Arkansas (University of Arkansas at Pine Bluff)

Plan of Work for 2023-2027

Status: Final (Approved 9/26/2022)

Executive Summary Overview

The University of Arkansas at Pine Bluff (UAPB), School of Agriculture, Fisheries and Human Sciences, comprises three academic departments, the 1890 Research and Extension programs, the Aquaculture and Fisheries Center of Excellence, and the Regulatory Science Center of Excellence. Research faculty are integrated into the academic departments. Personnel with a majority Extension appointment are under the supervision of the Assistant Dean for Extension and Outreach. The Department of Agriculture, the Department of Aquaculture and Fisheries, and the Department of Human Sciences are administered by department heads. Our Regulatory Science Center of Excellence and the Aquaculture and Fisheries Center of Excellence is housed in the Department of Agriculture and the Aquaculture and Fisheries, respectively. Each Center of Excellence is administered by a center director who has teaching, research, and extension responsibilities within the department. Under this structure, academic, research, or extension responsibilities are integrated. The department chairs and center directors are supervised by the interim dean/director of the School of Agriculture, Fisheries, and Human Sciences. Consistent with the land grant mission, UAPB Research and Extension faculty have a long history of providing leadership in developing and disseminating innovative practices and emerging technologies. UAPB researchers and Extension educators deliver research-based education to their clientele. Our Extension educators employ diverse educational methods to their clientele, including educational face-to-face and virtual forums, landowner visits, individual consultations, demonstrations, and field days and tours. Although the information is readily available in the Digital Age, UAPB remains a data provider independent of financial or philosophical interests. The focus of work conducted by UAPB is guided by input from a diverse range of clientele including, the small scale, socially disadvantaged, limited resource farmers and underserved farmers, rural families, underserved and vulnerable youth, the Arkansas aquaculture and fisheries industry, and individuals and agencies with interest in this clientele.

Merit and Scientific Peer Review Processes

Peer review has been defined as a process of subjecting an author's scholarly work, research or ideas to the scrutiny of others who are experts in the same field. Thus, it functions is to encourage authors (i.e. faculty and staff) to meet the accepted high standards of their discipline and to control the dissemination of research data to ensure that unwarranted claims, unacceptable interpretations or personal views are not published without prior expert review. Hence, UAPB will utilize the following process and of internal and external panels. In additon to a Expert Perr Review process. Thus, the scientific community, peer review has become an essential component of the academic writing process here at UAPB, ensuring papers published in scientific journals answer meaningful research questions and draw accurate conclusions based on evident base research, driven by data of professionally

executed experimentation. Thus, the major advantage of a peer review process is that peer-reviewed articles provide a trusted form of scientific communication. Since scientific knowledge is cumulative and builds on itself, this trust is particularly important to UAPB Peer Review Processes. Therefore, here at UAPB we require the use of Professional Grammarly program to check for grammar, to deter any form of plagiarism, to enhance our peer review process to guide our resource allocation and programming decisions making.

Stakeholder input: Action Taken to Seek Stakeholder Input

The University of Arkansas at Pine Bluff action taken to see stakeholders inputs that encourage their participation were the following:

1. Formed an official advisory committee that meets at least every six months via zoomand/or in person that encourage them to give their inputs to out goals and objectives for our critical areas, and the communities that we serve.

2. Ensured that the stakeholder participate with the university during annual program events such as UAPB Annual Rural Life Conferences, Farm Field Day and at our Annual Sweet Potato Growers meetings.

Stakeholder input: Methods to Identify Individuals and Groups

Updates to the content of the methods to identify section of the FY2020-2025 for the University of Arkansas at Pine Bluff's Research and Extension Plan of Work include the following:

1. Means for acquiring input varies depending upon the nature of the Research or Extension program and the diversity of relevant stakeholders;

2. These include local and state agencies, community groups, producers, families and youth, and other targeted audiences. Producer meetings, workshops, field days, conferences, and focus group discussions are principal means for gaining input; and

3. Our stakeholder input process is structured individually by programs to represent the differences in audiences served. This approach is taken because the clientele's needs for research and Extension assistance in programs are broad in scope, local in nature, and geographically limited.

Stakeholder input: Methods for Collecting Stakeholder Input

The University of Arkansas at Pine Bluff methods for collecting stakeholders inputs are the following:

Use of media to announce public meetings and listening sessions

Targeted invitation to traditional stakeholder groups

Targeted invitation to traditional stakeholder individuals

Targeted invitation to selected individuals from general public

Survey of traditional stakeholder individuals

Stakeholder input: A Statement of How the Input Will Be Considered

The University of Arkansas at Pine Bluff inputs from stakeholders were utilized to assist in setting priorities, identify key emerging issues, and develop and action plan, that will be related to our budget process. What has been learned is that key stakeholders input is important to our support base nad them telling our story, as well as promoting our brand.

Critical Issues

Access to Safe and Nutritious Foods

Initiated on: Nov 26, 2019
State: Arkansas

Term Length: Intermediate (1-5 years)

Food Safety

Research in hospitality management will be related to food production, food safety, and disease prevention/management. This will cover areas such as hypertension, heart disease, and diabetes prevention. Additionally, our international collaborations will reach out to other government agencies. The Food Safety Modernization Act (FSMA) made food safety education mandatory for large fresh fruit and vegetable producers. However, many small grocery stores and all major grocery stores are requiring all farmers, both large and small to be Good Agricultural Practices (GAP)-certified. We will provide GAP and FSMA training required to obtain certification and we will strengthen and establish infrastructure to improve the food safety awareness and practices among the local small, medium and large sized farming operations.

UAPB's Cooperative Extension Program will address obesity, food nutrition and food security through the Expanded Food and Nutrition Education Program (EFNEP) and the Supplemental Nutrition Assistance Program-Education (SNAP-Ed). These programs improve the health and well-being of families and youth with limited incomes.

The Aquaculture and Fisheries Department will conduct research on how the barrier function in fish is regulated in response to bacterial, parasitic and viral pathogens. In this way, we can avoid the use of chemotherapy in aquaculture systems and produce.

The Evans-Allen Project will study the effect of using the probiotics (live microbes) in food animals, particularly small ruminants to enhance the gut and fecal microbiome (microbial diversity) to force out the pathogenic foodborne microbes which are the potential source of microbial contamination of food and environment.

Science Emphasis Area

Education and Multicultural Alliances, Family & Consumer Sciences, Food Safety, Human Nutrition

Agriculture and Natural Resources Economics and Marketing

Initiated on: Nov 26, 2019
State: Arkansas

Term Length: Intermediate (1-5 years)

Small Farm Outreach: Farm Financial Planning

Many small and socially disadvantaged producers (SDPs) come to the University of Arkansas at Pine Bluff (UAPB) each year for assistance with their USDA loan applications. To meet the financial planning needs of this group of existing and beginning producers, the UAPB Small Farm Program (SFP) will continue to offer farm financial planning and technical assistance to producers. This will be the only farm business training that producers can obtain in the area.

Aquaculture Economics, Marketing and Natural Resources Management

The Aquaculture Economics, Marketing and Natural Resources Management program area goal is to promote sustainable growth of aquaculture and fisheries sectors in Arkansas as well as national and international levels through generation of new knowledge, insights and facilitation of evidence-based decision making by fish farmers, seafood manufacturers, traders and policy makers. Research studies will enhance profitability and sustainability of fish farm; develop better management of lakes, reservoirs and other water bodies; and improve competitiveness of U.S. aquaculture in the global seafood system.

Agricultural Economics/Business: Economic and Environmental Sustainability.

To help aspiring, beginning or new farmers and existing farmers, the Small Farm Program at UAPB has been encouraging farmers to diversify their operations with alternative crops, especially vegetables, to increase their income. A Linear Programming Model will be developed and used to simulate optimal production under various scenarios based on resource availability. The Model will be adjusted to analyze the sensitivity of the results to changes in quantity and price of labor and capital as well as in market prices.

Science Emphasis Area

Bioeconomy, Bioenergy, and Bioproducts, Education and Multicultural Alliances, Environmental Systems, Family & Consumer Sciences, Sustainable Agricultural Production Systems

Agriculture Production and Processing

Initiated on: Nov 26, 2019
State: Arkansas

Term Length: Intermediate (1-5 years)

Arkansas (AR) agriculture is worth over $20 billion/year. UAPB-SAFHS research and Extension activities support and improve agriculture. AR is first in bait and sportfish production; third in ornamental fish and catfish; and sixth in sweet potatoes (SP). Critical challenges include production efficiency, adequate water, soil health, resistant pests, climate, environmental concerns, energy, rising production costs, and food safety. Aquaculture/Fisheries (AQFI) research includes fish health, nutrition/feeding, marketing/economics, water quality, fish production/production systems and natural fisheries. The fish disease diagnostics labs save farmers thousands of dollars per year. The APHIS-certified lab inspects fish so that farmers can sell disease-free fish out-of-state. Specialty crop research will produce virus-indexed SP for AR growers, develop cultivars with novel genes for the SP improvement program, and improve its production efficiency, nutritional quality and medicinal value. UAPB is one of six centers developing virus-indexed slips within the National Clean Plant Network-SP. We study the role of summer and winter

cover crops in soil health restoration and sustainable vegetable cropping systems for socially disadvantaged farmers. Related field demonstrations are held annually for stakeholders. Nutrition and health research on livestock (ruminants, layer birds) is improving their overall performance. The Small Farm Program (SFP) raises crop yields and income on socially disadvantaged farms . Producers must use USDA, NRCS and Cooperative Extension recommendations to implement conservation practices that improve profitability. The SFP also help producers improve their forest land.

Precision Agriculture

For the past several decades, agricultural technology (agtech) has made tremendous strides in fostering increased crop yields and more efficient use of inputs such as water and fertilizer. More recently, U.S. farms' productivity trends have experienced fluctuations due to a plethora of factors, resulting in significant market responses and price reactions.1 Going forward, crop yield gains are projected to slow down.2 The recent recovery in agricultural commodity prices and farm income opens the potential for investment in a new tier of agtech, including precision agriculture (PA). This new generation of agricultural systems will help to address climate change adaptation alongside traditional goals of improved yields and reduced costs. As climate change risks are recognized, increasing uncertainties cloud the outlook for the continuation of historical trends in the growth of crop yields. Success in securing sustainable food will be highly dependent on the deployment of PA technologies to improve the efficiency and resiliency of agricultural systems.

The ongoing robust adoption of PA technology in the U.S. farm sector has resulted in the improved efficiency and cost reductions that these technologies deliver to the farm community. Furthermore, the expanded use of PA also generates nonfinancial, environmental benefits through reduced use of water, fossil fuels, fertilizer, and herbicides. Optimal fertilizer use reduces nutrient runoffs and decreased application of herbicides slows the development of weed varieties resistant to existing control methods. Greenhouse gas emissions are also lowered; fuel savings are enabled by GPS guidance systems that reduce machine field passes; and water scarcity issues are addressed using need-based application of water..

Hence, looking forward, continued commitment to investment in advancing agtech and wider adoption of PA technologies should be a crucial element in meeting the challenges of the next few decades for the global agriculture community. PA technologies have the potential to add increased resilience to the financial health of farm operators, contribute to the solution of regional food insecurity issues, while improving the environmental profile and supporting adaptation to climate change for the agricultural sector.

Science Emphasis Area

Environmental Systems, Food Safety, Human Nutrition, Sustainable Agricultural Production Systems

Environment, Energy, and Climate

Initiated on: Nov 26, 2019
State: Arkansas

Term Length: Intermediate (1-5 years)

Arkansas has an abundance of natural resources, including 19 million acres of forests, 122,312 miles of rivers and streams, and more than 600,000 acres of lakes and reservoirs. Arkansas has approximately 13,639,300 acres of agricultural land. Many African Americans do not see their forest land as an asset but as a liability. The UAPB Sustainable Forestry and Land Retention Program will help producers improve their forest land and see it as an asset, to educate and assist with heir property issues, and address the lack of government trust. Additionally, Socially Disadvantaged Producers are taught how to use sustainable agricultural practices that keep soils, nutrients, and pesticides on their land and prevent soil from silting and polluting streams.

Resource recovery and reuse are key components for reducing agriculture impact on the environment. Research at UAPB will focus on developing an interdisciplinary research program to transfer agriculture waste to biochar as a soil amendment then maximize its ability for pollution retention and toxicity reduction. A variety of local agricultural-residue-derived biochars will be produced through pyrolysis under different conditions.

The aquatic resources of the state of Arkansas are important for social, cultural, and economic reasons. Recreational fishing has an economic impact of more than $700 million in Arkansas. Faculty will work with aquatic organisms, aquatic habitats, stakeholders, and natural resource agencies to preserve ecosystem health and biodiversity, while simultaneously supporting management of recreational and commercial fisheries for the enjoyment and benefit of the public.

Climate Smart Practices

The University of Arkansas at Pine Bluff through its Cooperative Extension and Small Farm Outreach Programs will implement a systematic conservation outreach and climate-resilient agriculture training model for underserved farmers and ranchers and in the Rural Arkansas Delta region. The goal for this outreach is for UAPB, in collaboration with its partners, to expand the delivery of conservation outreach to historically underserved farmers (HUF) and ranchers. Training will be conducted at targeted project sites including:

UAPB's 871-acre farm at Lonoke (Lonoke County),

UAPB's Marianna Farm and Demonstration Center (52-acre farm in Lee County), serves Lee, St. Francis, Monroe, and Phillips Counties, and

East Arkansas Enterprise Community, Inc. (EAEC) project site (a 10-acre farm) in St. Francis County.

The research and demonstrations carried out on these farms will have local and national significance in water management issues, climate-resilient farming, soil conservation and carbon sequestration practices, restoration of wetlands and wildlife habitat, marketing specialty crops for small scale farmers, forestland management, and other areas where climate-smart practices can be expanded.

This project aims to provide a collaborative approach to training underserved farmers and ranchers, university students, and the next generation of farmers to adopt conservation practices and access the tools necessary to "build back better" climate-smart sustainable agriculture and food security in targeted areas of Arkansas.

Science Emphasis Area

Bioeconomy, Bioenergy, and Bioproducts, Education and Multicultural Alliances, Environmental Systems, Family & Consumer Sciences, Sustainable Agricultural Production Systems

Increasing Opportunities for Youth, Families, and Communities

Initiated on: Nov 26, 2019
State: Arkansas

Term Length: Intermediate (1-5 years)

UAPB's Research and Extension activities on increasing opportunities for youth, families, and communities will target the family with the desire to serve the community at large. 4-H, Family and Consumer Science (FCS), Aquaculture/Fisheries, Agriculture, and Human Sciences' and Extension professionals will address issues that impact youth, families and communities. Experiential learning curricula and programs that reinforces collaboration with youth and community businesses will ensure a competent workforce for the community.

GOLDEN priorities: **G**rowing our capacity through creating campus and community partnerships. **O**ptimizing the opportunities for our youth and community. **L**earning together through research initiatives, community events and in youth adult partnerships. **D**iversifying programs through seeking various grants for research and programing. **E**nriching the lives of youth and adults by using research based, peer reviewed curricula while also utilizing asset-based community assessment and program delivery which prepares them to be positive contributors in the local community as well as globally. **N**urturing minds and guiding discovery through experiential and project-based learning that teaches metacognition and encourages lifelong learning. The area of FCS will seek to understand the physical, social, psychological, growth and development and interpersonal relationships in family environmental settings. Additionally, FCS will address consumer preference pertaining to merchandising, textile and design.

Science Emphasis Area

Education and Multicultural Alliances, Family & Consumer Sciences, Youth Development