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FEED THE FUTURE INNOVATION LAB FOR FOOD SAFETY

PROCEEDINGS OF FRUIT AND VEGETABLE FOOD SAFETY:
EVIDENCE TO SUPPORT POLICY ACTION

A NATIONAL POLICY CONSULTATION



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**TENNESSEE
STATE UNIVERSITY**

PROCEEDINGS OF
FRUIT AND VEGETABLE FOOD SAFETY: EVIDENCE TO
SUPPORT POLICY ACTION

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**PROCEEDINGS OF
FRUIT AND VEGETABLE FOOD SAFETY: EVIDENCE TO
SUPPORT POLICY ACTION**

A NATIONAL POLICY CONSULTATION

6 BAISAKH, 2081 (APRIL 18, 2024)
THE MALLA HOTEL, KATHMANDU, NEPAL

Organizers:

Agriculture and Forestry University
Feed the Future Innovation Lab for Food Safety
Nepal Food Scientists and Technologists Association
Tennessee State University

Table of Contents

Executive Summary	1
Background.....	3
Objectives.....	3
Summary of Technical Discussions	4
Key Findings from the Food Safety Innovation Lab – Nepal Project	4
Current Status and Progress in Ensuring Fresh Produce Safety	5
Data and Evidence Needs for Informed Decision-Making	5
Generating Advocacy and Awareness on Fresh Produce Safety	6
Conclusion and Policy Recommendations.....	7
Acknowledgments.....	7
Appendix I: Program Agenda	9
Appendix II: About the Organizers and Co-Organizers	12
Appendix III: Photographs	13

Executive Summary

A one-day national policy consultation, Fruit and Vegetable Food Safety: Evidence to Support Policy Action, was co-hosted by the Feed the Future Innovation Lab for Food Safety, the Nepal Food Scientists and Technologists Association, Agriculture and Forestry University, and Tennessee State University. On 6 Baisakh, 2081 (18 April, 2024), 120 participants representing a variety of stakeholders convened at the Malla Hotel in Kathmandu, Nepal to exchange knowledge and experiences concerning fresh produce safety. Participants were enthusiastic and unified throughout the consultation to address knowledge gaps, understand the current landscape and challenges of fresh produce safety in Nepal, and contribute to effective policy interventions that improve the safety of fresh produce. The following six resolutions, based on a synthesis of the consultation's discussions are presented to the Government of Nepal and other engaged stakeholders as key considerations for improving fresh produce safety:

1. **Multidimensional Approach:** Ensure that food safety efforts address microbiological, chemical, and physical hazards and reach stakeholders across the value chain including growers, traders, and retailers.
 - a. Improvements in food safety demand investment and collaboration across all levels of government (national, provincial, local) and the public and private sectors. Public-private partnerships, cross-sectoral collaboration, and intersectoral coordination and cooperation are crucial to making perishable foods safe, healthy, and sustainable in Nepal.
 - b. Current policies emphasize chemical food safety, particularly related to pesticide residues, but there is a critical need to integrate microbial food safety into these efforts.
 - c. Integration of microbial safety training across the value chain requires awareness, trust, incentivization (monetary and non-monetary), and strong regulatory mechanisms.
2. **Consumer Awareness:** Improve food safety awareness among consumers to create demand for safe fresh produce. Inform consumers of NepalGAP, its credibility, and how to recognize NepalGAP-certified produce.
 - a. Evidence from the Feed the Future Innovation Lab for Food Safety's work indicated that consumers are willing to pay more for certified safe foods, but in practice, consumers have not been willing to pay more for NepalGAP-certified produce because they lack awareness of it.
 - b. Consumers need to be educated about food safety and its impact on health. Consumers cannot choose safe food if they do not know what safe food means.
 - c. Women play a crucial role in all stages of food production, distribution, and consumption. From the consumer end, women are often the primary household decision makers in purchasing and preparing food, and they care deeply about food safety. Empowering their awareness and capacity for enhancing food safety practices at all levels is vital.

3. **Right to Safe Food:** Ensure that policies to improve fresh produce safety consider affordability to all stakeholders. Individuals, regardless of their ability to pay, should not only have the right to food but also the right to safe food.
 - a. While market demand is important and can be an effective incentivization for producers to adopt safer growing/production practices, implementing safe growing practices will raise production costs for producers and market prices for consumers.
 - b. While some consumers may have the ability and willingness to pay more for safe food, all people, including those who cannot pay more, should have access to safe food.
 - c. Access to food is a right for all Nepali citizens; access to safe food should be a right for all too.
4. **Water Safety:** Invest in infrastructure, training, and laboratory testing at the local, provincial, and national levels to provide safe water for producers and consumers.
 - a. Feed the Future Innovation Lab for Food Safety research showed that water used by producers and consumers to wash fresh produce was frequently contaminated. Access to clean water for irrigation, washing, and processing at farms, markets, and consumer households is critical in providing safe food.
 - b. Evidence shows that washing produce, even with clean water, is not fully effective in removing microbial or chemical contaminants. Therefore, the burden of control to maintain food safety cannot be placed on end-point consumers. Access to clean water is needed at all stages of the value chain.
5. **Certifications and Standards:** Strengthen, enforce, and support uptake of reliable food safety certifications and standards.
 - a. Aligning national and international food safety standards is critical to creating a regulatory framework that producers, processors, markets, and retailers can comply with, improving domestic food safety and trade opportunities.
 - b. Strengthening chemical and microbial food safety certification processes and enforcement of regulations is needed, not only for domestic food safety but also for Nepal's competitiveness in international markets.
 - c. Collaborative and coordinated investment through the government is needed to enable and incentivize producers to adopt Good Agricultural Practices and attain NepalGAP certification to improve fresh produce safety.
6. **Laboratory Capacity:** Invest in harmonized data collection and support systems with modern technologies and trained individuals that can provide actionable information to all fresh produce stakeholders.
 - a. Investing in improved laboratory and testing capabilities, including facilities and technologies, accreditation, good laboratory practices, and enhancing human capacity to conduct testing and interpret data is essential.
 - b. Nepal has an opportunity to establish the use of modern technology to enhance food safety monitoring and surveillance, including through the use of advanced rapid digital diagnostic techniques and omics.
 - c. Reliable data is needed to prioritize the implementation of food safety practices that will be most effective in the Nepalese context.

Background

Consumption of fresh produce contributes to dietary diversity and supports the nourishment of individuals, households, and communities. However, when fruits and vegetables are consumed raw, they are more likely to be contaminated with foodborne pathogens that can cause disease (i.e., foodborne illnesses). Foodborne illnesses undermine the nutritional benefits of fresh produce consumption, and frequent recurrence enforces a vicious cycle of disease and malnutrition. The FSIL Nepal produce safety project, funded by the Feed the Future Innovation Lab for Food Safety, aimed to stimulate the availability of safe and nutritious fruits and vegetables by identifying the factors that drive producer supply and consumer demand, testing potential sources of food pathogen contamination, and training growers and extension agents via in-person workshops with a newly developed grower's manual on fresh fruit and vegetable safety specific to Nepal. This policy consultation was the culmination of research and capacity-strengthening efforts conducted during the two-year project period. The key strategies for government consideration presented in the Executive Summary are a compilation of the feedback received from the consultation from stakeholders to support the implementation of the Nepal Food Safety and Quality Act, 2081 (2024) and Guidelines.

Objectives

The main objectives of this consultation were to address knowledge gaps, deepen understanding of the fresh produce safety landscape in Nepal, and contribute to more targeted and effective policy interventions that improve access to safe and nutritious fresh produce. The policy consultation successfully met its objectives by providing a national forum to discuss three topic areas:

1. Critical data, evidence gaps, and needs to facilitate informed decision-making on fresh produce safety policies and regulations in Nepal.
2. Potential action points and implementation plans to facilitate advocacy and awareness of fresh produce safety as a key policy agenda.
3. Strengthening human and institutional capacity, awareness, and effective and targeted implementation mechanisms along the food supply chain.

A variety of stakeholders gathered to learn about Feed the Future Innovation Lab for Food Safety research results, discuss the above topic areas, and propose effective strategies that support and strengthen fresh produce safety. A total of 120 participants attended the national policy consultation held on 6 Baisakh, 2081 (18 April, 2024), at the Malla Hotel in Kathmandu, Nepal.

Summary of Technical Discussions

The consultation explored evidence and moderated discussions about a range of topics related to food regulations, growing and processing practices, food security, food safety, and nutrition. These topics were discussed within the framework of strengthening and transforming Nepal's fresh produce and agrifood systems. Four technical topics were discussed: (1) Key Findings from the Food Safety Innovation Lab – Nepal Project; (2) Current Status and Progress in Ensuring Fresh Produce Safety; (3) Data and Evidence Needs for Informed Decision-Making; and (4) Generating Advocacy and Awareness on Fresh Produce Safety.

Key Findings from the Food Safety Innovation Lab – Nepal Project

This discussion started with a presentation from Dr. Aditya Khanal, FSIL Nepal Principal Investigator, in which he described the key results and recommendations resulting from the two-year project funded by the Feed the Future Innovation Lab for Food Safety:

1. The project evaluated 394 water samples across Nepal, and 59% tested positive for the presence of bacteria that indicate fecal contamination and the possibility for contamination with foodborne pathogens. Accessibility and use of safe water are particularly critical in the fruit and vegetable value chains because they are often consumed raw in fresh salads without cooking.
2. Through surveys and choice experiments, the project found that consumers were willing to pay a 30% price premium for salad greens labeled with safety certifications, including both microbial and chemical safety. Youth consumers are potential change agents in food systems and were also shown to prefer food with safety labels or certified as safe, particularly when baseline knowledge of foodborne illness was higher and when they were nudged with information about food safety. The results indicate that consumer awareness campaigns may further increase demand for safer food and that there is a market for fresh fruits and vegetables labeled and certified to be produced using safe growing practices.
3. Surveys of fresh fruit and vegetable producers found that they were willing to incur around 13% additional cost to improve food safety. Access to credit and financial support, land ownership, food safety awareness and education, and access to markets positively influenced producer attitudes toward safer production practices.
4. Women are key decision makers in purchasing and preparing food and are taking on increased responsibilities at home and on farms due to male out migration. However, the FSIL Nepal project found gaps in food safety awareness and determined that women have less access to food safety training than men. Future education and outreach efforts should prioritize women's participation.
5. The FSIL Nepal project trained over 200 producers and extension professionals in food safety practices for fresh fruit and vegetable growing and handling. A training manual was also produced for future widespread distribution.

The discussion concluded by calling for collaboration among the national, provincial, and local governments; universities; and stakeholders to continue conducting research to develop an evidence base and use existing evidence to disseminate food safety knowledge to consumers and producers, support producers in adopting Good Agricultural Practices (GAPs), and specifically incorporate fruit and vegetable microbial food safety in new food safety regulations.

Current Status and Progress in Ensuring Fresh Produce Safety

This discussion addressed the growing concern over food safety in Nepal and suggested a comprehensive approach to tackle the issue, covering both microbial and chemical food safety and actions targeting farms, markets, and households. The following challenges and opportunities were identified:

- **Consumer confidence in food safety.** Participants emphasized the need for bringing research and information to consumers. FAO research provides evidence that Nepali consumers value food safety, with 99% of people in a survey expressing concern about the health, hygiene, and safety of food. However, they had low confidence that foods available in the market were safe, with 70% of respondents saying there is no food hygiene or safety and less than 1% having high confidence that food was safe.
- **Consumers do not value NepalGAP certification.** FAO research has shown that consumers do not recognize or understand the value of the NepalGAP logo on produce brought to market. This is despite evidence from the FSIL Nepal project that consumers are willing to pay a premium for produce labeled with safety certifications, and it highlights a need for educating consumers on the connection between NepalGAP and food safety. Increased consumer awareness, demand for safer food, and willingness to pay a premium for NepalGAP-certified food are needed to incentivize producers to adopt GAPs.
- **Food safety at markets.** Participants also discussed measures that can be taken at markets to improve food safety, including testing for pesticides and chemicals at the markets, preventing the sale of contaminated items, prosecuting vendors who repeatedly attempt to sell contaminated items, properly managing wastewater, using sanitizers on the ground to prevent cross-contamination across the market, and separating NepalGAP-certified produce from non-certified produce.
- **Food safety training and education.** Participants noted that across all levels of the value chain, women need equal access to training and education.

Data and Evidence Needs for Informed Decision-Making

This discussion highlighted the crucial role of data, particularly microbiological data, in improving fresh produce safety, and suggested several action items to support and improve data collection systems. Recurring themes of the discussion were laboratory testing capacity, use of modern technologies, and government support. The following challenges and opportunities were identified:

- **Testing capacity in public and private laboratories.** Throughout the discussion, participants emphasized the importance of food safety and quality data (both microbiological and chemical) when conducting risk assessments, prioritizing resources, and setting policies. In addition, participants agreed that consumer food consumption and public health data were also important. To accomplish this, there is a need to strengthen the existing testing capacity of laboratories, both public and private and at the national, provincial, and local levels. This capacity is important for both domestic commerce and the import/export market.
- **Laboratory accreditation and food safety standards.** Several participants highlighted the need for laboratory accreditation and the harmonization of domestic and international food safety standards.

- **Utilization of modern technologies.** Many modern technologies were mentioned throughout the discussion, including rapid testing devices, whole genome sequencing, genomics, and blockchain systems.
- **Data systems.** In addition to technological infrastructure, support systems are needed to make data accessible and effectively act upon it, such as data sharing systems, analytics, modeling, consumer complaint handling, and public-private feedback mechanisms.
- **Government infrastructure and support.** To implement the technological infrastructure and support systems, including participation in digital technologies, the government needs to provide support to producers and laboratories directly through training, infrastructure investment/development, and incentives for stakeholders.
- **Proactive steps not requiring data.** It was noted that without extensive data at present, growers and food processors can implement internationally recognized production standards such as GAPs to proactively improve food safety. Future data improvements will enhance these efforts.

Generating Advocacy and Awareness on Fresh Produce Safety

This discussion examined food safety awareness and perceptions among fresh produce stakeholders, resulting in a call to action for the government to support and direct the improvement of food safety awareness across the supply chain. Trust among stakeholders was a foundational theme throughout the discussion. The following challenges and opportunities were identified:

- **Low awareness of food safety among consumers and producers.** Participants discussed food safety knowledge lapses among consumers and producers, suggesting strategies for the government to support training and awareness. All participants agreed that both consumers and producers were generally unaware of food safety hazards and practices to improve food safety, especially for microbiological hazards.
- **Raising consumer awareness of food safety.** To raise awareness among consumers, participants mentioned educating children in schools and educating the public through government-sponsored advertising campaigns and by posting food and nutrition officers in municipalities to lead consumer education efforts.
- **Raising producer awareness of food safety.** To raise food safety awareness among farmers, the participants mentioned training, but there was not a clear indication of the best way to accomplish this, nor which entity would be responsible. Farmer participants at the consultation indicated they wanted more training from the government. The participants expressed urgency that government support, through streamlining of certification programs such as NepalGAP and generation of consumer food safety demand, was necessary for Nepali farmers to remain competitive with imports, largely from India.
- **Trust among food system actors.** Trust was mentioned several times by the participants. One aspect discussed was trust between stakeholders, including middlemen, to share the responsibility of maintaining safety and fairly pricing the safely produced fresh produce. In addition, participants mentioned obtaining information from trusted sources like the government or extension offices. Some comments were made about improving farm-level

communication by supporting local governments to participate in food safety implementations.

- **Affordability of safe food.** Food safety is important for all consumers – not just those who can afford it.

Conclusion and Policy Recommendations

Based on the comprehensive discussions throughout the national policy consultation, it is evident that improving food safety requires a holistic approach involving various stakeholders, including producers and consumers, and addressing microbial, chemical, and physical hazards. The approach must increase consumer awareness, empower women, provide equitable access to safe food, and invest in infrastructure, technology, and regulatory systems. Good Agricultural Practices (GAPs), contaminated water, and the need for harmonization of standards to facilitate compliance were some of the key issues raised during the national policy consultation. Collaboration between government, private sector, and international partners is essential for continued improvement, implementation, and enforcement of food safety measures in Nepal. Six resolutions synthesized from discussions throughout the policy consultation are presented for consideration by the Government of Nepal and other engaged stakeholders:

1. **Multidimensional Approach:** Ensure that food safety efforts address microbiological, chemical, and physical hazards and reach stakeholders across the value chain, including growers, traders, and retailers.
2. **Consumer Awareness:** Improve food safety awareness among consumers to create demand for safe fresh produce. Inform consumers of NepalGAP, its credibility, and how to recognize NepalGAP-certified produce.
3. **Right to Safe Food:** Ensure that policies to improve fresh produce safety consider affordability to all stakeholders. Individuals, regardless of their ability to pay, should not only have the right to food but also the right to safe food.
4. **Water Safety:** Invest in infrastructure, training, and laboratory testing at the local, provincial, and national levels to provide safe water for producers and consumers.
5. **Certifications and Standards:** Strengthen, enforce, and support the uptake of reliable food safety certifications and standards.
6. **Laboratory Capacity:** Invest in harmonized data collection and support systems with modern technologies and trained individuals that can provide actionable information to all fresh produce stakeholders.

Acknowledgments

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The organizers extend their sincere gratitude to all participants, panelists, moderators, chairs, and stakeholders who contributed to the national consultation with their excellent deliberations,

feedback, and recommendations. They also recognize Dr. Robin Shrestha and colleagues at the Feed the Future Food Systems for Nutrition Innovation Lab at Tufts University for their support in conceptualizing, planning, and engaging local stakeholders.

Event photography was provided by Mr. Prakash Shrestha/Hallfax Media Pvt. Ltd.

Appendix I: Program Agenda

8:00-9:00	Breakfast & Registration
9:00-9:10	<p>Welcome Remarks and Objectives of the Consultation</p> <p>Mr. Ram Hari Timilsina, Deputy Director, Directorate of Research and Extension and Associate Professor, Agriculture and Forestry University; Co-Principal Investigator, Feed the Future Innovation Lab for Food Safety-Nepal</p>
9:10-10:00	<p>Inauguration and Opening Remarks</p> <p>Chair: Dr. Punya Prasad Regmi, Vice Chancellor, Agriculture and Forestry University, Nepal</p> <p>Dr. Haley Oliver, Director, Feed the Future Innovation Lab for Food Safety, Purdue University</p> <p>Mr. Jason Seuc, Director, Economic Growth Office, United States Agency for International Development (USAID), Nepal</p> <p>Dr. Govinda Prasad Sharma, Secretary, Ministry of Agriculture and Livestock Development, Government of Nepal</p> <p>Closing and thank you remarks from the Session Chair, Dr. Punya Prasad Regmi</p>
10:00-11:00	<p>Session 1: Food Safety Innovation Lab Project Dissemination</p> <p>Chair: Mr. Rajendra Koirala, Province Secretary, Ministry of Land Management, Agriculture and Cooperative, Bagmati Province</p> <p>Moderator: Dr. Arjun Kumar Shrestha, Dean, Faculty of Agriculture, Agriculture and Forestry University</p> <p>Presentation: Safer Food Production and Consumption in Nepal: Understanding the Adoption of Food Safety Practices and Consumer Consciousness in Fresh Produce</p> <p>Dr. Aditya Khanal, Associate Professor, Tennessee State University; Principal Investigator, Feed the Future Innovation Lab for Food Safety-Nepal</p> <p>Panelists:</p> <p>Mr. Ram Hari Timilsina, Associate Professor, Agriculture and Forestry University; Co-Principal Investigator, Feed the Future Innovation Lab for Food Safety-Nepal</p> <p>Ms. Rita Gurung, Assistant Professor, Agriculture and Forestry University; Co-Principal Investigator, Feed the Future Innovation Lab for Food Safety-Nepal</p> <p>Mr. Saroj Poudel, SAHAVAGI-Nepal; Co-Principal Investigator, Feed the Future Innovation Lab for Food Safety-Nepal</p> <p>Mr. Rabin Aryal, Research Associate with Feed the Future Innovation Lab for Food Safety-Nepal, Agriculture and Forestry University</p> <p>Moderated Q&A session followed by closing remarks from the Chair/Moderator</p>

11:00-11:15	Tea Break
11:15-12:15	<p>Session II: Current Status and Progress in Ensuring Fresh Produce Safety in Nepal</p> <p>Chair: Mr. Som Kanta Rijal, Department of Food Technology and Quality Control, Ministry of Agriculture and Livestock Development, Government of Nepal</p> <p>Moderator: Dr. Atul Upadhyay, President, Nepal Food Scientists and Technologists Association</p> <p>Panelists:</p> <p>Dr. Arun GC, Programme Specialist, Food and Agriculture Organization of the United Nations, Nepal</p> <p>Dr. Debraj Adhikari, Senior Plant Protection Officer, Plant Quarantine and Pesticide Management Center</p> <p>Dr. Mahadeb Prasad Poudel, Executive Director, Kalimati Fruits and Vegetables Market Management Committee, Government of Nepal</p> <p>Moderated Q&A session followed by closing remarks from the Chair/Moderator</p>
12:15-1:30	Lunch
1:30-2:30	<p>Session III: Data and Evidence Needs for Informed Decision-Making on Ensuring Fresh Produce Safety in Nepal</p> <p>Chair: Mr. Binod Kumar Bhattarai, Director, Prime Minister Agriculture Modernization Project, Ministry of Agriculture and Livestock Development, Government of Nepal</p> <p>Moderator: Dr. Aditya Khanal, Associate Professor, Tennessee State University; Principal Investigator, Feed the Future Innovation Lab for Food Safety-Nepal</p> <p>Panelists:</p> <p>Dr. Randy Worobo, Associate Director, Feed the Future Innovation Lab for Food Safety, Cornell University</p> <p>Mr. Krishna Prasad Rai, National Food and Feed Reference Laboratory, Department of Food Technology and Quality Control, Government of Nepal</p> <p>Dr. Roman Karki, Chief, National Food Research Centre, Nepal Agricultural Research Council</p> <p>Dr. Atul Upadhyay, President, Nepal Food Scientists and Technologists Association; Country Lead, Scaling Up Nutrition (SUN) Business Network, Nepal</p> <p>Moderated Q&A session followed by closing remarks from the Chair/Moderator</p>

2:30-3:30	<p>Session IV: Generating Advocacy and Awareness on Fresh Produce Safety in Nepal (From Producers to Consumers)</p> <p>Chair: Dr. Hari Bahadur KC, Director General, Department of Agriculture, Ministry of Agriculture and Livestock Development, Government of Nepal</p> <p>Moderator: Dr. Uma Koirala, Professor, Tribhuvan University</p> <p>Panelists:</p> <p>Mr. Prabesh Shrestha, Farmer Representative</p> <p>Dr. Hom Bahadur Basnet, Dean, Faculty of Animal Science, Veterinary Science and Fisheries, Agriculture and Forestry University</p> <p>Mr. Madhav Timalsina, President, Consumer Rights Investigation Forum</p> <p>Mr. Sashan Devkota, Private Sector</p> <p>Moderated Q&A session followed by closing remarks from the Chair/Moderator</p>
3:30-4:00	<p>Tea Break</p>
4:00-4:30	<p>Actionable Strategies to Effectively Address and Improve Fresh Food Safety in Nepal</p> <p>Chair: Dr. Rishi Ram Kattel, Director, Directorate of Research and Extension, Agriculture and Forestry University</p> <p>Presentation: Compilation of Discussion Points for the National Consultation</p> <p>Mr. Ram Hari Timilsina, Deputy Director, Directorate of Research and Extension and Associate Professor, Agriculture and Forestry University; Co-Principal Investigator, Food Safety Innovation Lab-Nepal</p>
4:30-4:50	<p>Closing Remarks</p> <p>Dr. Ahmed Kablan, Senior Science Advisor, Center for Nutrition, Bureau for Resilience, Environment, and Food Security, United States Agency for International Development (USAID)</p> <p>Dr. Sharada Thapaliya, Registrar, Agriculture and Forestry University</p>

Appendix II: About the Organizers and Co-Organizers

Nepal Food Scientists and Technologists Association

The [Nepal Food Scientists and Technologists Association](#) is a solely autonomous, professional, non-profit organization of all Nepalese food scientists and technologists. Its mission is to develop and promote the agro-food processing sector to provide safe, wholesome, and nutritious food to the people of Nepal and foster economic growth.

Feed the Future Innovation Lab for Food Safety at Purdue University and Cornell University

The [Feed the Future Innovation Lab for Food Safety](#) is one of approximately 20 Innovation Labs funded by [Feed the Future](#), the U.S. Government's global hunger and food security initiative led by the [United States Agency for International Development](#) (USAID). Its mission is to reduce the burden of foodborne illness and break the cycle of disease, malnutrition, and food insecurity. The lab's approach includes increasing awareness of food safety; enhancing capacity to conduct food safety research; supporting policy development that enables food safety research, translation, and practice; and accelerating translational research for households, communities, and the food industry.

Agriculture and Forestry University

[Agriculture and Forestry University](#) is the first state-owned and technical university of Nepal, established in accordance with the Agriculture and Forestry University Bill enacted by the Parliament in 2010. The constituent campuses of Tribhuvan University, the Institute of Agriculture and Animal Sciences, and the Forestry Campus in Hetauda, together with the Dean's Office Institute of Agriculture and Animal Sciences Rampur were merged, and Agriculture and Forestry University was established in Rampur, Chitwan. The university aims to produce the highly skilled human resources required to promote education, research, and development in agriculture, livestock, veterinary science, fisheries, forestry, and allied disciplines. In addition, it aims to contribute to the all-around development of agriculture, livestock, and forestry to raise the socio-economic conditions of rural people through quality teaching, research, and extension.

Tennessee State University

[Tennessee State University](#), founded in 1912, is a public, historically Black land-grant university and leading public research institution located in Nashville, Tennessee, United States of America. The university offers diverse undergraduate, graduate, and professional programs spanning various scientific disciplines. Renowned for its commitment to research excellence and community involvement, the university plays a pivotal role in advancing scientific knowledge and fostering innovation. With a rich history of academic achievement and a dedication to serving diverse student populations, Tennessee State University continues to make significant contributions to scientific discovery and societal progress.

Appendix III: Photographs



Opening Session



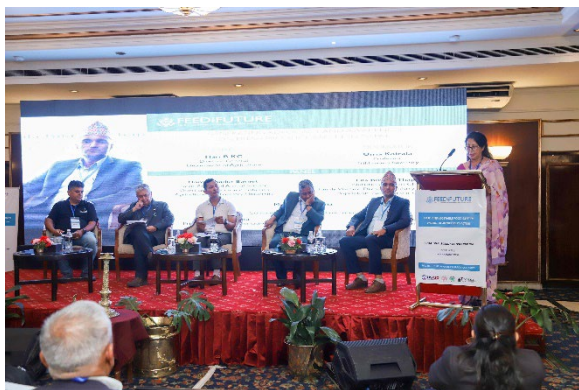
Session 1



Session 2



Session 3



Session 4



Closing remarks



Attendee participation during sessions



Group photo of participants

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