information is also collected. This contact information allows county agents to contact program participants one month following program completion to see what changes they have actually made.

Family Resource Management program materials include a brief evaluation instrument that can be used to determine knowledge gained and intended behavior changes. Contact information can be used to gather follow-up information related to specific actions.

The Youth Development program will use the national 4-H outcome indicators to discern outcomes and impacts.

The mentoring programs conducted by both universities will utilize pre and post data using the 4-H Common Measure evaluations to report the change in social competencies of youth participants.

Comprehensive program and departmental evaluation reviews for Research, Extension and Teaching Programs are conducted on a five to seven year cycle by various research based evaluation methods.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Economic & Community Development

2. Brief summary about Planned Program

Changes in the economy, technology, and population continue to transform communities, the economic climate and the lives of Arkansans. With a local presence in every county, the University of Arkansas Division of Agriculture strives to strengthen Arkansas communities and businesses through research and educational outreach. Economic and community development efforts are focused in five areas: Economic Viability and Sustainability; Rural Infrastructure; Leadership Development and Community Involvement; Quality of Life; and Population Composition and Change.

Economic Viability and Sustainability:

While most urban areas in Arkansas have recovered from the Great Recession, many rural areas have not rebounded and are still losing jobs and people. Natural resources and manufacturing remain critical to the state's economy, but the service sector accounts for the largest source of employment in both urban and rural areas. The ability of residents, businesses and communities to adapt to meet the current and future needs of industry is the key to a strong economy. Economic and community development programs to support value added agriculture, local foods system development, identification and access to new market opportunities, and develop strategies to be successful in the 21st century economy are available to help support economic viability and sustainability.

Rural Infrastructure:

There is increasing concern about how aging physical infrastructure may limit future economic growth and sustainability across the country and in Arkansas. The challenge of how to fund roads, public utilities and other facilities needed to maintain community viability and long term quality of life continues to be an issue. Increasing access to advanced telecommunications, high-speed Internet, and broadband connectivity is also important. The University of Arkansas Division of Agriculture offers research and extension programs to help communities and regions better understand these issues and develop strategies to address infrastructure needs.

Leadership and Community Involvement:

Effective and inclusive leaders are critical at the local, regional and state levels. Similarly, informed and engaged citizens play an important role in ensuring a successful future. Arkansas Extension's programs in this area focus on encouraging citizen engagement, educating residents about public issues and policy, creating a local environment that encourages collaboration and innovation, and leadership skill development.

Quality of Life:

Ensuring a high quality of life is a major factor in attracting and retaining families, retirees, workers and businesses. Research suggests that leveraging local and regional assets is an important key in creating positive change in those communities and regions. Leadership and strategic planning programs focus on showing local leaders how to be proactive in leverage their unique assets to build a sense of identity and create a high quality of place and life.

Population Composition and Change:

Arkansas' population grew 1.5 percent from 2010 to 2014, with urban areas growing nearly 4 percent while the rural population declined by 1.6 percent. The median age of the state's population is 39.8, and

41.5 in rural areas. The Hispanic population grew by 12 percent during this period and has grown to seven percent of the state's total population. The Division of Agriculture is conducting research and analysis about changes occurring in Arkansas and providing educational outreach to help individuals and communities address challenges and identify and take advantage of opportunities created as a result of these trends.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
602	Business Management, Finance, and Taxation	35%	0%	4%	0%
605	Natural Resource and Environmental Economics	5%	0%	8%	0%
608	Community Resource Planning and Development	30%	0%	21%	0%
610	Domestic Policy Analysis	5%	0%	19%	0%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	15%	0%	16%	0%
805	Community Institutions and Social Services	5%	0%	16%	0%
806	Youth Development	5%	0%	16%	0%
	Total	100%	0%	100%	0%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Arkansas' population grew only 1.5 percent from 2010 to 2014. However, there was a big difference in population change between urban and rural areas of the state during this four-year period. Urban areas grew by nearly 4 percent, whereas the population in rural areas declined by 1.6 percent. Many rural communities experienced an out-migration of residents while many urban areas experienced an in-migration of residents from within and outside the state. Approximately 29 percent of Arkansas' population growth during this period was due to in-migration. Rural areas continue to have older populations than urban areas due in part to the in-migration of retirees and young people moving to urban areas in search of work. Growth in the Hispanic population has increased after slowing during the Great Recession. The Hispanic population in Arkansas grew by 12 percent from 2010 to 2014 and was 7 percent of the state's total population in 2014. While the Hispanic population grew about the same rate in urban and rural areas of the state, Hispanics are a slightly higher share of the urban population (8.5%) compared to rural areas (5%). Seven rural and three urban counties had a Hispanic population of 10 percent or more in 2014. At the end of 2014 Arkansas' economy had regained the number jobs that were lost during the Great

Recession. However, the urban areas were the beneficiary of these new jobs while rural areas continued to lose jobs. Employment grew 2.3 percent in urban areas compared to a decline of 3.5 percent in rural areas from 2007 to 2014. Employment in Arkansas declined by 2.7 percent from 2007 to 2010 and increased by 2.8 percent from 2010 to 2014. This was slower than the 7.4 percent employment growth in the U.S. economy during this period. The Great Recession amplified the rural-urban divide in employment opportunities in Arkansas and the state economy grew slower than the U.S. economy since 2010. Arkansas continues to rank among the ten states with the highest poverty rates (18.4 percent in 2014) in the country. Pockets of extreme poverty remain throughout the state with 19 counties having a rate of 25 percent or greater. Access to food is a serious problem for low-income residents. For urban areas, 8.1 percent of low income persons are more than one mile from a store. For rural areas, 8.8 percent of low income persons are more than 10 miles from a store.

A high percentage of Arkansans reside in unincorporated areas and small towns (44 percent), placing an unusually heavy burden on local governments in rural areas with declining local tax bases. Rural areas were hit harder by the recession, and many county governments received less revenue from their local sales and/or property tax in 2014 compared to 2008. Forty-five of the 75 counties in Arkansas received less revenue from the sales tax in 2014 compared to 2008. This was in spite of 20 counties increasing their sales tax rate between 2008 and 2014. Seventeen counties received less revenue from the property tax in 2012 compared to 2008.

Supporting community and state leaders to who are dealing with these challenges and working with them to identify new opportunities and implement successful strategies is a priority for the University of Arkansas Division of Agriculture. Research and programs are provided through five major priority areas: Economic Viability and Sustainability; Rural Infrastructure; Leadership Development and Community Involvement; Quality of Life; and Population Composition and Change.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

The following assumptions underlie our planned economic and community development programs:

- Youth and adults need leadership, government, citizenship, civic engagement, and issue based knowledge and skills to better engage and serve local communities, regions and the state.
- Citizens, policy makers, leaders and other stakeholders will engage in a process of identifying needs and opportunities for research and education in service to their economic and social interests.
- State and local governments are willing to invest resources to build community capacity for economic and community development.
- State and local governments are willing to be more transparent and educate and engage their citizens on local issues.
- Citizens are willing to learn new skills and obtain the knowledge necessary to yield productive change.
- Members of the business community are in search of new and innovative ways to generate income,

while protecting the long term sustainability of their enterprise.

- Voters want a better understanding of issues on their state and local ballot.

2. Ultimate goal(s) of this Program

The goal of the Economics & Community Development planned program is to improve the social and economic well-being of Arkansas citizens and communities.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	16.5	0.0	2.0	0.0
2018	16.5	0.0	2.0	0.0
2019	16.5	0.0	2.0	0.0
2020	16.5	0.0	2.0	0.0
2021	16.5	0.0	2.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Planned Activity for the Program

In the area of Economic Viability and Sustainability:

- Identify trends affecting Arkansas communities and regions.
- Help Arkansas communities and regions identify and implement innovative economic development strategies.
- Provide education and technical assistance to Arkansas businesses and entrepreneurs.
- Help local governments explore innovative solutions and optimize resources.

In the area of Rural Infrastructure:

- Identify trends affecting Arkansas communities and regions.
- Provide tools for communities to assess infrastructure needs.
- Assist in identifying local, state and federal resources to address infrastructure challenges.
- Support communities' efforts to obtain and use information technologies, including broadband connectivity.

In the area of Leadership and Community Involvement:

- Provide leadership education for youth and adults.
- Assist local coalitions to develop and implement strategic plans.
- Work with communities and leaders to create environments that encourage innovation.

- Teach citizen involvement to enhance the vitality of Arkansas communities and regions.
- Engage diverse and under-served populations in civic involvement.
- Provide science--based information and education about public issues.

In the area of Quality of Life:

- Provide tools to help communities evaluate and enhance their quality of life assets and opportunities.
- Educate and motivate citizens to make decisions to improve their health, education, financial stability and quality of living and encourage others to do the same.
- Assist communities in quality of life marketing to targeted audiences.
- Partner with local government to explore and take advantage of opportunities to improve quality of life.
- Assist communities in quality of life marketing to targeted audiences.

In the area of Population Composition and Change:

- Inform policymakers and community leaders of pertinent population trends.
- Deliver programs that help leaders anticipate impacts of population changes.
- Develop and deliver programs for specific population groups based on demographic changes.
- Help Arkansans understand and address opportunities and challenges of the rural/urban interface.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> • Education Class • Workshop • Group Discussion • One-on-One Intervention • Demonstrations • Other 1 (Issue Forums) • Other 2 (Online Courses) 	<ul style="list-style-type: none"> • Public Service Announcement • Newsletters • TV Media Programs • eXtension web sites • Web sites other than eXtension • Other 1 (Podcasts) • Other 2 (Social Media)

3. Description of targeted audience

Audiences vary by categories of activity (see above). For each activity we try to involve all stakeholders relevant to the topic at hand; not all of the audiences listed below may be engaged during every activity.

- Attorneys
- Businesses/Industry - small, large, rural, urban, consultants, and other
- Producers - small, large, limited resource, retirement, and other
- Non-Farm private landowners
- Lenders
- Potential business owners (youth and adult)
- Elected officials - city, county, state, and federal
- Unelected community and business leaders
- Emerging and existing leaders
- Industry, trade and commodity organizations
- Civic, nonprofit, environmental, conservation, health and community organizations

- Organizational boards
- Federal, state and local policy makers - public agencies, administrators and other personnel
- Voters
- Research, extension and teaching professionals
- Educators
- General public
- Youth

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
 - Number of patents submitted
 - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of clientele contacts resulting from education classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational methods
 - Number of educational materials, curricula, newsletters, web-based modules and fact sheets developed
 - Number of dollars received to support programs (grants and other)
 - Number of Tax Preparers certified through Tax Schools
 - Number of web visitors on program-related web pages
 - Downloads from website
 - Number of educational materials, curricula, newsletters, web-based modules and fact sheets distributed
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of participants (youth and adult) who report conducting programs, community service projects, adopting new skills or accepting new leadership roles as a result of economic & community development programs
2	Estimated dollar value of program support volunteers (includes: EH; 4-H; Master Gardeners; conferences; etc.)
3	Dollar value of government contracts received by APAC business clients
4	Number of jobs created/retained as a result of economic & community development programs
5	Number of businesses created, retained, or expanded
6	Number of participants implementing new strategies, tools or technology as a result of economic & community development programs
7	Number of participants who indicate new knowledge gained as a result of economic & community development programs
8	Dollar value of grants generated by organizations, communities or regions as a result of economic and community development programs
9	Number of plans (new or revised) adopted and begun to be implemented (community, agency, local government, business or disaster) as a result of economic and community development programs
10	Number of new alliances or networks formed through some type of formal agreement or MOU
11	Dollar value of other in-kind resources contributed to organizations, communities or regions as a result of economic and community development programs

Outcome # 1

1. Outcome Target

Number of participants (youth and adult) who report conducting programs, community service projects, adopting new skills or accepting new leadership roles as a result of economic & community development programs

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 602 - Business Management, Finance, and Taxation
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 610 - Domestic Policy Analysis
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 - Community Institutions and Social Services
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

Estimated dollar value of program support volunteers (includes: EH; 4-H; Master Gardeners; conferences; etc.)

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 602 - Business Management, Finance, and Taxation
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 610 - Domestic Policy Analysis
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 - Community Institutions and Social Services
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

Dollar value of government contracts received by APAC business clients

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 602 - Business Management, Finance, and Taxation

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Number of jobs created/retained as a result of economic & community development programs

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 602 - Business Management, Finance, and Taxation
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

Number of businesses created, retained, or expanded

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 602 - Business Management, Finance, and Taxation
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 - Community Institutions and Social Services
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 6

1. Outcome Target

Number of participants implementing new strategies, tools or technology as a result of economic & community development programs

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 602 - Business Management, Finance, and Taxation
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 610 - Domestic Policy Analysis
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 - Community Institutions and Social Services
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 7

1. Outcome Target

Number of participants who indicate new knowledge gained as a result of economic & community development programs

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 602 - Business Management, Finance, and Taxation
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 610 - Domestic Policy Analysis
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 - Community Institutions and Social Services
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 8

1. Outcome Target

Dollar value of grants generated by organizations, communities or regions as a result of economic and community development programs

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 602 - Business Management, Finance, and Taxation
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 610 - Domestic Policy Analysis
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 - Community Institutions and Social Services
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 9

1. Outcome Target

Number of plans (new or revised) adopted and begun to be implemented (community, agency, local government, business or disaster) as a result of economic and community development programs

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 602 - Business Management, Finance, and Taxation
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 610 - Domestic Policy Analysis
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 - Community Institutions and Social Services
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 10

1. Outcome Target

Number of new alliances or networks formed through some type of formal agreement or MOU

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 602 - Business Management, Finance, and Taxation
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 610 - Domestic Policy Analysis
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities

- 805 - Community Institutions and Social Services
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 11

1. Outcome Target

Dollar value of other in-kind resources contributed to organizations, communities or regions as a result of economic and community development programs

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 602 - Business Management, Finance, and Taxation
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 610 - Domestic Policy Analysis
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 - Community Institutions and Social Services
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

Reductions in federal and state funding sources may negatively impact our ability to implement planned priorities.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Several strategies will be initiated and utilized for collecting program assessment information to determine program results, outcomes and impacts. Extension educators will use a variety of recommended methods to gather needed information. Collection methodology and assessment tools will be programmatic and audience centered. Examples may include, but are not limited to, the use of advisory groups, participant questionnaires, pre- and post-tests, interviews with program participants, and informal feedback. Unobtrusive means (request for additional information, purchase of videos and materials, increased participation and observation) will also be used to capture information. We will continue to gather socio-economic data and conduct trend analysis to better inform programs and policy choices.