Agriculture and Food Research Initiative Competitive Grants Program

Sustainable Agricultural Systems (SAS)

Fiscal Year (FY) 2021 Request for Applications (RFA)

LETTER OF INTENT DEADLINE: Varies by Program Area
APPLICATION DEADLINE: Varies by Program Area

ELIGIBILITY: See Part III, A of RFA

United States Department of Agriculture
National Institute of Food and Agriculture

NATIONAL INSTITUTE OF FOOD AND AGRICULTURE; U.S. DEPARTMENT OF AGRICULTURE

AGRICULTURE AND FOOD RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM

SUSTAINABLE AGRICULTURAL SYSTEMS

INITIAL ANNOUNCEMENT

CATALOG OF FEDERAL DOMESTIC ASSISTANCE: This program is listed in the Assistance Listings under the Catalog of Federal Domestic Assistance number 10.310.

DATES FOR LETTERS OF INTENT AND APPLICATIONS: The Program Area Descriptions section in Part I, C identifies the applicability of a Letter of Intent (LOI) and, if applicable, the deadline date for its submission. In these instances, it must be received by **5:00 p.m. Eastern Time** on the deadline date.

Applications must be received by **5:00 p.m. Eastern Time** on the deadline date indicated in the Program Area Descriptions section in Part I, C. Applications received after this deadline will normally not be considered for funding (see Part IV, C). Comments regarding this request for applications (RFA) are requested within six months from the issuance of this notice. Comments received after that date will be considered to the extent practicable.

STAKEHOLDER INPUT: We at the National Institute of Food and Agriculture (NIFA) seek your comments about this RFA. We will consider your comments when we develop the next RFA for the program, if applicable, and we'll use them to meet the requirements of section 103(c)(2) of the Agricultural Research, Extension, and Education Reform Act of 1998 (7 U.S.C. 7613(c)(2)). Submit your written comments by the deadline set forth in the DATES portion of this notice via email to Policy@usda.gov. (This email address is only for receiving comments regarding this RFA and not for requesting information or forms.) In your comments, please state that you are responding to this RFA.

Visit the NIFA Centers of Excellence website to access a factsheet on the Centers of Excellence (COE) designation process, including COE criteria, and a list of programs offering COE opportunities.

NIFA solicits proposed topics for Agriculture and Food Research Initiative (AFRI) RFAs from eligible state and national commodity boards on an ongoing basis. Topics must relate to the established AFRI six priority areas. Topics submitted by the commodity boards that align with NIFA priorities are chosen for inclusion in selected program areas of AFRI RFAs. Details on general information and topic submission resources for inclusion in future AFRI RFAs can be found at NIFA's Commodity Board Provision website.

Applicants are encouraged to view the Program Area Descriptions beginning in **Part I, C** of this RFA for additional details on commodity board-specific priorities and submission of applications relevant to these priorities.

EXECUTIVE SUMMARY: The Agriculture and Food Research Initiative (AFRI) is USDA's flagship competitive grant program that provides funding for fundamental and applied research, education, and extension projects in the food and agricultural sciences. Within AFRI, the long-term purpose of this Sustainable Agricultural Systems (SAS) Request for Applications (RFA) is to help transform the U.S. food and agricultural system to increase agricultural production by 40% in sustainable ways as we approach a world population of 10 billion by 2050, and to do so in the context of economic, societal, and environmental attributes of sustainability.

Solving agricultural challenges will require a convergence of science, technology, and policy to improve agricultural productivity; ensure a safe, affordable, and nutritious supply of food; invigorate and realize the promise of the bioeconomy; and promote the development of a talented agricultural workforce. Recent advances in plant and animal biology, new technologies, the integration of large and complex sources of data knowledge of infrastructure and markets, and holistic approaches offer unprecedented opportunities for meeting the demands of the growing population. Transformation of our nation's agricultural systems can ensure continued productivity growth, while conserving natural resources and minimizing the environmental footprint of agriculture. The transformation of food and agricultural systems also requires an investment in human capital to catalyze a secure and profitable global food system that meets the health and nutritional needs of people across rural and urban communities alike.

For FY 2021, applications to the SAS RFA must focus on systems approaches that promote transformational changes in the U.S. food and agricultural system within the context of the long-term goal of increasing American agricultural production by 40% with a reduction in environmental footprint by 50% by 2050. NIFA seeks creative and visionary applications that take a systems approach for projects focused on the themes in the USDA Science Blueprint: (1) sustainable agricultural intensification; (2) agricultural climate adaptation; (3) value-added innovation; and/or (4) food and nutrition translation. These projects are expected to significantly improve the supply of affordable, safe, nutritious, and accessible agricultural products, while fostering economic development and rural prosperity in America. These approaches must demonstrate current needs and anticipate future social, cultural, behavioral, economic, health, and environmental impacts. Additionally, the outcomes of the work being proposed should result in societal benefits, including promotion of rural prosperity and enhancement of quality of life for all those involved in food and agricultural value chains from production to utilization and consumption.

The amount available for new grants in this FY 2021 SAS RFA is approximately $150 million, for awards of up to approximately $10 million each.

This RFA covers one grant review cycle in FY 2021 using funding from FY 2020 and FY 2021 budgets. This RFA is being released prior to the passage of an appropriations act for FY 2021. Enactment of additional continuing resolutions or a full appropriations act may affect the availability or level of funding for this program.

This RFA solicits Standard Grants, Coordinated Agricultural Projects, and Strengthening Standard and Strengthening Coordinated Agricultural Projects (Food and Agricultural Science Enhancement; FASE), whereas project types solicited in this RFA are Integrated and Research projects. See **Part I, C** (Program Area Description) for grant and project types solicited, and **Part II, C** for a detailed description of each individual grant type and project type.

This notice identifies the objectives for the AFRI SAS program including program priorities, deadline dates, funding information, eligibility criteria for projects and applicants, and application forms and associated instructions needed to apply for an AFRI SAS grant.

The deadlines under this RFA are summarized as follows:

Program Code	**Program Area Priority Description**	**2021 Review Cycle Deadlines***
A9201	Sustainable Agricultural Systems	**Letter of Intent Deadline** – January 7, 2021 **Application Deadline –** April 1, 2021
A9211	Sustainable Agricultural Systems Program Evaluation	**Letter of Intent Deadline** – March 4, 2021 **Application Deadline –** July 1, 2021

* All LOIs and applications must be received by 5 p.m. EST on the deadline date.

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PART I—FUNDING OPPORTUNITY DESCRIPTION

A. Legislative Authority

Section 2(b) of the Competitive, Special, and Facilities Research Grant Act (hereafter referred to as the Act) (7 U.S.C. 3157), as amended, authorizes the Agriculture and Food Research Initiative (AFRI), a competitive grant program to provide funding for fundamental and applied research, education, and extension to address food and agricultural sciences in the following six 2018 Farm Bill priority areas:

1. Plant health and production and plant products;
2. Animal health and production and animal products;
3. Food safety, nutrition, and health;
4. Bioenergy, natural resources, and environment;
5. Agriculture systems and technology; and
6. Agriculture economics and rural communities.

To the maximum extent practicable, NIFA, in coordination with the Under Secretary for Research, Education, and Economics (REE), will make grants for high priority research, education, and extension, taking into consideration, when available, the determinations made by the National Agricultural Research, Extension, Education, and Economics Advisory Board (NAREEEAB) pursuant to the Competitive, Special, and Facilities Research Grant Act (7 U.S.C. 3157). The Secretary delegates the authority to the Under Secretary in 7 CFR 2.21, and the Under Secretary delegates that authority to NIFA.

B. Purpose and Priorities

The purpose of AFRI is to support research, education, and extension work by awarding grants to solve key problems of local, regional, national, and global importance in sustaining conventional, organic, and urban agricultural systems. These include farm efficiency, profitability and sustainability, ranching, bioenergy, forestry, aquaculture, rural communities and entrepreneurship, human nutrition, mitigating impacts of biotic and abiotic constraints on food production, food safety, mitigating food waste and food loss, physical and social sciences, home economics and rural human ecology, biotechnology, and classical breeding. Through this support, AFRI advances knowledge in both fundamental and applied sciences important to agriculture. It also allows AFRI to support education and extension activities that deliver science-based knowledge to end users, allowing them to make informed, practical decisions. This AFRI RFA provides funding for integrated research, education, and extension projects.

Food and agricultural systems are under the constraints of a growing population, pressure on natural resources, challenges of climate variability and change, and complex demands of ensuring nutritional security and food safety in a global economy. Addressing these challenges requires research, education, extension, and integrated programs in concert with agroecological approaches that increase agricultural and natural resource sustainability. The term "sustainable agriculture" (7 U.S.C. 3103) means a combined system of plant and animal production practices having a site-specific application that will, over the long-term, achieve the following goals: 1) satisfy human food and fiber needs; 2) enhance environmental quality and the natural resource base upon which the agricultural economy depends; 3) make the most efficient use of

nonrenewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls; 4) sustain the economic viability of farm operations; and 5) enhance the quality of life for farmers and society as a whole. AFRI encourages projects addressing enhancement of sustainability of agricultural systems.

Stakeholder Input
The AFRI Stakeholder Feedback page has information on AFRI-related stakeholder input.

Background
AFRI is NIFA's flagship competitive grants program for food and agricultural sciences. Funding is offered through the AFRI Foundational and Applied Science, Sustainable Agricultural Systems, and Education and Workforce Development Requests for Applications for addressing critical societal issues.

This AFRI RFA aligns with the following six USDA Strategic Goals:

1. Strategic Goal 2: Maximize the ability of American agricultural producers to prosper by feeding and clothing the world;
2. Strategic Goal 3: Promote American agricultural products and exports;
3. Strategic Goal 4: Facilitate rural prosperity and economic development;
4. Strategic Goal 5: Strengthen the stewardship of private lands through technology and research;
5. Strategic Goal 6: Ensure productive and sustainable use of our National Forest System Lands; and
6. Strategic Goal 7: Provide all Americans access to a safe, nutritious, and secure food supply.

The program area priorities in this RFA also align with the themes outlined in the USDA Science Blueprint. The outcomes of projects supported through this RFA are expected to provide foundations for achieving the goals of the USDA Agriculture Innovation Agenda. By emphasizing the use of automation, artificial intelligence and other data-driven approaches, this RFA also addresses the White House Office of Science and Technology Policy's (OSTP's) priority to advance Artificial Intelligence and Industries of the Future.

C. Program Area Descriptions

Total Program Funds – $150 million

In FY 2021, applications are solicited under the following two Program Area Priorities:

1. Sustainable Agricultural Systems

Program Area Priority Code – A9201
Proposed Budget Requests

a) Proposed Coordinated Agricultural Projects must not exceed **$10 million total per project (including indirect costs) for project periods of up to five years**. This program area anticipates making approximately fifteen new awards.
b) Food and Agricultural Science Enhancement (FASE) grants must adhere to the guidelines outlined beginning in Part II, C. 2.
c) Requests exceeding the budgetary guidelines will not be reviewed.

Requested Project Type – Integrated Projects only (must include Research, Education, and Extension components within a project)
Requested Grant Type – Coordinated Agricultural Project and FASE (Strengthening Coordinated Agricultural Project) Grants only
Letter of Intent Deadline – January 7, 2021 (5:00 p.m. Eastern Time)
Program Area e-mail Address for Submission of Letter of Intent – AFRI-SAS@usda.gov
Application Deadline – April 1, 2021 (5:00 p.m. Eastern Time)
Program Area Contacts – Dr. Mathieu Ngouajio and Dr. Megan O'Rourke, AFRI-SAS@usda.gov

Program Area Priority –
The purpose of the SAS Program Area is to promote the sustainable supply of abundant, affordable, safe, nutritious, and accessible food and other agricultural products, while enhancing economic opportunities and improving the long-term health and well-being of Americans.

The USDA Science Blueprint provides a strategic framework for leadership and direction in advancing USDA's scientific mission through 2025. Four of its overarching themes for research, education, and economics are used in this RFA, which solicits applications for projects focused on:

(1) sustainable agricultural intensification;
(2) agricultural climate adaptation;
(3) value-added innovation; and/or
(4) food and nutrition translation.

This RFA is soliciting creative and visionary project applications developed by transdisciplinary teams that integrate research, education, and extension activities and effectively use a systems approach to promote convergence of science and technology to solve challenges to current and future food and agricultural production systems. Economic sustainability of the food systems is an overarching priority for the projects funded in response to this RFA. The RFA also encourages projects that use genome design, prescriptive interventions, artificial intelligence and data, systems management, and/or automation for providing solutions in the topic areas of focus.

Agricultural systems are inclusive of value chains from production to consumption of food and other agricultural products, and from traditional open-field farms, ranches, and managed forests to controlled production in built environments across the rural-urban continuum. Consideration must be given to how new strategies or other technical interventions may alter existing systems and the future implications of unintended effects. Applicants must demonstrate that the changes resulting from the proposed efforts will enhance the viability of the food and agricultural value chain. This could include improving natural resources quality, food safety and quality, profitability, and the health and well-being of people and communities. The systems may include approaches that reduce the environmental footprint including, but not limited to, soil and ecosystem biodiversity and health, water and nutrient use, greenhouse gases, and energy use.

Projects must use a systems approach that recognizes and utilizes the convergence of rapidly advancing science and technology platforms including biotechnology, data science, artificial intelligence, nanotechnology, information science, cognitive science, public engagement and others to address these complex and intertwined problems, and ensure the economic, environmental, and community well-being goals of sustainable agriculture. Projects must include demonstrable efforts that enhance formal and nonformal education and training. This includes education of the current and next generation of farmers, workers, and scientists who must be equipped to use new skills, technologies, training, and experiences to find and implement solutions to global food and agricultural challenges. Extension and other engagement should produce significant behavioral changes leading to sustainable production and consumption practices and improving the health and well-being of the public.

Projects must plan to employ meaningful performance metrics that measure progress during the grant period toward the long-term goals described below. These metrics can include how the proposed system and its components contribute to productivity and profitability, reduced environmental footprint, enhanced natural resources, food safety and quality, nutritional security, human health and well-being, a skilled workforce, and more sustainable jobs in the agricultural sector.

Applications must address one or more of the following long-term goals:

a. Sustainable Agricultural Intensification
Ensure sustainable food supply with judicious use of resources and minimal environmental impacts using advanced technologies, regenerative agriculture, optimal management practices, and protection of plants and animals from biotic and abiotic stresses. Socially, economically, and environmentally sustainable intensification is necessary to overcome limitations in diminishing natural resources, and to meet accelerating demands for food, feed, fuel, and fiber. Projects supporting this goal must consider the multidimensional aspects of sustainability to address one or more of the following topics.

a1. ***Solutions to Labor Challenges*** – Alleviate labor challenges across agricultural supply chains through automation, ensuring farm and processing industry safety, utilizing artificial intelligence, predictive analytics and decision tools, and assessing economic and social impacts. As agricultural production practices and related technologies advance, failure to also address workforce challenges can threaten the food supply chain and the long-term competitiveness of U.S. agriculture. A systems-based approach is required to address current and future labor challenges and ensure the

sustainability of U.S. agriculture. Projects must develop, implement, and/or improve understanding of one or more of the following priorities:

- Predictive models, data surveillance programs, or decision support tools to aid in managing labor supply and demand;
- Technologies, breeding, or management strategies that increase automation, labor efficiencies, or create new job opportunities;
- Agricultural equipment for ergonomics, comfort, or safety;
- Social and economic impacts of proposed solutions to labor challenges; and/or
- Educational or extension programs or activities to alleviate agricultural labor challenges or enhance worker safety.

a2. ***Land Stewardship –*** Improve agroecosystems at farm, regional or landscape scales in the context of land ownership, conservation policy, or other factors. Sustainable intensification must conserve natural resources to ensure the long-term productivity of U.S. agriculture. Innovations in technologies, management, and policies for sustainable intensification and land stewardship must consider the socioeconomic context and impacts of new developments. Land stewardship should enhance natural resources such as soil health and conservation, clean air, clean and sufficient water, or biodiversity. Projects must develop, implement or enhance understanding of one or more of the following:

- Data-driven forecasts or models of changing environmental or climatic conditions;
- Novel plant, animal and/or microbial systems that mitigate the environmental impacts of production;
- Technologies or management strategies that measurably improve ecosystem services while maintaining or improving production efficiency or resiliency;
- Efficient and equitable agricultural trade or environmental markets; and/or
- Shifts in producer or consumer behaviors to positively impact environmental and socioeconomic landscapes.

a3. ***Food and Agricultural Production and Biosecurity –*** Secure and protect the integrity, reliability, sustainability and profitability of the food, agricultural and forest systems**.** Agricultural supply chains for feed, food, fiber and forest products are vulnerable to abiotic and biotic stressors and must meet the needs of a growing population. Compromises to these supply chains can threaten agriculture and public health. Innovative approaches can lead to more secure agricultural production systems. Projects supporting this goal must develop, implement, or improve understanding of one or more of the following:

- Methods to control or prevent transboundary, emerging, or reemerging pests or diseases of plants or food animals;
- Technologies, tools, models, management strategies, or decision-support systems to reduce pre-harvest losses or enhance efficient agricultural production, food safety or biosecurity; and/or
- Lowering social or economic barriers to, or reducing impacts of, adopting new technologies, tools or management strategies that enhance efficient agricultural production systems.

a4. ***Resiliency and Robustness of Food and Agricultural Systems –*** Protect U.S. food and agricultural systems from shocks that disrupt supply chains and cause hardships for producers, processors, distributors, and consumers. COVID-19 and other natural disasters have strained the U.S. food and agricultural sectors and rural communities in multiple ways. Processing, transportation, and procurement may need to adapt to stresses throughout the value chain. Furthermore, the impacts often disproportionately affect socially disadvantaged communities and decrease food and nutritional security. Novel approaches are needed to ensure the security of U.S. agriculture, forests, and food, and to facilitate decision-making during emergencies. Projects must develop, implement or improve understanding of one or more of the following:
   - Systems models and tools to examine impacts of alternative systems to make supply chains more resilient to anticipated or unforeseen threats;
   - New technologies, products or markets that enhance resiliency of U.S. agricultural, forest, or food systems;
   - Reductions in food losses caused by bottlenecks in supply chains during disruptions to the food system; and/or
   - Communities of Practice for collecting, analyzing, and disseminating socioeconomic information to make agricultural, forest or food systems more resilient.

b. Agricultural Climate Adaptation

Allow unmanaged and managed systems to be fully leveraged for mitigating and adapting to climate change. Adaptation to climate change in agricultural, rangeland and forestry systems requires the capacity to better predict climate stressors and their wide-ranging impacts on those systems within and across regions. Effective climate change adaptation will need new technologies, tools, management practices and systems approaches suitable for diverse plant- or animal-based production systems to improve resilience and enhance or maintain natural resources; these tools, practices and approaches should be included in all projects in this area.

Projects supporting this goal are encouraged to coordinate with USDA climate hubs. Projects must develop or implement one or more of the following:

- ***Plant and Animal Breeding –*** Resilient and efficient breeding programs to develop plant and animal germplasm, varieties, and breeds for newly relevant environments and for food system resilience, including topics such as plant breeding for carbon sequestration;
- ***Soil Health and Management Practices –*** Systems approaches to develop sustainable soil management practices or models that optimize resiliency, increase carbon sequestration, decrease greenhouse gas emissions per unit of productivity or profitability, and/or measurably improve soil health;
- ***Pest and Beneficial Management –*** Understanding, developing, or implementing management strategies for plant or animal pests (e.g., insects, diseases, or weeds) or beneficial organisms under changing climatic conditions; and/or
- ***Water –*** Technologies or management regimes with benefits at the farm or watershed-levels that allow for efficient monitoring, treatment, modeling, use,

reuse, recycling, and allocation of water resources or soil water availability under changing climatic conditions including extreme climatic events such as flooding or drought.

c. Value-added Innovation

Rural Agriculture-based Economy – Foster economic development and prosperity in rural America by catalyzing production of high-value biobased chemicals, food and feed ingredients, and other products using agricultural feedstock, enhancing local human capital, and attracting supportive infrastructure. The continued development of a rural agriculture-based economy encompasses development of biobased products and biomaterials that promote opportunities in agriculture and bioeconomy value chains, renewable energy, and ecosystem services. These high value end products from agricultural byproducts, emerging crops, livestock and forest feedstocks, enable new markets, establish new domestic supply chains and stimulate workforce and rural community development creating jobs and economic opportunities. Of interest in this theme are industrial hemp projects that examine the supply chain as a system, including breeding, cultivation, feedstock logistics, industrial processing of products, and market analysis.

Projects supporting this goal must develop or implement **both** of the following:

- ***New and/or improved strategies*** for biobased products that improve food, feed, industrial or other high value-added products; and
- ***Potential economic benefits*** over existing products and utilities; this includes addressing the full supply chain for high value-added product systems from feedstock through product formulation to end-user market demand.

d. Food and Nutrition Translation

Changes to food and agricultural systems influence the incidence of foodborne diseases and risks for chronic disease, as well as affect food wastage. Similarly, changes may affect food quality, bioavailable nutrients, and access to food, impacting health, community prosperity, and overall quality of life.

Projects must develop or implement one or more of the following:

- ***Cost-effective strategies and resources*** to ensure availability, accessibility, and affordability of safe and nutritious food for the health and prosperity of American communities;
- ***Pre-harvest and/or post-harvest interventions*** that may include approaches such as breeding, biocontrol, manipulation of the microbiome, or management strategies that promote food safety, enhance nutritional value, or reduce food waste;
- ***New approaches to improve understanding and/or engineering the functionality of foods***. Work should include consumer outreach and engagement along the food and agriculture continuum; and/or
- ***New knowledge of precision nutrition*** to provide healthy and accessible diets for distinct identifiable subpopulations and communities, including those with pre-existing conditions and disease risk factors, such as age and genetic composition.

Descriptions and examples of goals given above are meant to be guidance for project development, rather than being prescriptive. The project teams are expected to define the scope of their systems, system components, and detailed metrics that are directed at achieving one or more of the three goals in this RFA.

Program Area Additional Information:

- Letter of Intent (LOI) format is defined in Part IV, A. LOIs must include:
  (1) description of the goals and deliverables addressed by the project, including short, medium, and long-term objectives within the "specific objectives";
  (2) description of the scope of systems and justification of components under investigation within the "approach" section of the LOI;
  (3) clear descriptions and justification of the methods for the integrated and transdisciplinary approach to be used to achieve the desired goal(s) also within the "approach" section of the LOI; and
  (4) description of the benefits to the food, forest, or agricultural system within the "potential impact and expected outcomes" of the LOI.
- Competitive proposals will present a clear explanation of the system(s) chosen that will be selected and the associated problems that will be addressed through research, extension, or education. Proposals will explain the scope of the systems as well as the full extent of expected impacts. Applicants may choose to address at least one or, typically, more than one of the emphasis areas described in this Program Area Priority. A range of appropriate outcomes and impacts is expected for these projects.
- Improved assessment tools for monitoring conditions and evaluating the effects of adaptive management practices on increased resilience at different scales are also needed to support effective decision-making. Potential adaptive management practices may have multiple economic, ecological, or social effects on both urban and rural populations and may require new approaches to developing interdisciplinary educational curricula or extension programs to achieve optimum workforce development and adoption by stakeholders.
- Projects that enhance access and interest in agricultural education for communities underrepresented in STEM education that train or retrain the agricultural workforce are needed to enhance economic prosperity. Funded projects are expected to develop tools, techniques, or practices that can be rapidly adopted at home or by various educators and extension specialists to ensure effective formal and non-formal education.
- Projects must provide a clear description of how transdisciplinary approaches will be deployed to achieve the goals of the project as defined in Part VIII, D. Proposals must demonstrate transdisciplinary linkages necessary to address the complex challenges in developing sustainable agricultural systems.
- All applications must adhere to the requirements beginning in Part IV.
  - A Management Plan (see Part IV, C. 3. f. "Field 12. Other Attachments" for additional information) **must** include project governance, a stakeholder advisory board, involvement of an external evaluator, and progress reporting. The plan must clearly articulate with an organizational chart how the project will be governed. A well-thought out strategy must be put in place to enhance coordination, collaboration, communication, data sharing and reporting among members of the project team and

stakeholder groups. The management plan must include an advisory group of principal stakeholders, partners, and professionals to assess and evaluate the quality, expected measurable outcomes, and potential impacts for the proposed research, education and extension. An external evaluator must be employed, with a specified amount of funding set aside for evaluation support. Success in meeting objectives must be demonstrated through proposed project metrics. Reporting requirements must include a description of key achievements including the publicly available and compatible technologies, information, and data products.

  - A Data Management Plan (see Part IV, C. 3. f. "Field 12. Other Attachments" for additional information) must include making data publicly available with persistent identifiers or compatible with other open databases and sources. Machine readable data management plans produced using tools such as the DMPTool are strongly encouraged. A reasonable budget allocation for data management is allowed as a direct cost. Each Project Director (PD) must attend an inaugural PD meeting to share and coordinate their data management strategies with PDs from other funded projects to increase the value of the collective data through compatibility and sharing with regard to FAIR data standards, privacy, security and ethics.
  - A Logic Model (see Part IV, C. 3. f. "Field 12. Other Attachments" for additional information) must include elements detailing the activities, outputs, and outcomes of the proposed project. The logic model planning process is a tool that should be used to develop a project before writing the application. This information may be provided as a narrative or formatted into a logic model chart. For more information and resources, see Integrated Programs' Logic Model Planning Process located on the NIFA website.

- Applications from and collaborations with small to mid-sized institutions, minority-serving institutions, and/or institutions within the Established Program to Stimulate Competitive Research (EPSCoR) states are encouraged. Applications that include collaboration with international partners are also encouraged. For information on NIFA partnerships that may be of interest to applicants, see the AFRI International Partnerships website.
- For this Program Area, successful projects will integrate all three functions of the agricultural knowledge systems (i.e., Research, Education, and Extension) within a project focused around a problem or challenge. Each application should be planned, developed, and written in a manner that reflects the input and expertise of the entire integrated project team. Each integrated activity should be represented by one or more objectives within the application, with no more than two-thirds of a project's budget being allocated to any single function.
- Extension activities must meet the definition described in Part VIII, D and the guidelines for extension described for integrated project types (see the AFRI RFA Resources page, "AFRI Project Types" in the attachments list). In addition, extension components must include:
  - A high degree of engagement among researchers, extension or other engagement personnel, and relevant stakeholders, from inception through implementation of the project;
  - Approaches that consider the factors that impact decision making (e.g., assess individual, stakeholder group, or community needs; develop strategies that

incentivize changes in practices to manage lands, crops and/or systems; promote adoption of new technologies and other interventions based on knowledge of user preferences); and
    - Innovative approaches to disseminate project results and/or best management practices.

  Extension activities may include positive youth development programs such as 4-H.
- Educational activities must meet the definition described in Part VIII, D and the guidelines for education described for integrated project types (see the AFRI RFA Resources page, "AFRI Project Types" in the attachments list). In addition, educational components should make use of innovative approaches such as curriculum development, novel experiential learning opportunities, development of leadership skills (e.g., critical thinking, problem solving, communication), use of transdisciplinary and multi-institutional teams, online educational resources, citizen science, apps, or educational games. Investigators are strongly encouraged to engage a diverse population of students in these activities, including socially-disadvantaged and nontraditional students.
- Applicants must:
    - Clearly identify the systems addressed in their projects and provide justification for why that particular system, its scope, and components, were selected. Where possible, each application must describe the prioritization process used to determine which systems and components to investigate in terms of the food and agricultural production practices, supply chain components, consumption end uses, and impacts on people.
    - Describe a meaningful approach for blending research, education, and extension expertise and other extension and implementation approaches throughout the project to address principal objectives.
    - Provide evidence that the project is aligned with AFRI priorities outlined in the Farm Bill listed in Part I, A of this RFA.
    - Describe expected solutions or improvements and how these will be assessed and measured in their project.
    - Address the potential costs of a proposed solution in their project and describe how it can be scaled to be used in the short-and long-term based on technical, economic, and social feasibility.
    - Explain how the project will strengthen agricultural and food-production systems and how results will be adopted or applied at a local, regional, or national level.
- During the proposal review process, the diversity of agricultural systems and long-term goals included may be taken into consideration when making final awards.
- NIFA supports global engagement that advances U.S. agricultural goals. To attain the agency's goals for U.S. agriculture, global competence of our nation's agricultural workforce, and safe and nutritious food security in a growing world, NIFA recognizes that collaboration with international partners through AFRI can contribute to advances in U.S. agriculture. Thus, applications in response to this RFA may include collaborations with international partners but may only be submitted by eligible U.S. institutions. Such applications may include subcontracts to international partners or other institutions and must clearly demonstrate benefits to the U.S. Additional guidance on including international activities is provided on the AFRI International Partnerships website.

- Applicants are encouraged to consult the definitions and examples of the food and agricultural systems in: National Academy of Sciences report on "A Framework for Assessing Effects of the Food System," and the National Research Council food system definition. For additional resources on AFRI, including SAS, see the NIFA webpage.

2. Sustainable Agricultural Systems Program Evaluation
Program Area Priority Code – A9211
Proposed Budget Requests

d) Proposed projects must not exceed **$1 million total per project (including indirect costs) for project periods of up to five years**. This program area anticipates making up to one award.
e) Food and Agricultural Science Enhancement (FASE) grants must adhere to the guidelines outlined beginning in Part II, C. 2.
f) **Requests exceeding the budgetary guidelines will not be reviewed**.

Requested Project Type – Research Projects only
Requested Grant Type – Standard and FASE (Strengthening Standard) Grants only
Letter of Intent Deadline – March 4, 2021 (5:00 p.m. Eastern Time)
Program Area e-mail Address for Submission of Letter of Intent – AFRI-SAS@usda.gov
Application Deadline – July 1, 2021 (5:00 p.m. Eastern Time)
Program Area Contacts – Dr. Robbin Shoemaker and Dr. Ann Stapleton, AFRI-SAS@usda.gov

Program Area Priority –
The primary goal of this program area priority is to develop a synthesis and assessment of USDA NIFA's investments in the Sustainable Agricultural Systems (SAS) program from FY 2018 continuing through FY 2024. This priority calls for proposals to provide a programmatic review of the SAS projects, to include impacts, assessment and evaluation of this Coordinated Agricultural Project (CAP) program in relation to the program goals, the USDA Science Blueprint, the USDA Strategic Goals, and the USDA Agriculture Innovation Agenda. The project should provide an assessment of impacts of the SAS program, a roadmap for future SAS priorities, and education programming to support best practices for SAS project management. The successful application is expected to develop novel methods for assessing projects of this type and scale.

This synthesis project will provide a robust picture of the outcomes, knowledge, educational curriculum, extension activities and outreach, and tools that were developed as well as determine gaps in providing transdisciplinary advancements in integrated research, education, and extension. The desired outcome is to have a comprehensive analysis to determine the impact of USDA NIFA support of research, education, and extension in relation to identified systems challenges in the sustainability of U.S. agriculture and food production. The awardee will work closely with funded SAS projects and may provide project implementation and unified coordination frameworks or integrate across frameworks that are chosen by individual projects. Additionally, the awardee will work closely with NIFA staff in the planning and implementation of annual SAS Project Director's meetings.

It is recommended that the following information sources be used in projects:

- USDA Current Research Information System (CRIS) / NIFA Data Gateway

- USDA Science Blueprint
- USDA Agriculture Innovation Agenda
- USDA Research, Education, & Economics Information Systems (REEIS)
- USDA NIFA's Leadership Management Dashboard (LMD)
- Journal articles and education and outreach materials and reports resulting from or related to NIFA SAS projects
- SAS project personnel

Proposals must address **all** of the following criteria:

1. Identify or develop an analytical approach that can effectively synthesize and assess the success of the portfolio of SAS projects. This must include developing innovative quantitative/qualitative indicators or measures of the array of topics addressed by the projects and a method of assessing the individual and collective effectiveness of the projects and overall portfolio;
2. Identify the key topical areas that have been covered by NIFA's SAS program investments from FY 2018 to FY 2024, and the effectiveness of these investments in achieving national, departmental, and agency goals;
3. Ascertain the strengths and weaknesses in the portfolio that can inform the direction of future NIFA funding. This assessment should include broad applicability and gaps of portfolio coverage across regions, and disciplines of importance for research, education, and extension opportunities;
4. Identify the key findings and impacts of these SAS projects and emerging directions in food and agriculture science suggested by them. Evaluate whether these projects address the challenges identified at the national level that have been identified by other major organizations and stakeholders;
5. Ascertain and validate the direct and indirect beneficiaries from SAS funding and the impacts on diversity and inclusion in higher education and the agricultural sector;
6. Translational analysis of how the SAS projects can enhance the impact within the broader context of national agricultural imperatives;
7. Identification of barriers that have limited SAS projects from meeting their proposed goals, outputs, and impacts, and educational materials that can be utilized to more broadly implement best management practices across SAS projects; and
8. Establish and implement common metrics of performance that best predict project impacts that can be implemented across the SAS program.

Program Area Additional Information:

- Letter of Intent (LOI) format is defined in Part IV.
- Projects must propose products that will be available for public disclosure. For instance, a project might begin with a national workshop and might culminate in a national conference with proceedings and/or a white paper summarizing the proceedings.
- All applications must include a project management plan and a data management plan that assures preservation of and ready access to information and outputs from the project.
- All applications must budget organizing and conducting an annual project directors meeting for SAS projects to capture progress, identify project derived impacts and if necessary, realignments of the active projects.

- Applications may include funds to support travel to USDA NIFA offices to work with National Program staff and USDA systems on the topic.

PART II—AWARD INFORMATION

A. Available Funding

The anticipated amount available to support the AFRI program is approximately $425 million in FY 2020 and $425 million for FY 2021. NIFA anticipates approximately $150 million will be available to support program areas in this AFRI Sustainable Agricultural Systems RFA from FY 2020 and FY 2021 appropriations. Of the total amount available to make awards for the AFRI program, no less than 30 percent will be made available to fund integrated research, education, and extension projects. Of the AFRI funds allocated to research activities, no less than 60 percent will be directed toward grants for fundamental (or basic) research and 40 percent toward grants for applied research. Of the AFRI funds allocated to fundamental research, not less than 30 percent will be directed toward research by multidisciplinary teams. It is expected that no less than 15 percent of the FY 2020 and FY 2021 funds will be made available for Food and Agricultural Science Enhancement (FASE) Grants, and no more than two percent of the funds available for fundamental research will be made available for Equipment Grants (see Part II, C for information about FASE Grants including Equipment Grants). **This RFA is being released prior to the passage of an appropriations act for 2021. Enactment of additional continuing resolutions or a full appropriations act may affect the availability or level of funding for this program.**

Of the approximately $150 million available to support the program areas in this RFA, no less than 11.25% will be made available for FASE grant types under the FASE program.

The funds will be awarded through a grant for performance periods of up to five years. NIFA may choose to issue a grant on a continuation basis. A continuation award is an award instrument by which NIFA agrees to support a specified level of effort for a predetermined period of time with a statement of intention to provide additional support at a future date, provided that performance has been satisfactory, appropriations are available for this purpose, and continued support would be in the best interest of the federal government and the public.

There is no commitment by NIFA to fund any particular application or to make a specific number of awards. The Automated Standard Applications for Payment System (ASAP), operated by the Department of Treasury's Bureau of the Fiscal Service, is the designated payment system for awards resulting from this RFA. For more information see the ASAP website.

B. Types of Applications

In FY 2021, you may submit applications to one of the program areas in this RFA as one of the three types of requests:

(1) **New application**. This is a project application that has not been previously submitted to NIFA. We will review all new applications to ensure they meet administrative requirements and all applications will be competitively evaluated by a review panel using criteria and selection processes described in Part V—Application Review Requirements.

(2) **Resubmitted application**. This is an application that was submitted previously to NIFA but not funded. Project Directors (PDs) must respond to the previous review panel

summary (see Response to Previous Review, **Part IV, C**). We must receive resubmitted applications by the relevant due dates. We will evaluate resubmitted applications in competition with other pending applications in the appropriate program priority area to which they are assigned and review them according to the same evaluation criteria (Part V, B) as new applications. A renewal application that was submitted previously but not funded and is being resubmitted is also considered as Resubmitted application; however, PDs must include a Progress Report (see (2) above) and a Response to Previous Review. If you are resubmitting an application, enter the NIFA-assigned proposal number of the previously-submitted application in the Federal Identifier (Field 4.a. of the SF 424 (R&R) form).

C. Project Types and Grant Types

1. **Project Types**. Applicants must propose one of the AFRI project types specified within the relevant program area descriptions in **Part I, C** of this RFA. Only project types specifically solicited under each program area or program area priority described in **Part I, C** of this RFA will be considered for review. A detailed description of the project types (Research, Education, Extension, and Integrated Research, Education and/or Extension) available across AFRI is located on the AFRI RFA Resources page ("AFRI Project Types" in the attachments list).
2. **Grant Types.** Applicants must select the appropriate AFRI grant type specified within the relevant Program Area Descriptions in **Part I, C** of this RFA. Only grant types specifically solicited under each program area or program area priority described in **Part I, C** of this RFA will be considered for review. A detailed description of the grant types (Standard Grants, Coordinated Agricultural Projects, Conference Grants, Collaborative Grants, and FASE Grants) available across AFRI is located on the AFRI RFA Resources page ("AFRI Grant Types" in the attachments list).

D. Responsible and Ethical Conduct of Research

In accordance with sections 2, 3, and 8 of 2 CFR Part 422, institutions that conduct USDA-funded extramural research must foster an atmosphere conducive to research integrity, bear primary responsibility for prevention and detection of research misconduct, and maintain and effectively communicate and train their staff regarding policies and procedures. In the event an application to NIFA results in an award, the Authorized Representative (AR) assures, through acceptance of the award that the institution will comply with the above requirements. Award recipients shall, upon request, make available to NIFA the policies, procedures, and documentation to support the conduct of the training. See NIFA's Responsible and Ethical Conduct of Research page for further information.

PART III—ELIGIBILITY INFORMATION

A. Eligible Applicants

Applications may only be submitted by eligible entities. Failure to meet an eligibility criterion by the application deadline may result in the application being excluded from consideration or, even though an application may be reviewed, will preclude NIFA from making an award.

Eligibility is linked to the project type as specified below.

1. **Research, Education or Extension Projects**
   Eligible applicants for single-function Research, Education or Extension Projects include:
   a) State Agricultural Experiment Station;
   b) colleges and universities (including junior colleges offering associate degrees or higher);
   c) university research foundations;
   d) other research institutions and organizations;
   e) Federal agencies;
   f) national laboratories;
   g) private organizations or corporations;
   h) individuals who are U.S. citizens, nationals, or permanent residents; and
   i) any group consisting of two or more entities identified in a) through h).

   Eligible institutions do not include foreign and international organizations.

2. **Integrated Projects**
   Eligible applicants for Integrated Projects include:
   a) colleges and universities;
   b) 1994 Land-Grant Institutions; and
   c) Hispanic-serving agricultural colleges and universities (see NIFA's Hispanic-Serving Agricultural Colleges and Universities page).

   For item a) under Integrated Projects, the terms "college" and "university" mean an educational institution in any state which
   i) admits as regular students only persons having a certificate of graduation from a school providing secondary education, or the recognized equivalent of such a certificate;
   ii) is legally authorized within such state to provide a program of education beyond secondary education;
   iii) provides an educational program for which a bachelor's degree or any other higher degree is awarded;
   iv) is a public or other nonprofit institution; and
   v) is accredited by a nationally recognized accrediting agency or association.

   A research foundation maintained by a college or university is eligible to receive an award under this program.

3. **Food and Agricultural Science Enhancement Grants**
   Part II, C(2) of this RFA contains the eligibility details for Food and Agricultural Science Enhancement (FASE) Grants. Note that under FASE program, Strengthening Coordinated Agricultural Project and Strengthening Standard Grants are solicited in this RFA.

Applicants must respond to the program area priorities and deadlines found in **Part I, C** of this RFA. Grant recipients may subcontract to organizations not eligible to apply provided such organizations are necessary for the conduct of the project. Failure to meet an eligibility criterion by the application deadline may result in the application being excluded from consideration or, even though an application may be reviewed, will preclude NIFA from making an award (see Part III, B).

B. Request for Determination of Status

1. Minority–Serving Institution

If an institution is applying for a Strengthening Grant (see Part II, C. 2) and wants the Secretary to consider a group, beyond one included in the minority definition (see Part VIII, D), then documentation (see below) must be submitted as part of the requestor's Letter of Intent (if required) and the full application package (Part IV, C) by the applicable program area or program area priority deadline. The Secretary of Agriculture (or designated individual) will use the information in the documentation to determine whether the group or groups identified are qualified as a minority group for the purpose of receiving a Strengthening Grant under the FASE program (for Strengthening Grants information, refer to the AFRI RFA Resources page, "AFRI Grant Types" in the attachments list).

Documentation for the request for determination as a minority-serving institution must include the following and be provided in the order specified below:

a. A description of each minority group being submitted for determination;
b. Data or studies supporting this group's designation as a minority group; and
c. Data indicating that enrollment of the minority group(s) exceeds 50 percent of the total enrollment at the academic institution, including graduate and undergraduate and full-and part-time students.

2. Multi-Campus Institution

All institutions grouped under one main campus as listed in Table 1 following Part VIII, unless located in an Established Program to Stimulate Competitive Research (EPSCoR) state (listed in Part II, C. 2), are excluded from eligibility for all strengthening funds. However, if any campus within a multi-campus listing can provide information demonstrating that it is administratively independent or has an independent accreditation, then the institution may petition for an exemption to this rule and request eligibility for strengthening funds. The Letter of Intent (if required) and the application must include a letter indicating how the institution is independent of the main campus, either through accreditation or administration, how the institution is eligible as a small and mid-sized or minority-serving institution due to enrollment, and total federal funds received for science and engineering research and development. The letter must be signed by the Authorized Representative (AR).

C. Cost Sharing or Matching

Matching funds requirements for AFRI programs included in this RFA may be found at 7 U.S.C. 3157 (b)(9). If an applied **Research** (see Part VIII, D of this RFA) **or Integrated Project** with an applied research component, is commodity-specific and not of national scope, the grant recipient is required to match the USDA funds awarded on a dollar-for-dollar basis from non-federal sources with cash and/or in-kind contributions.

NIFA may waive the matching funds requirement based on submitted document (see Part IV, C(6) of this RFA), for a grant if we determine that:

a. The results of the project, while of particular benefit to a specific agricultural commodity, are likely to be applicable to agricultural commodities generally; or
b. The project involves a minor commodity, the project deals with scientifically important research, and the grant recipient is unable to satisfy the matching funds requirement.

For Equipment Grants: The amount of Federal funds provided may not exceed 50 percent of the cost of the equipment acquired using funds from the grant, or $50,000, whichever is less. Grantees are required to match 100 percent of Federal funds awarded from non-Federal sources. NIFA may waive all or part of the matching requirement if all three of the following criteria are met:

1. application is from a college, university, or research foundation maintained by a college or university that ranks in the lowest one third of such colleges, universities, and research foundations on the basis of Federal research funds received (see AFRI RFA Resources page "Table 2 Least Successful Institutions" in the attachments list, for more information);
2. the equipment to be acquired costs no more than $25,000; and
3. the equipment has multiple uses within a single research project or is usable in more than one research project. To be considered for this waiver, the budget justification (see Part IV, C(6) of this RFA) must include a letter signed by the institution's AR addressing the noted criteria.

D. Centers of Excellence

Pursuant to Section 7214 of the Agricultural Act of 2014 (Pub. L. 113-79), NIFA will recognize and provide priority in the receipt of funding to applications from "centers of excellence" that carry out research, extension, and education activities that relate to the food and agricultural sciences. NIFA held listening sessions in July 2014 and accepted written comments from stakeholders to inform NIFA's implementation of the COE provision. Information on COE provision, and frequently asked questions are available at the NIFA COE website.

A COE is composed of one or more of the following entities that provide financial or in-kind support to the COE.

a) State agricultural experiment stations;
b) Colleges and universities;
c) University research foundations;
d) Other research institutions and organizations;
e) Federal agencies;

f) National laboratories;
g) Private organizations, foundations, or corporations;
h) Individuals; or
i) Any group consisting of two or more of the entities described in a) through h).

COE designation is available only for the **standard grant** and the **Coordinated Agricultural Project (CAP) grant** applications submitted to the program areas or program area priorities in the Foundational and Applied Science, and Sustainable Agricultural Systems RFAs. If applicable, Part IV, C of the RFA contains additional requirements for COE consideration.

PART IV—APPLICATION AND SUBMISSION INFORMATION

A. Letter of Intent

If a program area or program area priority within this RFA requires a LOI (LOI), then a LOI is a prerequisite for submission of an application. Refer to the Program Area Descriptions beginning in Part I, C of this RFA for LOI deadlines for a specific program area or program area priority. For detailed guidance on LOI submission, see the AFRI RFA Resources page ("AFRI Letter of Intent Instructions" in the attachments list).

B. Electronic Application Package

Only electronic applications may be submitted via Grants.gov to NIFA in response to this RFA. We urge you to submit early to the Grants.gov system. For information about the pre-award phase of the grant lifecycle see the Grants.gov Pre-Award Phase page.

New Users of Grants.gov
Prior to preparing an application, we recommend that the Project Director/Principal Investigator (PD/PI) first contact an AR to determine if the organization is prepared to submit electronic applications through Grants.gov. If not (e.g., the institution/organization is new to the electronic grant application process through Grants.gov), then the one-time registration process must be completed **PRIOR** to submitting an application. It can take as long as two weeks to complete the registration process so it is critical to begin as soon as possible. In such situations, the AR should go to **"Register," in the top right corner of the Grants.gov web page (or go to** https://www.grants.gov/web/grants/register.html**), for information on registering the institution/organization with Grants.gov.** Part II, 1 of the NIFA Grants.gov Application Guide contains detailed information regarding the registration process. Refer to item 2, below, to locate the "NIFA Grants.gov Application Guide."

Steps to Obtain Application Package Materials
To receive application materials:

1. You must download and install a version of Adobe Reader compatible with Grants.gov to access, complete, and submit applications. For basic system requirements and download instructions, see https://www.grants.gov/web/grants/applicants/adobe-software-compatibility.html. Grants.gov has a test package that will help you determine whether your current version of Adobe Reader is compatible.

2. To obtain the application package from Grants.gov, go to https://www.grants.gov/web/grants/applicants/search-opportunity-package.html and enter the funding opportunity number where appropriate

   Funding Opportunity Number: USDA-NIFA-AFRI-007892

   Click "Search". On the displayed page, click the corresponding link to continue. A Grant Application Package is tied to a particular funding opportunity. You may move the forms amongst different Grant Application Packages, but you may ONLY submit an application to the particular funding opportunity to which the Grant Application Package is

associated.

Contained within the application package is the "NIFA Grants.gov Application Guide." This guide contains an introduction and general Grants.gov instructions, information about how to use a Grant Application Package in Grants.gov, and instructions on how to complete the application forms.

If you require assistance to access the application package (e.g., downloading or navigating Adobe forms) **or submitting the application,** refer to resources available on the Grants.gov website (https://www.grants.gov/web/grants/support.html). Grants.gov assistance is also available at:

Grants.gov customer support (https://www.grants.gov/web/grants/support.html)
800-518-4726 Toll-Free or 606-545-5035
Business Hours: 24 hours a day, 7 days a week. Closed on federal holidays.
Email: support@grants.gov
Grants.gov iPortal (see https://grants-portal.psc.gov/Welcome.aspx?pt=Grants):
Top 10 requested help topics (FAQs), Searchable knowledge base, self-service ticketing and ticket status, and live web chat (available 7:00 a.m. – 9:00 p.m. Eastern Time).
Have the following information available when contacting Grants.gov:

- Funding Opportunity Number (FON)
- Name of agency you are applying to
- Specific area of concern

C. Content and Form of Application Submission

Application and submission information including page limits and narrative font sizes for AFRI Sustainable Agricultural Systems RFA applications are available at AFRI RFA Resources page ("2021 Sustainable Agricultural Systems RFA Additional Information for Part IV, C" in the attachments list).

D. Submission Dates and Times

a. **Letter of Intent**
The Letter of intent if applicable, must be received at NIFA by **5:00 p.m. Eastern Time on the dates indicated in the Program Area Descriptions beginning in Part I, C** and in the format specified in Part IV, A. The LOI (if applicable) is a prerequisite for the submission of a full application.

b. Full Application
Applications must be received by Grants.gov by **5:00 p.m. Eastern Time on the dates indicated in the Program Area Descriptions beginning in Part I, C**. Applications received after this deadline will normally **not** be considered for funding.

We recommend that you conduct an administrative review of the application before submission of it via Grants.gov to ensure that it complies with all preparation instructions.

An application checklist is included in Part VII of the NIFA Grants.gov Application Guide to assist with this review.

You should check the application for completeness. The application should be checked for the following required items, which must include:

- Project Summary/Abstract
- Project Narrative
- Bibliography & References Cited
- Logic Model (if applicable)
- Management Plan (if applicable)
- Data Management Plan
- Facilities & Other Resources
- Curriculum Vitae
- Conflict of Interest Lists
- Current and pending support
- Budget
- Budget Justification
- Felony and Tax Certification Form (if applicable)

This is not an exhaustive list of required items; it only serves to highlight items that may be overlooked. **Failure to include any of the three critical required documents of Project Summary/Abstract, Project Narrative, or Bibliography & References Cited sections as PDF attachment will result in the application not being reviewed or considered for funding by NIFA.**

Instructions for submitting an application are included in Part IV, Section 1.5 of the NIFA Grants.gov Application Guide.

If you have trouble submitting an application to Grants.gov, you should FIRST contact the Grants.gov Help Desk to resolve any problems. Keep a record of any such correspondence. See Part IV, B for Grants.gov contact information.

We send email correspondence to the AR regarding the status of submitted applications. We strongly encourage you to provide accurate email addresses, where designated, on the SF-424 R&R Application for Federal Assistance.

If the AR has not received correspondence **from NIFA** regarding a submitted application within 30 days of the established deadline, contact the Agency Contact identified in Part VII of the RFA and request the proposal number assigned to the application. **Failure to do so may result in the application not being considered for funding by the peer review panel. Once the application has been assigned a proposal number, you should cite this number on all future correspondence.**

E. Funding Restrictions

7 U.S.C. § 3310 limits indirect costs for the overall award to 30 percent of Total Federal Funds Awarded (TFFA) under a research, education, or extension grant. The maximum indirect cost rate allowed under the award is determined by calculating the amount of indirect costs using:

1) the sum of an institution's negotiated indirect cost rate and the indirect cost rate charged by subawardees, if any; or
2) 30 percent of TFFA (TFFA = Field K., Total Costs and Fee, on SF-424 R&R Budget).

The maximum allowable indirect cost rate under the award, including the indirect costs charged by the subawardee(s), if any, is the lesser of the two rates.

If the results of 1), is the lesser of the two, the grant recipient is allowed to charge the negotiated indirect cost rate on the prime award and the subaward(s), if any. Any subawards would be subject to the subawardee's negotiated indirect cost rate. The subawardee may charge its negotiated indirect cost rate on its portion of the award, provided the sum of the indirect cost rate charged under the award by the prime awardee and the subawardee(s) does not exceed 30 percent of the TFFA.

If the result of 2), is the lesser of the two, then the maximum indirect cost rate allowed for the overall award, including any subaward(s), is limited to 30 percent of the TFFA. That is, the indirect costs of the prime awardee plus the sum of the indirect costs charged by the subawardee(s), if any, may not exceed 30 percent of the TFFA.

In the event of an award, the prime awardee is responsible for ensuring the maximum indirect cost allowed for the award is not exceeded when combining indirect costs for the Federal portion (i.e., prime and subawardee(s)) and any applicable cost-sharing (see 7 CFR 3430.52(b)). Amounts exceeding the maximum allowable indirect cost is considered unallowable and will be handled accordingly. See sections 408 and 410 of 2 CFR 200.

Indirect costs are not allowed for equipment or conference grants.

See Part V, section 7.9 of the NIFA Grants.gov Application Guide for further indirect cost information.

You may not use grant funds awarded under this authority to renovate or refurbish research, education, or extension space; purchase or install fixed equipment in such place; or the plan, repair, rehabilitate, acquire, or construction of buildings or facilities.

F. Other Submission Requirements

You should follow the submission requirements noted in Part IV, Section 1.5 in the document entitled "NIFA Grants.gov Application Guide."

For information about the **status of a submitted application**, see Part III, Section 6 of the NIFA

Grants.gov Application Guide.

Multiple submissions

In accordance with Part III, Section 5 of NIFA Grants.gov Application Guide, duplicate, essentially duplicate or predominantly overlapping applications submitted to one or more program areas within the AFRI (including FASE Grants) in any one fiscal year will not be reviewed. In addition, applicants may not submit to AFRI an application that is considered duplicate, essentially duplicate, or predominantly overlapping with an application submitted to another NIFA program in the same fiscal year.

PART V—APPLICATION REVIEW REQUIREMENTS

A. General

NIFA evaluates each application in a two-part process. First, we screen each application to ensure that it meets the administrative requirements as set forth in this RFA. Second, a scientific peer- review process will be used to technically evaluate applications that meet the administrative requirements using a review panel (see NIFA Peer Review Process).

Scientific Peer Review Process:
NIFA selects reviewers for the review panel based upon their training and experience in relevant scientific, extension, or education fields, taking into account the following factors:

- the level of relevant formal scientific, technical education, or extension experience of the individual, as well as the extent to which an individual is engaged in relevant research, education, or extension activities;
- the need to include experts from various areas of specialization within relevant scientific, education, or extension fields;
- the need to include other experts (e.g., producers, range or forest managers/operators, and consumers) who can assess relevance of the applications to targeted audiences and to program needs;
- the need to include experts from a variety of organizational types (e.g., colleges, universities, industry, state and Federal agencies, and private profit and non-profit organizations) and geographic locations;
- the need to maintain a balanced composition with regard to minority and female representation and an equitable age distribution; and
- the need to include reviewers who can judge the effective usefulness of each application to producers and the general public.

After each peer review panel has completed its deliberations, the responsible program staff of NIFA will recommend that your project is either approved for support from currently available funds or declined due to insufficient funds or unfavorable review.

NIFA reserves the right to negotiate with the PD/PI and/or the submitting organization or institution regarding project revisions (e.g., reductions in the scope of work, funding level, period, or method of support) prior to recommending any AFRI project for funding.

After the review process has been completed, NIFA sends copies of reviews, *not* including the identity of reviewers, and a summary (if applicable) of the review panel comments to the PD.

B. Evaluation Criteria

A reviewer's written evaluation entails two levels of assessment. First, the reviewer summarizes how well the application addressed each evaluation criterion. After the application has been assessed for strengths and weaknesses of each criterion, the reviewer then evaluates the overall likelihood that the project will have significant outcome and impact. The written reviews are used to begin panel discussions with other reviewers serving on the peer review panel. Through

these discussions, peer review panelists come to consensus on the final ranking of the applications. A complete description of NIFA's peer review process can be found at the NIFA Peer Review Process for Competitive Grant Applications page.

Detailed evaluation criteria for each project types, grant types, exploratory research projects and centers of excellence are found at the AFRI RFA Resources page ("AFRI Review Criteria" in the attachments list). We will use the appropriate evaluation criteria to review applications submitted in response to this RFA.

C. Conflicts of Interest and Confidentiality

During the peer evaluation process, we take extreme care to prevent any actual or perceived conflicts of interest that may impact review or evaluation. See the NIFA Peer Review Process for Competitive Grant Applications page for further information about conflicts of interest and confidentiality as related to the peer review process.

D. Organizational Management Information

Specific management information relating to an applicant shall be submitted one-time, with updates on an as-needed basis. This requirement is part of the responsibility determined prior to the award of a grant identified under this RFA, if such information has not been provided previously under this or another NIFA program. We will provide you copies of forms recommended for use in fulfilling these requirements as part of the pre-award process. Although an applicant may be eligible based on its status as one of these entities, there are factors that may exclude an applicant from receiving federal financial and nonfinancial assistance and benefits under this program (e.g., debarment or suspension of an individual involved or a determination that an applicant is not responsible based on submitted organizational management information).

E. Application Disposition

An application may be withdrawn at any time before a final funding decision is made regarding the application. Each application that is not selected for funding, including those that are withdrawn, will be retained by the agency for a period of three years.

PART VI—AWARD ADMINISTRATION

A. General

Within the limit of funds available for such purpose, the NIFA awarding official shall make grants to those responsible, eligible applicants whose applications are judged most meritorious under the procedures set forth in this RFA. The date specified by the NIFA awarding official as the effective date of the grant shall be no later than September 30 of the federal fiscal year in which the project is approved for support and funds are appropriated for such purpose, unless otherwise permitted by law. The project need not be initiated on the grant effective date, but as soon thereafter as practical so that project goals may be attained within the funded project period. All funds granted by NIFA under this RFA may be used only for the purpose for which they are granted in accordance with the approved application and budget, regulations, terms and conditions of the award, applicable federal cost principles, USDA assistance regulations, and NIFA General Awards Administration Provisions at 7 CFR part 3430, subparts A through E.

B. Award Notice

The award document will provide pertinent instructions and information including, at a minimum, the information described in 2 CFR 200.210.

See NIFA's Terms and Conditions page to view current NIFA award terms and conditions.

C. Administrative and National Policy Requirements

Several federal statutes and regulations apply to grant applications considered for review and to project grants awarded under this program. These may include, but are not limited to, the ones listed on NIFA's Federal Regulations page.

NIFA Federal Assistance Policy Guide—a compendium of basic NIFA policies and procedures that apply to all NIFA awards, unless there are statutory, regulatory, or award-specific requirements to the contrary—is available at NIFA's Policy Guide page.

D. Responsible and Ethical Conduct of Research

Refer to Part II, D for more information.

E. Expected Program Outputs and Reporting Requirements

The output and reporting requirements are included in the award terms and conditions (see NIFA's Terms and Conditions page for information about NIFA award terms). If there are any program or award-specific award terms, they will be identified in the award.

PART VII—AGENCY CONTACTS

For general questions related to the AFRI Programs, applicants and other interested parties are encouraged to contact:

AFRI Program Office:
Dr. Parag Chitnis, Acting Director, National Institute of Food and Agriculture
Dr. Michael Fitzner, Acting Deputy Director, Institute of Food Production and Sustainability
Dr. Timothy Conner, Acting Deputy Director, Institute of Food Safety and Nutrition and Institute of Bioenergy, Climate, and Environment
Dr. Suresh Sureshwaran, Acting Deputy Director, Institute of Youth, Family, and Community

Telephone: (816) 926-1604
E-mail: AFRI@usda.gov

Specific questions pertaining to technical matters may be directed to the appropriate Program Area Priority Contacts:

Table 1: Program Points of Contact

Program Area	Priority Program Area Contact
Sustainable Agricultural Systems	Dr. Mathieu Ngouajio and Dr. Megan O'Rourke; AFRI-SAS@usda.gov
Sustainable Agricultural Systems Program Evaluation	Dr. Robbin Shoemaker and Dr. Ann Stapleton; AFRI-SAS@usda.gov

For administrative questions related to

1. Grants.gov, see Part IV of this RFA
2. Other RFA or application questions, please email policy@usda.gov
3. Awards under this RFA, please email awards@usda.gov

PART VIII—OTHER INFORMATION

A. Use of Funds; Changes

1. Delegation of Fiscal Responsibility

Unless the terms and conditions of the award state otherwise, awardees may not in whole or in part delegate or transfer to another person, institution, or organization the responsibility for use or expenditure of award funds.

2. Changes in Budget or Project Plans

In accordance with 2 CFR 200.308, awardees must request prior approval from NIFA for the following program or budget-related reasons:

(i) Change in the scope or the objective of the project or program (even if there is no associated budget revision requiring prior written approval).
(ii) Change in a key person specified in the application or the federal award.
(iii) The disengagement from the project for more than three months, or a 25 percent reduction in time devoted to the project, by the approved project director or principal investigator.
(iv) The inclusion, unless waived by the federal awarding agency, of costs that require prior approval in accordance with 2 CFR 200 Subpart E—Cost Principles of this part or 45 CFR Part 75 Appendix IX, "Principles for Determining Costs Applicable to Research and Development under Awards and Contracts with Hospitals," or 48 CFR Part 31, "Contract Cost Principles and Procedures," as applicable.
(v) The transfer of funds budgeted for participant support costs as defined in §200.75 Participant support costs to other categories of expense.
(vi) Unless described in the application and funded in the approved federal awards, the sub awarding, transferring or contracting out of any work under a federal award, including fixed amount sub awards as described in §200.332 Fixed amount sub awards. This provision does not apply to the acquisition of supplies, material, equipment, or general support services.
(vii) Changes in the approved cost-sharing or matching provided by the non-federal entity.
(viii) The need arises for additional Federal funds to complete the project.

The awardee will be subject to the terms and conditions identified in the award. See NIFA's Terms and Conditions page for information about NIFA award terms.

B. Confidential Aspects of Applications and Awards

When an application results in an award, it becomes a part of the record of NIFA transactions, available to the public upon specific request. Information that the Secretary of Agriculture determines to be of a confidential, privileged, or proprietary nature will be held in confidence to the extent permitted by law. Therefore, any information that the applicant wishes to have considered as confidential, privileged, or proprietary should be clearly marked within the application. We will retain for three years a copy of an application that does not result in an award. Such an application will be released only with the consent of the applicant or to the extent

required by law. An application may be withdrawn at any time prior to the final action thereon.

C. Regulatory Information

This program is not subject to the provisions of the Executive Order 12372, which requires intergovernmental consultation with state and local officials.

Under the provisions of the Paperwork Reduction Act of 1995 (44 U.S.C. Chapter 35), the collection of information requirements contained in this notice have been approved under OMB Document No. 0524-0039.

D. Definitions

Please refer to 7 CFR 3430, Competitive and Noncompetitive Non-formula Financial Assistance Programs--General Award Administrative Provisions, for applicable definitions for this NIFA grant program.

For the purpose of this program, the following additional definitions are applicable:

Applied Research means research that includes expansion of the findings of fundamental research to uncover practical ways in which new knowledge can be advanced to benefit individuals and society.

Food and Agricultural Science Enhancement (FASE) Grants mean funding awarded to eligible applicants to strengthen science capabilities of Project Directors, to help institutions develop competitive scientific programs, and to attract new scientists into careers in high-priority areas of National need in agriculture, food, and environmental sciences. FASE awards may apply to any of the three agricultural knowledge components (i.e., research, education, and extension). FASE awards include Pre- and Postdoctoral Fellowships, New Investigator grants, and Strengthening grants.

Limited institutional success means institutions that are not among the most successful universities and colleges for receiving Federal funds for science and engineering research. A list of successful institutions is provided on AFRI RFA Resources page ("Table 2 Least Successful Institutions" in the attachments list).

Minority-serving institution means an accredited academic institution whose enrollment of a single minority or a combination of minorities exceeds fifty percent of the total enrollment, including graduate and undergraduate and full- and part-time students. An institution in this instance is an organization that is independently accredited as determined by reference to the current version of the *Higher Education Directory*, published by Higher Education Publications, Inc., 6400 Arlington Boulevard, Suite 648, Falls Church, Virginia 22042 (703-532-2300).

Minority means Alaskan Native, American Indian, Asian-American, African-American, Hispanic American, Native Hawaiian, or Pacific Islander. The Secretary will determine on a case-by-case basis whether additional groups qualify under this definition, either at the

Secretary's initiative, or in response to a written request with supporting explanation.

Multidisciplinary project means a project on which investigators from two or more disciplines collaborate to address a common problem. These collaborations, where appropriate, may integrate the biological, physical, chemical, or social sciences.

Small and mid-sized institutions are academic institutions with a current total enrollment of 17,500 or less including graduate and undergraduate and full- and part-time students. An institution, in this instance, is an organization that possesses a significant degree of autonomy. Significant degree of autonomy is defined by being independently accredited as determined by reference to the current version of the *Higher Education Directory*, published by Higher Education Publications, Inc., 6400 Arlington Boulevard, Suite 648, Falls Church, Virginia 22042 (703-532-2300).

Strengthening Grants mean funds awarded to institutions eligible for FASE Grants to enhance institutional capacity, with the goal of leading to future funding in the project area, as well as strengthening the competitiveness of the investigator's research, education, and/or extension activities. Strengthening grants consist of Standard, Coordinated Agricultural Project and Conference Grant types as well as Seed Grants, Equipment Grants, and Sabbatical Grants.

Transdisciplinary Team is composed of investigators from multiple disciplines that cross boundaries using holistic approaches to address complex challenges that cannot be solved using single-disciplinary approaches.

USDA EPSCoR States (Established Program to Stimulate Competitive Research) mean States which have been less successful in receiving funding from AFRI, having a funding level no higher than the 38th percentile of all States based on a 3-year average of AFRI funding levels, excluding FASE Strengthening funds granted to state agricultural experiment stations and degree-granting institutions in EPSCoR States and small, mid-sized, and minority-serving degree-granting institutions. The most recent list of USDA EPSCoR States is provided at AFRI RFA Resources page ("AFRI Grant Types" in the attachments list).

E. Materials Available on the Internet

AFRI program information will be made available on the NIFA AFRI website. The following are among the materials available on the NIFA website:

1. Stakeholder Input
2. Requests for Applications
3. AFRI Abstracts of Funded Projects
4. AFRI Annual Synopsis
5. Frequently Asked Questions
6. Interagency Programs

APPENDIX I: Most Successful Universities and Colleges Receiving Federal Funds (Table 1)

Any institution listed on this list, Most Successful Universities and Colleges Receiving Federals Funds, is not eligible for Strengthening Grants from the FASE program unless they are located in an EPSCoR state (see the AFRI RFA Resources page, "Table 1 Most Successful Institutions" in the attachments list).

APPENDIX II: Lowest One Third of Universities and Colleges Receiving Federal Funds (Table 2)

The lowest one third of universities and colleges receiving Federal funds is used to determine eligibility for possible waiver of matching funds requirement for Equipment Grants (see the AFRI RFA Resources page, "Table 2 Least Successful Institutions" in the attachments list).

APPENDIX III: Flow Chart for Strengthening Grant Eligibility

The Flow Chart for Strengthening Grant Eligibility will help to determine your eligibility to apply for strengthening grants (see the AFRI RFA Resources page, "FASE Strengthening Grant Eligibility Flow Chart" in the attachments list).