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# Title XII Report to Congress for Fiscal Year 2023

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The United States Agency for International Development (USAID) submits this report to Congress pursuant to Section 300 of Title XII of the Foreign Assistance Act of 1961, as amended, which requires:

The President shall transmit to the Congress, not later than September 1 of each year, a report detailing the activities carried out pursuant to this title during the preceding fiscal year and containing a projection of programs and activities to be conducted during the subsequent five fiscal years. Each report shall contain a summary of the activities of the Board established pursuant to section 298 of this title and may include the separate views of the Board with respect to any aspect of the programs conducted or proposed to be conducted under this title.

## I. ENGAGEMENT BY THE U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT WITH INSTITUTIONS DEFINED UNDER TITLE XII OF THE FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

### *Overall Summary of Fiscal Year 2023 Progress Across Feed the Future Innovation Labs*

USAID partners with Title XII universities on a wide range of topics to leverage the advanced capacities of U.S. universities, including on agricultural research and development, analytics, climate change, and nutrition. Many of these partnerships are within the Feed the Future Innovation Labs (FTFILs), which focus on research to reduce hunger, poverty, and malnutrition as part of the U.S. government's Global Food Security Strategy. In Fiscal Year (FY) 2023, the 22 FTFILs, supported by 83 U.S. colleges and universities in 39 states and U.S. territories, partnered with over 130 international institutions of higher education in 39 countries. These partnerships include both research and degree programs.

The FTFILs provide degree training to support the sustainability of food systems, agricultural and nutrition research, and development activities while helping develop the next generation of scientists. In FY 2023, the 22 FTFILs supported food security degree training for 305 individuals (47 percent female). Innovation Labs also provided 611 people with nutrition-related professional training (50 percent female), including 19 nutrition-related degrees.<sup>1</sup> Innovation Labs hosted 33 exchange visitors in food and agriculture at U.S. universities, including doctoral and master's degree candidates, research scholars, non-degree students, and short-term scholars.<sup>2</sup> In FY 2023, the FTFILs reported production of 178 peer-reviewed scientific publications.<sup>3</sup>

A FTFIL partners meeting was held in Nairobi, Kenya on May 15–19, 2023. The purpose of the meeting was to understand geographic differences, priorities, and trade-offs of climate change

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<sup>1</sup> FY 2023 data from Development Information Systems (DIS), USAID

<sup>2</sup> FY 2023 data from Training and Exchanges Management System (TEAMS), USAID

<sup>3</sup> FY 2023 data from Development Information Systems (DIS), USAID

mitigation and adaptation; highlight systems, scaling challenges, and transformative solutions; and embrace opportunities for local leadership and international collaboration.

A FTFIL annual meeting was convened in Washington, D.C., on September 12–14, 2023. The purpose of the meeting was to understand differing contextual approaches, priorities, and implications of inclusive gender research in agricultural innovation and development; spotlight systems and scaling obstacles while promoting transformative, equitable solutions; and seize opportunities for gender-focused leadership and global collaboration in driving inclusive innovation for improved livelihoods. Sessions included presentations on FTFIL approaches to innovate for social transformation, mainstream gender into traditional research agendas and scaling formulas, redirect innovation that could exacerbate inequality, and partner with minority-serving institutions (MSIs) for improved innovation, scaling, and local engagement.

Below are summaries of FTFILs' progress in FY 2023:

#### *FTFIL for Animal Health*

The FTFIL for Animal Health (AHIL), led by Washington State University, conducts research to develop and test improved animal health interventions such as vaccines and diagnostic tests, with a focus on East Coast fever (ECF). ECF, a tick-borne disease affecting cattle in eastern, central, and southern Africa is a major impediment to the growth of cattle industry in the region. In FY 2023, AHIL was selected by the regional ECF taskforce to serve as the secretariat to administer and coordinate the multi-country stakeholder body. Progress on research efforts to develop new vaccines included the realization of milestones toward the development of new live attenuated and subunit vaccines. To improve diagnosis of ECF at the field level, AHIL has made substantial progress on developing novel diagnostic tests utilizing techniques like CRISPR-Cas technology. AHIL has also collected baseline data to better understand the impacts of ECF on household nutrition and incomes. Researchers found that only 30 percent of women and 67 percent of children in the study area met recommended dietary diversity scores. A social behavior change communication strategy was co-created with the Kenyan government's Ministry of Health to address the gaps identified in the baseline study. Ten PhD and two MSc students were supported in FY 2023. All students had an opportunity to present their work at a range of fora, and two students published their first journal articles.

#### *FTFIL for Applied Wheat Genomics*

The FTFIL for Applied Wheat Genomics (AWG), led by Kansas State University, ended in August 2023. AWG developed new breeding methodologies using advanced genomics tools for the rapid development of heat-tolerant, high-yielding, and farmer-accepted varieties of wheat for South Asia. AWG simultaneously increased research-for-development capacity of the global wheat improvement system through the application of cutting-edge genomics in applied wheat improvement. AWG initiated large-scale application of genomics tools for improvement of wheat. Through AWG, over 92,000 candidate wheat varieties and breeding lines from the International Maize and Wheat Improvement Center global wheat program have been

genetically characterized. In addition, advanced testing for yield productivity for 4,806 elite candidate varieties has been completed in multiple locations across South Asia. Extensive field-testing data were brought together with genomic profiling to build trait-prediction models for selection and rapid advancement of the most promising, highest-performing, and most-climate-resilient candidate varieties. With a particular focus on heat-stressed environments, the Innovation Lab maintained the vision that the application of new tools for genomics and breeding can ensure that the yield and economic value of wheat crops for farmers in South Asia increase through rapid development of superior, climate-resilient wheat varieties. AWG activities included training support for local farmers, field staff, scientists, and students on the use of technology in phenotyping and characterizing wheat, identifying wheat diseases such as rust, and data analysis. Across four target countries, over 100 scientific staff were trained on data-management tools, and over 100 scientists, farmers, and industry personnel attended field days. To further strengthen research capacity, equipment (sprayers, threshers, and planters) was manufactured in local areas to help create uniform field trials and improve data quality.

#### *FTFIL for Climate-Resilient Cereals*

The FTFIL for Climate-Resilient Cereals (CRCIL) was awarded in late FY 2023 to Kansas State University. Research and capacity-strengthening activities of CRCIL are designed to fulfill four objectives: (1) discover, validate, and transfer novel alleles/haplotypes for traits critical in climate adaptation to elite breeding lines that improve the efficiency and accuracy of partner countries' Target Product Profiles-aligned trait discovery and breeding efforts; (2) strengthen the capacity of developing-country partners to enhance germplasm using new tools and methods for accelerating breeding for improved, locally appropriate cereal crop varieties targeted to smallholder farmers within their countries and regions; (3) leverage resources and align efforts supporting CRCIL objectives through coordination among essential stakeholders across the broader global research community; and (4) coordinate CRCIL research and outputs with other activities across the broader Feed the Future cereal crops improvement portfolio with both upstream market demand and downstream seed-system and scaling efforts. CRCIL progress will be reported in FY 2024.

#### *FTFIL for Crop Improvement*

The FTFIL for Crop Improvement (ILCI) serves as a support system for national agricultural research organizations (NAROs) in target regions to identify, develop, pilot, and transfer appropriate tools, technologies, and methods, equipping NAROs to deliver increased genetic gain and new varieties for key product profiles that advance the economic growth, resilience, and nutritional development goals of the U.S. government Global Food Security Strategy. During FY 2023, ILCI focused on developing tools, technologies, and methods; supporting regional Centers of Innovation across Africa, Latin America, and the Caribbean; and strengthening collaboration across disciplines and regions. In FY 23, ILCI developed and refined such tools as: a Practical Haplotype Graph breeding application programming interface server to make genomic evaluations more accessible; Triadic Comparisons of Technologies, or "Tricot" methodology to gather variety performance data under smallholder farmer field conditions;

and novel applications of several priority-setting methodologies (e.g., intra-household Willingness-to-Pay studies) to better understand differences in technology-adoption preferences across demographic groups. ILCI also addressed local partner constraints by incorporating offline and low-bandwidth capabilities into ILCI's core cloud-based computing platforms, including JupyterHub. U.S. university experts provided training for partner country breeding programs on the following, based on capacity assessments: AI modeling for predicting yield at large scale, gene editing, social science methods, data analysis and writeup, and large-data processing capacity for plant breeding pipelines. A Jupyter-Hub interoperability training course was also developed and is freely accessible. As a result, local researchers in 11 countries in Africa, Central America, and the Caribbean have applied modern approaches like barcoding, DNA sampling, the Breeding Management System platform, and phenotypic evaluation using the PhenoApps platform to their breeding programs; have released improved varieties and increased genetic gain for sorghum, sweet potato, and common bean using rapid cycling with genomic-assisted recurrent selection; have made trait discovery and breeding advances with sorghum, pearl millet, and taro for disease resistance, nutrition, and climate resilience; have applied priority-setting approaches in breeding agendas incorporating both biophysical and social science data; and have enhanced breeding product profiles through inclusive participatory trials to prioritize traits informed by preferences collected from youth, women, processors, traders, and consumers, to guide in developing improved varieties that meet diverse end-user needs in the market.

#### *FTFIL for Current and Emerging Threats to Crops*

The FTFIL for Current and Emerging Threats to Crops Innovation Lab (CETCIL) focuses on tackling pests, diseases, and weeds of crops in a climate-changed world. CETCIL is built on the global platform, PlantVillage, that the Pennsylvania State University has developed in partnership with the United Nations Food and Agricultural Organization (FAO), Consultative Group on International Agricultural Research (CGIAR), and NAROs. This platform approach has enabled collaborative research on novel approaches to monitor, predict, and combat current and emerging threats to crops in a world experiencing climate change.

In 2023, CETCIL deployed artificial intelligence (AI) to help Tanzania combat Banana Bunchy Top Virus (BBTV), enhanced water access to ensure feed and nutrition security for pastoralists in Kenya's arid and semi-arid lands, distributed 22,500 healthy seedlings to bolster the fight against BBTV, partnered with the International Center for Insect Physiology and Ecology to control fall armyworm through parasitoid innovations, and conducted banana paper experiments to control soil-borne pathogens in sweet potato.

For current threats, CETCIL follows the Forecast, Inspect, Training of Trainers, Evaluation, and Research approach:

- **Forecasting:** Enable the use of forecasting systems for biotic and abiotic stressors at the national and regional levels and build capacity for crop-threat surveillance and forecasting.

- Inspecting: Determine the levels of pests and contribute to improve and update the forecaster.
- Training: Build capacity for managing current threats with Integrated Pest Management (IPM) packages and the use of AI, cloud computing, apps, and genetic testing to secure effective monitoring and surveillance (including phylogenomics and stress modeling).
- Training of the Trainers: Build the capacities of youth and women to use AI-based extension systems, which empowers smallholder farmers and enables them to grow more food.
- Evaluation: Evaluate the success of control strategies on pest incidence using an initial surveillance strategy.
- Research: Evaluate existing IPM packages or develop new ones, improve surveillance tools and forecasting, and assess socioeconomic impact on gender and youth.

For emerging threats, CETCIL is following the Forecast, Assess, Research, Market and Surveillance approach:

- Forecast: Detect anomalies through crop surveillance, remote sensing, and machine learning.
- Assess: Rapidly assess any detected anomalies and work with local extension agencies and NAROs to manage and confirm new threats.
- Research: Develop research-driven solutions for the control of confirmed emerging threats based on a collective consensus of technical committees.
- Market: Engage with the private sector to accelerate market-based solutions.
- Surveillance: Evaluate different control strategies integrating the issues of gender/youth engagement and socioeconomic implications.

### *FTFIL for Fish*

The FTFIL for Fish works to reduce poverty and improve nutrition, food security, and livelihoods in partner countries through research and capacity strengthening for sustainable aquatic-food systems. In FY 2023, the FTFIL for Fish reached over 3,500 individuals with such cutting-edge technologies as an improved variety of a carp fish species known as rohu. The Generation 3 rohu carp, which has been shown to have improved growth rates over unimproved varieties, has been disseminated to 13 commercial hatcheries in Bangladesh as part of efforts to scale the fish variety. The FTFIL for Fish also engaged over 2,700 individuals through a range of events to promote knowledge sharing and adoption of best practices, including training on integrated rice-fish farming and aquaculture biosecurity best management practices. Partner scientists demonstrated through research that feed containing insect larvae was almost 20 percent more profitable than conventional feed in Nigeria and that feed with 35 percent protein promoted bighead catfish culture in a pond net-cage system in Cambodia. Scientists also developed interventions in Kenya to improve the nutrition and health of women and children by introducing selective fishing gear, which garnered 10 percent higher yields in conjunction with a nutrition social marketing campaign. The interventions resulted in significantly increased child growth, fish consumption, and dietary diversity for about 600 individuals.

### *FTFIL for Food Processing and Post-Harvest Handling*

The Food Processing and Post-Harvest Handling Innovation Lab (FPIL), led by Purdue University, led a portfolio of applied research and development activities to strengthen post-harvest value chains to support Feed the Future and to advance the U.S. government Global Food Security Strategy. The goal of the lab was to increase access to safe and nutritious foods by improving smallholder farmers' drying and storage capacity and expanding their market opportunities through diversified processed products that address market quality and nutritional needs. The program focused on cereal value chains in Kenya and Senegal.

In FY 2023, FPIL was in its final year and focused on wrapping up activities and continuing to build the capacity of local stakeholders. The activity completed a youth reseller study in Eastern Kenya, training 198 youth in 2023 (including 113 females) and an additional 34 people at a project dissemination workshop. In February 2023, FPIL held a dissemination workshop on the Aflasafe randomized controlled trial, training 75 people (including 31 females). FPIL also completed a capstone market and nutrition study and published seven peer-reviewed articles.

### *FTFIL for Food Safety*

Foods can be nutritious and available, but if those foods are unsafe, there is no food security. Contaminated foods are estimated to sicken 600 million people a year, contributing to impaired growth and development in children, food insecurity, and barriers to entry into global trade. By investing in data-driven approaches to identify the key points for intervention, the Feed the Future Innovation Lab for Food Safety (FSIL), led by Purdue University, supports countries in transforming the handling and processing of foods at the household, farm, and market level.

In FY 2023, FSIL subaward activities in Bangladesh, Cambodia, Kenya, Nepal, Nigeria, and Senegal made significant progress in data collection to better understand microbial food safety challenges in each country, analyze the roles and opportunities for women in food safety and in different food value chains, and identify appropriate food-safety interventions. In FY 2023, FSIL subaward activities published nine peer-reviewed journal articles, gave seven conference presentations, and hosted workshops and training sessions for producers, extension agents, government stakeholders, and the private sector.

Local capacity strengthening continued to be a priority area for the FSIL Management Entity (ME) and all subaward activities. FSIL has supported 29 graduate students to date, including 21 female students, and ten of the graduate students have completed degrees. The FSIL ME supported three graduate students to attend the International Association for Food Protection (IAFP) annual meeting in Toronto, Canada to engage with the most-current and groundbreaking food-safety research and to network with leading global food safety experts. Short-term trainings were held on survey enumeration, statistics and data analysis, microbiological laboratory methods, gender research theory, and food-safety practices, with a total of 244 trainees (117 female and 127 male). The FSIL ME hosted a virtual project workshop focused on local capacity strengthening in April 2023. Project teams reflected on progress achieved so far



in local capacity strengthening, developed plans for the remainder of the program, and identified opportunities to advance locally led development.

The FSIL ME continued to monitor and guide subaward activities through regular meetings and site visits in Bangladesh, Cambodia, Nepal, Kenya, and Nigeria. The second hybrid annual meeting was held in November 2022 at Texas State University, the lead institution for FSIL's activity in Bangladesh and one of three MSIs leading FSIL activities. The meeting provided an opportunity for project leaders, USAID representatives, the FSIL ME, technical experts, and advisory committee members to share progress, lessons, and feedback. FSIL highlighted project progress on Agrilinks, e-newsletters, and social media throughout the year with an emphasis on results and publications, capacity-strengthening efforts, and profiles on project leads from focus-country institutions and MSIs. The ME also hosted a two-part webinar series on risk-based approaches to addressing food safety.

#### *FTFIL for Food Security Policy Research, Capacity, and Influence*

The FTFIL for Food Security Policy Research, Capacity, and Influence (PRCI) completed year four successfully by consolidating capacity development of the centers of policy learning and by conducting highly relevant research on price increases and on fertilizer and soil health policy in anticipation of the African Union Fertilizer and Soil Health Summit. PRCI also initiated pilot activities in four African countries of an accountability system to assist countries to implement and monitor Nationally Determined Contributions and National Adaptation Plans under the Paris Agreement.

Combining strategic planning, leadership training, and diverse research opportunities has substantially enhanced the capacity, output, and recognition of all PRCI partner centers and the Africa Network of Agricultural Policy Research Institutes. Sustainable gains were achieved by emphasizing a Training-of-Trainers approach and by placing local partners in the lead on policy engagement. Examples of impact include PRCI-supported partners providing policy support to governments in Ghana, Zambia, and Malawi. PRCI exceeded targets for both capacity building and research in year four because of increased activities in Asia. The first in-person Global Gathering, held in Accra, Ghana, brought together Asian and African researchers for south-south exchange and dialogue.

#### *FTFIL for Food Systems for Nutrition*

The Food Systems for Nutrition Innovation Lab (FSN-IL) works to generate new evidence and disseminate promising technologies and practices that can support the uptake of food system innovations to improve incomes, diet quality, resilience, and nutrition. FSN-IL designs and manages an integrated effort across three interlocking activity domains to accomplish the following:

1. Generate new research for development (R4D) while also effectively disseminating existing but under-used, ready-to-use, pipeline-ready innovations;

2. Support human and institutional capacity development (HICD) in partner countries and in the United States aimed at promoting capacity to understand R4D and promotion of innovations; and
3. Engage across public and private sectors to catalyze uptake of innovations, share lessons on discovery-to-commercialization processes, and build expert resources, networks, and partnerships to support local solutions and critical development outcomes.

In FY 2023, FSN-IL conducted multiple stakeholder consultations in focus countries to provide a forum for sharing challenges to food-system transformation and innovation. These external consultations were conducted in three focus countries with over 300 stakeholders, including food producers, processors, distributors, retailers, small- and medium-sized enterprises (SMEs), startups, consumers, government officials, non-profit organizations, academic institutions, USAID missions, and members of the Scaling Up Nutrition (SUN) Business Network. FSN-IL released a first “Request for Application” (RFA) titled, “Actions to Support Storage, Packaging, and/or Cooling Innovations for Perishable Foods in Target Geographies.” The focus of the RFA was identifying actions to support storage, packaging, and cooling innovations to reduce loss and waste and to ensure the safety of nutrient-dense perishable foods in target countries (Bangladesh, Malawi, Mozambique, and Nepal). Five research projects were chosen and entered into subaward agreements with FSN-IL, with research rollout planned for FY 2024.

After an application process early in FY 2023, students from several 1890 universities were selected for a FSN-IL MSI student working group. The group will work to identify opportunities to assist students in preparing for a career in global development. A first meeting of the MSI student working group with FSN-IL and the 1890 Universities Foundation included introductions to food systems and the FTFILS and a review of expectations for students in the working group.

A series of webinars, “Thriving Solutions on Circular Economy and Food Loss and Waste”, was conducted throughout FY 2023, with global participants representing the public and private sectors and civil society. FSN-IL hosted a side event at the FAO Science and Innovation Forum 2022 titled, “Evidence Needs to Support Nutrition-Sensitive Innovations in Food Value Chains: Perspectives from South Asia and Southern Africa.” FSN-IL held its first annual partners meeting mid-year. Participants included Tufts University technical specialists, expert advisory board members, USAID, and consortium partners. FSN-IL is preparing a series of blog posts based on each session to disseminate further insights and priorities that were identified. Additionally, FSN-IL coordinated a G7 Summit Technical Workshop on Food Loss and Waste under the guidance of the USAID’s Bureau for Resilience, Environment, and Food Security (REFS).

#### *FTFIL for Genomics to Improve Poultry*

The FTFIL for Genomics to Improve Poultry, which ended in September 2023, sought to improve the production of indigenous chickens in Africa by developing strategies to genetically enhance their resistance to Newcastle disease (ND) infection and heat stress. In FY 2023, project teams in Ghana and Tanzania refined a genetic-selection tool to guide the selective breeding of indigenous chickens to enhance resistance to Newcastle disease and improve poultry

productivity, including increased egg production and growth rate. The teams also worked in collaboration with host-country government partners to improve understanding of the epidemiology of ND, including characterization of the strains of ND virus in Ghana and Tanzania. The team detected a wide range of ND strains and became the first team to detect a specific strain of ND in Tanzania. The team also identified the most-significant risk factors that contributed to infection and spread of ND among chickens in Ghana and Tanzania. The information will inform context-specific control strategy, including recommendations on the types of vaccines that should be used based on the relative prevalence of specific virus strains. The team also developed a training toolkit with materials focused on ND control and poultry breeding. The toolkit includes training materials on poultry biosecurity, ND vaccination administration, poultry disease outbreak investigation and response, and poultry genetics and breeding. A Training-of-Trainers approach was utilized to disseminate the knowledge and materials to extension agents and poultry producers.

#### *FTFIL for Horticulture*

The FTFIL for Horticulture conducts locally led research in four global regions (West Africa, East Africa, South Asia, and Central America) with oversight from regional managers in local partner institutions and focuses on indigenous fruit and vegetable production value chains with an emphasis on benefits to women and youth. In FY 2023, the IL implemented a research portfolio focusing on integrated pest management strategies, soil health, increased production, and postharvest loss. The research approach includes strengthening social and community components of market access, nutrition, increased biodiversity, and a gender-responsive approach. The IL also started a new activity in Guinea Bissau through a buy-in from the West Africa Regional Mission.

#### *FTFIL for Irrigation and Mechanization Systems*

The Feed the Future Innovation Lab for Irrigation and Mechanization Systems (ILIMS) was awarded in late FY 2023 to the Daugherty Water for Food Global Institute at the University of Nebraska. ILIMS generates research-based evidence to support the growth of vibrant irrigation and mechanization markets, develops strong institutions and local capacity for sustainability, and fosters opportunities for equitable access. ILIMS utilizes a research partner consortium of leading research institutions for both irrigation and mechanization with strong systems and market-based scaling approaches, as well as stakeholder networks.

ILIMS' work plan includes five priority knowledge gaps identified by recent research, stakeholder engagement, and public policy directions in target geographies: developing suitable socio-technical bundles that address the needs of specific producer types, including women, youth, and vulnerable people; establishing and strengthening institutions for natural resource governance and climate resilience; supporting inclusive market systems that enable scaling of profitable use of irrigation and mechanization; developing human-resource capacity that supports mechanization and irrigation system resilience; and formulating strategies for nutrition-sensitive mechanization and irrigation that safeguard and enhance health and

inclusivity. Cross-cutting issues, particularly gender and youth, as well as climate change, will be prominent across all areas. Preliminary countries of focus for the project include Nepal, Ethiopia, Rwanda, Ghana, Honduras, and Guatemala, and East and Southern Africa are regions of focus.

#### *FTFIL for Legume Systems*

The FTFIL for Legume Systems focuses on cowpea improvement and IPM in West Africa, common bean improvement in southern Africa, and lentil production systems in Nepal (through a USAID Nepal Mission buy-in). Research efforts this year brought several varieties of cowpea and common bean toward release in FY 2024 and saw the conclusion of multiple activities at the end of the first five years of the IL. Some of the biggest successes were in capacity strengthening of students and early career researchers—the IL supported eight doctoral and 48 master’s degree students and led multi-country grant-writing workshops to strengthen the capacity of early-career researchers to win international grants. In FY 2023, the IL started a five-year extension period during which it will bring new cowpea and common bean varieties to the market and expand research on multi-stakeholder platform efficacy to create lasting change in agricultural communities.

#### *FTFIL for Livestock Systems*

The FTFIL for Livestock Systems (LSIL) seeks to sustainably improve livestock productivity, marketing, resilience, and animal-source food (ASF) consumption using appropriate improved technologies, capacity development, and policies, in order to improve the nutrition, health, incomes, and livelihoods of vulnerable people. LSIL engages in long-term research and capacity-development efforts through a multi-disciplinary, integrated, and competitively funded approach. In Rwanda, research showed that health constraints, high cost of inputs, feed scarcity in the dry season, and farmer knowledge gaps in pig rearing are important constraints to pig production. Research also showed that women were more constrained than men in transporting the pigs to market, often settling to sell at the farm gate, which results in lower prices. In Burkina Faso, a baseline survey showed that the consumption of animal-source foods is influenced by socio-cultural constructs that negatively affect young children and pregnant women. LSIL continued to share findings and awareness about the importance of ASF for nutrition, health, growth, and cognitive development in 15 journal papers, 14 reports, and 31 additional publications. LSIL researchers and staff also gave seven conference presentations and 35 seminars.

#### *FTFIL for Markets, Risk, and Resilience*

In FY 2023, the Feed the Future Innovation Lab for Markets, Risk, and Resilience (MRR Lab) advanced 24 research projects across 10 countries. These projects include program impact evaluations and tests of new approaches for strengthening food security and resilience among farming households in sub-Saharan Africa and South Asia.

Notably, in Zambia, a focused budgeting activity increased household savings by 20 percent entering the hungry season, while also increasing farm output by nine percent in the following season. In another research effort, lab researchers developed a new method of measuring economic resilience that takes into account the presence of poverty traps and expands how we think about resilience by not only enabling people to get back where they were before the shock, but also analyzing where people would have been, accounting for growth trajectories.

Over the past year, the MRR Lab continued efforts to advance research localization, primarily through the Advancing Local Leadership, Innovation, and Networks (ALL-IN) model. African researchers supported under the initiative are publishing findings, influencing policy debates, and pioneering new approaches to strengthen rural community well-being and resilience. The MRR Lab team continues to provide capacity development support to ALL-IN researchers and the African host institution, International Centre for Evaluation and Development (ICED), in support of USAID's localization goals. MRR continues to co-manage the ALL-IN Research Network (ARN) with ICED, which now has more than 200 African researchers. ARN members receive capacity-strengthening support and opportunities for networking and collaboration.

The MRR Lab has continued to strengthen partnerships across the development community, ensuring that the Lab's valuable evidence and insights reach stakeholders who can readily incorporate those learnings into their own work. Over the past year, the MRR Lab demonstrated a steady commitment to increasing research knowledge dissemination channels and active shaping of global conversations and policies related to the resilience of rural livelihoods in the face of climate change. Through publications, social media, newsletters, a resource website, and active engagement in strategic partnerships, the MRR lab offered guidance on such critical development topics as risk management, technology adoption, market development, and resilience. Notably, the MRR Lab has been active in high-level policy fora, including [AIM for Climate](#), [Resilience Evidence Forum](#), [Global Shield](#), and all U.S. government-backed or multi-national platforms seeking evidence to address pressing issues of climate risk mitigation and resilience-building.

Challenges faced over FY 2023 varied by country context. Because of the far-reaching effects of the war in Ukraine on global agricultural markets, the results of several MRR Lab studies were more difficult to interpret, and research findings may underestimate program impacts compared to what may be possible in more "typical" years. Although most projects have been proceeding without any major disruptions, an anticipated project in Somalia was canceled due to the worsening conflict situation on the ground. However, the MRR Innovation Lab was able to redirect funds to further support existing activities to supplement its existing work with new activities explicitly designed to increase the development impacts.

#### *FTFIL for Peanut Research*

The FTFIL for Peanut Research develops evidence-based technologies and practices, facilitates the widespread adoption of these technologies, and strengthens the capacity of private/public sector organizations to sustain innovation by smallholders. The Groundnut Improvement

Network for Africa (GINA), a network for peanut breeding, has expanded to 13 countries, creating greater access to diverse varieties and genomic tools for crop breeding, knowledge, and expertise than is possible if each breeder and country is working alone. Demand for peanuts throughout Africa is growing, and the Peanut Innovation Lab has helped national programs develop improved varieties, optimum input packages (fertilizer, seeding rates, lime), and harvest and post-harvest improvements for yield and quality improvements. Private-sector partnerships are being developed, and in Malawi, a private-sector company has purchased U.S.-manufactured shelling and sorting equipment and is running at full capacity, with expansion targeted in both Malawi and the region. As peanuts transition from a home-consumption crop to a cash crop in many countries, women may be “crowded out” of a crop that has been traditionally theirs. The Innovation Lab is taking steps to help women maintain greater control and financial decision-making power over this important crop, which in turn is more likely to create greater overall household prosperity.

#### *FTFIL for Reduction of Post-Harvest Loss*

Globally, approximately a third of food is lost or wasted, which accounts for \$1 trillion in economic losses annually and contributes approximately 10 percent of anthropogenic greenhouse gases. The objective of the Post-Harvest Loss Innovation Lab (PHLIL), led by Kansas State University, is to generate research to reduce post-harvest food and seed losses to sustainably drive inclusive agriculture-led economic growth, strengthen resilience, and reduce malnutrition. PHLIL has enhanced in-country research and loss-mitigation capacity, generating evidence that is informing policy and innovations scaling within food systems.

PHLIL closed out in June 2023, concluding nine years of research partnerships in Bangladesh, Ethiopia, Ghana, and Guatemala and buy-in activities funded by USAID Missions in Afghanistan, Honduras, and Nepal. Program activities included: capacity needs assessment and tailored in-country capacity building for localization of research leadership and post-harvest mitigation expertise; biophysical and socioeconomic research into the drivers of and possible interventions to mitigate (including a Product Life Cycle and Target Product Profile approach) post-harvest loss in the food system; development, validation, adaptation, and deployment of drying and storage innovation technologies and practices at key intervention points across the food system; extension material development, utilization, and transfer to scaling partners for training food system actors in post-harvest loss reduction best practices and technology/innovation use; and catalyzing partnerships downstream of the PHLIL program to ensure localization and scaling.

In response to the shocks posed by the COVID-19 pandemic and Russia’s invasion of Ukraine, PHLIL redoubled its partnership efforts to accelerate innovation development and scaling to in turn bolster food and nutritional security. The program provided information to USAID on drying and storage technologies and proposed possible partners to help secure and export grain stranded in Ukraine.

PHLIL's approach, centered around localization and the product life cycle, has contributed to local production, private sector-driven, and public-sector-supported scaling of several key post-harvest loss reduction innovations and to the United Nations Sustainable Development Goal 12.3 of cutting the estimated global one third of food lost or wasted by one half by 2030. More research is needed to continue characterizing post-harvest loss drivers, changing behavior, and scaling innovations to achieve this critical resilience and food and nutrition security goal.

#### *FTFIL for Small-Scale Irrigation*

The FTFIL for Small-Scale Irrigation (ILSSI), which closed out in FY 2023, investigated how to feasibly and sustainably expand farmer-led, small-scale irrigation in Ethiopia, Ghana, Mali, and Tanzania. Research demonstrated how investments in small-scale irrigation (SSI) could be implemented to substantially contribute to agricultural growth, human well-being, and poverty reduction for millions of smallholder farmers. Research also documented multiple pathways between small-scale irrigation and improved nutrition, especially for women and children, and potential contributions to women's empowerment. While evidence indicated the potential benefits of small-scale irrigation investments for rural producers, research also focused on how to support sustainability. The project identified and mapped suitable areas in project countries to sustainably expand small-scale irrigation with a reduced negative impact on water resource availability under different climate scenarios and to scale field-level practices that can strengthen water productivity.<sup>4</sup> ILSSI also supported more than 100 students to earn bachelor's, master's, and PhD degrees.

#### *FTFIL for Collaborative Research on Sorghum and Millet*

The FTFIL for Collaborative Research on Sorghum and Millet (SMIL) completed its 10-year award in 2023. SMIL is a global hub of cutting-edge research for sorghum and pearl millet value chains. Focused on increasing the resilience of small-scale producers, SMIL links U.S. and international universities and research organizations in a collaborative effort to make sorghum and pearl millet the crops of the future in target countries Niger, Senegal, Ethiopia, and Haiti. The program is led by Kansas State University, in partnership with 15 institutions who lead projects, including Purdue University, Colorado State University, Texas A&M, the Senegalese Institute for Agricultural Research, the University of Hohenheim, 18 collaborating local organizations in West Africa, and 16 collaborating institutions in Ethiopia. In FY 2023, the final SMIL report summarized achievements including: 16 research projects that developed adaptation to sugarcane aphid and drought for smallholder sorghum farmers in Haiti and the United States; enhanced research in Africa for marker-assisted selection for sorghum disease resistance; genetic enhancement of pearl millet for yield, biotic, and abiotic stress tolerance; and sorghum trait deployment for improved food and feed value. SMIL funded educational expenses for 97 students representing a variety of degree levels, from agricultural engineers to doctoral degrees and postdoctoral studies. Four of these students received prestigious awards for their

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<sup>4</sup> From the ILSSI Legacy Report, 2013–2023. More detailed results can be found there.

[https://ilssi.tamu.edu/files/2023/11/ILSSI-Legacy-Report-2013-23\\_111623-300.pdf](https://ilssi.tamu.edu/files/2023/11/ILSSI-Legacy-Report-2013-23_111623-300.pdf)

accomplishments, including the BIFAD Student Award for Scientific Excellence in a Feed the Future Innovation Lab. SMIL also funded over 180 short-term training sessions at which nearly 14,000 individuals were trained. These trainees included producers, civil society members (predominantly researchers and students), government representatives, and individuals from private-sector firms. A capstone event, the second global sorghum conference, was co-hosted by SMIL and Kansas State University in June 2023 and focused on resilience and sustainability in the face of climate change. The global research network formed under SMIL was strengthened as 90 SMIL-supported participants shared results with 450 conference participants from 150 organizations.

### *FTFIL Soybean Innovation*

The Soybean Innovation Lab (SIL) involves a close working consortium of the University of Illinois, the University of Missouri, the International Institute for Tropical Agriculture, Mississippi State University, and the University of Florida to produce evidence-based technologies and practices, facilitate their dissemination for widespread adoption, and build the capacity of public-private partners across the soybean market systems in Feed the Future (FTF) target countries. SIL integrates the cross-cutting themes of gender equality, youth capacity building, environmental protection, and climate resilience into its technology platforms. SIL's strategy involves working backward from the needs of local private- and public-sector scaling organizations—that have a unique understanding of soybean's long value chain—to build, test, and then sustainably scale solutions. SIL's research-for-development activities span the value chain from input usage and commercial channels, to breeding productivity and seed system reform, through to agronomy and yield improvement, and on to utilization and demand expansion.

In 2023, SIL launched the Seed Catalog, the first-of-its-kind soybean variety catalog that connects high-yielding varieties from breeding programs and private companies with businesses and organizations interested in licensing and commercializing them. The Seed Catalog results from the Pan-African Trials (PAT) Program and features five leading soybean seed originators whose varieties are among the 388 varieties available for license: International Institute of Tropical Agriculture (IITA), Seed Co, Department of Agricultural Research Services (DARS)-Malawi, Crop Breeding Institute (CBI)-Zimbabwe, and Semillas Panorama-Colombia. Data from PATs supported the definition of four macro-environments (ME) in Africa. Temperature, elevation, and latitude determine the MEs, which allow for standardizing protocols, combining sites for analysis, increasing the number of observations, and improving statistical properties and data quality. In 2023, the PATs expanded to 30 countries, with trials in 100+ locations testing 207 soybean varieties. Three new soybean varieties were registered, two in Ethiopia and one in Zimbabwe. Ngongoni (TGx 2002-9FM), bred by IITA, is the newest high-yielding soybean variety available for licensing in Zimbabwe, reaching 4.4 metric tons/ha and 21.4 percent oil content. IITA has brought new soybean varieties to the African soybean market and now, in partnership with CBI, is promoting the newest variety in Zimbabwe.

The Soybean Management with Appropriate Research and Technology (SMART) Farm is SIL's primary product for helping soybean producers to improve yields. The program expanded to 16



countries across 74 locations. A total of 30,178 farmers are receiving input bundles based on SMART Farm results and 31,000 hectares were planted according to SMART Farm's recommendations. In this reporting period, 239 extension agents were trained in Malawi, Zambia, Madagascar, Kenya, Zimbabwe, and Mozambique, with 199 men and 40 women represented. The SMART Farm Soy App responds to the need for accelerated soybean familiarization and training and presents over 300 downloads to date.

Investments in SIL's multi-crop thresher improved threshing practices across 12,500 hectares. CAMS Engineering, based in Ethiopia, in partnership with SIL, developed a new service business model to promote gender inclusivity and empower women. An effective women's outreach program was designed and executed to recruit and train 74 young women between the ages of 18 and 35. In addition, training was provided to 20 agricultural service provision businesses to enhance their ability to report revenues accurately. CAMS has 100 threshers in service, 29 new Agricultural Service Provision businesses opening 116 professional jobs, and is hiring 550+ laborers into new jobs. SIL-University (SIL-U) serves as SIL's flagship online extension and learning platform and has reached over 3,700 learners from 115 countries and awarded 1,726 certificates. SIL-U currently offers 14 free, self-paced, and certificate-based courses and includes materials translated into five different languages.

#### *FTFIL for Sustainable Intensification*

The FTFIL for Collaborative Research on Sustainable Intensification (SIIL) is the global leader in transdisciplinary research, knowledge sharing, and capacity building using sustainable intensification as a way to improve global food and nutritional security. This vision is supported by the associated Digital and Geospatial Tools Consortium at Kansas State University, the Appropriate Scale Mechanization Consortium at the University of Illinois at Urbana-Champaign, the Policy Research Consortium at Rutgers University, and the SOILS Consortium with the International Fertilizer Development Center (IFDC).

SIIL successfully completed its ninth year since inception with activities in Burkina Faso, Cambodia, Guatemala, Haiti, Honduras, Niger, and Senegal. The SIIL continues to support the goal of developing an integrated research portfolio of sustainable intensification practices that offer the greatest potential to reduce hunger while improving the resilience and nutrition of smallholder farmers in the target regions. This fiscal year, SIIL has positioned itself to build on achievements and reflect on lessons learned while ensuring the continued relevance of the research with a focus on leveraging regional efforts, scaling innovations, and strengthening local institutional and human capacity.

During FY 2023, research projects and consortia have been working on scaling technologies and innovations with appropriate partners while wrapping up their research. Project teams had already identified promising innovations from their research by using a holistic approach and actively collaborating with strategic partners to leverage investments from both the public and private sectors. They were then able to communicate their successes through multiple knowledge management platforms, which have been key to successful implementation that will

ensure greater impact, reach, and return on investments. The SIIL continues to strengthen, grow, and collaborate with over 120 national and international entities (including nine CGIAR and 20 U.S. universities) and has supported more than 200 students and young scientists to work toward increasing agriculture productivity and resilience of cropping systems and supporting nutritional outcomes.

In FY 2023, the SIIL successfully completed all focus-country projects and the Appropriate Scale Mechanization Consortium. The Center for Sustainable Agricultural Intensification and Nutrition at Royal University of Agriculture in Cambodia successfully launched two Agricultural Technology Parks (ATPs) and showcased its capacity by hosting two conferences with local and regional partners. The Center of Excellence on Mitigation, Adaptation, and Resilience to Climate-Change established virtual classrooms in four of the six universities. The ATPs are offering training and extension programs designed to help farmers improve crop production and develop climate-smart practices. The SIIL has continued engagement and refinement of the activity tracker with the USAID Missions, Innovation Labs, and Accelerated Innovation Delivery Initiative (AID-I) to support communication, collaboration, and coordination activities in the USAID focus countries.

## II. FIVE-YEAR PROJECTION OF PROGRAMS AND ACTIVITIES

The U.S. government Global Food Security Strategy and Global Food Security Research Strategy continue to guide the design and implementation of activities and programs that will engage U.S. higher education institutions over the next five years. Priorities specific to U.S. university science, technology, and innovation activities and programming will collectively represent three themes: (1) climate-smart agriculture and food-system innovations, (2) nutrition and food systems, and (3) genetic improvement of crops and livestock. The Feed the Future research portfolio will continue to integrate biophysical, socioeconomic, behavioral, and policy research toward supporting affordable, nutritious diets for a well-nourished population; meeting the challenges of climate change; and strengthening and expanding access to markets and trade. Additionally, U.S. government funding is increasingly targeted at stakeholders directly in the development, adaptation, and dissemination of agriculture and food system innovations, providing the opportunity for smallholder farmers, women and youth, and private and public sector to drive appropriate innovations to scale locally.

The programmatic changes USAID anticipates, which are dependent upon the availability of funds, include expanding the topical breadth of the FTFIL portfolio. As part of this expansion, USAID REFS is planning to launch new FTFILs in FY 2025 that will directly address improved land management, holistic risk management, and expanded tree crop production in agricultural lands, with the goal of sustainably intensifying agricultural production and reducing and reversing deforestation. These planned FTFILs will focus on: (1) integrated water and soil management; (2) nutrient-dense and climate-resilient crop improvement and value-chain development targeting rainfed agricultural systems; (3) perennial tree crop utilization and improvement; and (4) risk-informed, behavioral change research that, while not focused solely on climate risks, will build on the insights of the Feed the Future Markets, Risk, and Resilience Innovation Lab. As mentioned in public discussions with BIFAD, these proposed FTFILs will work to expand the use of perennial crops, trees, and shrubs to increase the climate adaptation and mitigation potential of farming systems; increase crop-nutrient and water-use efficiency; reduce soil erosion and degradation; improve holistic risk management for resilient food systems, and improve ecosystem and watershed health. This research also suggests that there is a need for increased research on the behavioral changes necessary for increased uptake of climate-smart agriculture approaches.

USAID will continue to promote greater engagement of MSIs, including by providing professional development opportunities for MSI students and engaging MSIs in IL research activities.

### III. SUMMARY OF THE ACTIVITIES OF THE BOARD FOR INTERNATIONAL FOOD AND AGRICULTURAL DEVELOPMENT IN FISCAL YEAR 2023

BIFAD is an independent, presidentially appointed, seven-member advisory committee to USAID that includes no fewer than four representatives from U.S. universities, with additional representation from the private sector and civil society. Congress mandated the establishment of BIFAD, authorized under Section 298 of Title XII of the Foreign Assistance Act (FAA) of 1961, as amended, in recognition of the role that U.S. higher-education institutions play in agricultural development and in ensuring food security, both domestically and abroad. USAID funds and facilitates BIFAD's work in compliance with the Federal Advisory Committee Act of 1972.

#### **BIFAD Members**

BIFAD appointments from January 2022 did not change during FY 2023. BIFAD membership remained as follows:

- Laurence B. Alexander, BIFAD Chair and Chancellor of the University of Arkansas at Pine Bluff
- Pamela K. Anderson, Director General Emerita, International Potato Center
- Marie Boyd, Associate Professor, University of South Carolina Joseph F. Rice School of Law
- Rattan Lal, Distinguished Professor, The Ohio State University
- Saweda Liverpool-Tasie, MSU Foundation Professor, Michigan State University
- Henri G. Moore, Vice President/Head of Responsible Business, Haleon
- Kathy Spahn, President and CEO of Helen Keller International

#### **Prioritization of BIFAD Focus Areas**

Informed by discussions with Agency leaders, the Board developed a work plan to guide BIFAD activities for 2023–2024. The Board prioritized addressing three key global challenges through evidence-based recommendations to USAID: (1) strengthening agricultural and food systems to respond to global food security crises and to mitigate the impacts of shocks, including shocks caused by conflict, pandemics, and climate, (2) improving the affordability of safe and nutritious foods, recognizing that nutrition is foundational to development, and (3) identifying strategies and programs to adapt to and mitigate climate shocks in agricultural and food systems. In addition, BIFAD also committed to intentionally embedding the following cross-cutting themes in all areas of their work: (1) diversity, equity, inclusion, and accessibility, (2) locally led development, (3) research and development and higher education engagement, and (4) private-sector engagement.

Significant achievements of the Board in FY 2023 include the following:

### **Public Meetings**

- BIFAD convened a public meeting, *Fed to Thrive: Accelerating Action on Nourishing Foods for Infants and Young Children*, on October 19, 2022, as a side event of the 2022 Borlaug Dialogue at the World Food Prize under the theme “Feeding a Fragile World.” The meeting gathered expert presenters and sought public input on evidence-based solutions for increasing the affordability, availability, and convenience of nutrient-dense foods for infants and children six months to two years of age; providing adequate safety nets for families most vulnerable to early childhood malnutrition; and engaging across systems.
- BIFAD convened a public meeting, *Transformative Pathways Toward a Climate-Resilient Agriculture, Food, and Nutrition System: A Public Consultation Ahead of the 27th Conference of Parties*, on October 26, 2022, to present and deliberate the preliminary findings of a study, prepared by a BIFAD expert subcommittee, on systemic solutions for climate change adaptation and mitigation in agricultural, nutrition, and food systems. In consultation with the agricultural, nutrition, food systems, and climate change communities, BIFAD sought input on the emerging findings and aimed to strengthen the study recommendations and ensure their utility to improve long-term food security and inform ambitious implementation of USAID’s Climate Strategy.
- BIFAD convened a public meeting, *A Public Consultation on BIFAD’s Plans to Launch a Subcommittee on Minority Serving Institution Engagement and Leadership in USAID’s Agricultural, Food Security, and Nutrition Programming*, on June 28, 2023, to share plans for a proposed BIFAD Subcommittee on Minority Serving Institution (MSI) Engagement and Leadership and to invite expert panelists and invite stakeholders to provide input on the proposed subcommittee’s objectives and membership. Experts at the meeting provided perspectives on opportunities and challenges for USAID engagement and collaboration with MSIs in agriculture, food security, and nutrition programming.
- BIFAD convened a two-part public meeting, *Elevating Climate Change Adaptation and Mitigation in USAID’s Agricultural, Nutrition, and Food System Programming to Inform Strategy Implementation: A Discussion of the BIFAD Climate Change Subcommittee Draft Commissioned Report*, on September 11, 2023, to address the opportunities and challenges of transformational climate change adaptation and mitigation in USAID’s agricultural, nutrition, and food systems programming. The morning session, “A Vision for USAID Research to Advance Food Security, Nutrition, Climate, and Environment Goals,” focused on integrating climate change into the U.S. government Global Food Security Research Strategy. It aimed to strengthen relationships among environmental, agricultural, nutrition, and food systems research, promoting investments that consider climate impacts while advancing food security, nutrition, and environmental goals.
- The afternoon session, “A Deliberation of Draft Report Recommendations from the BIFAD Subcommittee on Systemic Solutions for Climate Change Adaptation and Mitigation in Agriculture, Nutrition, and Food Systems,” provided a platform for the BIFAD Subcommittee on Systemic Solutions for Climate Change Adaptation and Mitigation in Agriculture, Nutrition, and Food Systems to share and discuss the main

findings, targets, and recommendations of its draft report with BIFAD, USAID representatives, and other stakeholders.

## **Recommendations**

### ***Strengthening Food Systems Resilience in the Face of Shocks***

On December 19, 2022, BIFAD transmitted the following recommendations to USAID's Administrator from its May 23, 2022 public meeting, *The Global Food Security Crisis: Exploring the Evidence Base and Lessons from the Past to Strengthen Agricultural, Nutrition, and Food Systems in the Face of Shocks*:

1. Identify frameworks and/or examples of successful integration of humanitarian aid and longer-term assistance investments. Invest to understand how best to support immediate crisis response while also building longer-term food and nutrition systems resilience. Identify opportunities for integration of assistance investments with shorter and longer time scales across the Agency.
2. Invest to better understand consumption patterns. Invest in research to understand what people are eating (across different income groups, age groups, and genders) and what they want to eat, including local and indigenous foods. This should include information on both expenditure patterns and details on actual household consumption quantities. This research should support USAID's decisions on priority interventions to support improved access to affordable, safe, and nutritious diets and further elevate the importance of nutrition and dietary patterns for resilient food systems.
3. Invest to deepen understanding of how food, nutrition, and agricultural system actors are responding to multiple shocks and the implications for food system resilience. While combined and simultaneous shocks have only recently become the reality for some, multiple shocks have long been the reality of certain regions of Asia and Africa. Research to understand the drivers of past resilience in those regions, alongside research to understand how current system actors are responding to multiple shocks, will be important to guide strategies to support food system resilience.

### ***Diets of Infants and Young Children Six to 23 Months***

BIFAD transmitted the following recommendations to USAID's Administrator on February 21, 2023 from the October 19, 2022 public meeting *Fed to Thrive: Accelerating Action on Nourishing Foods for Infants and Young Children*:

1. Elevate improvement of diets of infants and children aged six to 23 months as central in USAID's multi-sectoral nutrition programming.
2. Organize USAID resources and structures to maximize multi-sectoral integration and long-term efforts. Identify and scale up promising solutions to address gaps in infant and young children's diets.
3. Focus social assistance programs to target households with women and children in the first 1,000 days to improve access to and uptake of nutritious diets for infants and young children.

4. Leverage USAID’s knowledge assets, convening power, and influence to partner with host-country governments and international bodies to improve the policy and regulatory environment for children’s diets, including standards for specialized complementary foods and related products.
5. Position young children’s right to nutritious diets as an essential priority in national development agendas.
6. Support development of an enabling environment for food industries, particularly small- and medium-scale enterprises, including improving access to necessary financing and technical assistance, and providing incentives for them to produce affordable and safe nutrient-dense foods for children six to 23 months of age.

**Draft Report: Operationalizing USAID’s Climate Strategy to Achieve Transformative Adaptation and Mitigation in Agricultural and Food Systems**

In advance of the September 11, 2023, public meeting, a [draft](#) of the peer-reviewed report, *Operationalizing USAID’s Climate Strategy to Achieve Transformative Adaptation and Mitigation in Agricultural and Food Systems*, was posted for public comment. The draft report included 2030 targets for USAID and a set of recommendations to achieve transformative change, encompassing both Agency operations and social and technical leverage points that merit additional investment. The recommendations were intended to support USAID’s implementation of the [USAID 2022–2030 Climate Strategy](#) throughout its agricultural, nutrition, and food systems portfolio. The recommendations in the draft report stemmed from multidisciplinary evidence gathering and independent expert consultations led by a BIFAD Subcommittee on Systemic Solutions for Climate Change Adaptation and Mitigation in Agriculture, Nutrition, and Food Systems. Members of the subcommittee include:

- Co-Chair Erin Coughlan de Perez, Research Director, Dignitas Professor, Friedman School of Nutrition, Tufts University, USA;
- Co-Chair Eva (Lini) Wollenberg, Research Professor, Gund Institute, University of Vermont, Associate Scientist, Alliance of Bioversity International and International Center for Tropical Agriculture (CIAT), USA;
- Mauricio Benitez, Nature-Based Solutions and Food Systems Lead, responsAbility Investments AG, Switzerland (until March 2023);
- Daniela Chiriac, Senior Consultant, Climate Policy Initiative, UK;
- Juan Echanove, Associate Vice President, Food and Water Systems, CARE, USA (until September 2022);
- Chinenye Juliet Ejezie, Founder and CEO, Dozliet, Anim Farms, and Country Coordinator, Climate Smart Agriculture Youth Network (CSAYN), Nigeria;
- Jessica Fanzo, Bloomberg Distinguished Professor of Global Food Policy and Ethics, Johns Hopkins University, USA;
- Mario Herrero, Professor, Cornell Atkinson Scholar, Department of Global Development, Cornell University, USA;
- Sophia Huyer, Gender and Social Inclusion Lead, Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA), ILRI, Canada;

- Andrew Muhammad, Professor and Blasingame Chair of Excellence in Agricultural Policy, University of Tennessee, USA;
- Carlijn Nouwen, Co-founder, Climate Action Platform for Africa (CAP-A), The Netherlands;
- Ishmael Sunga, Chief Executive Officer, Southern African Confederation of Agricultural Unions (SACAU), South Africa;
- Angelino Viceisza, Associate Professor of Economics, Spelman College, USA (until March 2023);
- Peter Wright, Senior Technical Advisor, Climate Resilient Agriculture, CARE, USA (from September 2022).

### **Recognizing Research Excellence for Impact: Presentation of the 2021 BIFAD Awards for Scientific Excellence in a Feed the Future Innovation Lab**

On December 7, 2022, BIFAD hosted a virtual awards program to present the recipients of the 2021 BIFAD Awards for Scientific Excellence in a Feed the Future Innovation Lab. The program, co-hosted with the Feed the Future Innovation Lab Council of Directors; the Integrated Pest Management Innovation Lab at Virginia Tech; and the Feed the Future Innovation Lab for Food Security Policy Research, Capacity, and Influence at Michigan State University, included presentations from the award recipients on their research and the impacts in local communities. The 2021 Senior Research Award recipient, Dr. Thomas (Thom) Jayne, University Foundation Professor Emeritus of Agricultural, Food, and Resource Economics at Michigan State University, presented economic and policy research on food systems transformation in Africa carried out with the Feed the Future Innovation Lab for Food Security Policy Research, Capacity, and Influence and other Feed the Future Innovation Labs. The 2021 Student Research Award recipient, Ms. Seerjana Maharjan, doctoral student at Tribhuvan University in Nepal, presented research on the ecology and biological control of invasive weed species in central Nepal carried out with the Feed the Future Innovation Lab for Integrated Pest Management.

### **Announcement and Presentation of the 2022 BIFAD Awards for Scientific Excellence in a Feed the Future Innovation Lab**

BIFAD awarded the 2022 BIFAD Global Innovator Award to Dr. Lora Iannotti, Professor at the Brown School at Washington University in St. Louis, Founding Director of the E3 Nutrition Lab, and Director of Planetary Health and Environmental Justice in Washington University in St. Louis. Dr. Iannotti is an expert in maternal and young child nutrition and nutrient deficiencies related to poverty and infectious diseases, and she serves as a Nutrition Specialist for the Feed the Future Innovation Lab for Fish, led by Mississippi State University. She was recognized for her research to improve nutrition for vulnerable groups through sustainable fisheries. Dr. Iannotti presented her research at an award celebration on September 12, 2023, during the Feed the Future Innovation Labs' annual meeting in Washington, D.C.

The BIFAD award recognizes outstanding research contributions to the interdependent objectives of the U.S. government's [Global Food Security Strategy](#): inclusive and sustainable agriculture-led economic growth, strengthened resilience among people and systems, and a well-nourished population. The Global Innovator Award recognizes a researcher whose



research demonstrates exemplary scientific merit, relevance to national and/or regional priorities, impact or demonstrated potential for impact, and demonstrated commitment to inclusive development and local capacity development.

Members of the BIFAD awards selection subcommittee that reviewed the 2022 award nominees included:

- Ms. Marie Boyd, BIFAD Member and Associate Professor, University of South Carolina Joseph F. Rice School of Law (chair)
- Ms. Henri G. Moore, BIFAD member and Vice President/Head of Responsible Business at Haleon
- Ms. Jahqethea Johnson, Northern Plains Region Agricultural Statistician at USDA-NASS and MANRRS National Graduate Student President
- Dr. James Hansen, Senior Research Scientist at the International Research Institute for Climate and Society (IRI), Columbia Climate School at Columbia University
- Dr. Laté Lawson-Lartego, Chief Innovation Officer, Global Innovation Lab for Equality (aGILE) at Oxfam America
- Dr. Abebe Shimeles, Honorary Professor at University of Cape Town, South Africa

### **BIFAD Remarks at a Congressional Event hosted by the Feed the Future Innovation Lab for Horticulture**

During the Feed the Future Innovation Labs annual meeting on September 12, 2023, BIFAD member Kathy Spahn, President and CEO of Helen Keller International, presented remarks at a congressional event hosted by the University of California at Davis, lead implementer of the Feed the Future Innovation Lab for Horticulture. Ms. Spahn gave an overview of the mission and current work plan of the Board and highlighted the draft report, *Operationalizing USAID's Climate Strategy to Achieve Transformative Adaptation and Mitigation in Agricultural and Food Systems*. She underscored the benefits of Innovation Labs to the global community, including to the United States, citing a previous BIFAD report that quantified the substantial benefits in exports and jobs, technology spillovers, health and nutrition, and security that accrue back to the United States through investments in agriculture and food security abroad. Ms. Spahn shared examples of Innovation Lab research results that have been put into practice, including Purdue Improved Crop Storage Bags to reduce aflatoxin contamination, chimney solar dryers to preserve crops and reduce post-harvest losses, and improved legume crop varieties for improved resilience to environmental stresses and pests.

Table 1 summarizes BIFAD's public events, stakeholder engagements, and formally transmitted recommendations to USAID during FY 2023.

**Table 1. Summary of BIFAD Events, Engagements, and Recommendations in FY 2023 (Oct 2022–Sept 2023)**

Date and Location	Event	Highlights
October 19, 2022, Des Moines, Iowa	BIFAD Public Meeting <i>Fed to Thrive: Accelerating Action on Nourishing Foods for Infants and Young Children</i> ,	BIFAD hosted the hybrid public meeting, <i>Fed to Thrive: Accelerating Action on Nourishing Foods for Infants and Young Children</i> , as a side event of the 2022 Borlaug Dialogue at the World Food Prize under the theme “Feeding a Fragile World.” The meeting convened expert presenters and sought public input on evidence-based solutions for increasing the affordability, availability, and convenience of nutrient-dense foods for infants and children six months to two years of age, providing adequate safety nets for families most vulnerable to early childhood malnutrition, and engaging across systems to deliver on the global commitment to feed a fragile world.
October 26, 2022, Virtual	BIFAD virtual public meeting, <i>Transformative Pathways Toward a Climate-Resilient Agriculture, Food, and Nutrition System: A Public Consultation Ahead of the 27th Conference of Parties</i>	At this virtual public meeting, authors of a <a href="#">working paper</a> —prepared for BIFAD and guided by the BIFAD Subcommittee on Systemic Solutions for Climate Change Adaptation and Mitigation in Agriculture, Nutrition, and Food Systems—presented preliminary findings related to climate-resilient pathways for inclusive, transformative systemic change in agricultural, nutrition, and food systems; priority systems for inclusive transformation in food, agriculture, and nutrition; barriers to inclusive transformation in agricultural, nutrition, and food systems; priority leverage points for transformative systemic change; and climate finance solutions to catalyze inclusive adaptation and mitigation actions in the agrifood sector.. Following the presentation, members of the subcommittee, BIFAD, USAID, and public participants commented and reacted to the working paper.
November 14, 2022, COP27 Food Systems Pavillion, Sharm El-Sheikh, Egypt, Hybrid	<i>Achieving Ambitious Food Systems Transformation in the Context of USAID’s New Climate Strategy: A Listening Session.</i>	Members of the BIFAD Subcommittee on Systemic Solutions for Climate Change Adaptation and Mitigation in Agricultural, Nutrition, and Food Systems and authors of a prepared for BIFAD presented preliminary findings of a <a href="#">working paper</a> , with dedicated time for input from COP 27 participants and the wider public. The session objectives were to improve the draft recommendations for the ambitious implementation of the USAID Climate Strategy,

		2022–2030 and to identify points of consensus and key gaps.
December 7, 2022, Virtual	<i>Recognizing Research Excellence for Impact: Presentation of the 2021 BIFAD Awards for Scientific Excellence in a Feed the Future Innovation Lab</i>	BIFAD event to recognize the 2021 BIFAD Awards for Scientific Excellence in a Feed the Future Innovation Lab recipients. The program, co-hosted with the Feed the Future Innovation Lab Council of Directors; the Integrated Pest Management Innovation Lab at Virginia Tech; and the Feed the Future Innovation Lab for Food Security Policy Research, Capacity, and Influence at Michigan State University, included presentations from the award recipients on their research and the impacts on local communities.
December 19, 2022	<i>BIFAD Recommendations on Resilient Food Systems</i>	In a memo to Administrator Samantha Power, BIFAD transmitted findings, conclusions, recommendations, and proposed follow-up work for BIFAD from its May 23, 2022 public meeting, <i>The Global Food Security Crisis: Exploring the Evidence Base and Lessons from the Past to Strengthen Agricultural, Nutrition, and Food Systems in the Face of Shocks</i> .
February 21, 2023	<i>BIFAD Recommended USAID Accelerated Action on Nutritious Foods for Infants and Young Children</i>	In a memo to USAID Administrator Samantha Power, BIFAD urged for continued agency leadership to address malnutrition in infants and young children to save lives and to help safeguard the health and well-being of future generations around the world. The BIFAD memo summarizes the findings, conclusions, and recommendations from deliberations with experts and public comment at BIFAD’s public meeting on October 19, 2022.
June 28, 2023, Virtual	<i>BIFAD virtual public meeting, A Public Consultation on BIFAD’s Plans to Propose a Subcommittee on Minority Serving Institution Engagement and Leadership in USAID’s Agricultural, Food Security, and Nutrition Programming</i>	The meeting assembled expert panelists and invited stakeholders to provide input on the proposed MSI subcommittee objectives and membership plan. At the meeting, expert panelists provided perspective on opportunities and challenges for USAID engagement and collaboration with MSIs in agriculture, food security, and nutrition programming. Members of the MSI community, underrepresented groups in academia, USAID implementing partners, and other stakeholders discussed and shared feedback on the draft objectives and membership plan for the BIFAD subcommittee during a public comment period.
September 11, 2023,	<i>BIFAD hybrid public meeting, Elevating Climate Change</i>	The meeting’s purpose was to address the opportunities and challenges of transformational

<p>Washington, D.C.</p>	<p><i>Adaptation and Mitigation in USAID’s Agricultural, Nutrition, and Food System Programming to Inform Strategy Implementation: A Discussion of the BIFAD Climate Change Subcommittee Draft Commissioned Report.</i></p>	<p>climate change adaptation and mitigation in USAID’s agricultural, nutrition, and food systems programming. The event and associated report sought to elevate a public dialogue on the efficient and effective operationalization of the USAID Climate Strategy 2022–2030. The program for the meeting included insights and deliberations from USAID, stakeholders, and the public on draft recommendations to integrate climate change adaptation and mitigation into USAID’s agricultural, nutrition, and food system programming, research investments, and operations, as well as mobilizing climate finance for more resilient and sustainable food systems.</p>
<p>September 12, 2023, Washington, D.C.</p>	<p><i>Feed the Future Innovation Labs Meeting</i></p>	<p>BIFAD members participated in the Feed the Future Innovation Labs’ Annual Meeting and celebrated Dr. Lora Iannotti, recipient of the 2022 BIFAD Global Innovator Award for Scientific Excellence in a Feed the Future Innovation Lab.</p> <p>BIFAD Member Kathy Spahn, President and CEO of Helen Keller International, represented BIFAD in remarks at a Congressional event hosted by the University of California, Davis, lead implementer of the Feed the Future Innovation Lab for Horticulture.</p>

#### IV. RESPONSE BY THE BOARD FOR FOOD AND AGRICULTURAL DEVELOPMENT TO THE REPORT SUBMITTED TO CONGRESS BY THE U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT FOR FY 2021 UNDER TITLE XII OF THE FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

BIFAD is pleased to respond to the Title XII Report to Congress for FY 2023. This past year was fraught with the continuing impacts of COVID, climate change, political instability, and conflict the world over—all of which eroded decades of past development gains. According to the United Nations’ annual state of global food security report, stalled progress on food security, “with the prevalence of undernourishment persisting at nearly the same level for three consecutive years after having risen sharply in the wake of the COVID-19 pandemic,” puts the world “far off track to achieve Sustainable Development Goal 2, Zero Hunger,” by 2030.<sup>5</sup>

The Board commends USAID and university partners in the United States and the Global South for their leadership and steadfast commitment to ending hunger, malnutrition, and poverty during these tumultuous times. The Board recognizes the need to balance responding to urgent on-the-ground needs in a timely way with the longer-term investments needed to build resilience in the face of so many shocks, including investments in strengthening local capacity and in research. The Board also acknowledges the inseparable link between climate change and hunger and malnutrition. The Board applauds USAID’s decision to incorporate its climate work into the Bureau for Resilience and Food Security, creating a new Bureau for Resilience, Environment, and Food Security. BIFAD values its partnership with the new Bureau and is committed to collaborating with USAID to ensure that the Board’s advice closely aligns with the Agency’s needs.

Having reviewed the FY 2023 report, the Board offers the following reflections:

##### ***Affordable Complementary Foods for Infants and Young Children Aged Six to 23 Months***

We reported last year about BIFAD’s recommendations on affordability, availability, and convenience of healthy and nourishing diets for infants and children aged six to 23 months. We are pleased to see that some of these recommendations have already been taken up and encourage continued focus on this crucial period in a child’s development when both physical and cognitive development outcomes are determined. The damage resulting from poor, low-nutrient diets in that age range is irreversible and preventable.

We reiterate our recommendation to elevate the quality of diets of infants and children six to 23 months of age as central in USAID’s nutrition programming across all relevant bureaus, given the lifelong impacts of poor diets in early life and the extraordinary nutrient needs of this age group. We underscore the need for multi-sectoral integration and longer-term investments, and the related need to ensure that USAID structures and resources are organized so as to maximize these. We also recognize and support the need for the development of an enabling

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<sup>5</sup> FAO, IFAD, UNICEF, WFP, and WHO. 2024. The State of Food Security and Nutrition in the World 2024 – Financing to end hunger, food insecurity and malnutrition in all its forms. Rome. <https://doi.org/10.4060/cd1254en>

environment that includes improved access to financing and technical assistance for food industries, particularly SMEs. As part of this, we highlight the need to provide incentives to food industries to produce affordable and safe nutrient-dense foods for children six to 23 months of age. These efforts have grown in importance due to the increasingly deleterious effects of both climate change and conflict on agricultural productivity and food prices.

The Board also recognized the important role that Feed the Future Innovation Labs and other USAID higher education partnerships play in identifying and scaling up promising solutions to address gaps in infant and young children's diets. It is critical that these initiatives continue to engage their local research partners and other stakeholders using a food-system approach. Specifically, the Board recommends continued and increased emphasis on research on scalable solutions to address the diets of children six to 23 months of age. The Board is simultaneously focused on the demand side, conducting an evidence review and convening an expert roundtable discussion on interventions to increase the sale, distribution, purchase and consumption of nutritious, healthy foods. These will feed into a public meeting in September 2024, which will result in recommendations regarding priorities, programs, and policies USAID can implement to increase the demand for nutritious foods.

### ***Climate Change Adaptation and Mitigation in Agrifood Systems***

As the past year was already 1.52°C warmer on average than pre-industrial temperatures, efforts to enable climate change adaptation are vital. These include such technologies as drought-tolerant crops, biochar to increase water-holding capacity, and improved access to and knowledge about technologies to support adoption. The Board has noted the significant efforts by FTFILs to support community, national, and global efforts to adapt to climate change, clearly articulated in their numerous activities and impressive achievements over the fiscal year. The Board is also pleased to have developed a report, guided by a subcommittee of 11 experts, and new recommendations intended to accelerate USAID's achievement of its ambitious Climate Strategy goals specific to agrifood systems programming.

### ***Inclusive Development, Localization, and MSI Engagement***

We appreciate the deliberate efforts made by several Innovation Labs to understand and address issues around gender and inclusion and to strengthen the capacity of local partners. Efforts by the FTFILs to collaborate with local partners and strengthen local research and research-based organizations are particularly impressive, with significant opportunities for lessons learned in line with the current USAID localization agenda. The Board notes that larger efforts by Innovation Labs continue to be made on farm, with less attention to the midstream and downstream of input and output value chains such as agro-dealers and seeds systems (on the input side) and wholesalers, processors, transporters, and food service providers (on the output side). The Board recommends giving additional attention to these segments of food supply chains (beyond the farm) because they can be significant drivers of the adoption of many FTFIL innovations at scale.

BIFAD is now working to establish the Subcommittee on MSI Engagement and Leadership—recently approved by USAID Administrator Samantha Power—to identify how the Agency can best bring the resources and capabilities of MSIs to bear on global agricultural development, food security, nutrition, and the related topics of climate change, environmental sustainability, and resilience.

MSIs face significant challenges in competing for USAID funding, and they are traditionally underrepresented in federal funding and programming. MSIs often have more limited financial resources than other institutions, making it difficult to compete for funding opportunities, and they therefore have less experience and familiarity with the grant application process and available funding streams. Despite these challenges, MSIs play a crucial role in the nation’s economy by enhancing workforce opportunities for disadvantaged individuals in careers that require advanced education and training.

The new subcommittee will support an Agency goal to promote and sustain the inclusive and equitable engagement of MSIs in Agency policy and programming relevant to the U.S. government’s Global Food Security Strategy. Recommendations will clearly identify opportunities to address specific gaps within USAID capacity, policies, and programs that may hinder MSI engagement. These recommendations will amplify solutions that enable both USAID and MSIs to more fully leverage MSI expertise and networks. The subcommittee will review USAID’s current programs and approaches to MSI engagement in order to assess the effectiveness and scalability of these initiatives.

### ***Going Forward***

The Board applauds USAID’s five-year vision and anticipated expansion of the topical breadth of the Feed the Future Innovation Lab portfolio, including an anticipated focus on integrated water and soil management; nutrient-dense and climate-resistant crop improvement and value-chain development targeting rainfed agricultural systems; and other priorities, subject to availability of funds. Crops must be viewed through the lenses of nutrient value *and* climate adaptation and mitigation. We concur with the need for increased research on the behavior changes necessary for increased uptake of climate-smart agricultural approaches. We underscore the interconnectedness of climate and nutrition—the climate crisis is a nutrition crisis, and the nutrition crisis is a climate crisis; neither can be tackled absent the other.

Submitted by the following BIFAD members on August 1, 2024:

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Henri G. Moore, Former Vice President/Head of Responsible Business, Haleon  
Kathy Spahn, President Emerita, Helen Keller International



V. APPENDICES

**Appendix 1:**

**U.S. Higher-Educational Partners of the Feed the Future Innovation Labs during Fiscal Year 2023**

SUMMARY

- Total of 83 institutions, of which 23 are MSIs, in 39 states, Washington, D.C., and Puerto Rico [Note: Universities with asterisks below are MSIs].
- 15 universities **lead** 22 Innovation Labs [Note: Lead universities are **bolded**].

Alcorn State University (MS)*	North Carolina A&T University*	University of California, Santa Barbara*
Arizona State University*	North Carolina State University	University of California, Santa Cruz*
Arkansas State University	North Dakota State University	University of Chicago (IL)
Auburn University (AL)	Northwestern University (IL)	University of Colorado
Boston University (MA)	Ohio State University	University of Connecticut
California State University Chico*	Oklahoma State University	<b>University of Florida</b>
Catholic University of America (DC)	<b>Pennsylvania State University</b>	<b>University of Georgia</b>
Clemson University (SC)	Prairie View A&M University (TX)*	<b>University of Illinois</b>
Colorado State University	<b>Purdue University (IN)</b>	University of Kentucky
Columbia University (NY)	Rutgers University (NJ)	University of Maine
<b>Cornell University (NY)</b>	San Diego State University (CA)*	University of Maryland, College Park
Delaware State University*	South Carolina State University*	Univ. of Maryland, Eastern Shore*
Duke University (NC)	South Dakota State University	University of Michigan
Emory University (GA)	Stanford University (CA)	University of Minnesota
Florida A&M University*	Syracuse University (NY)	University of Missouri
Georgia State University*	Tennessee State University*	<b>University of Nebraska</b>
Hamilton College (NY)	<b>Texas A&amp;M University</b>	University of North Carolina
Harvard University (MA)	Texas State University*	University of Pennsylvania
Iowa State University	Texas Tech University*	University of Puerto Rico, Mayaguez*
John Hopkins University (MD)	<b>Tufts University (MA)</b>	University of Rhode Island
<b>Kansas State University</b>	Tuskegee University (AL)*	University of Tennessee
Lincoln University (MO)*	University of Alabama	Utah State University
Louisiana State University	University of Alaska Fairbanks*	<b>Virginia Tech University</b>
Massachusetts Institute of Technology	University of Arizona*	<b>Washington State University</b>
<b>Michigan State University</b>	University of Arkansas	Washington University in St. Louis (MO)
Middlebury College (VT)	University of California, Berkeley	Williams College (MA)
<b>Mississippi State University</b>	<b>University of California, Davis*</b>	
Montana State University	University of California, Riverside*	
	University of California, San Diego	