



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



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Food Systems for Nutrition Innovation Lab Year 2: Annual Report

September 10, 2022 - October 9, 2023

Tufts Friedman School of Nutrition Science and Policy
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Management Entity Information

Tufts University's Friedman School of Nutrition Science and Policy is the Management Entity (ME) for the Feed the Future Food Systems for Nutrition Innovation Lab (hereafter called FSN-IL). The FSN-IL's core activities are funded under cooperative agreement 7200AA21LE0001 from the United States Agency for International Development (USAID).

Core Management Team	Position	Email Address
Patrick Webb	Program Director	Patrick.Webb@tufts.edu
Shibani Ghosh	Associate Director	Shibani.Ghosh@tufts.edu
Robin Shrestha	Research and Capacity Building Manager	Robin.Shrestha@tufts.edu
Elizabeth Marino-Costello	Senior Program Manager	Elizabeth.Marino_Costello@tufts.edu
Jennifer Rae Stickland	Project Administrator	Jennifer.Stickland@tufts.edu
Shaelin Cullen	Project Coordinator	Shaelin.Cullen@tufts.edu
Maha Sheikh	Communications Specialist	Maha.Sheikh@tufts.edu

Technical and/or Advisory Committee Information

Technical Specialists: Tufts University Friedman School of Nutrition Science and Policy

Lynne Ausman, Professor

Erin Coughlan de Perez, Associate Professor

Eileen Kennedy, Professor

Will Masters, Professor

Beatrice Rogers, Professor

Katie Stebbins, Executive Director, Food and Nutrition Innovation Institute

Expert Advisory Board

Richard Deckelbaum, Professor & Director, Institute of Human Nutrition College of Physicians and Surgeons, Columbia University

Rafael Flor, Senior Program Officer Bill and Melinda Gates Foundation

Isatou Jallow, Founder & Executive Director, AfriCAN - Africa Catalyzing Action for Nutrition Network

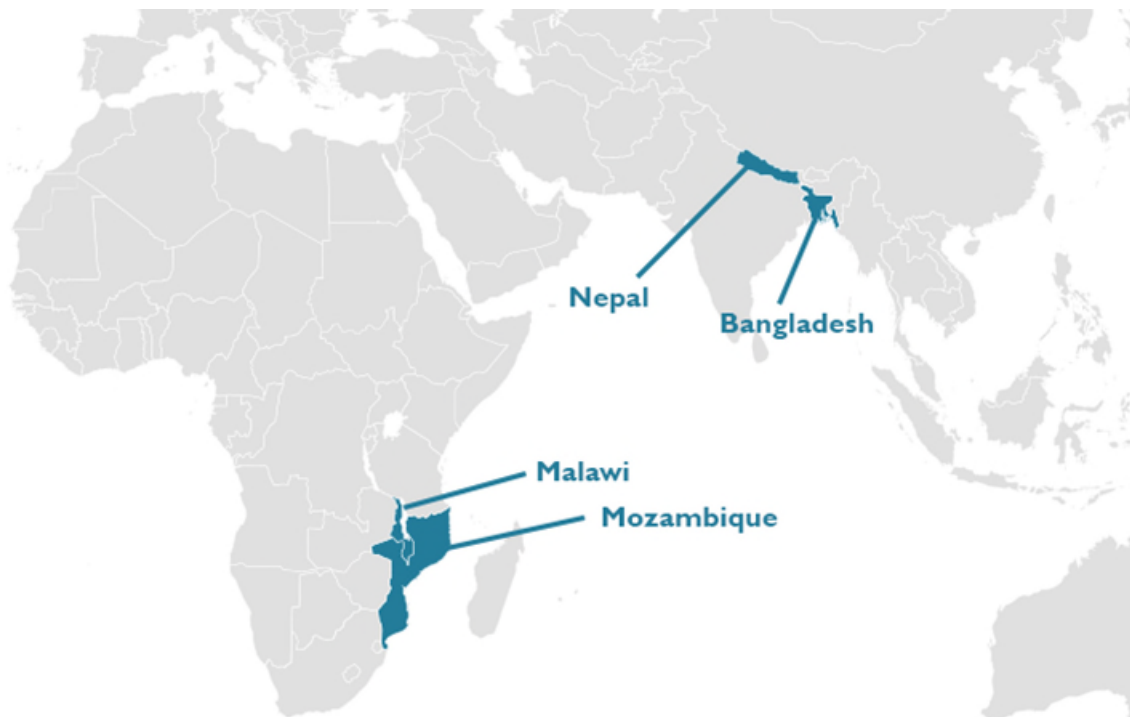
Ahmed Kablan, Senior Science Officer, USAID/RFS/Nutrition Center/Food Safety Division

Prabhu Pingali, Professor & Director, Tata-Cornell Agriculture & Nutrition Institute, Cornell University

Ram Shrestha, Director, International Affairs and Research CAFODAT College

Shakuntala Thilsted, Director, Nutrition, Health and Food Security Impact Area Platform, CGIAR

Map of FSN-IL's Target Countries



Consortium Partners

- The 1890 Universities Foundation
- Action for Enterprise (AFE)
- American Indian Higher Education Consortium (AIHEC)
- Arizona State University, Swette Center
- California State University, San Bernardino
- Global Alliance for Improved Nutrition (GAIN)
- Harvard T.H. Chan School of Public Health
- Helen Keller International (HKI)
- Hispanic Association of Colleges and Universities (HACU)
- International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
- International Food Policy Research Institute (IFPRI)
- Johns Hopkins University
- Michigan State University
- National Cooperative Business Association/CLUSA International (NCBA/CLUSA)
- Purdue University
- Texas A&M University (Borlaug Institute)
- Tuskegee University
- University of Colorado School of Medicine
- World Vegetable Center

Acronyms

AFE	Action for Enterprise
AIHEC	American Indian Higher Education Consortium
AGCI	Aspen Global Change Institute
ANH	Agriculture, Nutrition, and Health
AOR	Agreement Officer's Representative
BARI	Bangladesh Agriculture Research Institute
BAU	Bangladesh Agricultural University
BIFAD	Board for International Food and Agricultural Development
CAFODAT	College of Applied Food and Dairy Technology
CIMMYT	International Maize and Wheat Improvement Center
CoP	Community of Practice
COVID-19	Coronavirus Disease 2019
D4N	Delivering for Nutrition
DFTQC	Department of Food Technology and Quality Control
EMMP	Environmental Mitigation and Monitoring Plan
FAO	Food and Agriculture Organization of the United Nations
FCON	National Conference on Food Science and Technology
FLW	Food, Loss and Waste
FS	Food Systems
FSN-IL	Food Systems for Nutrition Innovation Lab
FTF	Feed the Future
GAIN	Global Alliance for Improved Nutrition
GFM	Global Farm Metric
GHG	Greenhouse Gas
HACU	Hispanic Association of Colleges and Universities
HBM	Health Belief Model
HICD	Human and Institutional Capacity Development
HKI	Helen Keller International
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IFPRI	International Food Policy Research Institute
IFSS	Innovative Food System Solution
IL	Innovation Lab
ILC	Innovation Lab Council
LMIC	Low and Middle-Income Countries
ME	Management Entity
MENA	Middle East and Northern Africa
MS	Master of Science
MSP	Market Systems and Partnerships
NCBA/CLUSA	National Cooperative Business Association/CLUSA International
NEFOSTA	Nepal Food Scientists and Technologists Association
POC	Point of Contact
R4D	Research for Development
RFA	Request for Application
RFP	Request for Proposal
RFS	Bureau for Resilience and Food Security
SBN	SUN Business Network

SHiFT	Sustainable Healthy Diets Initiative
SME	Small and Medium-Sized Enterprise
SOW	Scope of Work
SUN	Scaling Up Nutrition
TPB	Theory of Planned Behaviour
U.S.	United States
USAID	United States Agency for International Development

I) Executive Summary

The Food Systems for Nutrition Innovation Lab (FSN-IL) promotes food system innovations, novel technologies, and best practices to support improved diet quality, nutrition, and resilience. The goal of FSN-IL is to identify, test, and help scale promising nutrition-sensitive food system solutions from around the world by implementing an integrated effort across three domains to i) generate new research for development (R4D) while also effectively disseminating existing (but under-used) ready-to-use, pipeline-ready innovations; ii) support human and institutional capacity development HICD in partner countries and in the United States (U.S.) aimed at promoting capacity to understand R4D and promotion of innovations; and iii) engage widely 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.

Throughout Year 2 (FY23), the Food Systems for Nutrition Innovation Lab undertook comprehensive consultation and engagement activities to pave the way for research for development, human and institutional capacity-development, and engagement initiatives. The scoping exercise conducted through 18 consortium partners produced and finalized five thematic reports. From these, a manuscript on novel metrics for food systems and nutrition has been written in collaboration with Harvard and Boston Children's Hospital, and a peer-reviewed supplement is being prepared for publication in the journal *Nutrition Reviews*. Extensive consultations were conducted in three of the focus countries (Nepal, Bangladesh, and Malawi), and an engagement strategy was developed, facilitating interactions with over 100 diverse stakeholders in the target geographies. The first round of competitive grants was undertaken; a Request for Applications (RFA) was successfully released and five projects focusing on storage, packaging, and cooling innovations for perishable foods in target countries were selected and are ready for implementation.

Curriculum development needs were assessed in Bangladesh and Nepal, and a Master of Science curriculum in Food Technology and Applied Nutrition in Bangladesh was successfully reviewed. Exhibitions showcasing food business and entrepreneurship were held in Nepal that highlighted eight Nepal-based enterprises, and plans are underway for Food Frontiers 3.0, an innovation challenge, to kick off in Bangladesh in October 2023. FSN-IL supported the 9th National Conference on Food Science and Technology in Nepal and the Agriculture, Nutrition, and Health (ANH) Academy Week in Malawi, which served as platforms for discussions on food systems, nutrition, and sustainable development. Travel and training fellowships also were awarded to over 40 students and faculty from Nepal, Malawi, and Mozambique to attend the conferences. FSN-IL continued to support capacity-building on solutions to manage food loss and waste (FLW), and actively participated in USAID's Community of Practice on FLW, a G7 Technical Workshop on Food Loss and Waste, and planning for upcoming Aspen Global Change Institute (AGCI) workshops.

The cumulative efforts in Year 2 reflect FSN-IL's commitment to enhancing food systems for nutrition. Moving forward, the Lab is poised to continue its impactful work in FY24, building on the groundwork laid in FY22 and FY23.

II) Research Program Overview

The Food Systems for Nutrition Innovation Lab (FSN-IL) takes a comprehensive approach to generating evidence and disseminating scalable innovations (technologies, processes, and practices) that can support the uptake of food system innovations to improve incomes, diet quality, resilience, and nutrition. FSN-IL manages an integrated effort across three interlocking activity domains to i) generate new research for development while also effectively disseminating existing but under-used, ready-to-use, pipeline-ready innovations; ii) support human and institutional capacity development in partner countries and in the U.S. aimed at promoting capacity to understand R4D and promotion of innovations; and iii) engagement 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. Appropriate actions in the inter-connected activity domains will contribute to a range of development outcomes, including improved diets and nutrition, poverty reduction, enhanced sustainability of food systems, and resilience.

FSN-IL Activities

The three FSN-IL activities are elaborated below.

Activity 1: Research for Development

Effective R4D draws on the growing suite of potentially applicable solutions, translating evidence to adoption of best practices, tailored to a range of user needs. While numerous technologies, products, and practices focused on nutrient dense food crops and items have been successfully piloted in agriculture, post-harvest storage, processing and distribution, the process of scaling them up to wider adoption and replication has proven challenging. For example, innovators have not always engaged with the scaling process and potential promoters and adopters have not sufficiently engaged with R4D processes. Simultaneously, there are challenges faced by researchers who are involved in agriculture technology innovations to identify options most likely to support improvements in nutrition outcomes. As a result, significant gaps remain between investments in research and the “last mile” of the discovery-to-impact process.

Activity 2: Human and Institutional Capacity Development

HICD actions through the FSN-IL bring benefits to low- and middle-income countries (LMICs), U.S. institutions, development partners, and business networks. FSN-IL continues to establish a strong cadre of LMIC-based professionals with advanced competencies and skills, support local youth- and women-led small and medium-sized enterprise (SME) innovations, and strengthen organizations and networks in which these individuals are embedded. This strategy includes HICD initiatives that are both academic and non-academic in nature.

Activity 3: Stakeholder Engagement

Stakeholder engagement is fundamentally necessary throughout the discovery-to-impact process. FSN-IL seeks to catalyze uptake of findings from R4D and insights derived from HICD to promote awareness of and interest in nutrition-sensitive food system (FS) innovations. FSN-IL continues to promote uptake by actively engaging with private sector hubs and business associations that link suppliers, retail competitors, regulators, and other influential market stakeholders.

Theory of Change and Impact Pathways

Many technology and practice innovations already exist relating to food production, but few focus downstream on nutrition-sensitive markets and businesses, resilience, technology uptake, and the role of youth and women in enhanced value chain impacts. While the set of potential solutions grows, translation of evidence is lagging. The rationale underpinning the FSN-IL's proposed strategy is that stronger evidence and more effective dissemination are needed for technologies, products, ingredients, packaging, processes, storage, marketing, and consumer promotion of nutrient-rich foods, many of which are of higher value and more perishable than staple grains and tubers. The FSN-IL theory of change is based on effective integration of efforts and resources across the three principal domains of activity and is outlined in Figure 1.

For R4D, the theory of change involves three key steps supporting transmission of i) “on-the-shelf” and/or “potential” nutrition-sensitive solutions (technologies, processes, practices) to ii) potential users, leading to iii) wide adoption, with clear benefits to ultimate beneficiaries. Along this pathway from discovery to impact, FSN-IL will identify candidate solutions, prioritize options for real-world testing or further adaptation, establish rigorous evidence on feasibility, costs, and potential benefits along the value chain, disseminate findings, and document scalability. HICD includes activities that support both LMIC and U.S. institutions and stakeholders and raise capacities to generate and transfer knowledge, technologies, and practices for nutrition-sensitive food systems. Engagement will involve wide-ranging activities that will aim to enhance in-country academic, business and policymaker understanding of, and interaction with, relevant R4D and HICD activities while engaging regional and global stakeholders.



Figure 1. Food Systems for Nutrition Innovation Lab's Theory of Change Framework

Through active engagement with diverse categories of stakeholders, the FSN-IL will facilitate R4D and HICD to support the uptake of best practices and innovative nutrition-sensitive FS technologies. Figure 1 illustrates the interlocking nature of principal activities and feedback loops, their cumulative effects, and the overall process by which the generation of novel results will support scaling of nutrition-sensitive FS solutions.

III) Research for Development

Activity I: Scoping Exercises and Consultations

The aim of the scoping exercises and consultations pursued in Year 1 was to i) generate a preliminary census (identifying and listing) of innovations relevant across the food systems, ii) assess the technical viability, potential for scaling, and feasibility of such innovations in the real world, and iii) help prioritize 'best bet' innovations for possible funding under upcoming FSN-IL calls for research for development proposals.

In Year 2 (FY23), the outputs of the scoping exercise allowed the management entity (ME) to generate a robust strategy for R4D and inform the first round of calls for applications RFA, understand HICD needs in target geographies, and understand the stakeholder landscape and type of engagement that will be critical for the success of FSN-IL actions.

Activity I.1: Finalization of Scoping Exercise Reports

In Q1 of Year 2, the ME completed the review of the final scoping reports for each theme, as well as the innovation census and prioritization sheets received from the thematic scoping groups towards the end of Year 1. All but the Theme 5 report on "Novel Metrics on Food Systems for Nutrition" were finalized and copies of the first four scoping reports were submitted to USAID on January 19, 2023. The Theme 5 report was finalized in Q4 (July), at which time it was also shared with USAID.

In addition to the five reports, FSN-IL is closely coordinating with consortium partners at Harvard/Boston Children's Hospital to draft a manuscript on the findings from the Theme 5 scoping activity on novel metrics on food systems for nutrition. Additionally, FSN-IL received confirmation at the end of Q4 (September) on the request to publish the scoping reports as a supplement to the journal *Nutrition Reviews*. This is a significant milestone for FSN-IL, as this indicates that the findings from the scoping exercise will be disseminated among a wider audience in a reputable academic journal and will contribute to the broader scientific discourse on food systems and nutrition. Preparation of the supplement has begun accordingly.

Activity I.2: External Consultations

Between Q2 and Q3 of Year 2 (January-June), FSN-IL conducted a series of [external consultations](#) in three focus countries (Nepal, Bangladesh, and Malawi), and engaged with over 100 stakeholders, including food producers, processors, distributors, retailers, SMEs, start-ups, consumers, government officials, non-profit organizations, academic institutions, USAID Missions, and SUN business networks. The in-country consultations highlighted national and global challenges. Some of the common challenges that cut across FSN-IL's four focus countries include:

- Limited infrastructure for local food production, processing, packaging, and distribution
- High levels of food loss and waste along the supply chain (~30-40%)
- Economic barriers and lack of access to finance for small scale producers, SMEs, and start-ups
- Cost-effectiveness of business models
- Lack of awareness and demand about sustainable, safe, and nutritious food choices among consumers
- Policy and regulatory constraints and emphasis on coherence and systems approach affecting enabling environment of innovations that have the potential to be quickly scaled that would support improved diets and nutrition, reduce food loss and waste of perishable (nutrient dense) foods, and enhance food safety.

The framing of challenges and solutions through the internal and external consultations has allowed FSN-IL to redefine identified challenges as opportunities to develop conducive and enabling environments for innovations, and collaboratively design strategies and action plans in targeted geographies. One of the key R4D strategies adopted by FSN-IL is the concept of [socio-technical bundling of innovations](#) to comprehensively support or complement a set of innovations (technologies, processes, policies, and practices) to ensure reduction of food loss and waste while maintaining food safety and improved access and affordability of nutritious foods. Bundling of innovations should allow stakeholders to identify opportunities that exist in scaling and sustainability of innovations on retail, marketing, and consumer behavior. Through such broad consultation and in-depth exploration of the unfulfilled potential of existing innovations, FSN-IL contributes to an evidence-informed, practical roadmap towards healthier, safer, and more sustainable diets.

Activity 2: Research

FSN-IL is committed to filling the gap between the ambition for and achievement of scaling of nutrition-sensitive FS solutions in targeted resource-constrained settings. For this, the ME catalyzes rigorous R4D, primarily through openly competed awards. Such awards include grants for a 2- or 3-year period, depending on topics considered. These research priorities complement USAID and other donor-funded projects, safeguard scientific quality, provide opportunities to work with appropriate LMIC public- and private-sector institutions, and ensure that outputs and activities are relevant to FS stakeholders. For successful implementation of R4D activities, the ME focuses on developing and implementing a robust R4D strategy and program focused on the awarding of competitive grants. The sections below highlight the activities accomplished in Year 2.

Activity 2.1: Finalization of R4D Strategy

FSN-IL elaborated its R4D strategy to identify priority on-the-shelf innovations ready for testing, transfer, and potential upscaling based on outputs from the scoping exercise undertaken in Year 1 and external consultations undertaken in Year 2 with in-country stakeholders and local Missions. This strategy focused on awarding competitive grants. FSN-IL utilized the findings from the scoping exercise to successfully develop the priority R4D topics of the first research RFA (described in Activity 2.2). These findings, along with the strategy, will be used to inform the second RFA to be announced early in Year 3.

Activity 2.2: Finalization, Release, and Review of RFA

As part of the R4D activity, FSN-IL released the first round of “Request for Applications” (RFA) in Q1 titled, “Actions to support Storage, Packaging and/or Cooling Innovations for perishable foods in target geographies.” The focus for the RFA was on identifying actions to support storage, packaging, and cooling innovations to reduce loss and waste and ensure food safety of nutrient dense perishable foods in target countries (Bangladesh, Malawi, Mozambique, and Nepal). Priority was given to high quality proposals that further understanding of i) policy actions to enable and regulate scaling of innovations, ii) business strategies and models to enable scaling of innovations, and iii) cost-effectiveness of bundling of innovations around storage, packaging, and cooling. These topical areas are not mutually exclusive but should lead to actionable investments that support food systems transformation for nutrition in South Asia and Southern Africa.

The RFA included a two-step process. First, the ME received 20 concept notes submitted through the Piestar platform in response to the “Call for Applications” posted on December 16, 2022, of which 16 were selected by the review committee, and invited to submit a full proposal as part of step two. An external review committee comprised of Tufts technical specialists and FSN-IL partners reviewed the full proposals. Based on the USAID AOR’s recommendation and facilitation with the focus country missions,

respective point of contacts (POC) in three of the four country missions (Bangladesh, Mozambique, Nepal, and Malawi) were invited to review and provide feedback as non-voting members on the country-specific proposals. Recipients of the award were notified in April 2023. See Appendix B for the first page of the RFA Guidelines.

Activity 2.3: Implementation of Competitive Grants Program

Once final approval is received from USAID, FSN-IL will work with the grant awardees to finalize their work plans, and implementation of the five sub-awards will commence. The FSN-IL has begun developing the call for applications for the second round of competitive grants, to be implemented in Year 3.

IV) Human and Institutional Capacity Development

Activity 3: Human and Institutional Capacity Development

In Year 2, FSN-IL continued its commitment to strengthen both academic and non-academic human and institutional capacity development (HICD) actions through the FSN-IL targets benefiting LMICs and 1890s land grant institutions across the US, development partners, and business networks.

Activity 3.1: Finalization of HICD Strategy

As part of the process to develop the HICD strategy and activities, the ME finalized a call for applications for training and travel fellowships in the first half of FY23.

Activity 3.2: Development and Implementation of Advanced Competencies and Skills Training

Activity 3.2.1: Implementation of Travel Fellowships Targeting 1890s land grant institutions' Students and Faculty

In the second half of FY23, FSN-IL worked in close collaboration with the 1890 Universities Foundation to launch a student working group. The first charge for this student group is to identify gaps in student requirements around education in global development. To help address these gaps, the working group will identify conferences, programs, and short workshops for students to participate in, which will be funded through travel fellowships from FSN-IL.

Activity 3.2.2: Implementation of Training Fellowships Program Targeting 1890s land grant institutions and Focus Country Institution Students

Malawi

8th Annual Agriculture, Nutrition & Health Academy Week (ANH 2023)

In the first part of FY23, FSN-IL finalized the call for applications for travel fellowships targeting faculty and/or LMIC students to attend the 8th Annual ANH Academy week in Malawi in June of 2023. FSN-IL, in collaboration with the ANH Academy, supported eleven student researchers from Ethiopia, Bangladesh, Kenya, and Malawi to give oral and poster presentations through travel and training fellowships. Additionally, FSN-IL supported over 30 local Malawian students to attend the conference. These funds supported student presenters who otherwise would not be able to finance their participation. A complete list of presenters and their presentations are included in Table 3 of this report.

Nepal

9th National Conference on Food Science and Technology, June 12-13, 2023

Similar to the conference in Malawi, FSN-IL supported 10 Nepali students, (7 females, and 3 males) to participate in the Food Conference. All students that received travel fellowship support were from local academic institutions outside of Kathmandu.

Activity 3.2.3: Implementation of three Research Methods Workshops

In FY23, FSN-IL implemented three research methods workshops in the form of learning labs, private sector consultation workshops, and plenary sessions in the ANH and FAO Science and Innovation Forum.

In Q3, a learning lab on “Reducing Food Loss and Waste in Nutrient-Rich Value Chains,” led by Ahmed Kablan (USAID Bureau for Resilience and Food Security (RFS)) and Shibani Ghosh, was implemented at ANH 2023. In this learning lab, participants worked in groups and were assigned to discuss potential innovations in technologies, policies, and practices that would be needed to reduce food loss and waste in the Malawian food system, as well as the potential for the innovations to effect change individually and as a bundle of complementary actions. As an outcome of the learning lab, the 40 participants were able to identify key takeaways to adapt to their own work and/or research area.

In Q2 and Q3, the ME also planned and presented a plenary session for ANH titled, “Post-Farmgate Innovations to Support Healthy Diets.” FSN-IL identified panelists, developed a program agenda, and held working calls to prepare for the event. The panel included Jocelyn Boiteau, Postdoctoral Associate at the Tata-Cornell Institute for Agriculture and Nutrition, Saweda Liverpool-Tasie, MSU Foundation Professor in the Department of Agricultural, Food, and Resource Economics at Michigan State University, and Giacomo Zanella, Professor in Food Economics and Health at the University of Reading (UK). The event was moderated by Patrick Webb and Shibani Ghosh, FSN-IL Director and Associate Director, respectively. In this session, panelists discussed concepts of innovation within the post-farm gate space, presented research examining the potential for scaling up of innovations across the value chain with a focus on nutrient-dense foods, and identified priority information needs and ways forward. Ultimately, the panel discussion helped generate an understanding of the research and policy needs to support innovation in food value chains for healthy diets and a healthy planet with a focus on South Asia and Southern Africa.

Additionally, FSN-IL organized a one-day interaction with seven private sector startups and the SUN Business Network in Bangladesh in Q3. During the meeting, key challenges around capacity, finance, policies, and enabling environments in the context of Bangladesh were discussed. The meeting was part of FSN-IL’s strategic initiative aimed at fostering collaboration across sectors to contribute to improving food systems and nutrition in the country. By involving startups, FSN-IL is recognizing the role of innovation and entrepreneurship that often brings new ideas and solutions to the table when working to overcome challenges. Discussions revolved around the need for training, skills development, mentorship opportunities, options for financing to support the growth of the businesses, review of existing policies in Bangladesh to foster innovation and entrepreneurship, and regulatory and logistic barriers that can hinder the growth of startups. FSN-IL also emphasized the critical need to integrate a cost-effectiveness component in the business models of the start-ups.

Based on the learnings from Year 2, FSN-IL plans on implementing workshops in FY24 on topical areas of innovation scaling readiness, food safety, and circular economy around food loss and waste.

The Aspen Global Change Institute (AGCI) Workshop Collaboration

FSN-IL began preparations in Q3 for the Aspen Global Change Institute Workshop to be held in Year 3. Initial discussions have taken place, and the scope of work from AGCI has been received. The workshop will focus on identifying and discussing food loss and waste and mitigation plans that are actionable globally. More importantly, results of this workshop will include policy and programming recommendations for policymakers and donor organizations to implement.

Activity 3.3: Assessment of Curriculum Needs (in both 1890s land grant institutions and LMIC Institutions)

Under this activity, FSN-IL will develop a HICD strategy focused on both academic and non-academic capacity development, based on the HICD needs identified through the scoping exercise and external consultations in the US, with 1890s land grant institutions, and in focus geographies. This includes development and implementation of advanced competencies and skills training such as online learning modules, degree and non-degree courses, workshops on research methods or needs assessments, short- and long-term training opportunities, travel fellowships focused on supporting both focus country nationals and 1890s land grant institutions at research conferences, and food systems leadership training for policymakers and parliamentarians.

Activity 3.3.1: 1890s land grant institution Curriculum and Course Development Around Thematic Areas

One of the first charges of the student working group will be to conduct a needs assessment of their current training related to food systems and, in general, careers in global development. Specific course needs, course reviews, and curriculum reviews may be identified along with many other topical needs. FSN-IL expects the assessment to begin sometime during Q1 of the next fiscal year.

Activity 3.3.2: Curriculum and Course Development Needs Identified in Two Focus Countries

Bangladesh

In Q3, Patrick Webb and Robin Shrestha visited the Bangladesh Agricultural University (BAU), Daffodil University, and Bangladesh Agriculture Research Institute (BARI) for discussions on curriculum needs around food systems for nutrition. Discussions with these local academic institutions centered around ways to promote collaboration that can include curriculum enhancement relating to nutrition-sensitive FS solutions. In early Q4, FSN-IL received a request to review a Master of Science (MS) in Food Technology and Applied Nutrition curriculum from the Bangladesh Agricultural University School of Food Technology and Rural Industries. FSN-IL, along with faculty at Tufts University, are reviewing the proposed curriculum.

Nepal

With the assistance of long-time collaborator and FSN-IL Expert Advisory Board member, Ram Shrestha, Patrick Webb and Robin Shrestha met with the administration and faculty of the College of Applied Food and Dairy Technology (CAFODAT) in Nepal in Q3 and agreed to collaborate on the review of a MS curriculum. Further discussion and planning meetings are scheduled for early FY24.

Activity 3.4: Development and Implementation of Technology Challenges

Activity 3.4.1: Food System Technology Challenges

In Q3, Patrick Webb and Robin Shrestha had extensive interactions with GAIN Bangladesh and SUN Business Network Bangladesh. Based on these discussions, FSN-IL began planning for a Food Frontiers 3.0 event in Bangladesh that will kick-off in October 2023, and convene the final pitch in May 2024. The objective of this innovation challenge is to identify new and innovative ways to reach lower-income consumers with nutritious food products and build capacity of youth entrepreneurs on a sustainable food systems approach and business skills for managing enterprise. The challenge will also provide support in co-designing innovative business models that are geared towards improving the nutrition outcomes of the food system and develop a pre-seed investment for innovative ideas for transforming food systems in

Bangladesh. Discussions and identification of collaborators are underway to implement similar technology challenges in Mozambique and Malawi in FY24.

Activity 3.4.2: Food Business/Entrepreneurship Exhibition/Marketplaces

During the 9th National Conference on Food Science and Technology (9th FCON) in Q3, various stalls from eight organizations and the private sector in Nepal were exhibited. Exhibitors included entities such as the Food Enterprise Solutions, SMEs, start-up businesses (R&D Solutions Pvt. Ltd., Bee Keeping and Research Center), and private sector actors (Baliyo Nepal Nutrition Initiative, Nebico, Shubha Nepa Trading, and Vertex Spatial technology). The exhibition was held during the two days of the conference and was attended by over 300 participants.

Activity 3.5: Develop and Conduct Two Regional Symposia

Nepal

9th National Conference on Food Science and Technology, June 12-13, 2023

In January, the ME initiated conversations with the Nepal Food Scientists and Technologists Association in Nepal (NEFOSTA) and the Government of Nepal Department of Food Technology and Quality Control (DFTQC) to co-host the 9th National Conference on Food Science and Technology on June 12-13, 2023. The symposium served as a forum to guide and shape the policy environment for food systems in Nepal and as a platform to discuss a variety of challenges and innovations related to food, nutrition, and sustainable development. FSN-IL provided technical and logistical support throughout the planning period, from designing communications materials to informing the program agenda. Despite an initial delay in receiving branding approval, co-hosts were able to begin outreach and promotion of the Call for Abstracts, which resulted in over 50 abstracts submitted.

As a result of this first-time collaboration between NEFOSTA and FSN-IL, a total of 336 people attended the 9th FCON, where panel and technical sessions were held under the following thematic areas: food safety and governance, nutrition, nutrient-dense foods, drivers of food systems innovations, drivers of food systems, science and technology, and food loss and waste/byproduct utilization. The conference consisted of seven technical sessions and three panel sessions. Moreover, 22 poster presentations were exhibited during the conference, out of which six presentations were declared as winners. Exhibits from private industry also were showcased in a separate area, and included civil society organizations, non-governmental organizations, and international non-governmental organizations. In addition, FSN-IL provided travel bursaries and support for 10 students from various universities in Nepal to attend the conference.

The conference culminated in a 16-point resolution being drafted and accepted with acclamation. Overall, the 9th FCON was a great success with a diverse array of sessions that led to the development of groundbreaking solutions, which can be found in Appendix C. These solutions aim to address the evolving needs of the entire food value chain and effect its transformation into an **equitable**, resilient, and sustainable food system in Nepal.

D4N23 Conference

In Q4, FSN-IL joined IFPRI and other partners as a co-host to help plan the upcoming “Delivering for Nutrition (D4N) in South Asia: Equity and Inclusion” conference to be held in Kathmandu, Nepal in November 2023. Involvement in the conference stemmed from initial discussions with IFPRI at FSN-IL’s Annual Partners Meeting. FSN-IL has attended bi-weekly organizational meetings and helped promote the Call for Abstracts; over 100 applications were received. Members of the FSN-IL team also served as reviewers for the abstract review process.

Activity 4: Stakeholder Engagement

Activity 4.1: Finalization of an Engagement Strategy

In Q1 and Q2 of Year 2, the ME continued developing the engagement strategy through various consultations and activities with consortium partners, regional, and national stakeholders in the focus geographies, culminating in the FSN-IL Annual Partners Meeting in Q4, which further informed the final strategy.

Activity 4.2: Convening of the 1890s land grant institutions student Cross-Consortium Working Group

FSN-IL supports students from 1890s land grant institutions to engage with USAID's global development and humanitarian agenda. The overall intent for students from 1890s land grant institutions in the FSN-IL consortium is to play a prominent role in defining HICD needs and planning and implementing activities in the U.S. and focus countries. By drawing on student expertise and further supporting the growth and professional development of minorities and others historically underrepresented in international development, FSN-IL aims to nurture broader perspectives, creativity, and institutional change. Therefore, FSN-IL is working in close collaboration with the 1890 Universities Foundation's technical and administrative staff to design and implement the first student working group.

In Year 2, FSN-IL and the 1890 Universities Foundation identified the unique opportunity to create a new student working group so initiated weekly meetings to create scopes of work and determine the leadership/mentorship structure for the group. Under the mentorship of an 1890's Universities faculty member, this Master's and Ph.D. led student group will focus on student enrichment in leadership, research, and institutional collaboration in the food systems space.

Following months of planning, an official Call for Applications was released in mid-August through 1890 Universities Foundation channels and the announcement was shared with relevant Deans at several universities. Applications are currently being reviewed by three reviewers using a review rubric created by FSN-IL and the 1890 Universities Foundation, and six students will be selected to participate. The first working group of students is tentatively set to convene virtually in early October 2023. Dr. Judith Boateng, Associate Professor at Alabama A&M University, has agreed to be the faculty mentor for the group.

Activity 4.3: Support USAID's Community of Practice on Food Loss and Waste

The ME continues to participate in the quarterly FLW Community of Practice (CoP) meetings and share FSN-IL progress updates. Earlier in the year, the ME presented findings from the scoping exercise to the CoP members. The community also was informed about the finalized scoping reports and the release of the RFA.

In Q3, the ME worked with representatives from the Food Loss and Waste CoP to successfully organize a FLW focused learning lab, which was presented during the ANH Academy Week in Malawi. Approximately 40 participants were trained. Also, in Q3, FSN-IL Executive Advisory Board member Prabhu Pingali and Jocelyn Boiteau (both from Cornell University) presented sections from their upcoming book during a FLW CoP meeting. The meeting provided an opportunity for them to obtain feedback on the direction and approach of the content from a group of likeminded and passionate experts in the food loss and waste space.

Activity 4.4: Stakeholder Engagement

Management Entity

Activity 4.4.1 Quarterly Webinars

In Year 2, FSN-IL conducted a total of six webinars. Presentation slides and recordings of each webinar can be found on the [FSN-IL website](#).

- October 14, 2023: 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." Distinguished speakers representing FSN-IL's focus countries came together to discuss supporting innovations and technologies in food value chains for healthy diets and a healthy planet in Malawi, Mozambique, Nepal, and Bangladesh. Approximately 140 attendees from various countries attended this side event.
- November 30, 2022: FSN-IL hosted a webinar titled, "Identifying Innovations to Reduce Food Loss and Waste, Enhance Food Safety, and Promote Access to Nutrient Dense Foods Across the Food System," which aimed to share findings and key takeaways from the scoping exercise conducted in Year 1.
- January 29, 2023: FSN-IL hosted a webinar to introduce the Lab to private sector and government stakeholders in Bangladesh and discuss the research for development and HICD needs for Bangladesh's food systems transformation agenda.
- May 17, 2023: FSN-IL hosted a successful first webinar in collaboration with Thriving Solutions on the introduction to circular economy. Over 250 individuals registered for the event and more than 100 attended, offering positive feedback. Distinguished speakers included Seta Tutundjian from Thriving Solutions and expert speaker Omar Habbouth from Hivemind.
- June 6, 2023: FSN-IL conducted the second of three webinars with Thriving Solutions titled "Introduction to Food Loss and Waste." The webinar was attended by 130 participants globally and across the MENA region. Attendees represented all four sectors (government, private, public, and civil), with the highest representation coming from government. Distinguished speakers included Seta Tutundjian from Thriving Solutions and expert speaker Steve Finn from Leanpath.
- July 20, 2023: FSN-IL's Expert Advisory Board member Prabhu Pingali and Jocelyn Boiteau presented on "Food Loss Across Transforming Food Systems", which centered around eliciting feedback on a book proposal on food loss and waste. Speakers summarized the three major book sections to obtain feedback on the direction and approach: (a) definition and measurement frameworks, (b) food loss and waste pathways linked to food security, and (c) food loss and waste management and prevention approaches. Close to 100 attendees joined the webinar.

Activity 4.4.2 Stakeholder fora

Nepal

In Q2, Robin Shrestha traveled to Nepal and engaged with over 20 different public and private institutions to introduce the work of FSN-IL to potential stakeholders, discuss the dissemination of the first FSN-IL RFA, and plan and organize the national consultation workshop in Nepal. The key institutions that were represented included USAID Nepal, the Government of Nepal National Planning Commission, the Ministry of Agriculture, Sun Business Network Nepal, Baliyo Nepal Nutrition Initiative, the Chamber of Commerce, Food Enterprise Solutions, Idea Nepal Initiative, Helen Keller International, iDE, the Ministry of Health and Population, CAFODAT, Kathmandu University, and Mero Agro Private Limited.

FSN-IL initiated the collaborative interactions with the Government of Nepal National Planning Commission to co-host the national stakeholder consultation held on January 24-25, 2023. FSN-IL oversaw the overall planning of the consultation, which extended invitations to 100 participants from government,

non-government, private sector, academic, and civil society institutions. Feedback from the Government of Nepal, the private sector, and USAID Nepal on the FSN-IL consultation was very positive. During this time, FSN-IL also successfully completed a mapping of over 50 key stakeholders to coordinate, plan, and collaboratively engage with for upcoming FSN-IL activities in Nepal. Ultimately, FSN-IL hopes these engagements will support a community of practice that will drive impactful activities in the country's food system.

Bangladesh

In January, FSN-IL members traveled to Dhaka to initiate engagement with different stakeholders. One-on-one meetings were held with HKI, GAIN, CIMMYT, Abt Associates, Bangladesh Agricultural University, and the USAID Mission. An introduction to FSN-IL webinar was also held and attended by government, private sector, and agribusiness groups virtually.

In early June, Patrick Webb and Robin Shrestha traveled to Dhaka to meet with private sector and academic partners. They conducted a consultation meeting with a group of seven local food business startups and SMEs and had additional extensive interactions with the SUN Business Network Bangladesh Coordinator and GAIN Bangladesh. These meetings were very conducive to developing and shaping FSN-IL HICD activities in Bangladesh in FY2024 and beyond.

During the same trip, FSN-IL ME also visited the Bangladesh Agricultural University, Daffodil University, and the Bangladesh Agriculture Research Institute to hold discussions on innovation potential, food chain research, and meet with local networks of scientists. A meeting also was held with government officials from the Bangladesh Food Safety Authority who were extremely supportive of FSN-IL's agenda and offered to help as appropriate in coming years.

FSN-IL also supported key stakeholders and consortium partners from Bangladesh to attend the Food Conference in Nepal on June 12-13, 2023. During the conference, a plenary session was convened in which the invitees from Bangladesh and Nepal discussed food systems challenges, achievements, innovation needs, and further plans for development. The session provided a unique opportunity to explore perspectives on food system needs, constraints, and opportunities from a regional standpoint in South Asia.

Mozambique

Consultations with the USAID Mission, government, and non-government stakeholders in Mozambique took place in June. The meetings included an in-brief and out-brief with Mission staff: Melissa McKnight, FTF Innovation Lab coordinator, Ms. Paula Pimentel, Senior Agricultural Research and Technology Transfer Advisor, and Ms. Megan Thompson, Director for Nutrition. Meetings were also held with Corey O'Hara, the Chief of Party of the Feed the Future Resilient Coastal Communities project from iDE Mozambique, Mr. Rafael Ricardo Nzucule from GAIN Mozambique, Ms. Carolina Reynoso Pieters, Country Director of NCBA CLUSA, and Dr. Nephas Munyeché, Chief of Party of the FTF RESINA program.

Malawi

In late June, FSN-IL held an initial consultation with local stakeholders during the ANH Academy Week in Malawi. Nineteen participants attended from multiple sectors across the country, including the chairpersons of the SUN Business network, Fanny Gondwe and Isaac Mgeni, and Scott McNiven and Imogen Pace from USAID Malawi. Isaac Mgeni gave a presentation on the challenges and opportunities in supporting small and medium enterprises, particularly in the post-farm gate space. A lunch meeting was held with USAID Malawi colleagues Scott McNiven, Jeffrey de Graffenreid, and Meredith Jackson de Graffenreid. Also present

were Meghan Anson (FSNIL AOR), Ahmed Kablan, Nika Larian and Chris Rue, as well as the Chief of Parties for Agricultural Development.

Innovation Lab Council

In FY 23, Dr. Ghosh was elected to be the Vice Chair of the Innovation Lab Council (ILC) and interacted with the Innovation Council Chair (Dr. Erin McGuire) and BIFAD. She is also Chair-elect for FY 24. Through this role, the Lab has been able to engage with other Innovation Labs but also interact with regional and country Missions during the ILC annual meeting in Kenya. She, along with Dr. Webb, also represented the FSN-IL at the September ILC meetings in Washington, D.C.

FSN-IL Annual Partners Meeting

During Q3 and Q4, the Tufts team worked on logistical and technical details for the Lab's first annual partners meeting. At least one representative from each of the partner consortium institutions and all but one Expert Advisory Board member attended the meeting. Additionally, FSN-IL Tufts technical specialists and USAID representatives joined in-person. The ME provided a virtual option for additional consortium partner representatives who wished to attend. Unfortunately, since the competitive sub-award recipients had not yet been approved by USAID, representatives from their institutions could not attend.

Close to 40 partners and collaborators attended the partners meeting, which was opened by Christina Economos, the Dean of the Friedman School of Nutrition Science and Policy. The program agenda was designed so that by the end of the meeting, the ME would have recommendations from its collaborators on ways forward for research and capacity-building activities, thereby informing the FY24 work plan with these suggestions in mind. Specifically, the ME technical team invited partner groups to arrange panel discussions on particular themes related to food systems to initiate conversations, relying heavily on the attendees for their expert input and questions. As an output from the meeting and the rich discussion shared, FSN-IL is preparing a series of blog posts based on each session that will be posted on the project website to further disseminate insights and priorities that were identified.

Activity 4.4.3 Continued virtual engagement across different stakeholder groups (Missions, Labs, USAID initiatives, business networks, G7-Summit 2023)

G7 Summit Technical Workshop on Food Loss and Waste (FLW)

Under the guidance of the USAID RFS Bureau, the FSN-IL team coordinated a G7 Summit Technical Workshop on food loss and waste in Q4 that took place virtually on July 20, 2023. FSN-IL's Director, Patrick Webb, began the workshop with a presentation on food loss and waste and its relationship to climate and nutrition. After a lengthy group discussion, key takeaways emerged for next steps. One point that arose often pertained to the G7 group exploring private sector financing and investment in generating climate and environment impact data on food loss and waste. Calls for action were given around government involvement and on how to continue momentum.

In terms of FSN-IL's specific involvement in supporting the G7 group, the ME work plan will include internal engagement by sharing and coordinating Lab efforts around food loss and waste. There will also be external involvement by FSN-IL to continue to support the group by convening follow-up meetings and playing an integral role in executing the way forward.

Consortium Partners

Mozambique

In FY23, GAIN pursued engagement with the core FSN-IL and local GAIN country teams in Bangladesh and Mozambique to commonly define concrete opportunities for action on the ground to further FSN-IL's objectives. The focus was on collaboration with SUN Business Networks to ensure sustainability through private sector take-up of innovations.

Bangladesh

IFPRI is planning a meeting before the end of the FY between Patrick Webb and Shibani Ghosh of the FSN-IL and several Sustainable Healthy Diets initiative (SHiFT) research leaders in mid-September. It is hopeful that progress will be made in this meeting to determine ways that the SHiFT initiative and FSN-IL can collaborate in Bangladesh.

Malawi

Multiple FSN-IL partners, including Helen Keller International and Purdue University, attended the 8th Annual ANH Academy Week 2023 in Lilongwe, Malawi in-person and virtually. HKI participated in several FSN-IL Learning Labs at the conference.

Nepal

There is nothing to report at this time.

U.S.A.

All partners attended the first FSN-IL Annual Partners Meeting in Boston, held from July 27 - 28, 2023. A total of 34 attendees and collaborators were in attendance, including one representative from each consortium partner organization. The partners' meeting was interactive, with each session being discussion-based rather than presentation-focused, with time for a moderated Q&A at the end for partners to engage with each other and the FSN-IL team.

Table 1. FSN-IL Presentations in Year 2

Presenter	Event	Location	Topic	Date	Audience
Patrick Webb & Shibani Ghosh	FAO Science and Innovation Forum Side Event	Virtual	Evidence needs to support nutrition-sensitive innovations in food value chains: Perspectives from South Asia and Southern Africa	10/14/2022	139
Robin Shrestha	A panel discussion with experts from Bangladesh, Malawi, Mozambique and Nepal	Dhaka, Bangladesh	Agricultural Transformation: Role of Appropriate Scale Mechanization and Postharvest Loss Reduction Innovations	11/10/2022	107
Patrick Webb & Shibani Ghosh	FSN-IL Webinar	Virtual	Identifying Innovations to Reduce Food Loss and Waste, Enhance Food Safety, and Promote Access to Nutrient-Dense Foods	11/30/2022	83
Patrick Webb	22 nd IUNS – International Congress of Nutrition	Tokyo, Japan	Fishing for Complements: How Aquaculture Helps Improve Diet Quality among the Poor	12/7/2022	100

Patrick Webb	22 nd IUNS – International Congress of Nutrition	Tokyo, Japan	Nutrition for Resilience: Program Research Gaps & Opportunities	12/10/2022	100
Shibani Ghosh	Food Loss and Waste CoP Meeting (Innovation Labs)	Virtual	Enhance Food Safety, and Promote Access to Nutrient-dense Foods	1/10/2023	15
Patrick Webb	National Stakeholder Consultation on Food System Innovations and Challenges in Nepal	Kathmandu, Nepal	Welcome & Introduction to the FSN-IL: Goals and Objectives – Expanding thinking beyond multisector programming to support innovations across the food system for improved nutrition	1/24/2023	26
Shibani Ghosh	National Stakeholder Consultation on Food System Innovations and Challenges in Nepal	Kathmandu, Nepal	Identifying Innovations to Reduce Food Loss and Waste, Enhance Food Safety, and Promote Access to Nutrient-Dense Foods: Scoping Findings	1/24/2023	10
Patrick Webb	National Stakeholder Consultation on Food System Innovations and Challenges in Nepal	Kathmandu, Nepal	What Can Food Systems Transformation Deliver?	1/25/2023	49
Shibani Ghosh & Robin Shrestha	National Stakeholder Consultation on Food System Innovations and Challenges in Nepal	Kathmandu, Nepal	Identifying Innovations to Reduce Food Loss and Waste, Enhance Food Safety, and Promote Access to Nutrient-Dense Foods: Methods and overview of FSN-IL's scoping of scalable innovations	1/26/2023	49
Patrick Webb & Robin Shrestha	FSN-IL Webinar	Virtual, Dhaka, Bangladesh	Introduction to the FSN-IL in Bangladesh: Innovations to Reduce Food Loss and Waste, Promote Food Safety and Access to Nutrient-Rich Foods	1/29/2023	14
Patrick Webb	High level meeting	Windsor, England	Strengthening links between climate and food system transformation	2/14/2023	45
Shibani Ghosh	Innovation Lab Council Meeting	Nairobi, Kenya	Climate Change and Nutrition in Equitable Climate Change Outcomes: How are Different People Impacted?	5/17/2023	150
Seta Tutundijan, Omar Habboush	FSN-IL Webinar	Virtual	Introduction to Circular Economy	5/17/2023	113
Seta Tutundijan, Steve Finn, Patrick Webb	FSN-IL Webinar	Virtual	Introduction to Food Loss and Waste	6/6/2023	130
Patrick Webb	Keynote address at the 9 th FCON	Kathmandu, Nepal	Food science and Innovation for Safe, Healthy, Sustainable Diets in Nepal	6/13/2023	336

Patrick Webb, Robin Shrestha	Introductory presentation on FSN-IL to Bangladeshi SMEs and SBN stakeholders	Bangladesh	Innovations to Reduce Food Loss and Waste, Promote Food Safety and Access to Nutrient-rich Foods	6/19/2023	10
Patrick Webb	Learning Lab, ANH	Lilongwe, Malawi	Concepts of Food Loss and Waste	6/26/2023	40
Shibani Ghosh	Learning Lab, ANH	Lilongwe, Malawi	Strategies/Approaches towards addressing FLW	6/26/2023	40
Patrick Webb	Malawi in-country consultation	Lilongwe, Malawi	What Can Food Systems Transformation Deliver?	6/28/2023	30
Shibani Ghosh	Malawi in-country consultation	Lilongwe, Malawi	Scaling Innovations to reduce food loss and waste, promote food safety and improve access to nutrient rich foods	6/28/2023	30
Isaac Mgeni	Malawi in-country consultation	Lilongwe, Malawi	Role of private sector in supporting nutrition goals in Malawi	6/28/2023	30
Patrick Webb	ANH Plenary titled "Scaling Post farm gate innovations to support healthy diets"	Lilongwe, Malawi	Introduction to the FSNIL	6/29/2023	300
Giacomo Zanello	ANH Plenary titled "Scaling Post farm gate innovations to support healthy diets"	Lilongwe, Malawi	Context Matters: Barriers and Enablers of Innovation Diffusion in the Food Loss and Waste Sector in LMICs	6/29/2023	300
Saweda Liverpool-Tasie	ANH Plenary titled "Scaling Post farm gate innovations to support healthy diets"	Lilongwe, Malawi	Supporting inclusive food systems via MSME innovations in the midstream of Africa's supply chains	6/29/2023	300
Jocelyn Boiteau	ANH Plenary titled "Scaling Post farm gate innovations to support healthy diets"	Lilongwe, Malawi	Linking quality to quantity: Measuring food loss and waste of perishable foods	6/29/2023	300
Jocelyn Boiteau, Prabhu Pingali, and Robin Shrestha	FSN-IL Webinar	Virtual	Food Loss Across Transforming Food Systems	7/20/2023	95
Patrick Webb, Shibani Ghosh	G7 Technical Workshop	Virtual	G7 Technical Workshop Introductions	7/20/2023	37

Patrick Webb	G7 Technical Workshop	Virtual	Setting the Scene: Food Loss and Waste, Climate, and Nutrition	7/20/2023	37
Patrick Webb and Shibani Ghosh	Annual Partners Meeting	Boston, MA	Welcome & Identifying Innovations to Reduce Food Loss and Waste, Enhance Food Safety, and Promote Access to Nutrient-Dense Foods	7/27/2023	41
Gerald Shively, Shalander Kumar, Eric Bost, Erin Coughlan de Perez	Annual Partners Meeting	Boston, MA	Session 1: Scaling actions that link smallholder production systems and value chains	7/26/2023	41
Bea Rogers, Alan de Brauw, Rafael Flor, Douglas Taren	Annual Partners Meeting	Boston, MA	Session 2: Scaling actions for post-farmgate processing, packaging, and storage of perishable nutrient dense foods	7/26/2023	41
Sara El-Sayed, Ina Schonberg, Will Masters, Tom Van Mourik	Annual Partners Meeting	Boston, MA	Session 3: Scaling actions around marketing and distribution of perishable nutrient dense foods	7/26/2023	41
Katie Stebbins, Jody Harris, Shibani Ghosh, Charlotte Pedersen	Annual Partners Meeting	Boston, MA	Session 4: Scaling actions around consumer choices, demand, and retail promotion	7/26/2023	41
Lynne Ausman, Quintin Gray, Desmond Mortley	Annual Partners Meeting	Boston, MA	Session 5: 1890s land grant institutions Student Working Group Meeting	7/26/2023	41
Kassandra Harding, Andrew-Thorne-Lyman, Eileen Kennedy, Felicia Wu	Annual Partners Meeting	Boston, MA	Session 6: Food System for Nutrition Metrics	7/27/2023	41
Rolf Klemm, Isatou Jallow, Quintin Gray, Desmond Mortley, Robin Shrestha	Annual Partners Meeting	Boston, MA	Session 7: Shaping Future of Food Systems for Nutrition - HICD	7/27/2023	41
Shibani Ghosh	Annual Partners Meeting	Boston, MA	How to better engage across the food systems communities (Innovation Labs, CGIAR, donors, UN agencies, other research initiatives)?	7/27/2023	41

Table 2. Partner Consortium Presentations in Year 2

Presenter	Event	Location	Topic	Date	FSN-IL Role
Shalander Kumar - ICRISAT	Webinar	Virtual	Strategies to leverage the role of women in ensuring sustainable nutrition	10/14/2022	FSN-IL Related Work
Shalander Kumar - ICRISAT	C-II National Post-Harvest Summit	Mumbai, India	Building a climate smart value food chain: Innovations for post-harvest segment	11/30/2022	FSN-IL Related Work
Shalander Kumar - ICRISAT	Golden Jubilee National Conference on 'Evolving Pathways for Sustainable Agriculture & Rural Development'	Bengaluru, India	Transformation pathways towards livelihood security and farmers' prosperity in India	1/12/2023	FSN-IL Related Work
Shalander Kumar - ICRISAT	International Conference on Innovations to Transform Drylands	Hyderabad, India	Understanding the dynamics of sorghum value chains in India: Contrasting aspiration and outcomes	2/22/2023	FSN-IL Related Work
Gerald Shively - Purdue	ANH Malawi 2023	Lilongwe, Malawi	Writing for a research audience: tips for greater success	6/21/2023	FSN-IL Funded

Table 3. Travel Fellowship Presentations at ANH 2023

Name	Abstract Title	Final Allocation
Md. Mizanur Rahman Sarker	Impact Of Microcredit with Inputs on Diets, Nutrition and Health: An Evidence From Panel Data of Unprivileged Households in Bangladesh	Poster
Lizzie Shumba	Adapting the Global Farm Metric (GFM) Sustainability Metric for Malawi	Poster
Joshua Kafotokoza	A Raindrop Never Feels Responsible for the Flood: Revisiting the Empirical Relationship Between Climate Shocks and Food Security	Poster
Abdullah-Al Mamun	Climate Changes and Future Predictions of Seafood Availability in Bangladesh	Poster
Stevier Kaiyatsa	How Does Transport Costs Affect Price Dispersion of Nutrient-Dense Foods Across Markets in Rural Malawi?	Poster

David Banda	Adapting The Global Farm Metric (GFM) Sustainability Metric for Malawi	Poster
Jackline Odhiambo	Comparison Of the Effect of a Multisectoral Agricultural Intervention on HIV-Related Health Outcomes Between Widowed and Married Women	Oral
Eward Mushi	Psychological Predictors of High-Iron Beans Consumption Behaviour in Tanzania: Applying Theory of Planned Behaviour (TPB) And Health Belief Model (HBM)	Poster
Anteneh Ali	Effects Of Nutrition-Sensitive Child-Owned Poultry Intervention on Egg Intake, Anthropometry, Gross Motor Development, Anemia and Morbidity Status Among Young Children in Southern Ethiopia: Cluster-Randomized Community Trial	Poster
Usman Ibrahim	Impact of Insurgency and Banditry on Food Insecurity, Farmers' Income, Households' Diet and Nutritional Status in Northeast Nigeria	Poster
Annet Adong	Conflict exposure and food consumption pathways during and after conflict: Evidence from Northern Uganda	Poster

Table 4. FSN-IL and Consortium Partner Publications in Year 2

Organization	Type	Title	Author	Status
FSN-IL	Journal Article	Seaweed's contribution to food security in low- and middle-income countries: Benefits from production, processing and trade	Patrick Webb; Natalie K. Somers; Shakuntala Thilsted	Awaiting Publication
Boston Children's Hospital	Journal Article	Assessing environmental enteric dysfunction via multiple assays and its relation to growth and development among HIV-exposed uninfected Tanzanian infants.	Jacqueline M Lauer; Miles A Kirby; Alfa Muhihi; Nzovu Ulenga; Said Aboud; Enju Liu; Robert K M Choy; Michael B Arndt; Jianqun Kou; Wafaie Fawzi; Andrew Gewirtz; Christopher R Sudfeld; Karim P Manji; Christopher Duggan	FSN-IL Related Work

ICRISAT	Journal Article	Assessing the rural food environment for advancing sustainable healthy diets: Insights from India	Shalander Kumar; Abhishek Kumar; Kavitha Kasala; Padmaja Ravula	FSN-IL Related Work
ICRISAT	Journal Article	Food systems that empower women for sustainable healthy diets in low and middle-income countries	Abhishek Kumar; Kavitha Kasala; Shalander Kumar	FSN-IL Funded
IFPRI	Journal Article	Poverty, price and preference barriers to improving diets in sub-Saharan Africa	Marie Ruel	FSN-IL Related Work
IFPRI	Journal Article	Consumer demand for milk and the informal dairy sector amidst COVID-19 in Nairobi, Kenya	Jef Leroy	FSN-IL Related Work
IFPRI	Journal Article	Video-based behavioral to change consumption patterns: Experimental evidence from urban Ethiopia	Alan de Brauw	FSN-IL Related Work
Purdue	Journal Article	Food Safety in Lao PDR: Current Challenges and Opportunities	Leah Thompson; Gerald Shively	FSN-IL Related Work
University of Colorado	Journal Article	COP 27 insights to increased food-systems climate adaptation and resilience	Yevheniia Varyvoda	FSN-IL Related Work
University of Colorado	Journal Article	Considering Ecosystem Services in Food Systems Resilience: synergies and tradeoffs	Yevheniia Varyvoda	FSN-IL Related Work

Table 5. FSN-IL Short-Term Trainings in Year 2

Country of Training	Brief Purpose of Training	Who Was Trained?	Number Trained			
			M	F	Other	Total
Global	FSN-IL Side Event at FAO Science and Innovation Forum: Evidence needs to support nutrition-sensitive innovations in food value chains: Perspectives from South Asia and Southern Africa	Varied stakeholders from government, private, research and civil sectors	59	79	1	139
Global	Webinar: Identifying Innovations to Reduce Food Loss and Waste, Enhance Food Safety and Promote Access to Nutrient Dense Foods Across the Food System	Varied stakeholders from government, private, research and civil sectors	30	50	3	83
Nepal *	Day One of National Stakeholder Consultation on Food Systems Innovations and Challenges in Nepal	Varied stakeholders from government, private, research and civil sectors	21	5	0	26

Nepal *	Day Two of National Stakeholder Consultation on Food Systems Innovations and Challenges in Nepal	Varied stakeholders from government, private, research and civil sectors	35	14	0	49
Bangladesh	Introduction to the FSN-IL in Bangladesh: Innovations to Reduce Food Loss and Waste, Promote Food Safety and Access to Nutrient-Rich Foods	Varied stakeholders from government, private, research and civil sectors	12	2	0	14
Global	Webinar Series with Thriving Solutions: Introduction to Circular Economy	Varied stakeholders from government, private, research and civil sectors	53	60	0	113
Global	Webinar Series with Thriving Solutions: Introduction to Food Loss and Waste	Varied stakeholders from government, private, research and civil sectors	62	64	4	130
Egypt	Cairo Workshop on Introduction to Circular Food Economy with Thriving Solutions	Varied stakeholders from government, private, research, and civil sectors	16	12	0	28
Malawi	ANH Learning Lab	Varied stakeholders from government, private, research, and civil sectors	N/A	N/A	N/A	40
Global	Webinar: Food Loss Across Transforming Food Systems	Varied stakeholders from government, private, research, and civil sectors	46	47	2	95

*FSN-IL incorrectly added both of these consultations to the short-term training table in the Semi-Annual Report. These are both stakeholder engagements and will not be counted as training in the future.

V) Governance and Management Entity Activity

Activity 5: Governance and Administration

In Year 2, the ME awarded 13 sub-awards, extending previous Year 1 partner working relationships for Years 2-5; the final two partner awards are expected to be completed in the next few months. The ME successfully managed the first RFA process and will soon finalize the five new awards. The ME also completed all capacity-building activities per the work plan in all focus countries plus one additional country (Egypt), reported and responded to the AOR, Mission, and other USAID requests, and maintained and met all USAID and Tufts University financial management processes.

Activity 5.1: Management Entity Operations

The ME filled two open positions in FY23: a Project Coordinator, who supports operations such as travel, Piestar, and reporting, and at the end of the fiscal year, onboarded a second Project Manager to work with the technical team. The second Project Manager is expected to join the team in Q1 of FY24. The new

team member was chosen given her lengthy work experience in the global development space, and the ME expects ramp up time to be minimal. The Project Coordinator has also played a significant role in assisting the ME and 1890 Universities Foundation engagement and the rollout of the new student working group. Given the complete, rapid, and almost simultaneous rollout of capacity-building activities throughout the last year, the ME has continued with operational support from an existing project administrator within Tufts University. The Communications Specialist, hired at the end of the previous fiscal year, is fully onboarded and has been a valuable addition to the ME team, supporting a seamless transition with successful webinar facilitation, high-level G7 USAID event coordination, annual meeting preparations, and the creation of numerous communication materials for international FSN-IL planned activities.

Activity 5.2: Communications

In early January of 2023, the FSN-IL website was approved by the USAID Governance Board after months of back-and forth communications. The FSN-IL Communications Specialist works closely with the web developer at the Friedman School of Nutrition Science and Policy to update the website regularly to inform on FSN-IL activities, events, news, publications, and more. Additionally, the team created an activity page on Agrilinks and uses that platform to post webinar announcements and blog posts to further their reach.

FSN-IL continues to disseminate information about the Lab through MailChimp and social media, including Twitter, Facebook, and YouTube. To date, there are over 2,000 subscribers to FSN-IL's e-list on MailChimp. In Q2, FSN-IL expanded its social media presence to LinkedIn, with a follower count of nearly 300.

In Q3, the FSN-IL team created a variety of communication materials to display at the Feed the Future Innovation Labs' Meeting in May. Materials included an "About Us" flyer, webinars infographic, stakeholder engagement flyer, scoping exercise infographic, and a progress dashboard infographic that displays the number of people FSN-IL has reached since Year 1. These communication materials have been displayed at events, including the 9th National Conference on Food Science and Technology in Nepal, the Africa Food Systems Forum 2023 in Tanzania, and more recently, the Feed the Future Innovation Labs' Meeting in Washington DC. FSN-IL will continue to update these infographics and flyers on a regular basis.

Activity 5.3: Project and Knowledge Management

During the FY23 fiscal year, the FSN-IL team met regularly with the Piestar technical team to update several features of the FSN-IL reporting platform on Piestar. Updated features include the FSN-IL dashboard, which now includes an updated target country map, RFA winner information, and regular announcements to consortium partners. FSN-IL worked with Piestar to adjust the Impact Module forms to mirror the USAID report templates. The new project coordinator has been brought up to speed on Piestar knowledge and management of the system and has been working over the past three months to fine tune the platform to meet the FSN-IL team's needs. The team was able to resolve technological challenges linked to reporting process from the last fiscal year and conducted a successful Partners Annual Reporting session for Year 2. Partner submissions and reflections have been recorded by FSN-IL and incorporated throughout this Annual Report. The FSN-IL team will continue to meet with the Piestar technical team to resolve outstanding issues that impact the team's ability to edit modules, export forms to Word, and collaborate in real-time.

Activity 5.4: Governance Oversight

The ME spent the year preparing new sub-awards with existing consortium partners and wrapping up expenditure payments processing and compliance oversight from Year 1, as the scoping reporting ended. For Year 2, a new partner consortium scope of work was undertaken that included thought leadership and capacity-building involvement planning, as well as individual participation in the annual meeting. During the

year, consortium partners continued to report via the Piestar knowledge platform site for the semi-annual and annual reports. During Year 2, an additional \$350,000 was obligated to the existing partners for work going forward. The FSN-IL ME planned to award about \$1.4M to the new RFA winners with a commitment over three years of a total of \$3.5M. We expect to award the first tranche in the first quarter of FY24. The ME has collaborated with the FSN-IL Expert Advisory Board comprised of esteemed colleagues who were selected and invited based on their relevant expertise, seeking their involvement in various capacity-building activities, as well as the creation of the RFAs and most important, in driving the strategic direction for FSN-IL.

Activity 5.5: Development of an EMMP Plan

The EMMP Plan development will be completed after the awarding of the RFA in Q1 of Year 3, when final approval for the awards is received from USAID.

VI) Issues

Management Entity

Website Approval

Receiving final approval for the FSN-IL website took longer than expected. The process began in October with the USAID Governance Board and lasted until mid-January. Despite the website delays, the FSN-IL team managed to post the Request for Applications, relying heavily on email and Piestar to ensure that applicants could access the required documents.

Learning Lab with Purdue University

Early in the fiscal year, the ME began discussions with Purdue University (FSN-IL consortium partner) to explore the possibility of coordinating a learning lab on research methods during the ANH Academy Week in Malawi. Unfortunately, due to scheduling conflicts and planning for other activities culminating in the same month, the learning lab was put on hold to be conducted at another time in the future.

Workshop with GAIN Bangladesh

FSN-IL initiated interactions with GAIN Bangladesh (FSN-IL consortium partner) to plan a one-day workshop with key government and non-government stakeholders in June 2023 on identifying barriers and challenges in food systems, with a focus on promoting food safety and reducing food loss and waste. Based on guidance from GAIN Bangladesh, it was decided to move the one-day workshop to October 2023 due to conflicts in June and to allow for better planning and representation of key stakeholders. In lieu of the June workshop, Patrick Webb and Robin Shrestha traveled to Dhaka to meet with private sector and academic partners.

Consortium Partner Issues

A common issue reported by FSN-IL partners was that the delay in funding or approval for sub-awards caused project start dates to be pushed back into the second year (FY23). As a result, Helen Keller International was not able to participate in-person at the ANH academy week in Malawi from June 26-30 due to late finalization of their contract with Tufts. Other partners, however, including Purdue, ICRISAT, and University of Colorado, wrote that the delayed start dates did not inhibit the progress of their work.

Arizona State University and GAIN both shared the desire to have more communication with FSN-IL in order to discuss opportunities to leverage project metrics. As expressed during the Annual Meeting, ASU also felt they could contribute more in supporting more traditional productions and looking at true cost accounting within the metrics work being done. ASU was brought in to review the Theme 3 scoping report on Infrastructure, Transport, and Markets after it was completed, but they are not sure if the recommendations were considered. Many of the recommendations in Theme 3 were generic and not country-specific, and ASU feels that a more in-depth scoping should be conducted.

GAIN shared that their "challenges" have been rephrased as opportunities, with focus on the two countries where GAIN has country offices (Bangladesh and Mozambique) and global initiatives that can be leveraged. They posed several important questions, including the following:

- How can we leverage earlier extensive work around innovation challenges organized by SBN, for example the Food Frontiers work in Bangladesh, and most recently the EatSafe innovation challenge supported by SBN and the IFSS team?
- How can we leverage existing work we do in Mozambique on animal sourced foods, with innovations around fish and poultry affordable and environmentally friendly?
- How can we align with new multi-donor work at GAIN for the program called "Nutritious Food Pathways," which is running in 10 countries including Bangladesh and Mozambique, where innovation on combined nutritional and environment outcomes are in focus?

VII) Ukraine Supplemental Buy-in Scope of Work

On September 2, 2022, FSN-IL received \$200,000 as a Buy-In to an existing Cooperative Agreement award focusing specifically on food loss and waste. Overall, the budget supported activities primarily through technical and logistical assistance, with the remaining funds being used to support travel and one in-person capacity-building activity.

In the first half of FY23, Patrick Webb and Shibani Ghosh completed the first activity, which was to provide technical assistance to the Feed the Future Market Systems and Partnership (MSP) activity to accelerate engagement with the private sector and increase the uptake and scaling of food loss and waste scaling solutions. Specifically, the FSNIL team provided technical support to MSP on market analysis, opportunity identification, and ensuring that private sector partnerships include technically sound nutrition approaches. FSNIL participated in technical assistance to MSP in the design, solicitation, and awarding of grants. Both Patrick Webb and Shibani Ghosh participated in the grant proposal review as well.

The second activity supported capacity building around solutions to manage food loss and waste in the Middle East and North Africa region. In this, FSNIL began a relationship with Thriving Solutions, a woman-owned enterprise that focuses on supporting low- and middle-income economies in advancing food and nutrition and water security, reducing carbon emissions, and safeguarding biodiversity, by signing an agreement to implement one workshop and three webinars focused on food loss and waste, primarily targeting participants from Missions in Egypt and Jordan. All webinars were well attended by government, private, public, and civil sectors, with over 300 attendees.

In Q3, Shibani Ghosh joined the Thriving Solutions staff along with USAID Washington DC Representative, Ahmed Kablan, to conduct the in-person workshop in Cairo, Egypt. Although FSN-IL invited a selected number of staff from the Jordan Mission, they could not attend. A total of 28 stakeholders participated

over the course of the three-day workshop, of which 14 participants were from the private sector, eight were from the government, and the remaining were from the civil and public sectors.

VIII) Future Directions

Management Entity

In FY24, FSN-IL has outlined a continuation of its key activities across the R4D, HICD, and stakeholder engagement domains. FSN-IL will continue its commitment to conducting research aimed at generating evidence on scaling innovative solutions through its second round of competitive grants. The publication of scoping reports in the journal, *Nutrition Reviews*, is a significant aspect of FSN-IL's undertaking of the scoping activities. FSN-IL will continue to invest in building the capacity of individuals and institutions in its focus countries and students in 1890s land grant institutions in the US. Engagement activities are crucial for fostering collaboration and ensuring that research and innovations are effectively integrated into practice.

The overarching goal of FSN-IL is to advance FSN-IL's mission in contributing to positive development outcomes in the field of food systems and nutrition.

Partners' Future Work

FSN-IL received positive feedback from its consortium partners on the continuation of work that was completed in Years 1 and 2. From the Partners Annual Report that was conducted in August by FSN-IL, there are clear themes on future collaboration that have been highlighted below:

1. Partners will continue to provide support for RFA applications through Years 2-4.
2. Partners will support FSN-IL in the development and implementation of capacity-building workshops and training. This will include the organization and preparation of learning labs at an annual symposium or conference, virtual or in-person, with local stakeholders of a target country.
 - a. Arizona State University has affiliate faculty at the Swette Center working on Nepali food systems.
3. Partners will participate in quarterly and annual meetings.
4. Pursue opportunities to collaborate with FSN-IL at international meetings focused on food systems and nutrition initiatives.
5. Support FSN-IL with the development of journal articles and research studies to disseminate findings from the scoping reviews.
 - a. Harvard University is working on adapting the scoping report from Theme 5 on Metrics for Food Systems completed last year into a manuscript to be published in a peer-reviewed journal.
 - b. Conditional on award timing, IFPRI hopes to plan synergistic research between FSN-IL Research for Development projects and the CGIAR ShiFT initiative.
 - c. John Hopkins has suggested that there are a few papers from FY 1 that will be submitted.
 - d. Boston Children's Hospital continues their work on randomized trials in low-resource areas to assess the impact of the nutritional management of childhood undernutrition, diarrheal diseases and the small, vulnerable newborn.
6. Partners are interested in international visits to target countries or hosting students from target countries.
 - a. Arizona State University suggested hosting students from the four target countries to receive training at one of their programs or labs.

- b. The University of Colorado is interested in conducting a site visit to a target country to provide input on how to improve post-harvest processing, packaging, and storage of foods.
- 7. Proceed with the 1890s land grant institutions Consortium Student Working Group.
 - a. FSN-IL and the 1890 Universities Foundation have released a call for applications for the Food Systems Student Working Group. The working group is expected to be implemented at the beginning of October 2023.
- 8. Work with FSN-IL to develop and/or present specific webinar topics.
 - a. California State University and Arizona State University are interested in participating in or presenting an FSN-IL hosted webinar.
- 9. Partners will continue to work on innovative analyses and development of partnership with the ME to drive the FSN-IL agenda.
 - a. GAIN has offices in two of the four target countries and believes there are opportunities to provide a greater contribution to work in Bangladesh and Mozambique. Examples include building on the extensive network with SUN Business Network in both countries and assessing opportunities for FSN-IL collaboration on innovation challenges to action in Bangladesh, including young entrepreneurs, women, and youth involvement. GAIN is supporting governments to act on their UN-FSS food system transformation pathways, links to FSN-IL could be relevant for policy related issues that need to be addressed around the enabling environment.
 - b. Helen Keller International plans to collaborate with Tufts University to facilitate in-country food system assessments in Nepal, Bangladesh and possibly Mozambique.
 - c. ICRISAT would like to focus their work with FSN-IL in the coming years on (a) strengthening post-harvest segments of the value chains of nutrient dense and climate resilient millets, particularly targeting high malnutrition affected regions in Northeastern India; (b) innovations for supporting a science-policy interface for large scale scaling of aflatoxin management across the value chain in Malawi; (c) promotion of value-added products through facilitating entrepreneurship and product development in groundnut for addressing nutrition challenges in Bangladesh, and (d) understanding nutrition security challenges and designing appropriate interventions in highly vulnerable regions of Mozambique.

Appendix A: Success Stories

Success Story I: Eleven young researchers attend ANH2023 through travel fellowships provided by FSN-IL to present their research



FSN-IL Director and Associate Director with recipients of ANH 2023 travel fellows

This year, the 8th Annual ANH Academy Week (ANH 2023) took place online and in-person in Lilongwe, Malawi from June 19-30, 2023. As a co-host for ANH 2023, FSN-IL provided travel bursaries as one form of support for the conference. These travel bursaries were awarded to select presenters who were interested in participating in the conference in Malawi but did not have the funds to do so. In total, FSN-IL helped to support eleven young researchers from Ethiopia, Bangladesh, and Kenya to feature their work through oral and poster presentations.

These young researchers were grateful for the opportunity to attend this prestigious conference. For some, ANH Academy week served as their first opportunity to present an oral or poster presentation at a research conference. By receiving an FSN-IL bursary, researchers were able to disseminate their findings to a broader, more global audience that they otherwise would not be able to reach. Additionally, many fellows were able to network with other individuals who share similar research interests and establish professional relationships with them. In a report submitted to FSN-IL, one fellow wrote “these connections have the potential to foster future collaborations, joint projects, or research partnerships, thereby enhancing my professional network and facilitating access to novel opportunities.”

By actively participating in the conference, fellows were able to expand their networks and leave with fresh insights to their research. One fellow wrote, “I gathered actionable lessons from the conference on agriculture and nutrition-sensitive interventions, some of which I have put to motion and [am] beginning to implement in my organization.” Fellows left feeling inspired, saying “[FSNIL’s] assistance has not only enhanced the recognition of my work but has inspired and empowered me to do more, knowing that my work matters.”

Success Story 2: FSN-IL collaborates with the 1890 Universities Foundation to create an opportunity for graduate students interested in food systems to participate in a student working group



Members from FSN-IL and the 1890 Universities Foundation with the faculty advisor for the student working group

1890s land grant institutions in the Food Systems for Nutrition Innovation Lab (FSN-IL) consortium play a critical role in defining human and institutional capacity development needs, planning activities, and implementing them in the U.S. By drawing on such expertise, the FSN-IL is committed towards supporting the growth and professional development of **minorities and others historically underrepresented** in international development.

For the past year, FSN-IL has been collaborating with the 1890 Universities Foundation to create an opportunity for graduate students interested in food systems within the 1890 institutions. While initial conversations were held in April 2022, FSN-IL and the 1890 Universities Foundations regrouped in January 2023 to get things moving along. Colleagues from the Foundation provided valuable insight in all aspects of the planning process, from who should be included, what is currently feasible, and what the application and rubric should assess.

After months of sorting through the logistics and creating a concept note, FSN-IL and the 1890 Universities foundation is pleased to announce that the first call for applications was released in mid-August, right on track with the team's timeline. In a three-week period, FSN-IL received 8 number of applications from interested Masters and Ph.D. level students interested in a career around food systems.

This student-led working group will be instrumental in helping to identify the needs of the 1890 Universities students. It will give FSN-IL direct access to better understanding where there are gaps for these students and what opportunities can be developed to help further a career path in food systems. These graduate students will not only have the opportunity to develop their leadership skills but will also be able to network with a group of likeminded students and faculty.

Success Story 3: Collaboration between GAIN and the University of Colorado, and two top universities in Bangladesh, has paved the way for future study success.

A collaboration with two Food Systems for Nutrition Innovation Lab (FSN-IL) partners, University of Colorado and GAIN, and two top universities in Bangladesh, Bangladesh Agricultural University (BAU) and The Islamia University of Bahawalpur - Pakistan, was established in late 2022 in response to the FSN-IL RFA: *Actions to Support Storage, Packaging, and/or Cooling Innovations for Perishable Foods in Target Geographies*.

Together, GAIN and the University of Colorado developed a concept note around bundling of biofortification and hermetic storage solutions.

Although the concept note was not selected for the final round of the RFA process, GAIN and the University of Colorado both consider this collaboration to be a success as it provided an opportunity for all parties to work together in determining better methods to test hermetically sealed storage for grains. During the process of investigating new methods of testing, input was received from the GAIN Bangladesh office and the four institutions were able to create connections with relevant local partners to ensure local relevance. By making these connections and ensuring local relevance, a foundation has been set for future collaboration and success in creating immediate impact on the issue of grain storage. GAIN and University of Colorado partners are committed to these innovations and are looking for other resources to improve the chance to scale.

Success Story 4: Annual Partners Meeting in Boston creates space for consortium partners and collaborators to come together to further the food systems transformation agenda



Group picture with FSN-IL, partners, and collaborators

The Food Systems for Nutrition Innovation Lab (FSN-IL) is unique in that it works closely with a world-class consortium of partners, expert advisory board members, and Tufts technical specialists who are all integral to the functionality of the Lab. These collaborations help to leverage past relationships and investments by all partners and help to facilitate upscaling of outreach. Similarly, FSN-IL's Expert Advisory Board helps to provide oversight across activity domains while Tufts technical specialists provide thought leadership to the Lab as needed. While FSN-IL has maintained close contact with all three groups over the past two years, these interactions have remained separate and have been mostly virtual.

The success of FSN-IL's partners meeting comes from the new and old connections formed during this two-day in-person gathering. FSN-IL's consortiums and collaborators were able to build on and further relations, not only with the Lab members but amongst themselves. Many have worked together extensively during the scoping exercises in Year 1 but were meeting in-person for the first time. While the meeting started off with updates from the Lab, the remainder of the meeting focused on interactive discussions with ample time for questions and comments.

With so many diverse perspectives in the room, the final session brought everyone together to focus on how FSN-IL could better engage across the food systems communities in order to transform FSN-IL's agenda. Since there are so many existing activities, FSN-IL can coordinate with our consortium partners to complement each other's work to shift the focus from individual points of the food value chain to food systems and change thinking. By leveraging these valuable relationships, including those with other Feed the Future Innovation Labs and the USAID Food Loss and Waste Community of Practice, we can further our goal of generating new research on how to facilitate innovation that can make an impact on transforming the food systems agenda for better nutrition outcomes.

Appendix B: RFA Form



Feed the Future Food Systems for Nutrition Innovation Lab

Request for Applications

Actions to support Storage, Packaging and/or Cooling Innovations for perishable foods in target geographies

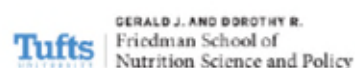
This Request for Applications (RFA) titled "Actions to support Storage, Packaging and/or Cooling Innovations for perishable foods in target geographies" is issued by the Feed the Future Innovation Lab for Food Systems for Nutrition. The FSN-IL is a five-year collaborative research program implemented by Tufts University. The program is funded by the United States Agency for International Development (USAID) under Cooperative Agreement Award No. 7200AA19LE00003.

Target Countries: Bangladesh, Malawi, Mozambique, Nepal

Application Submission Process and Timeline

Activity	Date
Issue date	December 16, 2022
Deadline for submission of written questions	December 22, 2022
Posting of responses to written questions on Piestar RFX	January 6, 2023
Deadline for submission of concept notes	January 20, 2023
Invitations sent for full proposals	February 6, 2023
Deadline for submission of full proposals (to be confirmed with invited applicants)	March 10, 2023
Anticipated award notifications	April 14, 2023
Anticipated start date of awards	May 15, 2023

All concept notes must be submitted to our application portal, Piestar RFX, before 5:00pm EST (GMT-4:00) on the date indicated above. Please allow plenty of time for internet delays and submit prior to 5:00pm. Written questions regarding this solicitation must be submitted to Piestar RFX 5:00pm EST on the date indicated above.



Appendix C: Draft Resolution from the 9th National Conference on Food Science and Technology

The Draft Resolution on promoting food science and innovations for safe, healthy diets and sustainable food systems includes the following points:

1. The conference recognizes that equitable, resilient, and sustainable food systems provide pathways to achieving key sustainable development goals by 2030 (food system – safety, quality, malnutrition, distribution, and processing), and reinforces the commitment to the eradication of poverty, elimination of hunger and malnutrition, and advancing women's empowerment, youth employment, climate resilience and sustainable water, forest, and land management.
2. The conference reiterates the 'critical need' for policy coherence and, where needed, amendment of current national legislation and policies around food and food standards, nutrition, health, and agriculture to ensure equitable, resilient food systems in Nepal, across all government levels and seven provinces. Current policies and commitments, such as the UN Food System Commitment, Nutrition for Growth (N4G), Right to Food, Food Sovereignty Act, and the Multisectoral Nutrition Plan need to be integrated with the food safety policies and food systems transformation strategies to enhance cross-sectoral harmonization and the enhancement across all policies.
3. The conference strongly advocates support of and investment in food science, innovations, technologies, processes, and practices to significantly expand national ambitions to improve food safety, reduce food loss and waste of nutrient-rich foods, such as fruits and vegetables, and animal source foods, improve industrial waste treatment, and promote healthy eating behaviors through food systems innovation, nutrition education, and local diversification and promotion of the indigenous food.
4. The conference reinforces the need for promotion and sensitization of food safety practices and healthy and safe eating behaviors through an integrated public-private collaboration.
5. The conference advocates and recommends the government of Nepal on forming a *National Food Science and Technology Council* to prioritize research, innovation, monitoring and evaluation, regulations, and generation of quality human and institutional capacity, including curriculum development, while ensuring review of schools and the B. Tech (food) curriculum in the context of innovations and food safety.
6. The conference acknowledges the importance of investment in food systems innovations, both on the farm and post-farmgate, characterized by commercialization, trade, consumer awareness, and education for health and sustainable diet with focus on high value food trading, such as tea, coffee, honey, ginger, cardamom, *churpi* (dried cheese), etc.
7. The conference advocates investment in good practices and food safety management systems across the food system.
8. The conference acknowledges the impact and the need to invest in reducing GHG emissions as a result of food systems footprints (land use, soil degradation, food loss and waste, etc.)
9. The conference advocates investment in R&D on nuclear techniques and innovative practices, such as food irradiation, non-radioactive isotopes, high-pressure processing, etc. The conference also advocates linkage between industry and research institutions along with universities for innovations.
10. The conference strongly advocates the support and investment for human and institutional capacity building to promote effective implementation, promotion, scale-up and sustainability of food systems innovations.
 - a. This includes investment in building human capacity on (i) improving food quality standards and labeling, (ii) reducing food contaminants and toxins, (iii) promoting information technology around food innovations, and (iv) improving production of indigenous

crops/foods as well as consumption of quality diet in vulnerable and indigenous ethnic groups.

11. The conference strongly advocates linking research and development (R&D) with research for development (R4D) through continued engagement with academia, government, civil society, development partners, and private sector more effectively to real life policy and effective and efficient evidence-informed program actions. This requires action not only by the policy makers but also by the researchers, academia, associations of experts and scientists, and the private sector.
12. The conference promotes convenient food commodities, both commercial and traditional, used as a vehicle for food enrichment, fortification, and supplementation. For example, the government should promote food industries to go for a nutrition upliftment system and enrichment in commodities such as e.g., milk with vitamin D; flour and rice with minerals, juice with vitamin, water with minerals, etc.
13. The conference advocates having a clear definition of healthy and unhealthy diet and terminologies.
14. As Nepal builds on the initial achievements of the 2021 Food Systems Summit, targeted actions to transform our food system in the coming years need to emphasize on the following actions:
 - a. By 2030, Nepal should aim on improving domestic supply of nutrient-rich foods of all kinds, and find ways and innovative approaches, technologies, processes, practices, policies, as 'bundle of innovations' to collectively reduce post-harvest losses, optimize processing, storage, and marketing practices, improve food safety (including minimizing chemical and anti-microbial residues in foods), and encourage consumer demand for healthier diets. This requires systems thinking about entry points for policy actions across the entire food system in Nepal, closely monitoring progress, building capacity of government across all levels, in the provinces as well as national stakeholders, to think about appropriate steps toward local food system transformation, and enhancing knowledge about best practices that can be shared countrywide.
 - b. Transformative change requires bundled actions that involve multiple players. Engagement and interactions amongst actors across food value chains, from local government, corporations, SMEs, food technologists, regulators, financiers, civil society groups, and farmers, need to do better to claim their space in food systems governance in Nepal, including NEFOSTA.
15. To achieve the objectives and outcomes of the resolution, the conference strongly urges NEFOSTA at the federal level, as well as its chapters at the provincial and local levels, for effective policy and program advocacy, human and institutional capacity development, research for development coordination, and collaboration across multi-sector and multi-stakeholders.
16. NEFOSTA will facilitate close engagement with government stakeholders, development partners (such as the Feed the Future Food Systems for Nutrition Innovation Lab), and local government and non-government partners and institutions in promoting food science and innovations for safe, healthy diets and sustainable food systems.