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ABOUT NIFA

MISSION

The USDA National Institute of Food and Agriculture (NIFA) invests in and advances agricultural research, education and Extension to solve societal challenges.

VISION

Lead innovation across the nation through transformative discoveries, education and engagement that addresses agricultural challenges.

NIFA is the extramural research funding agency at the U.S. Department of Agriculture. Congress has entrusted us with more than 70 funding programs, totaling almost \$2 billion. We provide funding mainly through capacity, or formula, and competitive grant programs. Our team of nearly 400 experts is dedicated to serving agriculture through research, education and Extension across all communities, benefiting all ages of people who call America home.

USDA is an equal opportunity lender, provider and employer.

EXECUTIVE SUMMARY

NIFA Listens FY 2023 – FY 2024 is a biennial stakeholder listening opportunity to collect input to understand key challenges, promising opportunities and recommended top priorities related to advancing agricultural research, education and Extension. An invitation to provide online input via email and/or participate on a Zoom call was circulated with a <u>Federal Register Notice</u> posted on Sept. 16, 2022. Information about the event was also published on <u>the NIFA website</u>. https://www.nifa.usda.gov/nifa-listens-investing-science-transform-lives

Over 700 registered participants joined two 2.5-hour virtual Zoom sessions on Nov. 2, 2022, where 49 preregistered speakers offered oral statements in five-minute slots. Written input from 59 stakeholders was also received via email. A total of 108 stakeholders from 87 distinct organizations, located in 36 U.S. states and Washington, D.C., provided input during NIFA Listens FY 2023 – FY 2024.

Concurrently, NIFA Speaks gathered input from NIFA employees. Findings are available in this report.

NIFA implemented text analytics workflows leveraging the USDA EDAPT Data Science Workbench. New natural language processing (NLP) algorithms supported sentiment analysis and unbiased identification of top topics clusters and semantic relationships. New Tableau dashboards were designed to support further insight discovery. As reference, this report includes a qualitative analysis RRDC Stakeholder report, including a qualitative analysis comparing priorities identified. (See Appendix 4.)

This report executive summary collected stakeholders' challenges, their list of opportunities and top priorities. Bulleted sections within this document, unless numbered, do not indicate preferred ranking of importance. Consistently, the reader will find how stakeholder input aligns with <u>USDA strategic plan FY2022-FY2026</u> as well as with the <u>NIFA Strategic Plan</u>.

CHALLENGES

- Rapid ecosystem degradation: soil, water quality, pollutants and emergent pest and disease
 pressures, and biodiversity loss are all affecting the quality-of-life. "Long-term use of
 conventional pesticides, lack of efficacy, detection of microbials and chemicals (PFAS) as
 contaminants in food products and associated diseases."
- "The science of carbon sequestration is still deeply uncertain."
- "Over 100 million acres in the Midwest is exposed and unplanted between harvest and next crop."
- Seed availability of stress-tolerant varieties and cover crop varietal options, organic varieties sustainable protein production varietal options.
- Supply-demand gap for locally produced organic products.

- Limited systems-based research at the nexus of nutrition, food production and climate, as "only 25 cents out of every 1,000 dollars spent by federal government is dedicated at this nexus."
- Lack of understanding on food imports sustainability practices, including pesticides, therapeutics applied, overall U.S. dependency on imports for its food supply (i.e., seafood, fruits, produce).
- "Prevalence of nutritionally poor, unsustainably produced foods and inequity in food systems."
- "Antimicrobial resistance (AMR) demands a multifaceted approach. The most daunting public health challenge facing the world."
- Aging farmers in contrast to current rural youth development vulnerabilities.
- Sustaining health and safety of farmworkers, family farmers, timber harvesters, reduce their exposure to farm chemicals, occupational injury and death rates.
- Listed challenges around Integrated Pest Management (IPM), referenced limited IPM-trained Extension specialists.
- Maintaining a robust diagnostic network: reduced workforce dedicated to developing early detection and diagnostics of multiple pest and disease threats linked to global trade and climate change.
- Cooperative Extension System stagnated funding: "Below 1990s levels" while demand for their services has increased (climate change-related). Extension professionals have limited opportunities for their professional development: "We trained county agents for better jobs in private industry;" there is high turnover; there is inability to take advantage of competitive funding; low morale; "Extension support for aquaculture has been disappearing."
- Data, availability and its interoperability across research, Extension and education.
- NIFA Data Gateway: "Lack of standardization; keywords and knowledge areas is inconsistent."
- Grant application process is complex and time consuming: "The funding process for early career researchers is complex and time consuming: over 1,200 hrs./year, 4-6 proposals per year; a quarter or more than a half a faculty's member time is spent writing grants, focus taking away time from research."
- AFRI grant size: >\$600K-\$10M, increases inequities in entities funded.

MOST PROMISING OPPORTUNITIES

Support climate-related research, Extension and education; strengthen ag-food-climate tech
innovation ecosystem: data, people, networks. "Future research and technological
advancements must focus on greater efficiency, affordability and agility while improving
nutritional value and reducing planetary impact; move away from siloed approaches and

- embrace a broader systems approach to strengthen the efficiency, sustainability and resiliency of the food system and ensure better nutrition and health equity around the globe."
- Carbon economy: "What climate-smart practices are most effective at reducing operational greenhouse gas emissions? And how does adoption of these high-impact practices affect other aspects of farm operations that producers care about, such as profitability and biodiversity? What technologies and tools are best suited to help monitor the true climate benefit that has been realized via adoption of climate-smart practices? How do these effective practices and new monitoring technologies come together in reliable, repeatable protocols or best practices, such that all producers, innovators, academics and companies are using the same yardstick to measure, report and verify success?" "The emerging 'carbon economy' of paying farmers for their emissions reductions can only be built on accurate quantification." "Research is critically needed to develop valuation metrics for carbon-sequestration and GHG emissions in specialty crops."
- Future cropping systems that maintain continuous living cover, incorporate a diverse range of crops, increase seed availability, public-funded lines. Conserve forest genetic resources and germplasm. Advanced perennial-based and perennial-annual integrated systems: livestock and crops.
- Continue to sustain organic research, develop seed and animal breeds, publicly accessible, regionally adapted, engaged BIPOC (Black, Indigenous, and other people of color) leadership and participation in organic plant breeding.
- Research opportunities that leverage entrepreneurship, food systems security, environmental and economic sustainability along the rural-urban continuum.
- Sustain Cooperative Extension services: "Expand Extension's ability to participate in competitive programs and to build partnerships." Develop Extension education: "A national Extension training center" certificate program. Attract and retain next generation Extension specialists.
- Increase and diversify staff and resources for Extension programs serving marginalized
 communities, engage with researchers to identify the research needs of these communities
 and fund projects that address their priorities; African American, Native American, Hispanic,
 Hmong and other traditions employ advanced agroecological and climate-friendly systems
 and practices that make vital contributions to the goals of resilience, food security and climate
 mitigation, and are the backbone of the success of these farming communities.
- Nutrition research support is necessary to continue to clarify linkages between diet and health and to enhance nutrition-related disease prevention.
- Farmers participatory opportunity to apply for research grants and be part of panels. Their
 integration to the research and Extension ecosystem is necessary as early adopters of
 technologies, knowledge dissemination and learning from their experiences and practices.
 "Farmer-led research is high impact with low overhead compared to academic."

- Consistently monitor consumer trends: As consumers are shaping the demand to advance U.S sustainable agriculture (aquaculture, alternative protein and organic produce [high value and faster growing market segments]).
- "Advance understanding of the role that microbial science plays in advancing modern food safety and security and resilience to a changing climate."
- Food Animal Residue Avoidance Databank (FARAD) funding should be expanded to account for food offered for import into the U.S. from countries with drugs not approved for use in the U.S.
- Target new RFA directed toward farmworkers, family farmers and timber harvesters, and that focuses on reducing farm chemical exposure, occupational injury and death rates, and respiratory diseases, among other hazards.
- Federally funded AG-data repository, enhance coordination and collaboration.
- Regional science innovation engines (NSF-like).
- Explore new communication approaches to convey scientific, technical accomplishments: sustainability practices, pest management, conventional and new alternative pesticides, farmer and consumer acceptance; make reporting accessible, links to outputs: tools, bulletins, source of new varieties released, who has benefit, demographics, more transparency.

TOP PRIORITIES

MORE RESEARCH, FUNDAMENTAL AND APPLIED

- To clearly define climate mitigation, resilience and climate adaptation-related research areas and fields: Adoption of climate-resilient, stress-tolerant (abiotic and biotic) nutritious varieties, monitor and secure soil and water quality, sustain research on the plant, animal (food), wildlife, soil, water and air systems continuum. Research into practices, technologies, tools and interventions that directly and significantly reduce net greenhouse gas emissions; in particular, reductions of methane and nitrous oxide emissions, while also studying opportunities to sequester carbon; methane emissions from enteric fermentation; methane-inhibiting feed additives targeting microbes in the rumen; livestock genetics targeted to reduce methane emissions, enhanced-efficiency fertilizers (EEFs) research; high carbon sequestration crop research, providing more transparent and detailed information on how funded projects related to climate mitigation improve data accessibility and transparency; "NIFA knowledge areas categories too broad" underestimates mitigation-related research.
- To continue investing in integrated, cross disciplinary research at the intersection of soil health, water quality, food production, ecosystem conservation and biodiversity.
- To improve nutrition security and improve the quality and diversity of and access to nutritious
 foods throughout the United States; school nutrition has a critical role to play in the fight
 against obesity. Support the child nutrition program, meal patterns development and research
 on the standards for various reasons including food and nutrition safety, health and well-being
 of children.
- To understand and mitigate pathogens on produce related to climate change impacts of pathogen contamination and proliferation on ready-to-eat (RTE) crops.

- To increase sustainable, high-value protein production. Animal protein production: beef safety, product quality, alternative to antibiotics, livestock sustainability, meat science. Aquaculture-based: fish; alternative proteins (plant and cell-based); insect, algae, fungi-based proteins. Uncover other plant genetic resources: wild and feral edible plant species; support protection of traditional Indigenous knowledge.
- To understand consumer trends, and technology acceptance.
- To broaden and diversify food production systems: new crops, plant breeding and seed production, support small seed companies, Indigenous seed keepers, organic producers, forest landowners, protect germplasm.
- To understand microbiomes: soil, water, plant, animal and human, genomic sequencing, and surveillance of pathogens, to bolster efforts to combat antimicrobial resistance; research initiatives and enhanced research capacity to support animal health.
- Climate-smart, climate resilience, climate adaptation science, climate hubs; all data is
 interoperable, better manage climate change risks, to create a clear plan for public access to
 federally funded research and data. Promote and enable data sharing practices across
 organizations, help identify opportunities to improve research, improve customer services,
 and identify areas where education and services may be needed.
- To understand food as medicine: "Research on nutrient-dense, organic/pastured and locally produced real foods is critical to the success of food-as-medicine treatment protocols."
- Develop alternative biopesticides and fungal bioherbicides.
- Invest in broadening biosecurity networks: diagnostics, people and technology development.
- More longitudinal data both here in the U.S. and around the world to look at insect
 populations over time and research into the ways in which people may be creating additional
 challenges for the insect world through habitat disruption, overuse of insect management
 products to protect pollinators, increase international collaboration, improving the capacity
 for early detection and rapid response; zoonotic disease.
- Genomics and computing to revolutionize forest tree breeding.
- Incentivize farmer-led research and participation in panels.
- Data and analytics to evaluate, assess and allocate resources; timely responding to regional and local needs.
- To anticipate and mitigate effects due to food supply chain disruptions.
- NIFA enables technology innovation and knowledge transfer.

STRENGTHEN COOPERATIVE EXTENSION SYSTEM, MORE INTEGRATED APPROACHES

- Encourage next generation Extension specialists, broaden scope and allow opportunities to apply for funding: Capacity for Success; make competitive funding programs more available to Extension by encouraging and supporting more integrated and Extension-led projects; consider strengthening language in RFAs and in policy and practice that provides Extension the opportunity to participate in meaningful ways in competitive funding programs. Support IPM extension.
- Support of Extension system programs and services to ensure local producers have a dependable market for their crops and livestock; to ensure food safety and food system

security: to help conserve natural resources. To engage K-12 and youths to develop appreciation and interest in our food ecosystems and become stewards and participants of sustainable food systems.

- Competitive grants to fund integrated research, education and Extension projects that enhance the ability of producers and processors to grow and market climatesmart/sustainable products or transition into operations of existing climate-smart and sustainable supply chains.
- Expand the Cooperative Extension System's engagement with nonprofits and the private sector, including retailers, cooperatives, seed and feed companies, forest landowners, forestry consultants, and procurement foresters.

FOCUSED EDUCATION FUNDING

- To sustain 4-H, rural youth development, and school health and wellness.
- To support students and early career researchers and researchers at small institutions and non-Land-grant institutions; graduate student funded research grants must be provided with adequate pay and resources to succeed.
- To develop new and broaden existing curricula on data science for agriculture and food.
- To promote next generation Extension specialists.
- To help producers commercialize their products.
- To encourage new career paths: next generation of professionals enabled with advanced skills
 in data science, modeling and analytics applied to precision farming, soil and water quality
 and management, weather, crop and livestock health monitoring, pest and disease detection
 and monitoring, and yield. New entrepreneurs in ag-tech, food-tech, climate-tech, diagnosticstech, food safety, supply chain and logistics, and microbiome-related disciplines.
- To promote and support technical development of farmworkers, harvest workers, family farmers and timber harvesters' health and safety.
- To create a clear plan for public access to federally funded research and data; Open Access publications.
- To consumers on NIFA research, and education outputs and impacts, sustainable agriculture programs, food safety.
- NIFA enables technology innovation and knowledge transfer; need to communicate it.

NIFA APPLICANT JOURNEY AND EXPERIENCE

• To reduce complexity — award applicant journey is complex and time consuming.

STAKEHOLDER OVERVIEW

Feedback from 87 stakeholders was classified under 21 distinct organization types, located in the 36 states as depicted in Figure 1

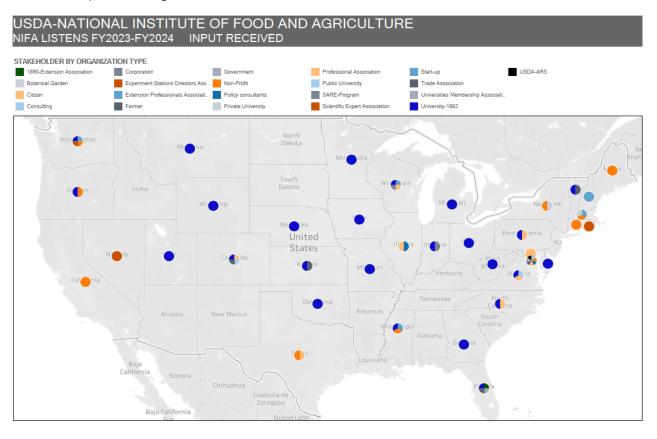


Figure 1. U.S map depicting NIFA listens FY202-FY2023 stakeholder organization type. It shows 21 distinct organization originally located in 36 states.

Most of the input was received from 1862 Land-grant Universities (34.48%), followed by nonprofits (17.24%), professional associations (17.24%), trade associations (4.6%) and Extension professional associations (4.6%). In addition, policy consulting firms (2.3%), Experiment Station directors (2.3%), farmers (2.3%) and other consulting firms (2.3%) provided input. One public non-Land-grant university (1.15%) and one private university (1.15%) submitted comments. Feedback was also shared by an 1890 Extension Association and University Membership Association (1.15%), and a scientific expert association (1.15%). The government category included contributions from the U.S. Fish and Wildlife Service (1.15%) and USDA Agricultural Research Service (1.15%). Independent comments were received from a Sustainable Agricultural Research and Education Program awardee (1.15%), citizen

(1.15%), an Ag-Tech start-up (1.15%), a public global corporation (1.15%) and a botanical garden (1.15%). The full list of contributing stakeholders can be found in <u>Appendix 1.</u>

No input was received from representatives of the following organizations: 1994 Tribal Colleges and Universities and U.S Insular Areas. It is important to highlight that, concurrently to NIFA Listens FY 2023 – FY 2024, other targeted listening sessions were held: NIFA hosted a 1994 Tribal Colleges and Universities session on Nov. 16, 2022 (see other listening sessions in Appendix 5).

Sentiment analysis revealed positive sentiment scores across all 21 stakeholder organization types.

Details can be found in Appendix 2.

EMERGENT THEMES

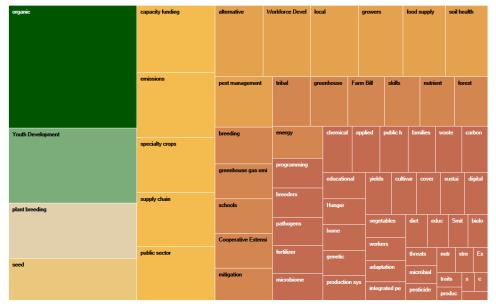
Panel A

Two methods supported the identification of emergent themes, visualized below in Figure 2, Panels A and B. Panel A depicts the most frequent two-successive terms or N-Gram 2, listing climate change, Extension education, food security and natural resources as the most cited two successive terms. Panel B depicts the topics discovered using Lingo4G. The top five include organic, youth development, plant breeding, seed and capacity funding.

Figure 2. Panel A shows N-gram-2-word cloud visualization and Panel B shows high level topics revealed using scores from Lingo4G.

NIFA LISTENS FY2023-FY2024 N-GRAM-2 WORD CLOUD- Most frequent 2-succesive terms- TF=Term freq smith lever human health education investment impacts climate climate mitigation ecosystem services agricultural systems supply chain climate smart health equity greenhouse gas priority extension extension programs ability extension quality life food security natural resources smart agriculture workforce development youth development climate change extension education fundamental knowledgefood safety cooperative extension capacity funds sustainable agriculturepest management food systems soil healthfarmers rancherspriorities extension extension professionals nutrition health carbon sequestration gas emissions public sector production systems food supply integrated pest plant breeding Panel B

NIFA LISTENS FY2023-FY2024 THEMES-Lingo4G scores



More research on climate adaptation science.

- Sustain, strengthen Cooperative Extension System.
- Consumer-driven demand of organic and protein production segments is strong (plant based, animal, alternative). Continue support for economic growth, with more research inbreeding, seed production and high-yield organic varieties releases. There is limited seed availability of organic and cover crops and diversification food systems. Limited organic breeding efforts.
- Consider a research system where producers/farmers and their farms have a participatory
 opportunity to become eligible to apply for research grants; farmers' knowledge, expertise,
 traditional knowledge, land stewardship, innovators, partners, adapting, and mitigating
 climate change real-time; early adopters.
- The majority of our issues and fundamental knowledge gaps are being addressed in the <u>USDA</u> strategic plan for 2022 to 2026; the <u>White House task force on hunger</u> and the <u>NASEM</u>
 (National Academies of Sciences, Engineering, and Medicine) board consensus studies; focused, enhanced <u>coordination</u> and <u>collaboration</u> across LGUs and across agencies and food systems is the challenge that demands attention. Executing on these strategies, tracking progress towards goals.
- Reduce complexity, more time for research: grant application journey is time-consuming, complex grant application systems and processes.
- Data: availability, interoperability is essential to track success and impact.

NIFA LISTENS INPUT:

What are the greatest challenges that you see facing food and agriculture?



- "We have been far less successful at reducing environmental impact than increasing the number of calories produced per acre; remarkable yield potentials for most other crops, yet soil and biodiversity loss and water degradation continue unabated at unacceptable and unsustainable levels."
- "A global pandemic, climate change, energy and water shortages, and escalating military conflicts have tested the resiliency and flexibility of the global and domestic food supply chain. Millions around the globe suffer from food and nutrition insecurity, yet 1/3 of food produced is wasted."
- "Lower funding priority that has been given to animal compared to crop research in the last few decades; Hunger, climate change, sustainability and equity."
- "Due to underfunding of nutrition for decades, nutrition science lags other biomedical sciences."
- "Overconsumption of added sugars and saturated fats."
- "Growing issue of diet-related chronic diseases and the numerous disparities in food and nutrition security across our nation."
- "Food availability and equitable access, water quantity and quality; extreme weather, population expansion and demographic shifts; aging workforce; economic sustainability."
- "Our forests, crops, homes and livelihood are all threatened by pests that enter our nation on cargo from other nations."
- "Farm insects, diseases, weeds and vertebrate pests continue to present a substantial threat to farm viability and food security; pest management is made exponentially more challenging."
- "Flat funding of capacity funds; Cooperative Extension System is below 1990 levels in real dollar terms."
- "Fundamental knowledge gap exists that limits the ability of Extension to respond to these challenges: food availability and equitable."
- "Access, water quality and quantity, extreme weather variability, sea level rise and saltwater inundation, population expansion, and aging workforce and economic sustainability."

- "Farmers can easily communicate their issues, but most researchers are not asking nor are they listening."
- "The overwhelming volume (>90%) of seafood that is imported to the U.S. comes from countries without the stringent food safety and environmental standards."
- "Insect biodiversity loss and the important ways in which insects underpin all life on earth."
- "Robust breeding programs or biological control introductions require more supporting infrastructure and time than standard chemical efficacy trial work."
- "Only about 2% of research funding currently goes into organic system: organic varieties unavailability, seed producers' primary production challenges include estimating and achieving seed yields, controlling weed, pest and disease pressure".
- "Focus on higher education does little to ease the logistical burdens to would-be skilled meat cutters, butchers and entrepreneurs of rural operations."
- "PFAS (Per- and polyfluoroalkyl substances) chemicals can end up in wastewater treatment plants as sludge, and these sludge residuals have been permitted in many states to be spread on farm soils as a fertilizer; PFAS contamination endangers farm families, the agriculture sector and our food system."
- "AFRI programs offer up to \$10 million per project, and grant funding is trending toward larger projects broader in scope. This leaves smaller projects with more targeted proposals going unfunded. We understand that larger projects have benefits, but they can also increase inequities in entities funded."
- "To address the roadblocks created by non-standardized and random data structures long fostered by a research culture resistant to data sharing must invest considerable planning and resources into what data are collected, managing that data and then the long-term sustainability preservation and curation practices while open data policies."

NIFA LISTENS INPUT:

What are the most promising opportunities/solutions for advancement?



- "Move away from siloed approaches and embrace a broader systems approach to strengthen the efficiency, sustainability, and resilience of the food system and ensure better nutrition and health equity around the globe."
- "Development and implementation of solutions will require multi-stakeholder engagement."
- "To create and maintain a national database for use by all stakeholders: federal-funded research data repository."
- "FAIR data (findability, accessibility, interoperability and reusability)."
- "Consistent data across jurisdictions will empower decision makers to confidently make data informed decisions."
- "NIFA does not comprehensively report climate mitigation and adaptation-related grant-making and spending; knowledge area categories such as Weather and Climate, Pollution Prevention and Mitigation, and Agroforestry, but these are too broad to identify climate-related spending trends; it appears to substantially underestimate mitigation-related funding; \$143 million on mitigation-related projects in FY21, nearly three-times larger than NIFA's estimate; create a climate mitigation knowledge area; improve consistency of project keywords."
- "Explore more coordination of federal and state funding cycles."
- "Food production with reduced inputs while maintaining productivity and controlling production cost."
- "More support and technical assistance for small-scale food producers located in states that are not considered production states; need more food with a smaller environmental footprint:

- urban, inner-city small farms, community and school gardens; backyard and rooftop horticulture."
- "Cooperative Extension System (CES) ability to participate in competitive programs and to build partnerships; Extension professionals help farmers, ranchers and landowners develop and adopt climate-sensitive practices. To address the lack of Extension support for U.S. Aquaculture. To evaluate whether it is possible to revive the federal-state partnership in Extension."
- "Increase and diversify staff and resources for Extension programs serving marginalized communities, engage with researchers to identify the research needs of these communities, and fund projects that address their priorities; African American, Native American, Hispanic, Hmong and other traditions employ advanced agroecological and climate-friendly systems and practices that make vital contributions to the goals of resilience, food security and climate mitigation, and are the backbone of the success of these farming communities."
- "Nutrition research support is necessary to continue to clarify linkages between diet and health and to enhance nutrition-related disease prevention."
- "Advance understanding of the role that microbial science plays in advancing modern food safety and security."
- "Safe and effective bioherbicides will be welcomed by organic and conventional farmers alike."
- "Strengthening U.S. scientific capacity in coffee research."
- "Envision future cropping systems that maintain continuous living cover through a combination of strategies, including cover cropping, relay planting and perennials. Integrated scientific advances are needed to achieve this vision."
- "Health concept co-equal with human health and animal health."
- "What alternative protein inputs are the best from a techno-functional, cost, scale, nutrition, food safety, environmental and consumer acceptance perspective?"
- "Increase research into developing seed and animal breeds publicly accessible, regionally adapted to organic systems."
- "Proactively address farmer and consumer acceptance of new IPM technologies."
- "MSU Extension found that the number one issue of importance to our stakeholders was water quality."
- "Diversified perennial based and perennial annual integrated farming systems."
- "I estimate 70% of proposals deserve funding; furthermore, we have no ability to pick the winners and losers in the outcome of such research."

NIFA LISTENS INPUT:

What is your top priority for research, Extension or education for NIFA?

CITIZEN, FARMER, PRODUCER



- "Prioritize climate change in one way or another, whether it's helping producers to adapt to climate change that's expected or helping producers to mitigate climate change through either sequestering carbon in the soil or reducing their use of fossil fuels."
- "Farmers bring the 4-H kids out, and they bring the schools out and show them how to farm and how processing is done out of their budget."
- "Focus on inner-city gardens, rooftop gardens and bringing fresh foods and vegetables to cities."
- "For a researcher to have a funded project every three years, which is becoming an expectation especially for early career researchers, they need to write in the neighborhood of four to six proposals per year. These proposals take anywhere between 100 and 200 hours, and that's 400 to 1,200 hours per year writing competitive funding proposals. So out of a planned 2,000-hour work week that means a quarter to more than half a faculty member's time is spent writing grants rather than doing research."

NON-PROFIT



- "Helping farmers prepare for and apply production practices that are not just climate smart but more broadly regenerative, considering water quality, biodiversity, etc. and the health of their workers."
- "Research into practices, technologies, tools and interventions that directly and significantly
 reduce net greenhouse gas emissions; in particular, reductions of methane and nitrous oxide
 emissions, while also studying opportunities to sequester carbon; prioritize basic research on
 rumen microbiology, methane; to ensure the efficacy, safety and cost effectiveness of existing
 and emerging methane-inhibiting feed additives."
- "Market-based continuous living cover (CLC); need for a robust federal research and development program for continuous living cover."
- "To prioritize research on per- and polyfluoroalkyl substances, or PFAS substances, and their contamination in farm soils, water systems and crops."
- "More investments in 1890 and 1994 and Hispanic-serving Institutions; BIPOC researchers; research that helps farmers improve climate change resilience and mitigation; soil health and resilience to climate change and other stresses."
- "Ensure investments in organic research within/commensurate with organic's market share."
- "Research on economics, cost/benefit analysis of IPM practices."
- "More farmer-driven SARE program and the AFRI Sustainable Systems (SAS)."
- "Organic producers include improved organic IPM for weeds, insects, pests and diseases; integrated strategies to optimize long-term soil health, crop nutrition and yields; and developing more cultivars for organic systems and adapting to climate change."

- "Public research investments in organic plant breeding and seed initiatives should continue to increase while diversifying who participates in research. Organic seed production challenges must be elevated to a high-priority research priority."
- "Research on nutrient-dense, organic/pastured and locally produced real foods is critical to the success of food-as-medicine treatment protocols."
- "Systems-based research at the nexus of nutrition, food production, climate and environment; promote more equity in research."
- "Coffee research and Extension is the expansion of ways to foster international research collaboration between U.S. scientists and researchers in coffee-producing countries."

1890 EXTENSION ASSOCIATION- ASSOCIATION EXTENSION PROFESSIONALS



- "Climate resilient communities; health equity and well-being; economic and workforce development; 4-H Positive Youth Development; urban, closing the digital opportunity gap; and diversity, equity and inclusion."
- "There's a fundamental knowledge gap that exists that limits the ability of Extension to
 respond to these challenges. These gaps include food availability and equitable access, water
 quality and quantity, extreme weather variability, sea level rise and saltwater inundation,
 population expansion and aging workforce and economic sustainability; a robust flexible and
 connected Extension system is critical."

EXTENSION PROFESSIONALS' ASSOCIATION



- "Capacity for success: make competitive funding programs more available to Extension by encouraging and supporting more integrated and Extension-led projects."
- "Strengthening language in RFAs and in policy and practice that provides Extension the opportunity to participate in meaningful ways in competitive funding programs."
- "The Cooperative Extension System, in partnership with and local governments, addresses societal challenges through responsive, inclusive and effective educational programs that address local needs and opportunities."
- "The greatest need we have from our federal partner is to support increases in capacity funding."
- "The ability of Extension to meet local community needs depends almost entirely on the human capacity of its community-based Extension educators and the science-based backstopping provided by university-based faculty and specialists."

EXPERIMENT STATIONS DIRECTORS ASSOCIATION



- "Adequate and appropriate support for the nation's #1 R&D enterprise: the state experiment stations. Consider for a moment that state experiment stations conducted approximately 73% of the U.S.' public R&D in 2017."
- "Solving complex food systems challenges requires state-of-the-art, highly integrated research that recognizes and leverages the unique producer and consumer characteristics."
- "Sustainability, competitiveness and profitability of food and agriculture."
- "Developing profitable systems that conserve and recycle water."
- "Developing institutional mechanisms that create incentives for sharing water and that
 increase public support for balancing the requirements for food production on the one hand
 and the life-quality issues of society on the other."

PRIVATE AND NLGU-PUBLIC UNIVERSITY



- "Farmworker training and career advancement grants; farmworker-focused research and engage with farmworker communities; grant accessibility."
- "We need AgrAbility in more states and with an increase in funding per project."

UNIVERSITIES-1862



- "Support of Extension system programs that conserve natural resources and improve ecosystem services."
- "Continuous living cover can help ensure nutritional security and meet demand for plant-based products."
- "Support for Extension programming in the social sciences; data collection on socially disadvantaged farmers; there's a real lack of data and difficulty accessing data."
- "More funding on biosecurity programs, plant health in general and for the national plant diagnostic network; professional development for diagnosticians."
- "IPM research and outreach efforts: increase support for IPM outreach and an additional focus
 on understanding the social facets of IPM, specifically related to grower implementation and
 consumer acceptance of IPM practices. Increased support for applied IPM research: nonchemical-based strategies, robust breeding programs or biological control introductions
 require more supporting infrastructure and time."
- "Genomics and computing to revolutionize forest tree breeding."
- "Research is the impact and effectiveness of food assistance programming on the long-run wellbeing of a.) program participants and b.) communities with participating residents."
- "Broad procurement and technology needs assessment for the nation's school districts and their local food producers and suppliers."
- "Public sector plant genetic transformation research; regeneration and transformation (RT)."
- "New areas of research related to food safety as it impacts quality of products and access to markets not only from a microorganism contamination of food and beverages perspective but also food safety research that includes other (chemical/environmental) contaminants."
- "Need programs to allow interdisciplinary natural and social science approaches to solving the problems that accompany climate change, accumulation of environmental toxins, loss of

biodiversity, invasive species of plants and pests, threats to animal health and disease, antimicrobial resistance."

- "Programming priorities: water issues, water management and forest management."
- "Funding to go directly to producers for doing the research they want to do on the ground is very high impact."
- "To support producers who want to take risks and try new things and share their findings with their peers."
- "To support professional development opportunities for producers."

UNIVERSITIES MEMBERSHIP ASSOCIATION -APLU



• "Capacity funding, Research Facilities Act (RFA), workforce development, climate change, food security and bio-based Innovations."

PROFESSIONAL ASSOCIATION



- "Nutrition research and education; to provide for a diverse portfolio of nutrition research, from basic nutrient requirements up to complex data analytics for predictive algorithms and -omics analyses."
- "Schools' nutrition has a critical role to play in the fight against obesity."
- "We would like to see increased investments to support the creation and access of data."
- "Impact of meat quality on adapting animal production to climate change biomarkers of stress or climate change and meat or post-mortem muscle tissue; the role of the microbiome in adapting animal production to climate change."
- "To prioritize biotechnology to support research on the microbiomes for plant, animal and human health and to bolster efforts to combat antimicrobial resistance."
- "We need to also focus on infrastructure animal science, an infrastructure-intensive endeavor; food security, one health and stewardship."
- "Research on pathogens on produce related to climate change impacts of pathogen contamination and proliferation on ready-to-eat (RTE) crops."
- "There is an urgent need for more longitudinal data both here in the U.S. and around the world to look at insect populations. Protect pollinators; increase international collaboration, improving the capacity for early detection and rapid response, innovative approaches at - and prior to - border inspections; continue support of IPM (Integrated Pest Management)."
- "Development and accelerated implementation of technologies to reduce food loss and waste across the food supply chain, such as packaging technologies to improve shelf-life, valorization of waste streams and crop losses."

- "Development and implementation of food processing technologies that minimize resource use (e.g., water, energy) while maintaining food safety and improving nutrient retention and quality."
- "Supporting increased long-term funding for cultivar development and plant breeding research, including conservation and pre-breeding in the public sector through competitive grants and capacity funds."
- "Weed genomics; site-specific or precision weed management."

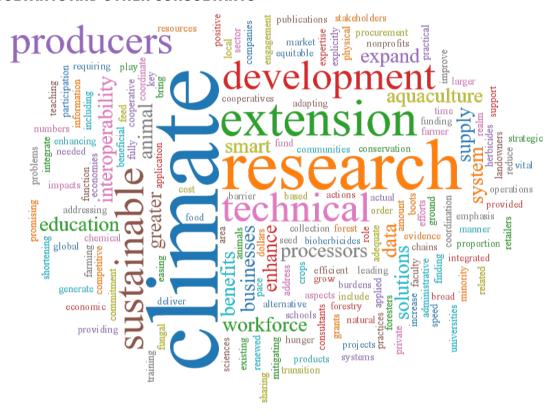
TRADE ASSOCIATIONS



- "Beef Safety: Investigating pre-harvest management practices on salmonella carriage. Beef's
 role in a healthy dietary pattern and beef's role in optimal human health. Modernization of
 yield grade equation and the tools that evaluate carcass grades. Sustainability: Water, land
 and other resource utilization in sustainable beef production. Alternatives to AntibioticsImmunomodulators. Understanding the impact of diet on methane reduction in cattle
 production. Animal Health and Well-Being."
- "More research funding on alternatives to animal-sourced foods like meat and dairy that are
 instead made from plants, cultivated animal cells or biotechnology. Highlight the gap in
 alternative protein-focused education and workforce development programs in the U.S."
- "To understand basic science behind crop-specific conservation practices that not only sequester atmospheric carbon but provide other environmental benefits."
- "Evaluate research and outreach efforts that incentivize small businesses to develop microgrids for renewable energy. To develop valuation metrics for carbon sequestration and green harvest greenhouse gas emissions in specialty crops."
- "Conduct research to assess economic viability, profitability and sustainability of regenerative agriculture."
- "Sustainable packaging distribution and sale of fresh produce requires packing and packaging that is low-cost, biodegradable and stackable."
- "1. Labor and automation. 2.Climate-smart and smart energy. 3.Biotech tools and resources 4. Sustainable packaging. 5. Technologies to reduce food waste and food loss. 6. Systems "One Health" approach to food safety. 7. Health benefits of consumption of fresh produce and floral. 8.Integrated Pest and Pollinator Management. 9.Water: safety and use efficiency. 10.Soil health. 11.Data needs."
- "To rebuild and adequately fund a network of aquaculture Extension specialists; "organize frank discussions with relation to increasing base Extension support for aquaculture

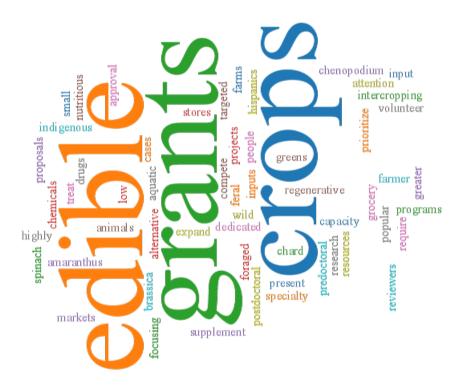
producers, especially in major aquaculture-producing states, with priority given to Extension programming, not grant writing."

POLICY CONSULTANTS AND OTHER CONSULTANTS



- "To address climate change more explicitly in its research, Extension and education offerings, to provide better evidence-based training, technical assistance, and workforce development for producers and processers in climate-beneficial practices; 1) technical assistance, 2) workforce development, and 3) data interoperability."
- "Research in the development of fungal bioherbicides to function as an alternative to the use of chemical herbicides."
- "To re-focus on providing the 'boots-on-the-ground' Extension support for U.S. aquaculture producers."
- "Enhancing coordination and collaboration across the system and the programs to expand and funding to minoritized communities; schools and businesses are all focused on these large programs."

U.S. FISH & WILDLIFE SERVICE, USDA-ARS; SARE PROGRAM AWARDEE; BOTANICAL GARDEN



- "Strengthening pre-doctoral fellowships and postdoctoral fellowships programs at 1890 schools and the schools targeted towards indigenous people and Hispanics, strengthening their capacity to compete for grants."
- "Funding resources for farmers to get small grants to do research on their own farms; farmers as reviewers of proposals; expand regenerative ag."
- "Wild and feral edible plants: highly nutritious, Amaranthus spp., Chenopodium spp., and Brassica spp. Focusing on these and other volunteer edible plants could present a low-input supplement (or in some cases alternative) to crops that require greater inputs and attention (e.g., spinach, chard)."

START-UP - CLIMATE TECH



- "The science of soil carbon sequestration is still deeply uncertain."
- "To invest in researching high-impact and quantifiable climate solutions for reducing greenhouse gas emissions from pasture-based dairy and beef production systems."
- "Research into manure management techniques in diverse climates and how adoption of these
 practices impact methane and nitrous oxide emissions, conserve nitrogen and recycle manure
 nutrients into compost is needed."
- "Research to develop highly cost-efficient monitoring technologies and protocols to measure GHG emissions and reductions associated with various other climate-smart practices."
- "Investing in on-farm projects to reduce Scope 3 greenhouse gas (GHG) emissions (all GHG emissions from the production, use and disposal of our products), but additional resources are needed to advance this work beyond what any one individual company can do."
- "Help maintain net GHG mitigation for the long term, improve the accuracy and affordability of measuring and verifying net GHG emissions, help early and new adopters market their climatesmart products, gaining recognition and rewards for the continued use of best practices, and feasibly scale beyond the pilot phase, both economically and technically."
- "What technologies and tools are best suited to help monitor the true climate benefit that has been realized via adoption of climate smart practices?"
- "Grazing and pasture management: grazing lands have the highest potential to sequester carbon of any form of in the world today, but this potential is under-utilized through lack of research and training to farmers."

SCIENTIFIC EXPERT ASSOCIATION



- "Improving food distribution and use to reduce waste."
- "Improve health we need to fund large-scale integrated research programs."

NIFA LISTENS INPUT

What is NIFA doing right?

- "To continue to expand their current efforts, such as "From Learning to Leading: Cultivating the Next Generation of Diverse Food and Professionals Program (NEXTGEN)," to consider how they may further engage and support students interested in pursuing careers in nutrition, food and sciences. Career training, as well as additional training opportunities, particularly for first-time AFRI applicants."
- "NIFA is doing a great job at making information and personnel accessible to Extension at the regional level. Reestablishing state liaisons will help increase accessibility at the state level."
- "NIFA's valuable programming for advancing sciences, food production, and food safety and security."
- "NIFA has made great (and appreciated) strides by providing integrated and Extension-led funding opportunities in AFRI and by providing leadership in partnering opportunities, such as with CDC. However, in too many of the integrated proposals which include Extension, it still appears that Extension is an afterthought and was assigned a limited role."
- "AgrAbility is a crucial, credible ally and advocate for the farmer and rancher."
- "NIFA has always stressed multidisciplinary efforts."
- "NIFA has awarded over15 million in research funding to 12 alternative protein research projects at universities across the country since 2020."
- "SARE, ORG, OREI and AFRI and capacity programs including Hatch and Smith-Lever are instrumental in identifying sustainable farming solutions that improve climate change resilience adaptation and mitigation."
- "We applaud NIFA's efforts to foster the culture of innovation and see continued support for SBIR programs as integral to the success and competitiveness of the horticulture industry."
- "To continue with their support for socially disadvantaged and underserved farmers."
- "I have been impressed with NIFA's commitment to LGBTQ in hiring practices and programs. Who knew the federal government could lead this effort by example."
- "The accessibility to NIFA staff is greatly appreciated; the agency does a lot with the funds available but more funds are needed."
- "Commend leadership for working to rebuild the agency staff capacity after the losses experienced as a result of the relocation from D.C. to Kansas City."
- "Support New National Center for resilient and regenerative Precision in Lincoln, NE."

FY2023-FY2024 METHODOLOGY

NIFA encourages all stakeholder input to address key challenges and opportunities related to advancing agricultural research, education and Extension. An invitation to provide online input and or participate on a Zoom call was solicited with the Federal Registry Notice posted on Sep 16, 2022, and a specific NIFA Listens website. The following seven questions were posted as a framework to solicit stakeholder feedback, most of the input received addressed one or few of these questions:

- 1. What are your top priorities for research, Extension or education for NIFA?
- 2. What are the most promising opportunities/solutions for advancement of these food and agricultural priorities?
- 3. What are the greatest challenges that you see facing food and agriculture in the coming decades, and what fundamental knowledge gaps exist that limit the ability of research, Extension and education to respond to these challenges?
- 4. Based on those challenges, what general areas of food and agricultural research should be advanced and supported to fill the knowledge gaps, and what is your top priority for research, Extension and/or education for NIFA investment?
- 5. How accessible do you find information about NIFA programs and activities to be?
- 6. What can NIFA do to make information and resources more accessible?
- 7. What is NIFA doing right, and are there opportunities to improve?

Online input from external stakeholders was received via email at nifalistens@usda.gov thru Nov. 30, 2022. On Nov. 2, 2022, two sessions were conducted via Zoom to receive oral input during a two and a half hour session. Registered stakeholders had up to five minutes to provide their input. All employees at NIFA were encouraged to attend these calls. Virtual sessions recordings are publicly accessible and can be accessed at the NIFA website: morning and afternoon.

ADVANCED TEXT ANALYTICS

Text analytics workflows were implemented leveraging USDA EDAPT Data Science Workbench. We applied unstructured text clustering on LINGO4G to initially identify top topics and clusters, and semantic relationships. New Natural Language Processing (NLP) workflows were also implemented for text categorization using Python (Pandas, NLTK, scikit-learn-TF-IDF) to support text preprocessing, tokenization into n-grams (word frequency analysis), word clouds generation and sentiment analysis (positive, negative, neutral). As we received unstructured input, further text analytics included Term Frequency-Inverse document frequency (TF-IDF) as a statistic to reflect how important a word(s) is to a document in a collection of all NIFA Listens input. It adjusts to the fact that some words or groups of words (N-GRAM-1,-2,-3 consecutive terms) appear more frequently in general and helps to identify topic-clusters of interest. Further visualizations and tableau dashboards were designed and are available for further insight generation.

NIFA LISTENS FY2023-FY2024 is in alignment with key engagement strategies in the <u>NIFA Strategic plan</u> <u>FY2022-FY2026</u>.

APPENDICES

Appendix 1. List of stakeholders providing input

Organization	Org type		
Florida A&M University	1890-University and Association of Extension Administrators		
New York Botanical Garden	Botanical Garden		
Citizen	Citizen		
Citizen	Citizen		
Biotech Investments	Consulting		
Engle-Stone Aquatics LLC	Consulting		
Corteva	Corporation		
Northeastern Regional Association of State Agricultural Experiment Station Directors (NERA)	Experiment Stations Directors Association		
Western Association of Agricultural Experiment Station Directors (WAAESD)	Experiment Stations Directors Association		
Association of Northeast Extension Directors (NEED)	Extension Professionals Association		
Association of Southern Region Extension Directors (ASRED)	Extension Professionals Association		
North Central Cooperative Extension Association (NCCEA)	Extension Professionals Association		
Western Extension Directors Association (WEDA)	Extension Professionals Association		
Citizen	Farmer		
Farmer also Kansas City Food Hub, North Central Administrative Council	Farmer		
US Fish & Wildlife Service (Aquatics Animal Drug Approval Partnership Program (AADAP)	Government		
Agricultural Viability Alliance Carrot Project https://www.thecarrotproject.org/agricultural-viability-alliance/	Non-Profit		
Environmental Defense Fund	Non-Profit		
Friends of the Mississippi River	Non-Profit		
Hempcollective.org	Non-Profit		
Maine Farmland Trust	Non-Profit		
National Sustainable Agriculture Coalition (NSAC)	Non-Profit		
North Eastern Integrated Pest Management Center- Cornell University	Non-Profit		
Organic Farming Research Foundation (OFRF)	Non-Profit		
Organic Seed Alliance (OSA)	Non-Profit		
Rivers Of Life Center https://www.hempexemption.com/ Horticulture.	Non-Profit		
The Breakthrough Institute	Non-Profit		
The Homestead Education Center	Non-Profit		
Union of Concerned Scientists	Non-Profit		
Wholesomewave.org	Non-Profit		
World Coffee Research	Non-Profit		
Bipartisan Policy Center	Policy Consultants		

FASS.org- Science Policy Committee- Animal Agriculture	Policy Consultants	
Harvard Law School-HLS-Food Law and Policy Clinic	Private University	
American Society for Nutrition	Professional Association	
School Nutrition Association	Professional Association	
Agricultural & Applied Economics Association	Professional Association	
American Meat Science Association	Professional Association	
American Society for Microbiology	Professional Association	
American Society of Agronomy (ASA), Crop Science Society of America (CSSA),	Durfaccional Association	
Soil Science Society of America (SSSA)	Professional Association	
American Society of Animal Science (ASAS)	Professional Association	
American Veterinary Medical Association (AVMA)	Professional Association	
Association of Food and Drug Officials (AFDO)	Professional Association	
Entomological Society of America	Professional Association	
Entomological Society of America (ESA)	Professional Association	
Institute of Food Technologists (IFT)	Professional Association	
National Association of 4-H Youth Development Professionals	Professional Association	
National Association of Plant Breeders (NAPB)	Professional Association	
Weed Science Society of America (WSSA)	Professional Association	
Colorado Mesa University - coloradomesa.edu	Public University	
Sustainable Agriculture Research and Education (SARE)	SARE-Program	
Washington State Academy of Sciences	Scientific Expert Association	
Pioneer Public Affairs on behalf of Neutral Foods https://www.eatneutral.com	Start-up	
National Cattlemen's Beef Association (NCBA)	Trade Association	
Good Food Institute (GFI)	Trade Association	
International Fresh Produce Association (IFPA)	Trade Association	
National Aquaculture Association (NAA)	Trade Association	
Association of Public and Land-grant Universities (APLU) Mississippi State University-Extension - Center for Government and	Universities Membership Association	
Community Development - Extension Disaster Education Network		
(EDEN)	University-1862	
Colorado State University	University-1862	
Forever Green Initiative, University of Minnesota	University-1862	
Iowa State University	University-1862	
Kansas State University - Great Plains Diagnostic Network (GPDN)	University-1862	
Michigan State University	University-1862	
Michigan State University	University-1862	
Montana State University Extension	University-1862	
North Carolina State University (NCSU)	University-1862	
North Carolina State University (NCSU)	University-1862	
Ohio State University	University-1862	

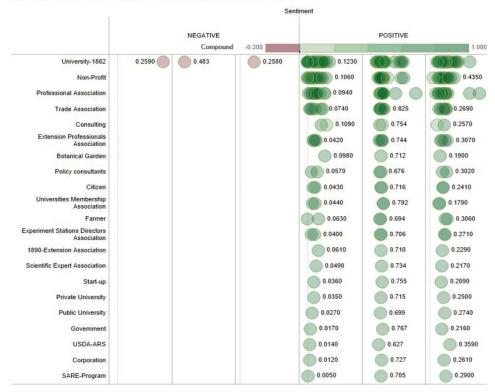
Ohio State University	University 1962
Ohio State University	University-1862
Ohio State University	University-1862
Ohio State University	University-1862
Oklahoma State University, Institute of Biosecurity	University-1862
Oregon State University	University-1862
Penn State Extension	University-1862
Purdue University - Cooperative Extension Service (CES) Extension Committee on Policy (ECOP)	University-1862
Purdue University 4-H	University-1862
University of Delaware	University-1862
University of Florida	University-1862
University of Georgia	University-1862
University of Minnesota	University-1862
University of Minnesota Extension	University-1862
University of Missouri Extension-HHP (Healthy Homes Partnership) and HHTC (Healthy Homes Training Center)	University-1862
University of Missouri - School of Natural Resources	University-1862
University of Nebraska - Institute of Agriculture and Natural Resources	University-1862
University of Vermont	University-1862
University of Wisconsin - Madison	University-1862
University of Wisconsin - Madison Division of Extension and Public Media	University-1862
University of Wyoming - Sustainable Agriculture Research and Education (SARE)	University-1862
Utah State University	University-1862
Virginia Tech - AgrAbility Program Coordination	University-1862
Washington State University	University-1862
West Virginia University Extension	University-1862
USDA - ARS	USDA-ARS

Appendix 2. Sentiment Analysis

The graph below reveals the sentiment score after analyzing all NIFA Listens FY 2023 – FY 2024 input received. Sentiment scores were generated using a lexicon and rule-based, unsupervised learning algorithm (Valence Aware Dictionary and sEntiment Reasoner). The compound sentiment scores supported identification of positive, neutral and negative input. Overall, all input received (99%) was categorized as positive. By leveraging the sentiment score, only one record listed a negative score. This negative score reflects input provided to highlight opportunities to address and prioritize refugees, asylees and humanitarian parolees, and food insecurity and poor nutrition. This input was received from a Utah State University student.

USDA-NATIONAL INSTITUTE OF FOOD AND AGRICULTURE





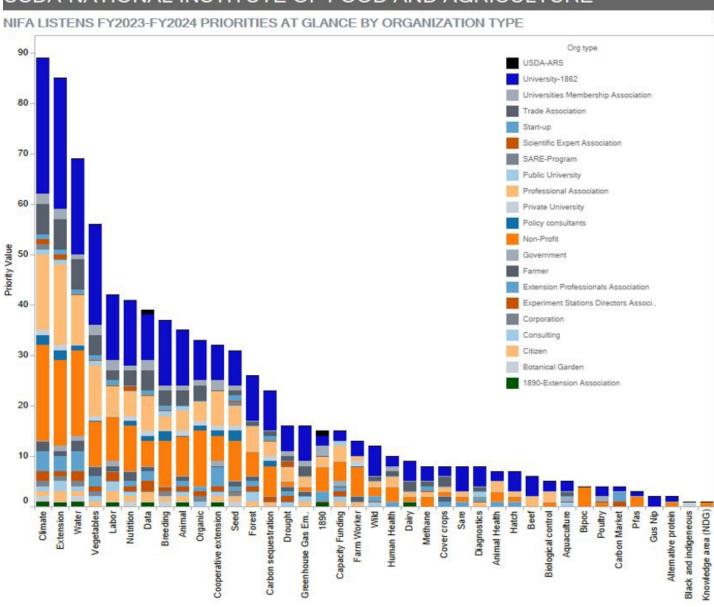
Org. type: University - 1862, Utah State University Student

Type: Email

Text: "Thank you for the opportunity to provide input on priorities. Refugees, asylees and humanitarian parolees come to the U.S. under direct circumstances and are particularly vulnerable to poor nutrition and poor health, in addition to other risks such as food insecurity and poverty. The U.S. is also currently increasing numbers of refugees admitted each year and has recently resettled close to 80,000 Afghans. For these vulnerable immigrants to thrive and not fall into intergenerational poverty, it is critical to both research and apply best practices for nutrition, food security and nutrition education for this population. The inclusion of research, teaching and Extension creates an excellent opportunity for funding holistic, effective approaches for improving nutrition and health for refugees, asylees and humanitarian parolees."

Appendix 3. Visualization of stakeholder top priorities

USDA-NATIONAL INSTITUTE OF FOOD AND AGRICULTURE



Appendix 4. RRDC Stakeholder Report Analysis

In 2021, the Regional Rural Development Centers (RRDC) began a national listening session initiative with the goal of rapidly appraising stakeholder priorities related to the community, economic and workforce development of rural communities in the U.S.

RRDC collected structured stakeholder input with a survey instrument with pre-defined topic areas seeking to identify regional priorities, potential for expansion and programming of high value. The RRDC report "Findings from a Rapid Assessment of Stakeholder Priorities" is included here as reference. While this report is impactful for NIFA decision making and program development on its own, we attempted to investigate if there was any correlation between the RRDC topic priority ranks with NIFA Listens.

We leveraged the data reported in the RRDC report (Table 2) identifying eight topic areas:

RRDC Report Priority Rankings of topic areas for the entire sample (n=641 stakeholders) and groupings

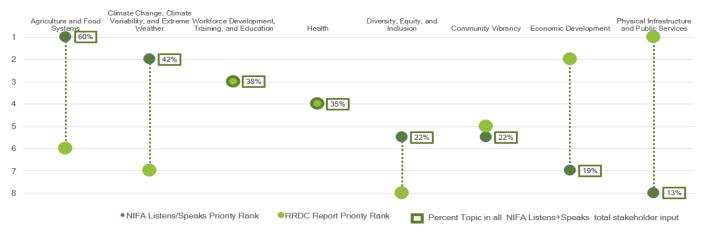
Topic Area	North Central (28%)	Northeast (13%)	South (32%)	West (18%)	National- scope (8%)	Total set of responses*
Physical infrastructureand public services	3	1	2	1	2	1
Economic development	1	2	4	2	3	2
Workforcedevelopment, training, and education	2	3	1	4	6	3
Health	5	5	3	3	1	4
Community vibrancy	4	7	6	5	4	5
Agriculture and foodsystems	6	6	5	7	8	6
Climate change, climate variability, and extreme weather	8	4	8	6	7	7
Diversity, equity, and inclusion	7	8	7	8	5	8

Priority 1
Priority 2
Priority 3
Priority 4

^{*}All regions and 1% (no region)

We conducted a qualitative analysis by aligning each of the eight pre-defined priority topic areas identified in the RRDC report from Table 2 (Total Set of Responses) to the NIFA Listens data set. Each item of NIFA Listens input was assigned to any of the eight topic areas. The following figure shows how the RRDC topic areas are represented in NIFA Listens FY 2023 – FY 2024.

NIFA Listens and Speaks Priority Ranks Association with RRDC Report Priorities



Rs = -0.56288, p (2-tailed) = 0.14633

The RRDC topic area most represented within the NIFA Listens data set was Agriculture and Food Systems (60% of all NIFA Listens input received), followed by Climate Change, Climate Variability and Extreme Weather (42% of all NIFA Listens input received), Workforce Development, Training and Education (38%); Health (35%); Diversity, Equity and Inclusion (22%); Community Vibrancy (22%); Economic Development (19%); and Physical Infrastructure and Public Services (13%).

Below are the topics and subtopics described in the RRDC report:

1. Agriculture and food systems

Local and regional food systems development

Sustainable on-farm practices and value capture

New market development for agricultural and forestry products

Land access, heirs' property and farm transition

2. Climate change, climate variability and extreme weather

Disaster preparation, mitigation and management

Natural and environmental resources management

Community and economic resiliency planning

Mitigation and adaptation strategies

3. Workforce development, training and education

Certificates and other professional training

Apprenticeships and internships

Skills gaps and strategic planning for workforce development

Educational programs in high schools, colleges and universities for jobs of the future

Retraining and transition assistance

4. Health

Nutritional security, food access and food affordability

Behavioral and mental health services

Substance abuse issues, including opioids

Public health, including availability and access to medical facilities and services

5.Diversity, equity and inclusion

Equitable and inclusive economic growth

Entrepreneurship among socially disadvantaged communities

Community racial understanding

Addressing disparities in access to programming

6. Community vibrancy

Youth development, engagement and rural retention

Community governance, leadership and resident engagement/participation

Placemaking, culture and arts

Aging and inter-generational engagement

Population changes and demographics

7. Economic development

Rural innovation, entrepreneurship, and small business creation and retention

Sustainable growth (including "closed loop" and "circular" economies)

Exports and international trade

Tourism, recreation, travel and hospitality

8. Physical infrastructure and public services

Energy, including renewable production and reliable access

Broadband/high-speed internet access, affordability and reliability

Housing access and affordability

Transportation infrastructure renewal

Appendix 5. LIST OF NIFA STAKEHOLDER LISTENING OPPORTUNITIES

LISTENING SESSION	SCOPE- Institute	Online Virtual-Date	Published	Links to announcement, recordings, notes-reports (public)
Gus Schumacher Nutrition Incentive Program (GusNIP)	Program Specific-IFSN	21-Oct-21	19-Oct-22	GUSNIP FY2021 LISTENING
NIFA LISTENS FY 2023 – FY 2024	NIFA-wide	2-Nov-22	27-Jun-23	Internal Draft-this report
1994 Tribal College Research Grant	Program Specific-IYFC	16-Nov-22	27-Jan-23	1994 Tribal College FY2023 LISTENING
Laying Hen and Turkey Research Program	New Program Specific-IFPS	14-Feb-23	24-July-23	Recording
Research Facilities Act Program-RFAP for Minority- serving Institutions)	New Program Specific-IYFC	13-Apr-23	27-Apr-23	RFAP FY 2023 virtual session recordings
Multiple Aquaculture Stakeholder Listening Sessions Hosted by NIFA and ARS: Research and Extension in Support of Tribal Aquaculture. Other: Catfish, Salmonids, Basses and Baitfish, Mollusk and Crustaceans; Warmwater Marine Fish; Aquaponics	New Program Specific-IFPS- ARS	12-Jun-23	April-2023	Tribal Aquaculture announcement