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

Identifying Innovations to Reduce Food Loss and Waste, Enhance Food Safety, and Promote Access to Nutrient-Dense Foods

November 30th, 2022

Shibani Ghosh, *Tufts University* | Patrick Webb, *Tufts University*

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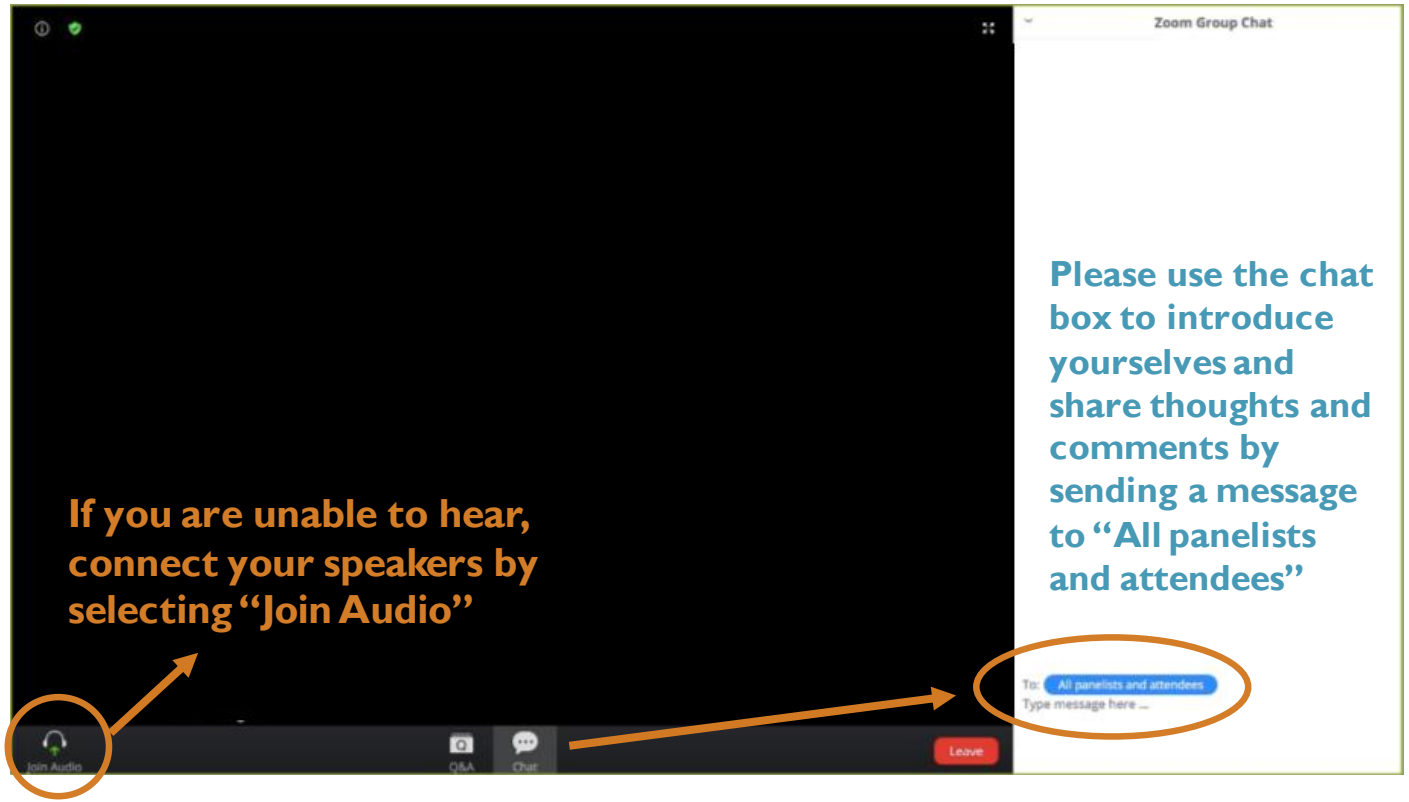
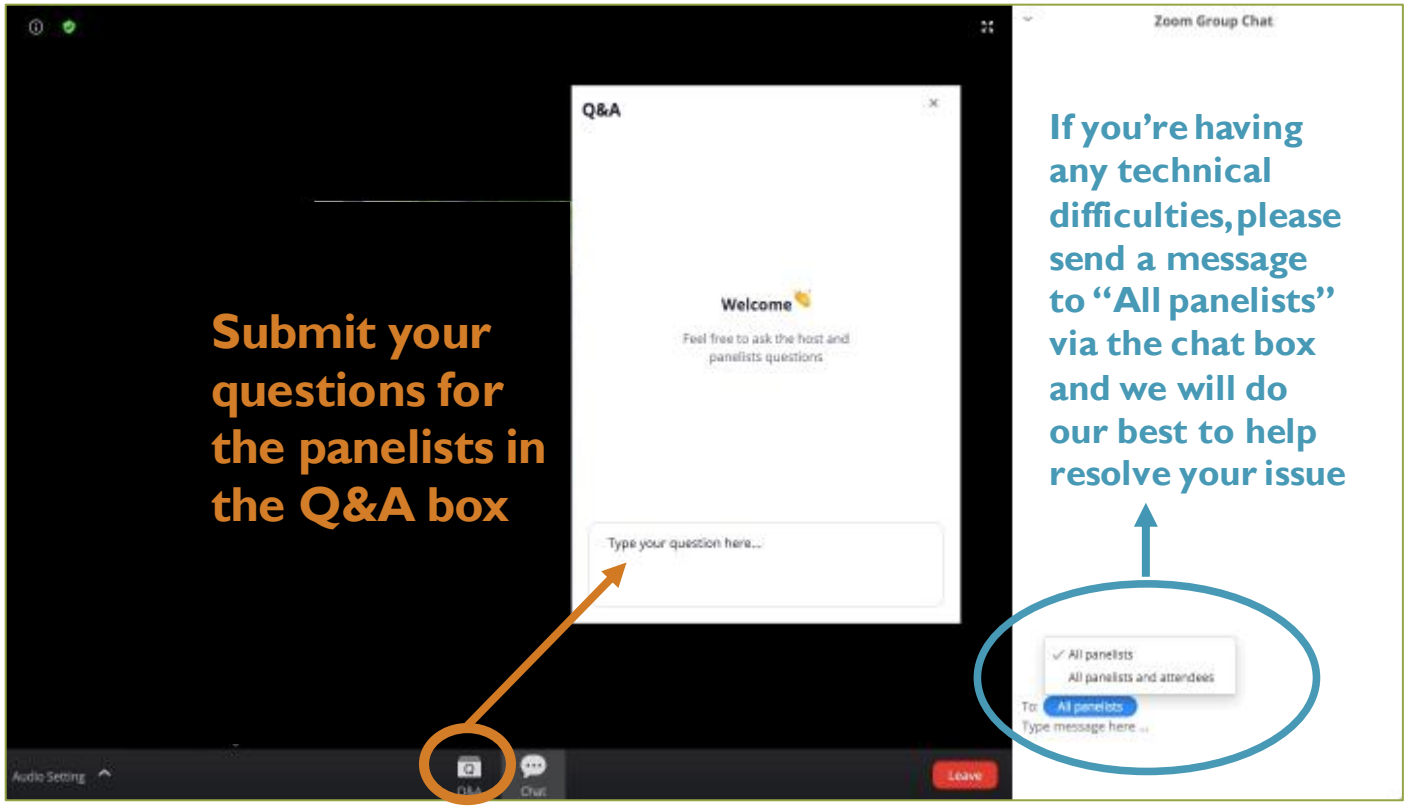
On behalf of the Food Systems for Nutrition Innovation Lab

Tufts UNIVERSITY | GERALD J. AND DOROTHY R. Friedman School of Nutrition Science and Policy

WELCOME TO THE ZOOM WEBINAR



Q&A AND CHAT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The Food Systems for Nutrition Innovation Lab Presents:

Identifying Innovations to Reduce Food Loss and Waste, Enhance Food Safety and Promote Access to Nutrient Dense Foods Across the Food System

Zoom Webinar | Wednesday, November 30th, 2022 | 1:00-2:00 PM (ET)

Photo Credit: Pexels

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"Innovation needs to come in bundles: in technology but critically also in agency, finance, institutions, and the very innovation processes itself. These bundles of innovations must be tailored to different agri-food systems."

Lawrence Haddad (GAIN) 2022

"Successful innovation requires enabling regulatory, and sociocultural environments – these are context specific. Bundles of context-dependent and mutually reinforcing socio-technical innovations are essential for the much-needed transition of our global food systems."

Jo Swinnen (IFPRI) 2022

"Innovation is multifaceted, it is about partnerships and adoption. New technologies and knowledge must travel hand-in-hand with facilitative policies and institutions."

Claudia Sadoff (CGIAR) 2022

"Science- and evidence-based innovations [be they] technological, financial, policy, legislative, social and institutional – are needed across agrifood systems.

These solutions often come as packages; for example, **scaling up a new technology may require conducive policy and legal frameworks, targeted financing, closing of the digital divide, social acceptance, and sound governance and institutions**."

Nepal's National Pathways for Food Systems Transformation (2021)

- Recognize the role of private sectors in food production/value addition and engage/involve them.
- Develop framework for the private sector engagement in producing healthy foods, popularizing healthy dietary pattern.
- Value chain development of local crops /commodities based on green technologies/regenerative agriculture practices in partnership with private sector.

Towards Sustainable Food Systems in Bangladesh (2021)

- Private investment in inputs, processing, storage, packaging, transportation and marketing of agri-food products and services will be promoted, with special attention given to hard-to-reach areas.

- There is substantial food and nutritional loss along the agri-food value chain arising from harvest and postharvest losses due to inadequate infrastructure and lack of updated technologies. Investment in reliable storage is beyond the capacity of individual smallholder farmers and calls for public-private sector collaboration.

Building Healthier, Sustainable and Equitable Food Systems for a Better Malawi (2021)

- Current food systems are not sustainable and not meeting the food and nutrition security, environmental sustainability, social economic and territorial balance requirements in Malawi.

- Government and private sector should invest more in market linkages and infrastructure (e.g., cold chain) to facilitate processing, storage, local trade and consumption of nutrient-rich foods, especially perishable fruits and vegetables.

- Introduce a holistic approach to food waste management through measurement, separation, recycle, re-use.

Mozambique's Food Systems Transformation Pathway (2021)

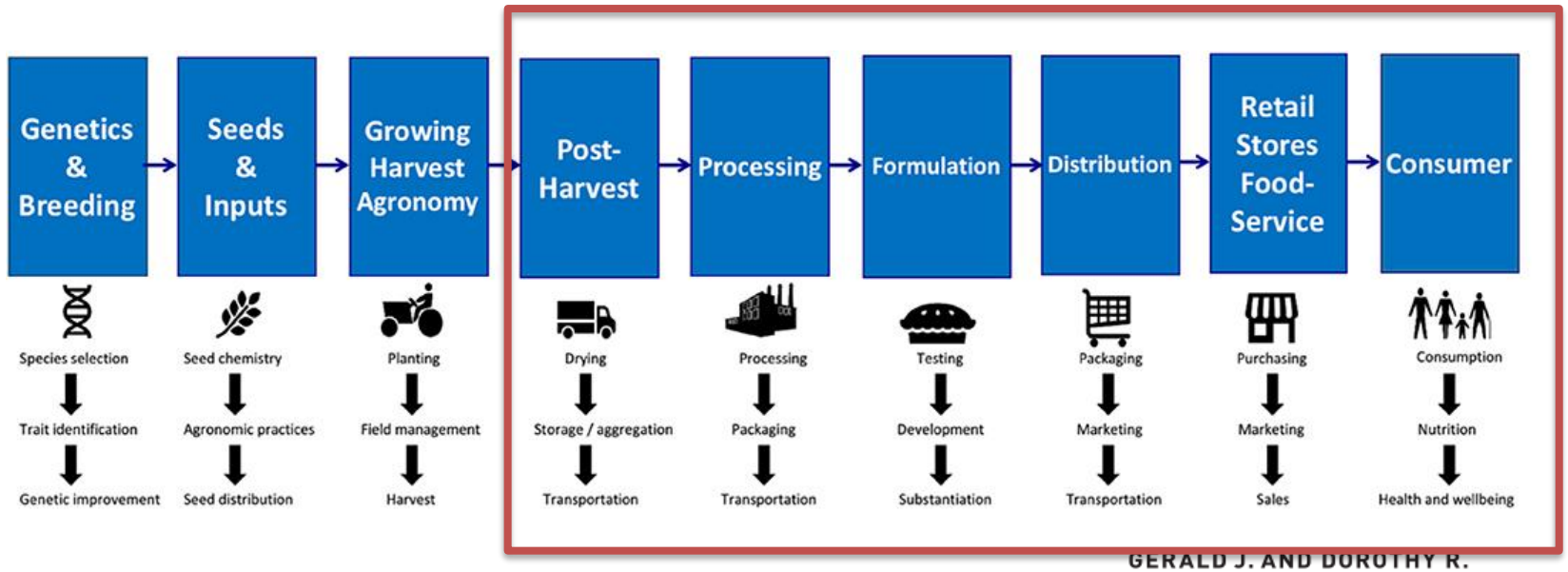
- The private sector is a crucial element for the sustainability of food systems given its expected active role in operationalizing the different activities linked to food systems, starting from primary production to food distribution and sale.

- Research promotion, focusing on marketing aspects and on improvements to the overall business environment.

- Integrated planning for small and medium enterprises (SMEs) as well as trainings for SMEs in business technical and managerial aspects.

Innovations along food value chains to support healthy diets

- Identifying and scaling technologies/innovations (in Bangladesh, Nepal, Mozambique and Malawi).
- Enhancing food safety, cutting food loss and waste.
- Guiding policy innovations to improve food environments (regulation, standards, principles).



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COLLABORATORS

INNOVATION LAB FOR FOOD SYSTEMS FOR NUTRITION (2022-2025) – GOALS

i) **R4D to generate evidence** on potentially scalable nutrition-sensitive food system technologies and practices, (incl. assessing existing but under-used, ready-to-use, pipeline-ready innovations)

ii) **Capacity Development** in partner countries *and in the U.S.* to generate new knowledge and support teaching and training around such knowledge

iii) **Stakeholder engagement** across public and private sectors, business and academics, to catalyze scaling and uptake of nutrition sensitive innovations.

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SCOPING EXERCISE

Step 1: Census generation

Review literature, conduct searches, knowledge and existing networks

Step 2:

Prioritization- utilize the adapted USAID Agricultural Scalability tool to prioritize innovations

Step 3

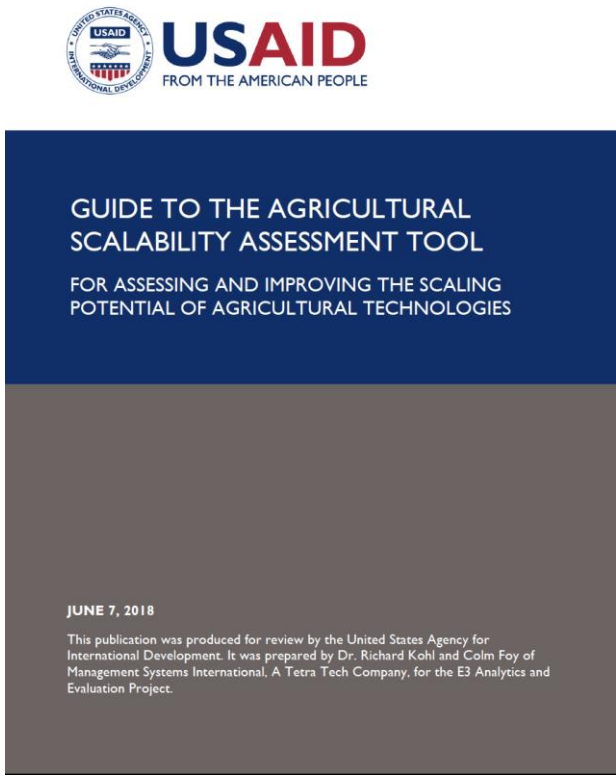
Internal feedback and consensus generation to finalize prioritized list

Step 4

Identification of evidence based 'on the shelf' innovations for FSN-IL geographies

Development of R4D strategy to support FSNIL R4D actions

a) Better understand HICD needs in focus geographies
b) Outline the stakeholder landscape and type of engagement that will be critical for the success in focus geographies.

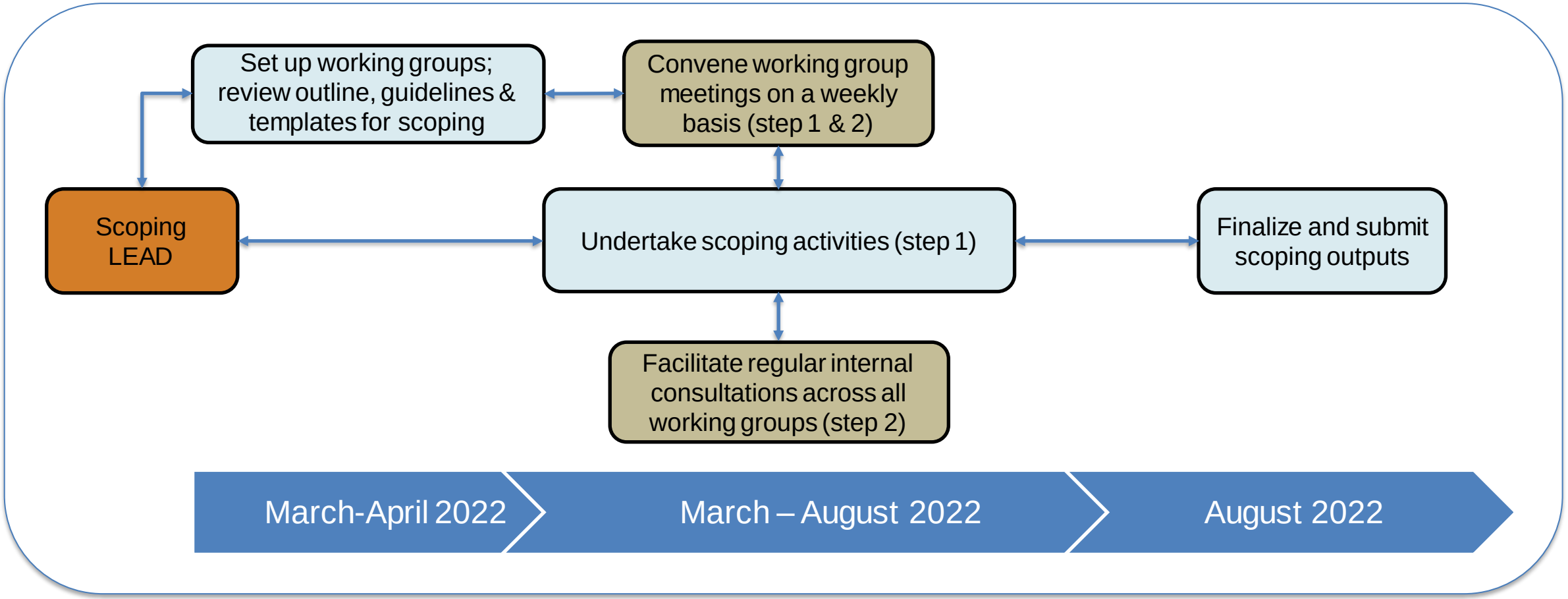


SCOPING LEAD BY THEMATIC AREA

Thematic Area	Scoping LEAD
Theme 1: Agriculture Production, harvest post-harvest losses (on farm)	Purdue University
Theme 2: Post farm-gate processing, packaging & storage	University of Colorado
Theme 3: Marketing and Distribution- Infrastructure, transport & markets	Action for Enterprise (AFE)
Theme 4: Food Environment, consumer choice, retail promotion	Global Alliance for Improved Nutrition (GAIN)
Theme 5: Nutrition Metrics	Harvard University

Approximately 10 members per thematic group ~ 50-60 experts from across 20 institutions participated

Process & Timeline



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Theme 1: Agriculture Production, Harvest, and Post-Harvest Losses

Scoping Exercise Report

Food Systems for Nutrition Innovation Lab

August 14th, 2022

Prepared by Purdue University Lead Team consisting of Gerald Shively, Paul Ebner, Peter Hirst, Jacob Ricker-Gilbert, and Gary Burniske, with assistance of FSN-IL Theme 1 consortium partners, including Quintin Gray (1890 Foundation), John Phillips (the American Indian Higher Education Consortium), Tom van Mourik (Helen Keller International), Kumar Shalander (ICRISAT), Felicia Wu (Michigan State University), Charlotte Block (NCBA/CLUSA), Erin Coughlan de Perez (Tufts University) and Texas A&M University's Borlaug Institute

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Theme 2: Post-Farmgate Food Processing, Food Packaging and Food Storage

Scoping Exercise Report

Food Systems for Nutrition Innovation Lab

August 15th, 2022

Prepared by the University of Colorado Lead Team consisting of Douglas Taren, Yevheniia Varyvoda and Julie Long with assistance from the FSN-IL Theme 2 consortium partners Kathleen Merrigan, Suzanne Palmieri (Arizona State University); Christina Pedersen, David Morgan, Oliver Camp (GAIN); Gerald Shively, Jacob Ricker-Gilbert, Gary Burniske, Haley Oliver (Purdue University); Conrad Bonsi, Eunice Bonsi, Lucy Asare-Baah, Desmond Mortley, John Onuh, Robert Zabawa, Clarissa Harris (Tuskegee University)

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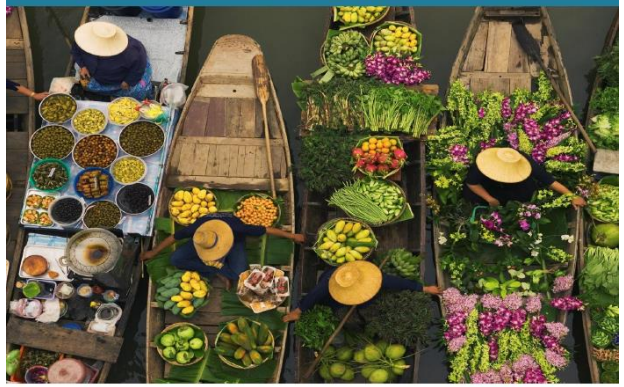

Theme 3: Infrastructure, Transport and Markets

Scoping Exercise Report

Food Systems for Nutrition Innovation Lab

August 17th, 2022

LEAD: AFE – Action for Enterprise

PARTNER CONTRIBUTORS:
Arizona State University
Helen Keller International (HKI)
International Food Policy Research Institute (IFPRI)

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Theme 4 - Food Environment, Consumer Choice, and Retail Promotion

Scoring Exercise Report

Food Systems for Nutrition Innovation Lab

August 15th, 2022

LEAD: GAIN – Global Alliance for Improved Nutrition

PARTNER CONTRIBUTORS:
California State University, San Bernardino
Helen Keller International (HKI)
World Vegetable Center
Tufts University

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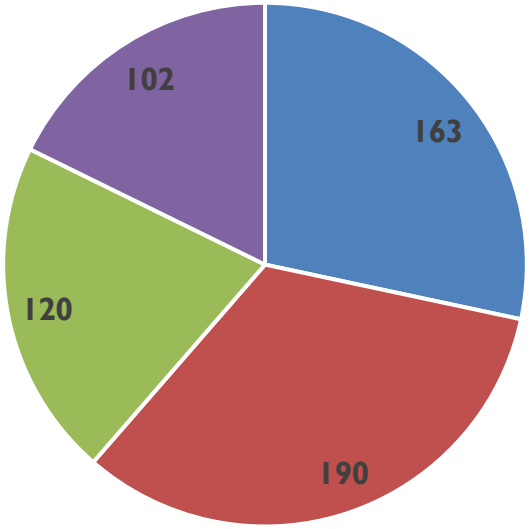
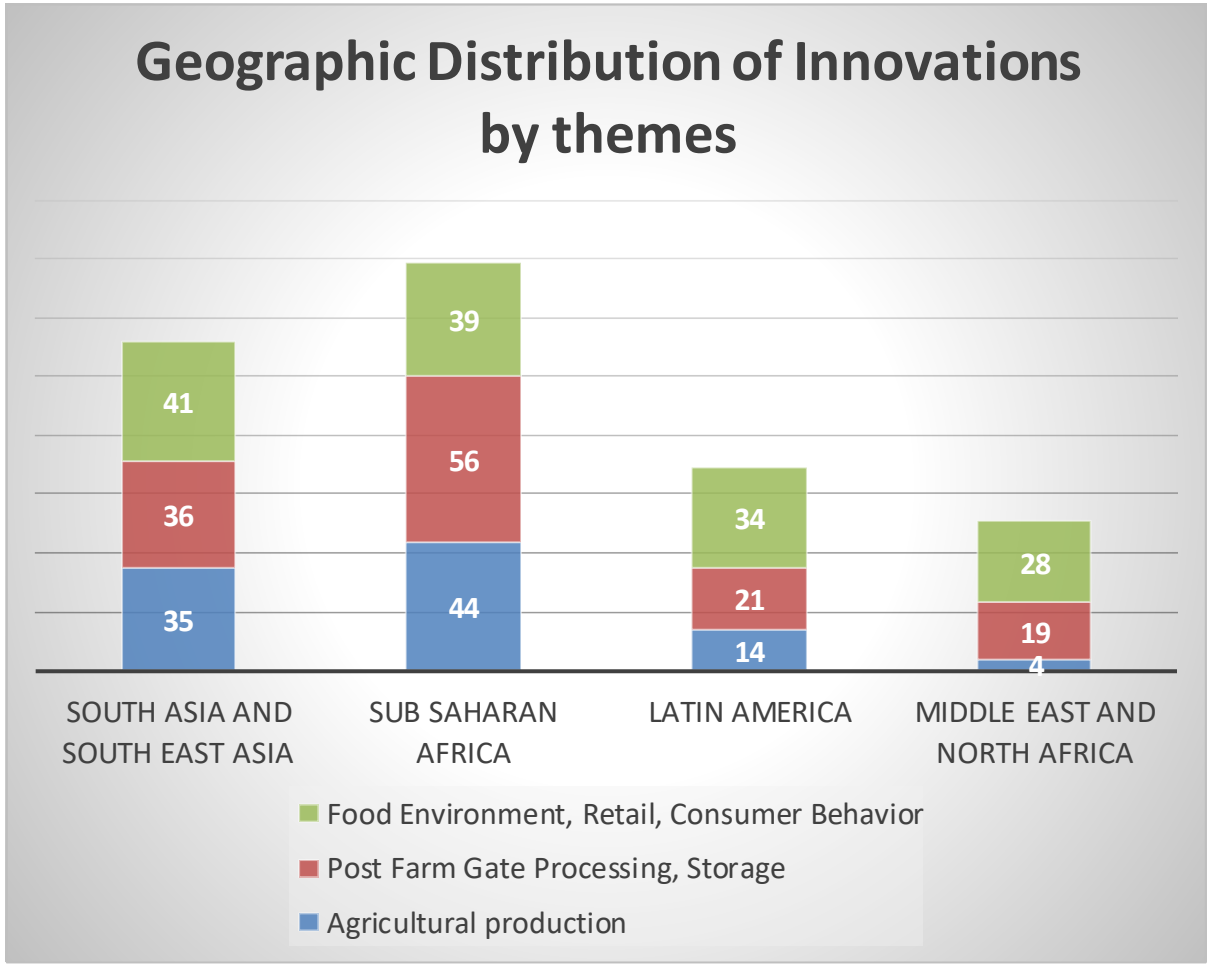
INNOVATION CENSUS - FINDINGS

A total of 276 innovations focusing on nutrient dense foods,food loss and waste and food safety

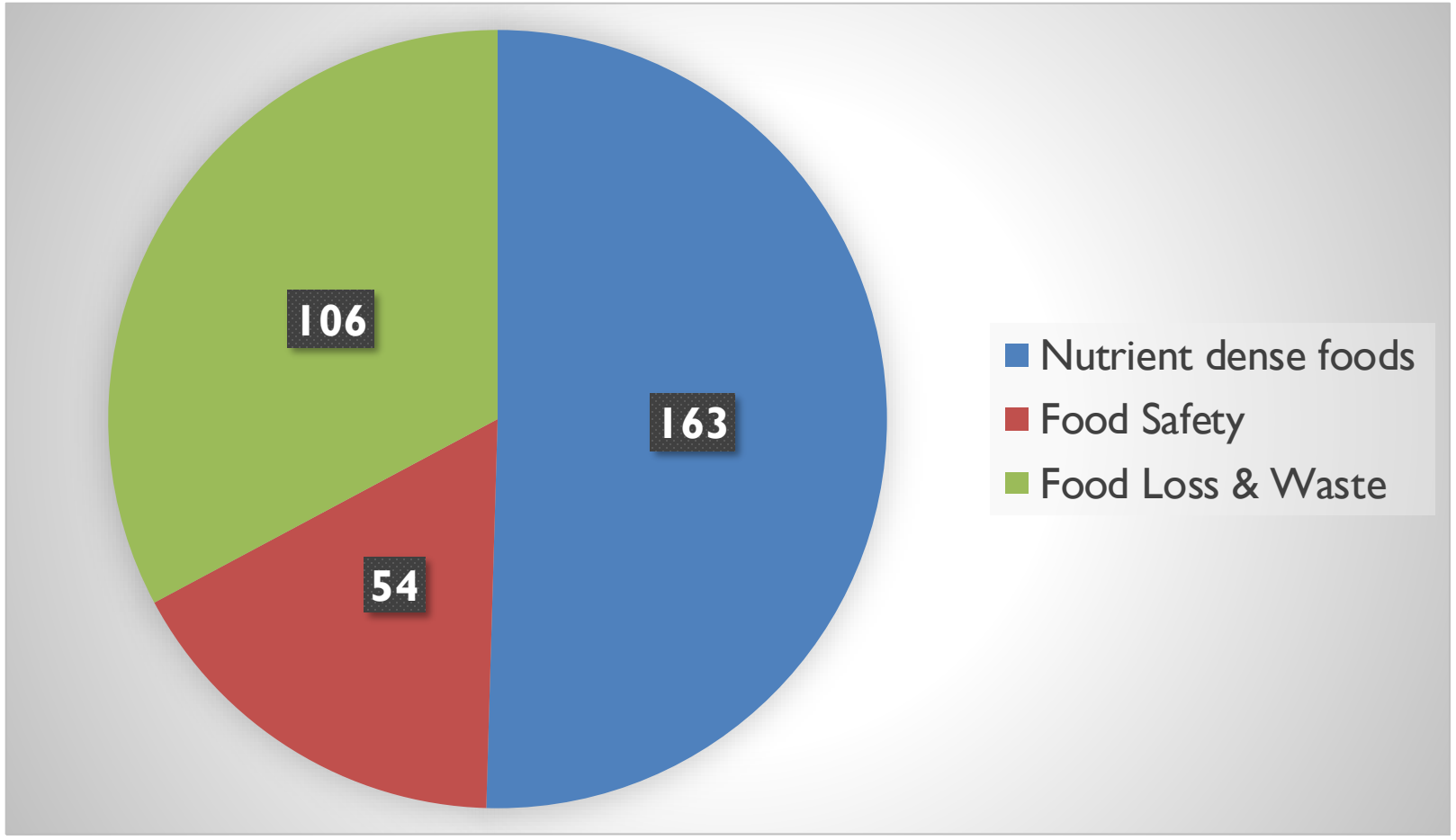


South Asia and South East Asia
Sub Saharan Africa
Latin America
Middle East and North Africa

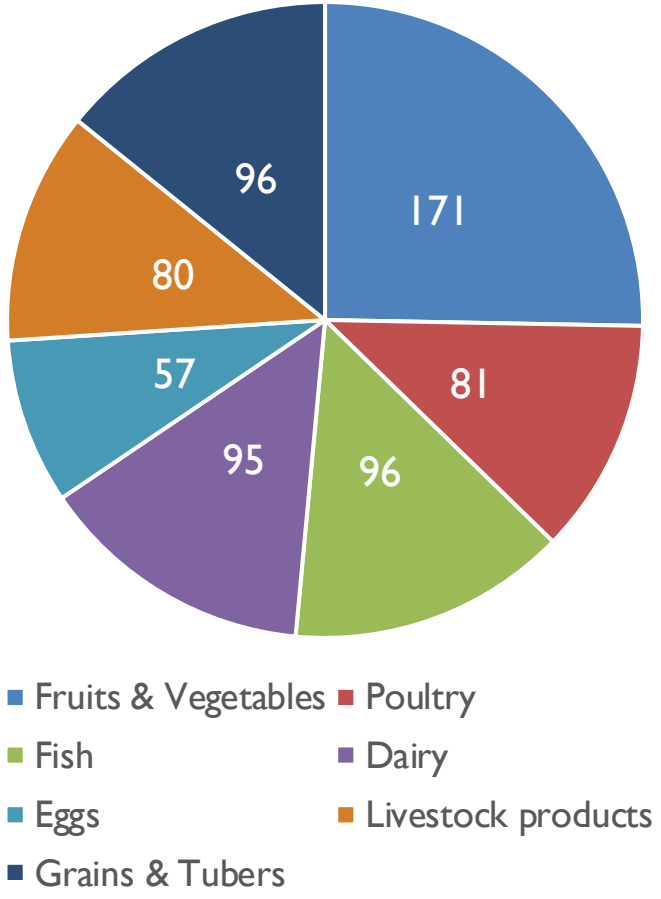


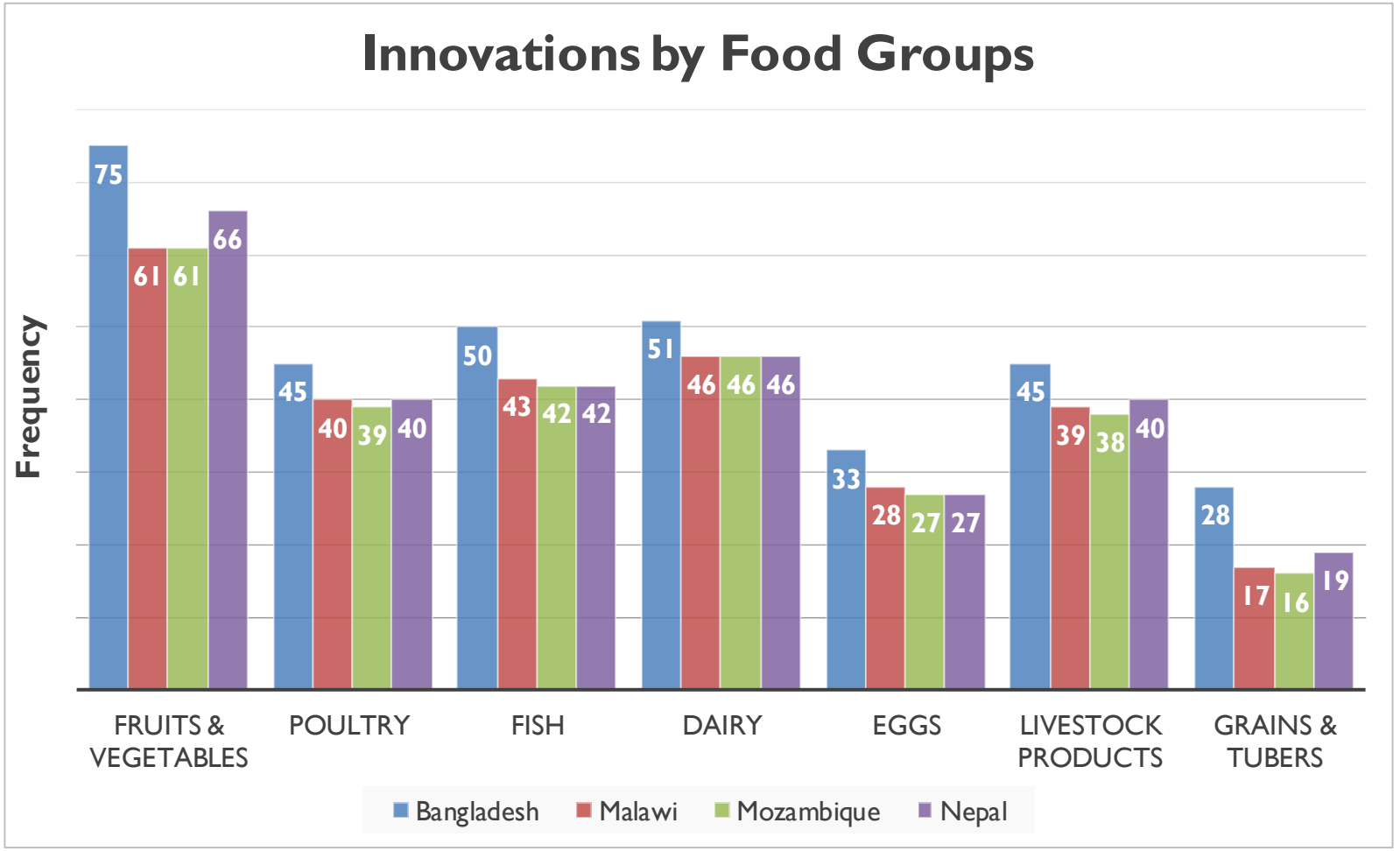
76 Innovations are from the Global Innovation Exchange Database

INNOVATIONS BY PRIORITY AREAS

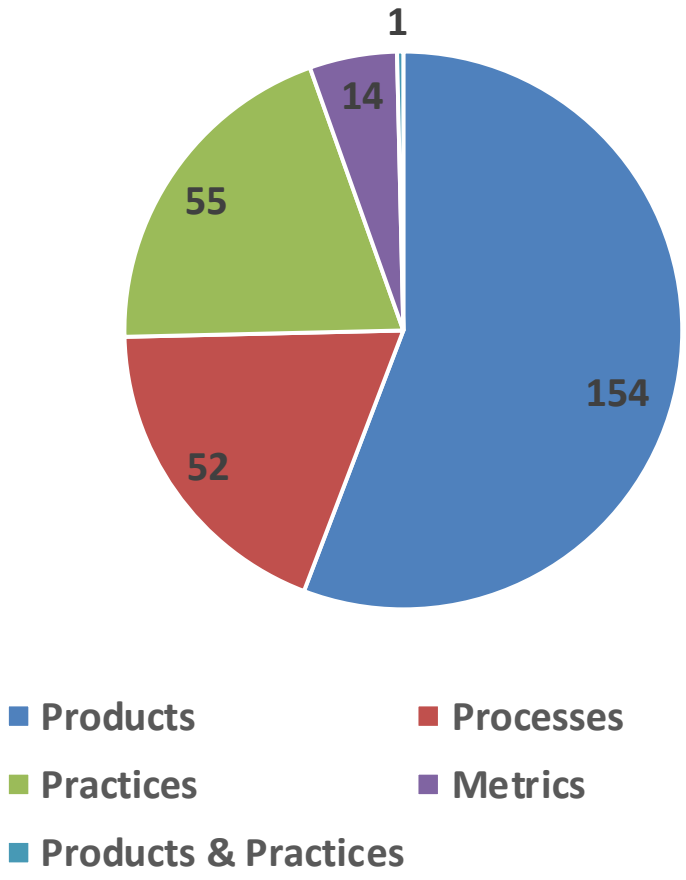


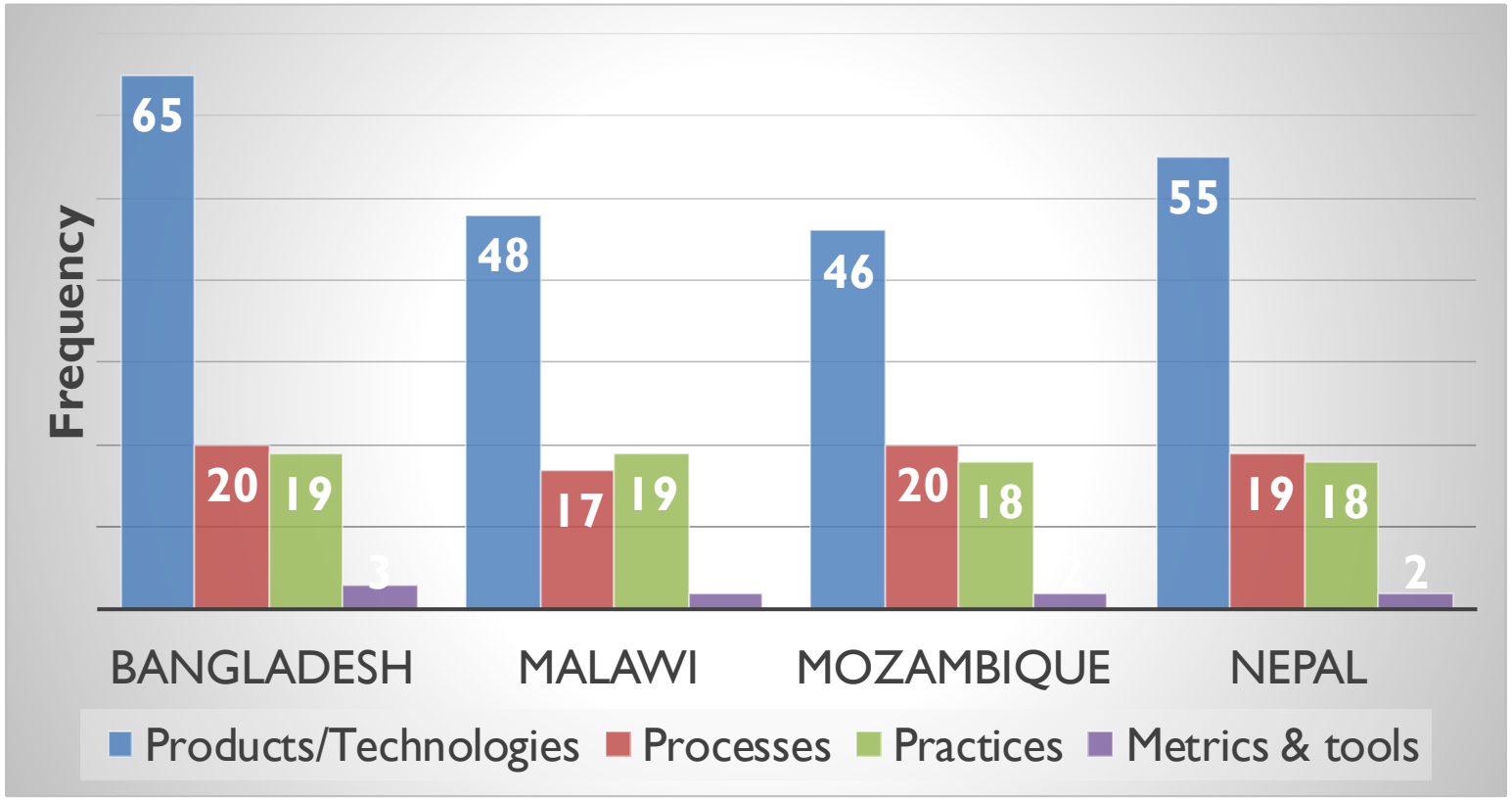
INNOVATION BY FOOD GROUPS



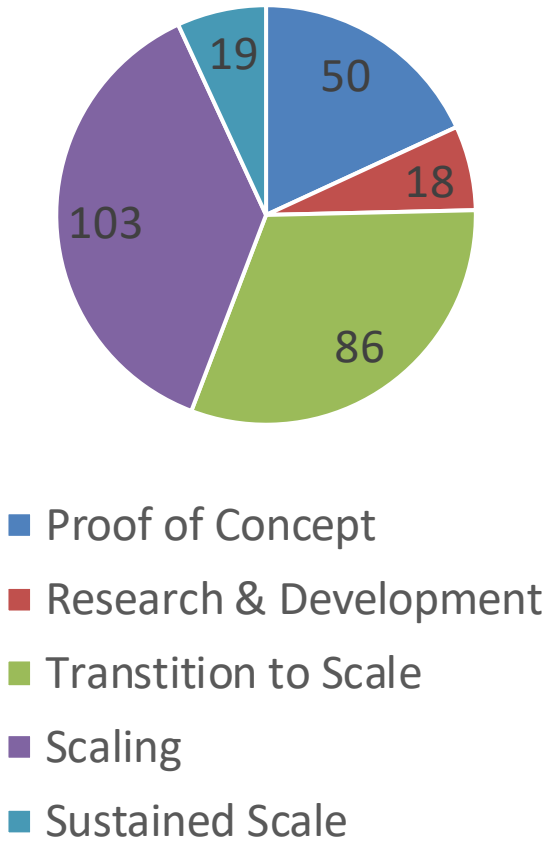


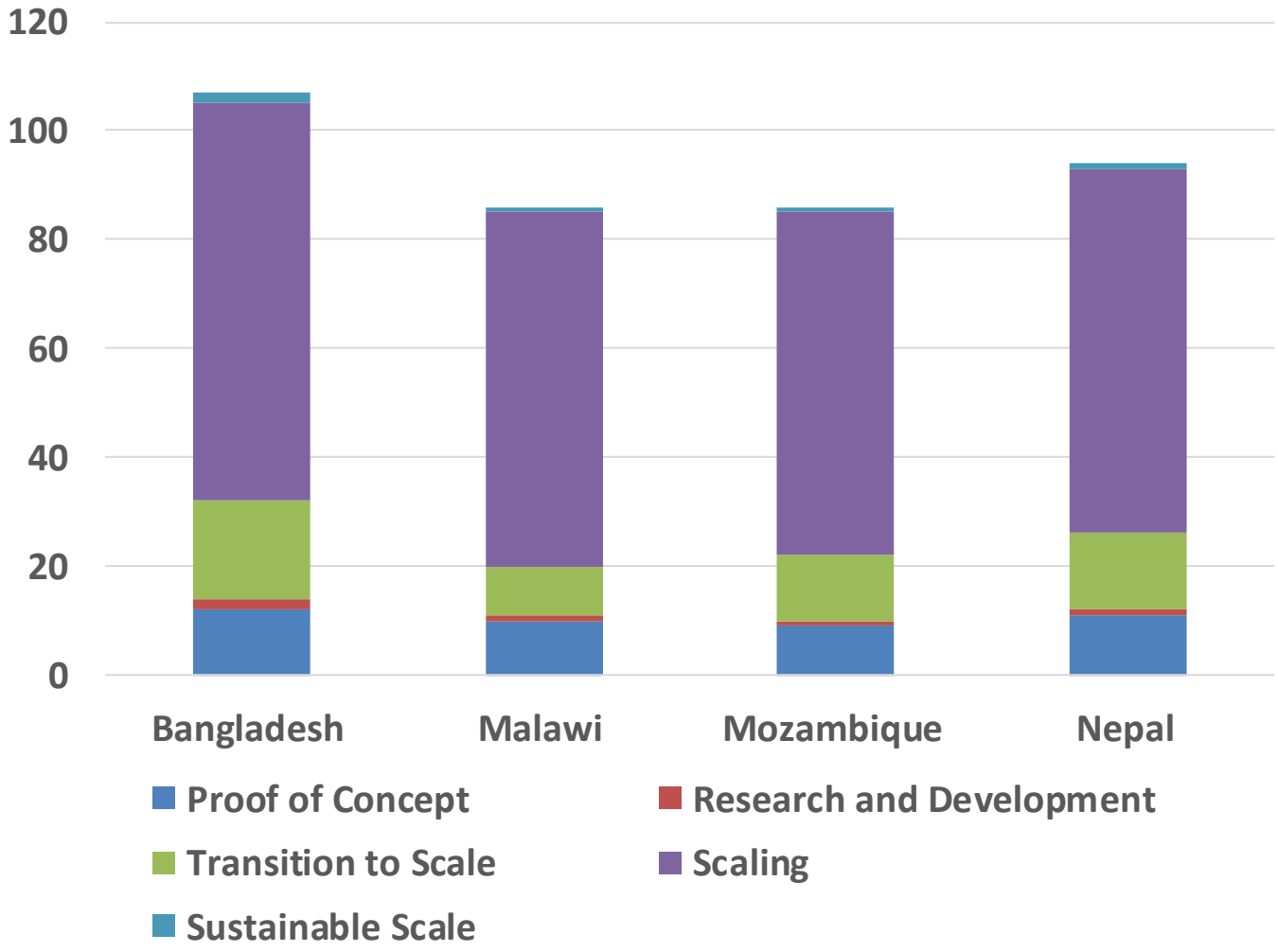
INNOVATION TYPES



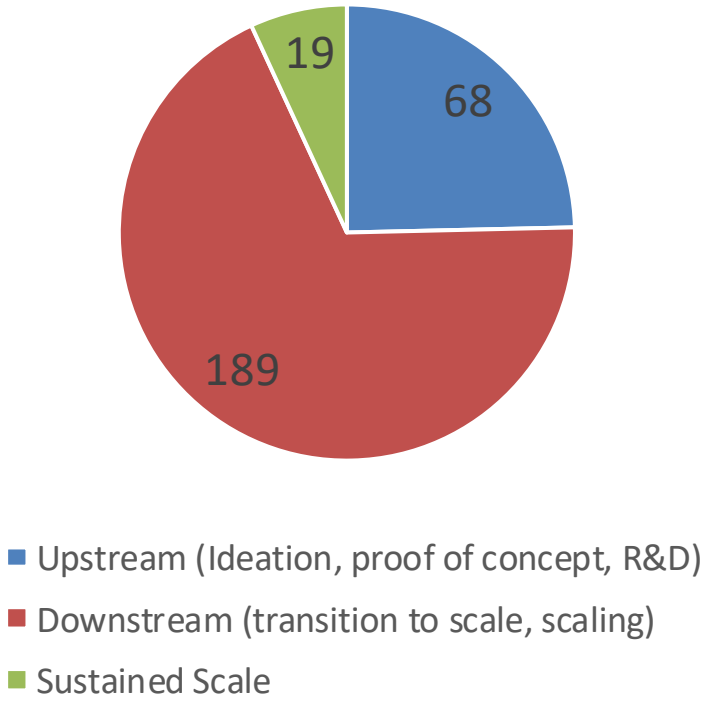


INNOVATIONS BY STAGE



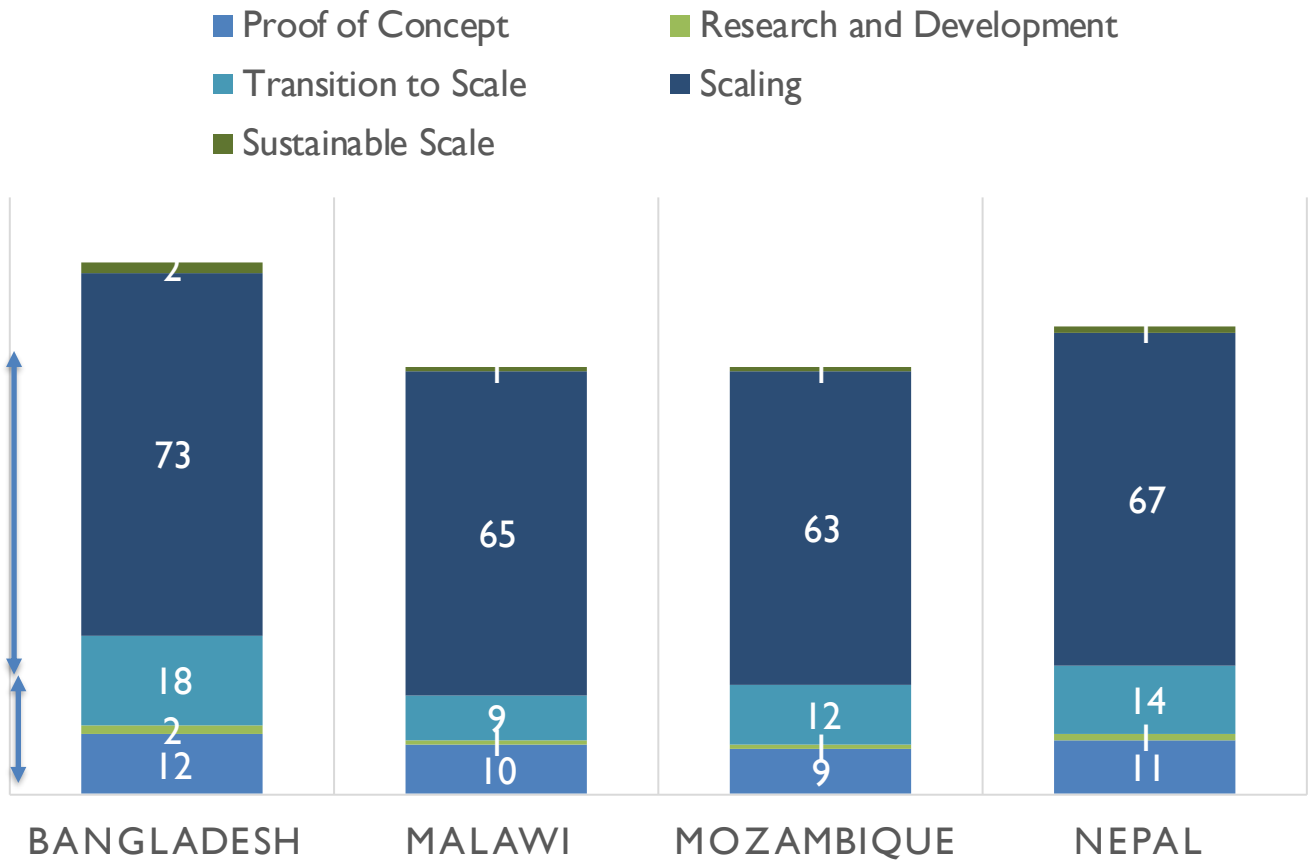


INNOVATION DEVELOPMENT STAGE



Downstream (Transition to Scale, Scaling and sustainable scale)

Upstream (Proof of concept, R&D)



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BUNDLING INNOVATIONS TO IMPROVE EGG CONSUMPTION

Innovations (Products, Processes, & Practices) to improve egg consumption

Innovation: Stage of Development	Value Chain domains			
	Production, harvest & post-harvest	Post farm-gate Processing & Storage	Infrastructure, Transport, & Markets	Food Environment, Consumer choices, & Retail Promotion
Stage 1: Ideation				
Stage 2: Research & development				
Stage 3: Proof of Concept		Traditional Knowledge (Oil Coating of Eggs) (Practices)		"Un Oeuf" One Egg (Practices)
Stage 4: Transition to scale	Sure-Hatch Incubators & Hatchers (Product)			Food4Education (Practices/process)
Stage 5: Scaling			Rapid testing kits for Salmonella (Product)	
Stage 6: Sustainable scale			Active Packaging (Product)	

Bundling of Innovations

Figure adapted from: C.B. Barrett et. al., Socio-Technical Innovation Bundles for Agri-Food Systems Transformation, Sustainable Development Goals Series

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BUNDLING INNOVATIONS REDUCE POST HARVEST LOSS OF GRAINS AND FOOD SAFETY RISKS

Innovations (Products, Processes, & Practices) on Reducing Post-Harvest Loss of Grains

Innovation: Stage of Development	Value Chain domains			
	Production, harvest & post-harvest	Post farm-gate Processing & Storage	Infrastructure, Transport, & Markets	Food Environment, Consumer choices, & Retail Promotion
Stage 1: Ideation				
Stage 2: Research & development				
Stage 3: Proof of Concept		Netting Bags		
Stage 4: Transition to scale	Post-harvest drying: BAU-STR Dryer	Low-cost moisture content measurement (Grain Mate)* Drying Bead* Technology; Saving Grains		
Stage 5: Scaling	Post-harvest storage Hermetic/PICS bags		Dry Cards*; Blockchain; Point of sale system for grains	Innovative multi-media campaigns to spread knowledge about healthy, sustainable diets and food waste
Stage 6: Sustainable scale				

* Implemented in one of the four FTF FSN-IL Focus countries (Bangladesh, Malawi, Mozambique, Nepal

Figure adapted from: C.B. Barrett et. al., Socio-Technical Innovation Bundles for Agri-Food Systems Transformation, Sustainable Development Goals Series'

KEY TAKEAWAYS

- Innovations in LMICs focused primarily on products/technologies, less so around processes, practices and behaviors around uptake of products.
- Research and thinking need to delve further into concepts of bundling of innovations in order to support at scale (e.g., socio-technical bundling, context specific bundling)
- Rigorous empirical evidence on effectiveness, cost-effectiveness of innovations whether products, processes or practices/behaviors supporting reduction in loss and waste, food safety and nutrient density is needed
- Engaging both public and private sector will be critical in achieving transformation. Private sector, key contributors towards increasing accessibility availability of a healthy diet, are inherently driven by profit.
- Scaling up innovations requires a conducive policy environment while ensuring regulatory oversight, an efficient market system, transportation and infrastructure as well as consumer behavioral strategies to ensure nutrient dense perishable foods are available and accessible to all while accounting for food safety and food loss and waste.

NEXT STEPS

- Using census and prioritization findings to identify innovations with potential for application and/or for future research
- Fine tuning the focus of the RFA: e.g., which innovations/bundles to push towards scaling research, cost effectiveness research versus those that are more upstream
- List of innovations and reports from four exercises released for review and feedback
- Finalizing theme 5 scoping exercise
- External stakeholder perspectives on scoping findings
- Release of first RFA focused on research for development (Anticipated date Dec 8, 2022)

Q&A

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