



# **PROGRESS REPORT**

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## **THE POSTHARVEST EDUCATION FOUNDATION (PEF)**

**2011-2024**



**January 2025**

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## I. INTRODUCTION

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The global population is projected to reach more than 9.8 billion by 2040 and 11.2 billion by 2100, which will likely pose a significant challenge to international food and nutritional security. Substantial efforts are underway to enhance crop yields, develop more efficient varieties, and optimize resource utilization. On the other hand, a significant amount of food is being lost due to postharvest losses throughout the supply chain. The issue of food loss and waste is important and evident in all parts of the world. In the case of developing countries, postharvest losses occurring earlier in the handling chain are more severe. The losses are likely attributable to improper handling practices, insufficient storage and transportation infrastructure, inadequate packaging and temperature management, limited technological adoption in key areas, such as cold chain management, and inadequate investment in modernizing and improving food production systems.

According to global studies by the United Nations Food and Agriculture Organization (FAO), World Resources Institute (WRI), and the World Bank Group (WBG), a staggering one-third of all agricultural produce is lost before it reaches consumers. In a recent report, FAO specified that 13.8% of food is lost on farms after harvest, during transit, storage, and processing, costing an estimated amount of more than US\$400 billion each year. Therefore, reducing these losses is increasingly recognized as the most resource-efficient strategy for sustainably increasing food availability and ensuring global food security.

During the last couple of decades, several research studies have been carried out on food losses, these have reported different sources of losses and developed many innovative ways to reduce losses. But proper transfer of knowledge in the improved postharvest handling of crops is still critically lacking, especially in low- and middle-income nations. Effective extension and training about factors affecting food loss and wastage and suitable remedies are essential to reduce losses.

Reducing postharvest loss (PHL) and food waste presents one of the best strategies for increasing food availability for both the present and future needs. A diverse range of stakeholders, including government agencies, private corporations, and non-governmental organizations (NGOs), are actively engaged in addressing this critical issue.



In 2011, Dr. Lisa Kitinoja and a small group of like-minded individuals founded **The Postharvest Education Foundation (PEF)**, a non-profit public charity organization based in Oregon. The founding board had vast experience in global postharvest consulting work but was concerned that there was little to no access to affordable training for those living and working in developing countries. The PEF was established to equip young horticultural professionals with the knowledge and skills to address food losses, identify postharvest challenges, and implement effective solutions in their own countries. This

approach empowers small-scale farmers to minimize wasted resources and increase their incomes, contributing to a more sustainable and equitable food system.

### Who is Dr. Lisa?

*Dr. Lisa possesses a deep-rooted passion for food security and sustainable agriculture. Her journey began in New York City, where a childhood experience with a community-driven walkathon to combat hunger ignited her interest in the interconnectedness of food and social justice. Further inspired by her grandmothers and great-aunts, she developed a keen understanding of food preservation techniques during her teenage years. This passion led her to pursue scientific studies in college, where she became acutely aware of global food insecurity and the need for equitable access to resources.*

*Dr. Lisa's commitment to addressing these challenges propelled her to earn two master's degrees in vegetable crops and international agricultural development from the University of California, Davis. Subsequently, she earned a doctorate in Agricultural Extension Education from Ohio State University, specializing in reducing food losses and waste in fruit and vegetable production. Her career has been dedicated to empowering communities through practical solutions. Since 1990, she has served as a private horticultural consultant, international trainer in postharvest technology, and project director across over 20 developing countries, primarily in Africa, India, Indonesia, and the Middle East. Her work has spanned collaborations with prominent organizations such as Africare, Care International, WFLO, Winrock International, USDA, USAID, the Gates Foundation, UN FAO, the World Bank, and numerous US universities.*



**Listen to Dr. Lisa's interview on Green is Good**  
<https://youtu.be/Ba-zls3Y9FQ>

### Founding Board Members (2011)



Dr. Adel A. Kader, Dr. Diane M. Barrett, Dr. Lisa Kitinoja, Dr. Devon Zagory and Patrick Brown (L to R - Above).  
Cathy Kitinoja and Symantha Holben (L to R - Below).



## Our Mission

The mission of PEF is to provide innovative programs that motivate and empower people with the aim of reducing global food losses, and maintaining quality, market value, nutritional value and food safety.

## Objectives

- Conducting a variety of postharvest e-learning programs for young professionals who work with small-scale farmers in developing countries
- Providing free access to postharvest training materials for those who are involved in extension work and training of farmers, produce handlers, small-scale food processors, and marketers
- Supplying the postharvest tools and basic equipment for use in applied research and for improving practical field operations
- Organizing postharvest workshops for e-learners who complete the e-learning programs
- Offering long-term mentoring for participants in e-learning programs and other postharvest enthusiasts via social networking websites
- Conducting short courses, study tours, and workshops
- Providing advice and guidance for establishing local postharvest training and services centers (PTSC)

## Approach

PEF works to achieve the objectives through a three-pronged approach, all managed by volunteers. The first and key approach is capacity building through the PEF Postharvest E-learning course, which includes 10 assignments (readings, fieldwork and written reports) available in public/open access space, so individuals or groups can participate at no cost, and on their schedules. The second is publications including whitepapers, research articles, books and book chapters on various topics related to postharvest and cold chain management. Most of the publications are available for free access on the PEF website. Finally, PEF offers consultation and mentoring on establishing postharvest infrastructure, cold chain management, capacity building programs and sustainable food systems.



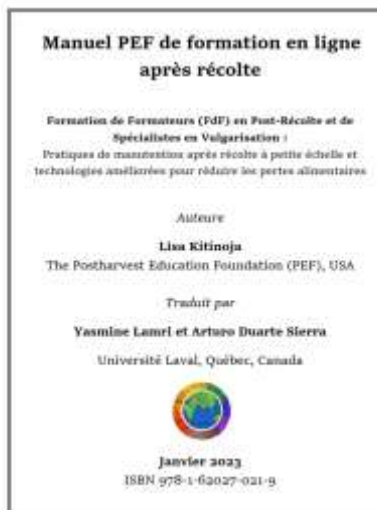
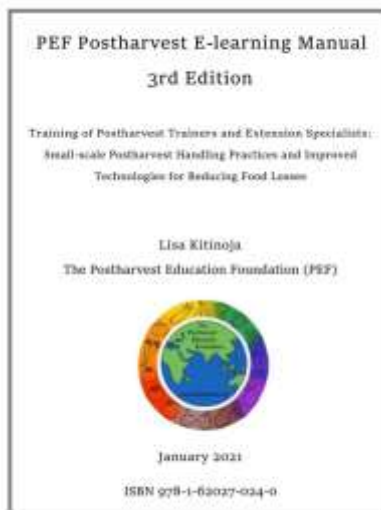
## **2. PEF POSTHARVEST E-LEARNING PROGRAM**

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The PEF Postharvest E-learning Program evolved from instructional materials initially developed by Dr. Lisa in the 1990s for extension agents in Egypt. These materials were subsequently adapted for audiences in Jordan, Lebanon, Morocco, India, Indonesia, and numerous African countries between 2001 and 2010. This training program was initially designed for young horticultural professionals, primarily focusing on enhancing postharvest handling practices for fruit and vegetable crops. Over the years, the scope of the program has expanded to encompass a broader audience, including researchers, extension workers, NGO staff, and graduate students working with a wider range of crops. These expanded areas of focus now included grains, legumes, pulses, root and tuber crops, coffee, tree nuts, herbs, and spices.

From 2011 to 2020, the program was overseen by a volunteer Board of Directors at PEF, who provided guidance and mentorship. The funding for the program was secured through participant registration fees (US\$300) and private donations to PEF. The participants enrolled in January and progressed through 10 self-paced assignments, allowing individuals with full-time employment or graduate studies to complete the program by December. In November 2016, the PEF Postharvest E-learning manual was made freely available online, enabling individuals and groups to participate at their own pace. The manual's agenda is the same as the earlier version of the PEF Postharvest E-Learning Program but without a fixed timeline. The self-exams and access to a free online forum for participants to receive feedback and encouragement were incorporated. Optional components, such as postharvest toolkits and closing workshops, require separate budgeting.

The third edition of the manual with updated topics was published in January 2021. This manual included twelve assignments and an optional assignment. The manual was translated into French and Spanish languages with the help of Arturo Duarte Sierra, Yasmine Lamri, and Mireya Ramirez Perez from Laval University, Canada. All three versions are available for download for free on the PEF website.



[Download English Manual](#)

[Download French Manual](#)

[Download Spanish Manual](#)

## Course content

The manual comprises twelve assignments, each offering mentor-guided reading materials, practical fieldwork tasks, and structured written reports, all accompanied by detailed instructions for the e-learner. The manual provides complete guidance, including clear instructions, recommended readings, report outlines, and self-assessment tools to reinforce learning. All assigned reading materials are readily accessible as free-to-download resources, and the manual includes a link to PEF's Google Drive folder containing the Training of Trainer (ToT) training materials.

Six assignments out of twelve require the preparation of concise written reports. Each report can be self-reviewed by the e-learner using the provided outline and list of questions, facilitating a comprehensive review of their learning process and outcomes. The manual also enables a lead instructor to implement a localized program, using the guidelines to review written reports and provide constructive feedback or follow-up questions to individual e-learners.

The PEF e-learning program is typically delivered over an extended period, ideally 8 to 14 months. While program durations may vary based on project type and participant numbers, one year has proven optimal for participants to absorb the extensive information on postharvest technology and extension education methods effectively, engage in cross-time zone online forum discussions, and build confidence in their newly acquired knowledge and skills.

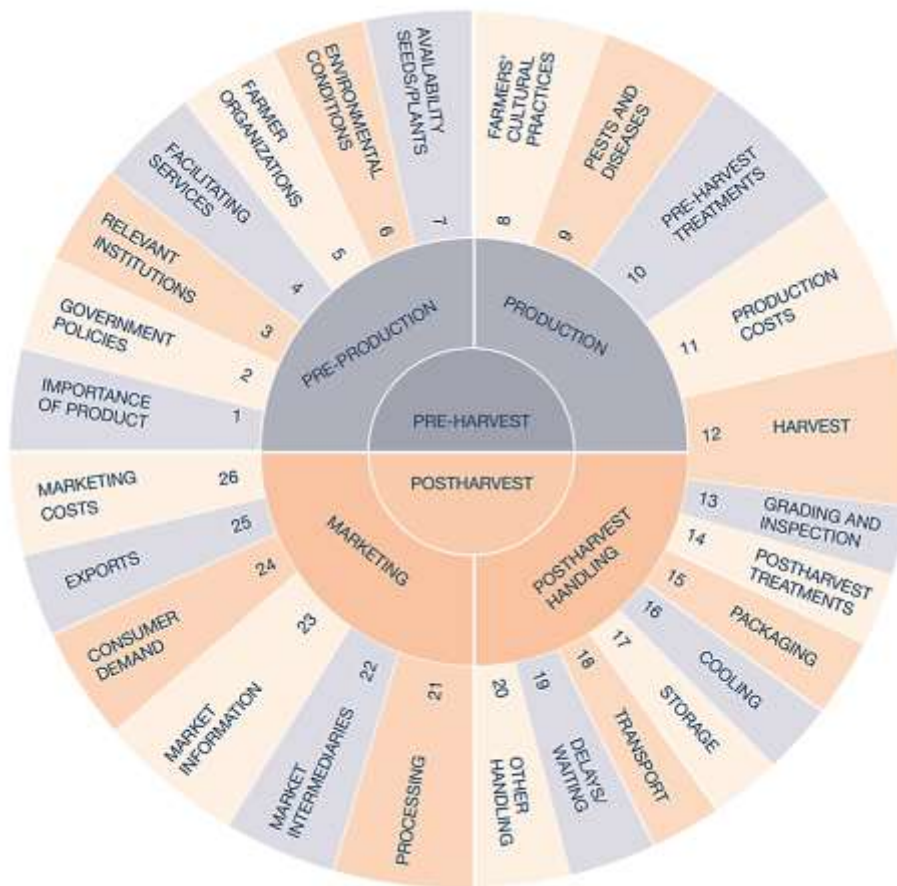


After an instructor-guided e-learning program is completed, a culminating live in-person workshop is recommended, provided local resources permit. This workshop allows participants who have completed all written reports to convene, share experiences, meet the instructor, and receive a Certificate of Completion and a Postharvest Tool Kit. Organizing a closing workshop can cost around US\$1000 to US\$2000 per person to cover expenses such as travel, accommodation, venue rental, and the postharvest tool kit, which can be sourced from Fanny Ipinge of the NGO "Postharvest Tool Kits and Services" in the Netherlands. The kit comprises over 20 essential items, including a refractometer, digital scale, digital temperature probe, measuring tools, color charts, quality rating scales, quality assessment tools, and various postharvest training aids and supplies.

The core component of the e-learning program is the **Commodity Systems Assessment Methodology (CSAM)**, a structured approach that guides participants in identifying the root causes and sources of postharvest losses (PHL) and quality issues. Each participant undertakes this assessment, focusing on their chosen crops and postharvest handling systems. The CSAM methodology, meticulously developed and refined over decades (LaGra 1990; LaGra, Kitinoja and Alpizar 2016), comprises 26 distinct components. The outputs of CSAM extend beyond traditional loss assessment to encompass cost-benefit analysis, ultimately facilitating the development of effective extension programs and projects. By pinpointing the causes and sources of PHL, CSAM empowers stakeholders to prioritize research, extension, and advocacy efforts tailored to specific crop needs.

The manual provides a comprehensive framework for conducting CSAM assessments, featuring detailed instructions and sample questionnaires for each component. It includes a good number of examples across various crops, along with a comprehensive list of questions and prompts for tailoring assessments to specific local contexts. The manual further guides participants in organizing and presenting data effectively. Through the CSAM process, the suitability of "best postharvest practices" and appropriate technologies for the community and clientele is determined. Trainees subsequently conduct cost-benefit analyses using one or more improved practices and technologies.





26 Principal Components of CSAM (La Gra et al., 2016)

A key objective of the PEF program is to train future trainers. The assignments incorporated within the program are designed to equip trainees with the following skills:

- Familiarity with small-scale postharvest handling practices and appropriate technologies.
- Designing postharvest demonstrations tailored to local farmers, traders, processors, and marketers.
- Setting measurable goals and objectives for postharvest training programs.
- Utilizing postharvest extension methods, simple postharvest tools, and basic equipment for quality assessment and training purposes.

The manual also includes an optional learning assignment on the Postharvest Training and Services Centre (PTSC) design. A Postharvest Technology and Service Center (PTSC) serves as a customizable innovation platform designed to address the specific training needs of local clientele. The PTSC can be tailored to accommodate diverse target groups and crops, providing a centralized



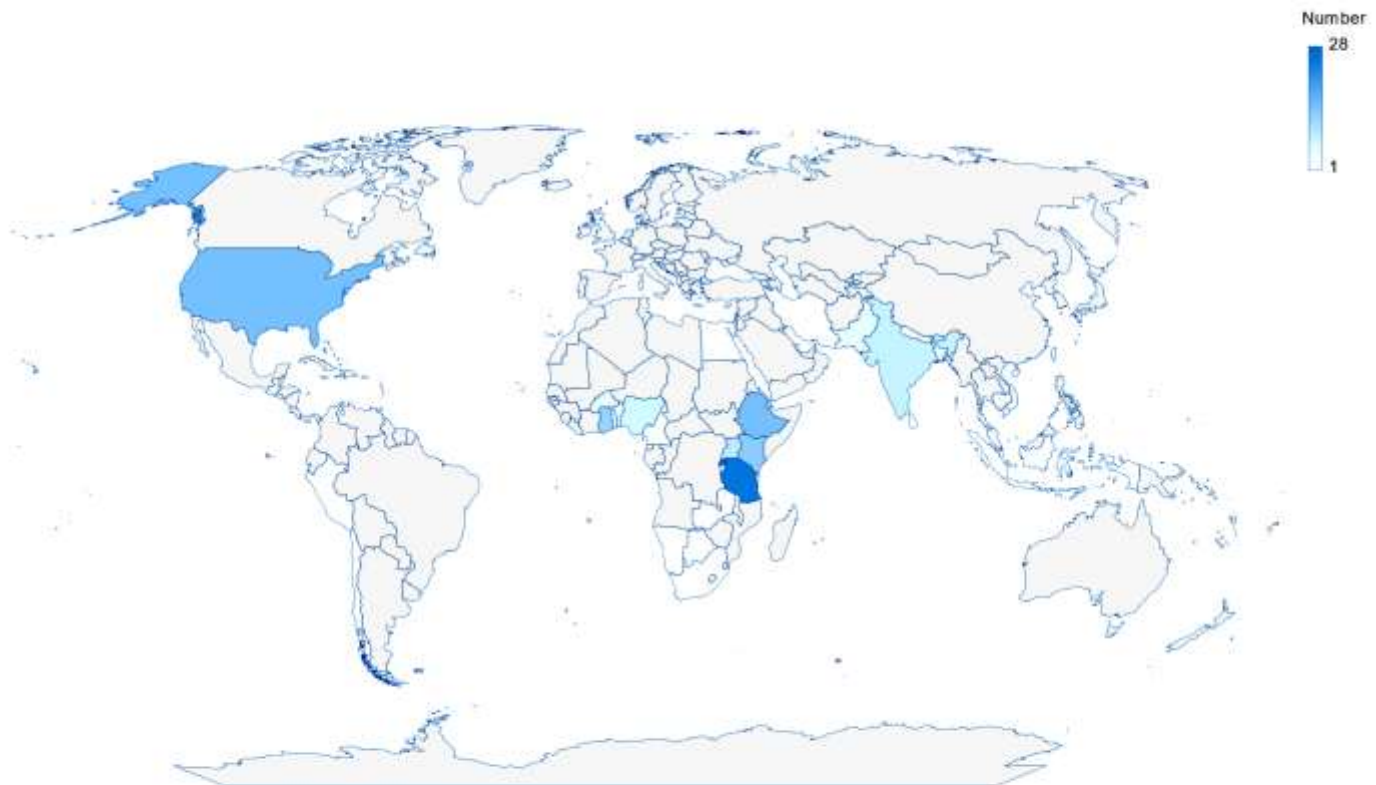
hub for postharvest demonstrations, and training programs and providing access to essential handling, marketing advice, tools, and supplies.

## PEF E-learning Alumni Network

Since 2011, 181 individuals from 31 different countries, predominantly from Africa (17 nations) and Asia (10 nations), have formally graduated from the e-learning Program, forming a wide network of postharvest specialists trained through PEF. The list of candidates and hyperlinks to their LinkedIn profiles are listed on the PEF webpage - <https://postharvest.org/programs/>.

Our discussion group “Postharvest Training” on LinkedIn, includes more than 18,000 members, who interact and assist one another with a wide variety of postharvest research activities, educational programs, and outreach/extension work. <https://www.linkedin.com/groups/3770124/>

## Geographic spread of PEF E -Learning Graduates (2011 -2024)





<b>PEF E-LEARNING GRADUATES</b>				
<b>FROM YEAR 2011 TO 2024</b>	<b>S. NO.</b>	<b>CONTINENT</b>	<b>COUNTRY</b>	<b>GRADUATES</b>
	1	Africa	Benin	4
	2	Africa	Botswana	1
	3	Africa	Burkina Faso	5
	4	Africa	Cameroon	2
	5	Africa	Egypt	2
	6	Africa	Ethiopia	15
	7	Africa	Ghana	12
	8	Africa	Kenya	13
	9	Africa	Malawi	1
	10	Africa	Namibia	1
	11	Africa	Nigeria	7
	12	Africa	South Africa	1
	13	Africa	Rwanda	28
	14	Africa	Tanzania	25
	15	Africa	Togo	2
	16	Africa	Uganda	9
	17	Africa	Zambia	2
	18	Asia	Bangladesh	3
	19	Asia	Bhutan	7
	20	Asia	Cambodia	4
	21	Asia	India	8
	22	Asia	Indonesia	1
	23	Asia	Iran	1
	24	Asia	Lebanon	1
	25	Asia	Nepal	2
	26	Asia	Pakistan	5
	27	Asia	Sri Lanka	1
	28	Europe	Malta	1
	29	North America	United States	15
	30	South America	Chile	1
	31	South America	Peru	1
			<b>Total</b>	<b>181</b>

Since 2020 many new graduates have completed the program on their own and not everyone has been counted in the total.

The graduates regularly communicate with the PEF and have achieved notable success in training and outreach initiatives. Their expertise in identifying the root causes of food losses, along with the knowledge and practical application of postharvest technologies – including solar drying, zero-energy cool chambers, processing, packaging, storage, and marketing – has significantly enhanced their impact and career progression.



Many have transitioned into roles as private consultants, while others have secured positions as postharvest researchers, extension officers, trainers, and educators. The collective efforts of these graduates have played a crucial role in mitigating food losses within their respective communities.

Testimonial of Angelique from Rwanda on the ADMI platform about the PEF E-learning course:  
<https://postharvestinstitute.illinois.edu/building-capacity-angelique/>

The screenshot shows the ADMI website header with the logo 'ADMI Institute for the Prevention of Postharvest Loss University of Illinois' and navigation links: ABOUT US, PROJECTS, BLOG, RESOURCES, TRAINING, and a search icon. The main content area features the title 'Building capacity in the field: Angelique's story' by Angelique Uwamahoro, co-founder of Food Sustainability Initiative, Rwanda. The testimonial text describes her experience with the PEF e-learning program, highlighting the practical skills gained and the application of knowledge in the field. A small portrait photo of Angelique is included on the left side of the testimonial.

**ADMI** Institute for the Prevention of Postharvest Loss  
University of Illinois

ABOUT US PROJECTS BLOG RESOURCES TRAINING

## Building capacity in the field: Angelique's story

By Angelique Uwamahoro, *co-founder of Food Sustainability Initiative, Rwanda*

I was very fortunate to participate in a postharvest e-learning program offered by The Postharvest Education Foundation (PEF). I graduated with a rich package of information and skills from PEF in 2017. Learning never ends. I am presently using the knowledge acquired from PEF by training, sensitizing and providing services to farmers, sellers, transporters, packers, storage operators and all people involved in postharvest handling on good postharvest technologies and management.



The online, self-paced delivery mode of the program motivated me to enroll in the PEF e-learning program. It allowed learners to gain practical skills and gave enough time to explore postharvest via field work and case studies. PEF also provided postharvest tool kits for the learners who successfully completed the programs. I acquired new knowledge in cooling techniques, evaluating the cost and benefits of improved practices, postharvest loss assessment, and designing a Postharvest Training and Service Center (PTSC).



**PEF Workshops** - Lizanne Wheeler, a long-time PEF volunteer, was active in planning and implementing many of our postharvest training activities from 2011 to 2018.



# THE POSTHARVEST EDUCATION FOUNDATION

Progress Report (2011-2024)



Arusha, Tanzania



Bali, Indonesia



Noida, India

# THE POSTHARVEST EDUCATION FOUNDATION

Progress Report (2011-2024)



California, USA



Ethiopia

# THE POSTHARVEST EDUCATION FOUNDATION

Progress Report (2011-2024)



Arusha, Tanzania



Ethiopia



Arusha, Tanzania





### 3. PUBLICATIONS

PEF has compiled a comprehensive collection of articles, manuals, presentations, and training aids, all readily available for download and use in developing effective training programs and workshops. Our board members have also contributed a selection of their highly valued resources and digital documents, and most of them are freely accessible on the PEF website for download and distribution.

Some key publications include:

#### Manuals

##### 1. 100 Under \$100: Tools for Reducing Postharvest Losses



"100 Under \$100: Tools for Reducing Postharvest Losses" by Teutsch and Kitinoja, presents a comprehensive guide to minimizing food waste along the agricultural value chain, from farm to consumer. This resource highlights a diverse range of techniques and tools, encompassing both established practices and innovative solutions. The guide caters to a wide spectrum of needs, with some tools suitable for individual smallholder farmers while others require collaboration among farmer groups or entrepreneurial ventures. Notably, each tool offers a positive return on investment, often recouping its cost after a single use through reduced losses and increased harvest yield. This translates to a direct positive impact on profitability for farmers, with subsequent uses contributing to ongoing financial gains.

The primary target audience for this resource is the extensive network of Agricultural Extension Workers employed by governments, intergovernmental organizations, agribusinesses, and NGOs. These professionals play a crucial role in educating smallholder farmers and empowering them to adopt these loss-reducing strategies.

<https://postharvest.org/wp-content/uploads/2023/12/100-under-100-Postharvest-Tools-Book-PEF-2019.pdf>



## **2. Small-Scale Postharvest Handling Practices: A Manual for Horticultural Crops (Kitinoja and Kader, 2015)**

This fifth edition of this manual includes the practices for postharvest handling and information on many additional practices for reducing losses, maintaining quality and ensuring food safety during small-scale handling and food processing of horticultural commodities. Earlier editions of the manual have been translated into Spanish, French, Punjabi, Arabic, Afrikaans, Bengali, Khmer, Vietnamese, Bahasa Indonesian, Swahili, Amharic, and Chinese with the support of our colleagues at the University of California, Davis, as well as agricultural universities and postharvest extension programs globally. The manuals are available for download (pdf format) from the UC Davis website, free of charge, and are now in 12 languages!



<https://postharvest.ucdavis.edu/publication-category/small-scale-postharvest-technology>

## **3. PEF Reducing Postharvest Losses Manual and PPTs for Sub-Saharan Africa**



This comprehensive training manual has been developed, specifically designed for extension workers, technical specialists, and field practitioners operating within Sub-Saharan Africa (SSA). It presents a diverse array of options for mitigating food loss, enabling practitioners to select and implement solutions tailored to the specific causes of loss identified within SSA's food supply chains. The manual carefully considers the costs and potential benefits of each solution, ensuring its applicability across various beneficiary groups. The full package of training materials (manual plus PPT slides) is focused on 3 food groups (cereals & pulses, roots & tubers, fruit & vegetables), 5 segments of the food supply chain, and 5 beneficiary groups.

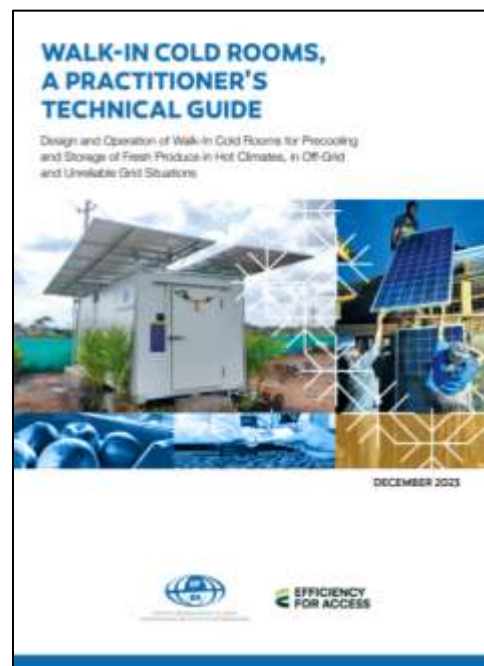
[https://postharvest.org/wp-content/uploads/2024/01/PEF\\_2023\\_Manual\\_1\\_RPL\\_SSA.pdf](https://postharvest.org/wp-content/uploads/2024/01/PEF_2023_Manual_1_RPL_SSA.pdf)



#### **4. WALK-IN COLD ROOMS, A PRACTITIONER'S TECHNICAL GUIDE - Design and Operation of Walk-In Cold Rooms for Precooling and Storage of Fresh Produce in Hot Climates, in Off-Grid and Unreliable Grid Situations.**

This guide provides accessible, practical guidance to developers, owners, operators, and suppliers on the specification, installation, and operation of efficient and cost-effective precoolers and cold rooms in off-grid, unreliable, and limited power supply environments.

The guide supports project managers throughout the cold room procurement process, empowering them to engage in informed discussions with specialists and suppliers. It equips project managers with the necessary knowledge to ask pertinent questions and provides suppliers with the information required for optimal design decisions, ultimately enabling the effective operation of the cold room.



<https://iifir.org/en/fridoc/walk-in-cold-rooms-a-practitioner-s-technical-guide-design-and-148065>

#### **5. Commodity Systems Assessment Methodology.**

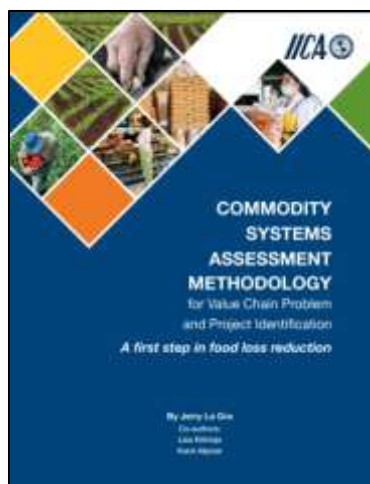
The manual 'Commodity Systems Assessment Methodology for Value Chain Problem and Project Identification: A first step in Food Loss Reduction' authored by Jerry LaGra, Lisa Kitinoja, and Karol Alpizar explains in detail the concept of CSA methodology and how it can be used to identify the issues in the agricultural value chain and decide the appropriate approach to reduce food loss and wastes. It is available for free download in both English and Spanish languages.

The CSAM is a method used for training the trainers in the PEF E-learning program, in which an e-learner collects data on the causes and sources of postharvest losses and quality problems. Each trainee chooses a crop of interest for their home country and spends several weeks doing a literature review, interviewing farmers, traders, and marketers, and summarizing the findings across 25 components along the value chain from the farm to the market.



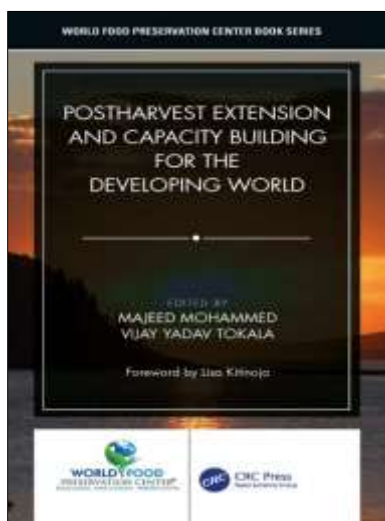
LaGra, J., Kitinoja L. and K. Alpizar (2016). Commodity Systems Assessment Methodology for Value Chain Problem and Project Identification: A first step in food loss reduction. San Jose, Costa Rica: IICA. 246 pp. [\[PDF\(English\)\]](#)

LaGra, J., Kitinoja L. and K. Alpizar (2016). Metodología de evaluación de cadenas agroalimentarias para la identificación de problemas y proyectos: un primer paso para la disminución de pérdidas de alimentos San Jose, Costa Rica: IICA. 246 pp. [\[PDF \(Spanish\)\]](#)



## Books

### 1. Postharvest Extension and Capacity Building for the Developing World



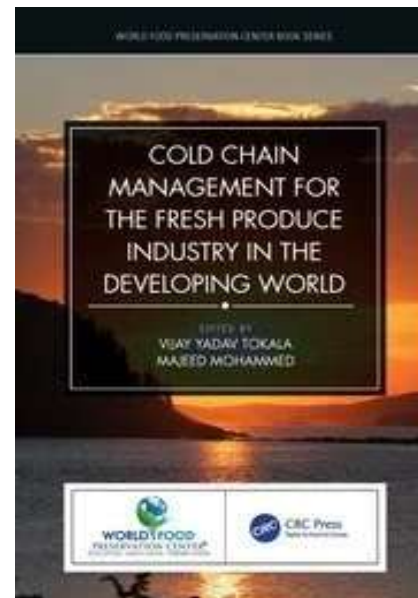
The book edited by Majeed Mohammed and Vijay Yadav Tokala is a comprehensive resource for professionals working in postharvest extension and outreach. It includes practical methodologies and insights on training postharvest trainers, assessing food loss, building capacity in universities and agro-industries, utilizing online education methods, developing cost-effective extension models, and learning from successful initiatives. This book equips professionals with the knowledge and tools needed to address postharvest challenges and promote sustainable food systems in developing countries.

<https://www.taylorfrancis.com/books/edit/10.1201/9781315115771/postharvest-extension-capacity-building-developing-world-majeed-mohammed-vijay-yadav-tokala>



## 2. Cold Chain Management for the Fresh Produce Industry in the Developing World

The book provides a comprehensive analysis of the vital role of cold chain management in promoting sustainable food systems and enhancing global trade in perishable products. It emphasizes the crucial role of extension education in implementing effective cold chain practices, showcasing case studies from Asia, Africa, and the Caribbean. The book includes contributions from international organizations, researchers, and industry experts, exploring resilient, sustainable, and innovative approaches to cold chain development. The book also includes detailed discussions on various cooling systems, success stories, capacity-building initiatives, and opportunities for future advancements in cold chain management within developing countries.



<https://www.taylorfrancis.com/books/edit/10.1201/9781003056607/cold-chain-management-fresh-produce-industry-developing-world-vijay-yadav-tokala-majeed-mohammed>

Mohammed, M. and L. Kitinoja (2020). Significance of Improved Postharvest Management of Perishable Commodities. *Agriculture Observer* 1(3):23-29.

Kodjogbe, G. (2020). Postharvest Losses Reduction on Vegetables Supply Chain in West Africa. *Agriculture Observer*, 1(4): 34-41. <http://www.agricultureobserver.com/downloadfile21.aspx?id=124>

Dandago, M. A., Kitinoja, L., & Abdullahi, N. (2020). Commodity system assessment on postharvest handling, storage and marketing of maize (*Zea mays*) in Nigeria, Rwanda and Punjab, India. *Journal of Horticulture and Postharvest Research*, 51-62.

CERES 2030 Project findings. Stathers, T., Holcroft, D., Kitinoja, L. et al. (2020) A scoping review of interventions for crop postharvest loss reduction in sub-Saharan Africa and South Asia. *Nature Sustainability*. <https://doi.org/10.1038/s41893-020-00622-1>



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- WWF (2018). No Food Left Behind. World Wildlife Fund. <https://www.worldwildlife.org/pages/no-food-left-behind> (Dr. Lisa led the field studies and was a contributing author to this World Wildlife Fund Report.)
- Kitinoja, L., V.Y. Tokala and A. Brondy. (2018). Challenges and opportunities for improved postharvest loss measurements in plant-based food crops. *Journal of Postharvest Technology*. 6(4): 16-34.
- Kitinoja, L., V.Y. Tokala and A. Brondy. (2018). A review of global postharvest loss assessments in plant-based food crops: recent findings and measurement gaps. *Journal of Postharvest Technology*. 6(4): 1-15. (+) Databases and references (hundreds of studies) used for the review. Link to Google Drive– just click to open the folders: [Download] Database 1: PHLs by crop and country. Database 2: Annotated reference list.
- Kitinoja, L., Spang, N., Gillman, A., Pearson, P., McBride, M. Prezkop, L. (2018). Maximizing Farm Resources and Edible Food Rescue. Specialty Crop Loss Report. World Wildlife Fund.
- USDA (2016): Handbook 66: The Commercial Storage of Fruits, Vegetables, and Florist and Nursery Stocks. <https://www.ars.usda.gov/ARSUserFiles/oc/np/CommercialStorage/CommercialStorage.pdf>
- Kitinoja, L. (2016). “Innovative Approaches to Food Loss and Waste Issues”, Brookings Institute: Ending Rural Hunger Report.
- Lipinski, B. et al (2013). Creating a Sustainable Food Future, Installment Two: Reducing Food Loss and Waste. (Dr Lisa was a contributing author to this World Resources Institute working paper.)



## PEF White Papers

Year	Authors	Title	Citation	
2022	Deirdre Holcroft	Design Improvements for Applied Postharvest Studies	Holcroft, D. (2022). Design improvements for applied postharvest studies. PEF White Paper No. 22-01. La Pine, Oregon, USA: The Postharvest Education Foundation	<a href="#">[Download]</a>
2020	Deirdre Holcroft and Lisa Kitinoja	Fresh produce food safety risks and their mitigation	Holcroft, D. and L. Kitinoja (2020). Fresh produce food safety risks and their mitigation. PEF White Paper No. 20-01. La Pine, Oregon, USA: The Postharvest Education Foundation	<a href="#">[Download]</a>
2019	Robert Nshizirungu and Lisa Kitinoja	Tomato Postharvest Management in Rwanda	Nshizirungu, R. and L. Kitinoja (2019). Tomato Postharvest Management in Rwanda. PEF White Paper No. 19-04. La Pine, Oregon, USA: The Postharvest Education Foundation.	<a href="#">[Download]</a>
2019	Frederick Mba	A survey on pineapple quality problems and postharvest losses in Benin	Mba, F. (2019). A survey on pineapple quality problems and postharvest losses in Benin. PEF White Paper 19-03. La Pine, Oregon (USA): The Postharvest Education Foundation.	<a href="#">[Download]</a>
2019	Mohamed M. El-Mogy and Lisa Kitinoja	Review of best postharvest practices for fresh market green beans	El-Mogy, M.M and L. Kitinoja (2019). Review of best postharvest practices for fresh market green beans. PEF White Paper No. 19-01. La Pine, Oregon, USA: The Postharvest Education Foundation.	<a href="#">[Download]</a>
2018	Thomas Buyinza and Lisa Kitinoja	Commodity Systems Assessment of Cassava in Uganda	Buyinza, T. and L. Kitinoja (2018). Commodity Systems Assessment of Cassava in Uganda. PEF White Paper No. 18-01. La Pine, Oregon, USA: The Postharvest Education Foundation.	<a href="#">[Download]</a>
2018	Deirdre Holcroft	Curing and Storage of Tropical Roots, Tubers and	Holcroft, D. (2018). Curing and Storage of Tropical Roots, Tubers and Corms to Reduce Postharvest Losses. PEF White	<a href="#">[Download]</a>



		Corms to Reduce Postharvest Losses	Paper No. 18-02. La Pine, Oregon, USA: The Postharvest Education Foundation.	
2015	Deirdre Holcroft	Water Relations in Harvested Fresh Produce	Holcroft, D. (2015). Water Relations in Harvested Fresh Produce. PEF White Paper No. 15-01. La Pine, Oregon, USA: The Postharvest Education Foundation.	<a href="#">[Download]</a>
2015	Lisa Kitinoja and Adel A. Kader	Measuring Postharvest Losses of Fresh Fruits and Vegetables in Developing Countries	Kitinoja, L. and A.A. Kader (2015). Measuring Postharvest Losses of Fresh Fruits and Vegetables in Developing Countries. PEF White Paper No. 15-01. La Pine, Oregon, USA: The Postharvest Education Foundation.	<a href="#">[Download]</a>
2014	Diane M. Barrett	Creating Fruit and Vegetable Postharvest Technology Videos	Barrett D. M. (2014). Creating Fruit and Vegetable Postharvest Technology Videos. PEF White Paper No. 14-01. La Pine, Oregon, USA: The Postharvest Education Foundation.	<a href="#">[Download]</a>
2013	Lisa Kitinoja	Returnable Plastic Crate (RPC) systems can reduce postharvest losses and improve earnings for fresh produce operations	Kitinoja, L. (2013). Returnable Plastic Crate (RPC) Systems Can Reduce Postharvest Losses and Improve Earnings for Fresh Produce Operations. PEF White Paper No. 13-01. La Pine, Oregon, USA: The Postharvest Education Foundation.	<a href="#">[Download]</a>
2013	Harvey C. Neese; Thomas V. Dechert; Robert J. (Bob) Haggerty; James McCullough; Judith Edmister; Jerry La Gra and Lisa Kitinoja	Gathering Data to Address Postharvest Loss Challenges: Commodity Systems Assessment Methodology	Neese, H.C. et al (2013). Gathering Data to Address Postharvest Loss Challenges: Commodity Systems Assessment Methodology. PEF White Paper No. 13-02. La Pine, Oregon, USA: The Postharvest Education Foundation.	<a href="#">[Download]</a>





2013	Lisa Kitinoja	Use of Cold Chains for Reducing Food Losses in Developing Countries	Kitinoja, L. (2013). Use of Cold Chains for Reducing Food Losses in Developing Countries. PEF White Paper No. 13-03. La Pine, Oregon, USA: The Postharvest Education Foundation.	<a href="#">[Download]</a>
2011	Devon Zagory	The Building Blocks of a Food Safety Program	Zagory, D. (2011). The Building Blocks of a Food Safety Program. Produce Marketing Association (PMA). Included with permission.	<a href="#">[Download]</a>

## PEF Newsletters

PEF publishes quarterly newsletters that include interesting updates and activities from our e-learners, partners, and supporters in the postharvest domain. Since 2017, we have published 32 issues, and each has been archived and can be downloaded via the PEF website.

### 2024 Newsletters:

<p><b>October 2024, Issue #32</b></p> <p><b>PEF President's Message</b></p> <p>Dr. Vijay Kishor Talsani President</p> <p><b>International Day of Awareness of Food Loss and Waste (IDAW)</b></p> <p><b>\$50,000 Post-Harvest Loss Reduction Prize</b></p> <p><b>October 2024 (Issue 32)</b></p>	<p><b>July 2024, Issue #31</b></p> <p><b>PEF President's Message</b></p> <p>Dr. Vijay Kishor Talsani President</p> <p><b>International Day of Awareness of Food Loss and Waste (IDAW)</b></p> <p><b>\$50,000 Post-Harvest Loss Reduction Prize</b></p> <p><b>July 2024 (Issue 31)</b></p>	<p><b>January 2024, Issue #30</b></p> <p><b>PEF President's Message</b></p> <p>Dr. Vijay Kishor Talsani President</p> <p><b>International Day of Awareness of Food Loss and Waste (IDAW)</b></p> <p><b>\$50,000 Post-Harvest Loss Reduction Prize</b></p> <p><b>January 2024 (Issue 30)</b></p>
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## 4. PEF AWARDS

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Over the years, PEF has awarded e-learning graduates with grants and awards, to recognize and encourage their work.

### PEF Kader Awards

Dr. Adel A. Kader (1941-2012) was a distinguished Professor Emeritus of Postharvest Physiology in the Department of Plant Sciences at the University of California, Davis. He dedicated his career to advancing postharvest science until his passing in December 2012. Dr. Kader's contributions included mentoring graduate students and postdoctoral researchers, teaching courses on postharvest physiology and technology of horticultural crops, and extending knowledge to producers, handlers, and consumers. He was a founding member and served on the Board of Directors of The Postharvest Education Foundation (2011-12).

The Kader Award in Postharvest Training includes:

- An award certificate in honor of Dr. Adel A. Kader and signed by the chair of the PEF Board of Directors
- A trip to participate in the PEF Global e-learning closing workshop
- A cash prize of US \$500

From 2013 to 2019, 11 E-learning graduates were awarded the PEF Kader Award in Postharvest Training:



2013  
**Noel Valentin Mulinda**  
Rwanda



2014  
**Esther Mwisango**  
Tanzania



2015  
**Mekbib Seife Hailegebrile**  
Ethiopia



2015  
**Dr Olubukola M. Odeyemi**  
Nigeria



2016  
**Dr Mohmad Arief Zargar**  
India



2016  
**Roseline Marealle**  
Tanzania



2017  
**Gerefa Sefu**  
Ethiopia



2017  
**Dr Mohammed Razu Ahmed**  
Bangladesh



2018  
**Dr Vijay Yadav Tokala**  
India



2019  
**Wilberforce and Irene Muyomba**  
Uganda











**Cooperative Ventures Awards - 2020**

The COVID-19 pandemic presented significant challenges to support e-learning graduates and postharvest specialists. With travel restrictions and the cancellation of in-person events, we sought innovative ways to help our alumni continue their work in 2020-2021. PEF launched the Cooperative Ventures Award which aimed to encourage the development and implementation of locally driven postharvest training and outreach activities in their respective countries. The grant program encouraged collaboration with local organizations, fostering a spirit of shared expertise and resource utilization. It involves joint planning, sharing training staff, or leveraging local resources like venues, funding, or training materials.

The "Cooperative Ventures" grant provided a US\$1,000 cash award to PEF e-learning graduates demonstrating a need for funding to develop or enhance a postharvest training program. This financial support was intended to facilitate collaborative efforts with local organizations, promoting a lasting impact on postharvest education within each recipient's community.

The grant was made possible by Cooperative Ventures, a US-based small business owned and operated by Dr. Lisa Kitinoja since 1993.

 <p><b>Adams Abdul Rahaman</b> Ghana</p>	 <p><b>Mildred Osei- Kwarteng</b> Ghana</p>	 <p><b>Abdi Keba Wirtu</b> Ethiopia</p>	 <p><b>Jacinta Nyaika</b> Malawi</p>
 <p><b>Frederick Mbah</b> Benin</p>	 <p><b>Robert Nshizirungu</b> Rwanda</p>	 <p><b>Regina Kamga</b> Cameroon</p>	 <p><b>Mazalo Chantal Pali</b> Togo</p>



**Winners of PEF 2020 Cooperative Ventures Grants for Postharvest Training**

<b>Name</b>	<b>Country</b>	<b>Crops</b>	<b>Proposed topics</b>	<b>Participants</b>
<b>Adams Abdul-Rahaman</b>	Ghana	Soybean	Drying and storage	75 growers and storage operators
<b>Regina Kamga</b>	Cameroon	Vegetable crops	Postharvest handling	25 growers
<b>Kwizera Mudenge Ernest</b>	Rwanda	Vegetables	Postharvest handling, ZECC storage	55 growers and marketers
<b>Jacinta Nyaika</b>	Malawi	Vegetables	Cold storage, reusable plastic crates	50 growers
<b>Frederick Mbah</b>	Benin	Pineapples	Solar drying	Study tour for 10 growers
<b>Robert Nshizirungu</b>	Rwanda	Vegetables and maize	Postharvest handling and demonstrations	770 farmers and traders
<b>Chantal Pali</b>	Togo	Okra and hot peppers	Postharvest handling, drying	50 growers and marketers
<b>Mildred Osei-Kwarteng</b>	Ghana	Leaf lettuce	Postharvest handling, ZECC storage	34 growers who supply restaurants
<b>Abdi Keba Wirtu</b>	Ethiopia	Avocado	Training of postharvest trainers	75 trainers
<b>François Oliviér Ouedraogo</b>	Burkina Faso	Fruit and vegetables, root crops	Drying and processing	30 growers

**PEF Leadership Award - 2024**

Three e-learning graduates (Vincent Gasasira, Fanny Ipinge and Dr. Olubukola M. Odeyemi) were selected by the Board of Directors in June 2023 to receive the PEF Postharvest Training Leadership Award. Each awardee received a postharvest resources/tools/training kit valued at US\$1500 and was invited to participate in a study tour in Kenya from 18-22 November 2024.

As part of the PEF Leadership study tour, the team interacted with members of the PEF Board of Directors (Dr. Vijay Yadav and Dr. Diane), representatives from the African Centre of Technology Studies (ACTS), Techwin Ltd., Cold Solutions, Jungle Harvest, and Soko Fresh to discuss their work and explore possible future collaborations. The team also met some of the PEF E-learning graduates



from the University of Nairobi (UoN) and Jomo Kenyatta University of Agriculture and Technology (JKUAT) to learn more about their postharvest research activities.



**Fanny Ipinge**

Co-founder, Postharvest Tool  
Kits and Services,  
The Netherlands/ Botswana



**Dr Olubukola M. Odeyemi**

Assoc. Professor, Federal Univ.  
of Agriculture, Nigeria



**Vincent Gasasira**

Founder, Postharvest-Plus,  
Rwanda



PEF Leadership Awardees at Lari Subcounty, Kenya



The School of Biosystems and Environmental Engineering at Jomo Kenyatta University of Agriculture and Technology (JKUAT)



PEF Team visiting Techwin Limited, Nairobi



PEF Team visiting Cold Solutions, Tatu City, Ruiru



PEF Team with Prof Jane and Prof Moses at the University of Nairobi





## 5. PARTNER ORGANIZATIONS AND DONORS

### Partner Organizations

PEF has partnered with many organizations to access resources and deliver its objectives.

Some of the key partner organizations of PEF include:

1. ADMI Institute for the Prevention of Postharvest Loss, University of Illinois
2. Agribusiness Associates Inc. (ABA)
3. Champions 12.3
4. Global Alliance for Improved Nutrition (GAIN)
5. Global Cold Chain Foundation (GCCF), formerly known as the World Food Logistics Organization (WFLO)
6. Global Knowledge Initiative (GKI)
7. Save Food Initiative (a program of the UN FAO)
8. World Food Preservation Center (WFPC)
9. World Resource Institute (WRI)





### PEF Donors

PEF is a non-profit public charity organization with 501 (3)(c) tax exemption status via the IRS in the USA (FEIN 45-1240017). Generous private donations are the main source of funds for PEF activities.

Some of the regular donors of the PEF:

#### Individuals:

- Adel A Kader
- Amanda Brondy
- Anne Turner
- Aviva Nebesky
- Barbara Grady
- Bernard Rwubatse
- Beth Mitcham
- Betsy Teutsch
- Cathy Kitinoja
- Chris Kitinoja
- Clara Bertucci
- Cynthia Fisher
- Daryl Salm
- David Doerfert
- Deirdre Holcroft
- Devon Zagory
- Diane Barrett
- Diane Beckles
- Eileen Kitinoja
- Gurbinder S. Gill
- Guy Kodjogbe
- Hala Chahine
- Hassen Yassin
- Hilda Vasanthakaalam
- Jana Arnold
- Jan Henderson
- Jo Lamberti
- Joe Sciandra
- John Sargeant
- Jolie Wheeling
- Keith Forman

- Kukom Edoh Ognakasson
- Lisa Kitinoja
- Majeed Mohammed
- Maryann Morelli DeSarro
- Mauricio Rodriguez
- Mekbib Seife Hilegebrile
- Melissa Rosen
- Mildred Niinisto
- Ngoni Nenguwo
- Nikki King Tatsuno
- Noel Valentine Mulinda
- Olubukola Odeyemi
- Olufemi Oluteyo
- Paul Bailey
- Rhonda Hughes
- Robert Odoi
- Ruth Liebesman
- Sintayehu Musie
- Steve Maximay
- Sunil Saran
- Symantha Holben
- Vijay Yadav Tokala

#### Organizations:

- Cooperative Ventures
- ADMI
- WFLO
- ABA
- StoreItCold
- Amity University
- Postharvest Innovations LLC



### In-Kind Donors:

(books, manuals, tools, postharvest equipment for training, venues, logistics):

- Adel A. Kader (postharvest books, tools, digital resources)
- Devon Zagory (postharvest books, tools)
- Deirdre Holcroft (postharvest videos, tools)
- Postharvest Innovations LLC (training materials, demo supplies)
- QA Supplies (20% discount on postharvest tool kits)
- DehyTray, Purdue University (demo equipment)
- StoreItCold (CoolBot units)
- University of Idaho (CSAM manuals)
- University of California, Davis (venues for training)
- Udayana University, Bali, Indonesia (venues for training)
- Tuskegee University (venues for training)
- University of Rwanda (venues for training)
- Amity University, India (venues for training, lodging)
- Jimma University, Ethiopia (venues for training, lodging)
- Semera University, Ethiopia (venues for training, lodging)
- University of Nairobi, Kenya (venue for training)
- Horticulture Innovation Lab (postharvest tour sites hosting)

### Small Grants/ Contracts:

- CIRAD (Centre de Coopération Internationale en Recherche Agronomique et Développement, France)
- International Institute of Refrigeration (IIR, France)
- Hudson Global Fund, GCCF/WFLO (USA)
- ADM Institute for Postharvest Loss Prevention (USA)
- GAIN (Global Alliance for Improved Nutrition, Switzerland)
- UN Food and Agricultural Organization (FAO, Rome, Italy)
- World Food Logistics Organization (USA)
- Pakistan Cold Chain Project (USAID)



**Volunteer postharvest trainers and PEF representatives at international events and/or on event planning committees**

(\* = participated in 3 or more events):

- Lizanne Wheeler\*
- Patrick Brown\*
- Awad Hussein
- Leony HalosKim
- Hala Chahine
- Gurbinder S. Gill
- Sunil Saran
- Susanta K. Roy
- Dhruv Gupta
- Olubukola Odeyemi\*
- Deirdre Holcroft\*
- Diane Barrett\*
- Vijay Yadav Tokala\*
- Lisa Kitinoja\*
- Guy Kodjogbe\*
- Aditya Parmar
- Ali Mohammed
- Bertha Mjawa\*
- Majeed Mohammed
- Hilda Vasanthakalaam
- Beth Mitcham
- Amanda Brondy
- Cathy Kitinoja
- Samuel Njuguna
- Florence Kiburi
- Emmanuel Ayua
- Jane Ambuko and her postharvest team

The value of these professionals' volunteer efforts cannot be overstated. If PEF had to pay for their services and travel costs, the costs would often be US\$1000 or more daily. A conservative estimate of the minimum number of volunteer days of work per year is 50 (equal to US\$50,000 per year). Over 14 years of PEF operations, this contribution would be valued at a minimum of US\$700,000.



## 6. PAST PROGRAMS

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### Pilot Project for Extension of Postharvest Technologies

#### October 2012 in Arusha, East Africa

Drs. Diane Barrett and Lisa Kitinoja worked together during 2010-13 on a Hort CRSP-funded project in East Africa where a pilot Postharvest Training and Services Center (PTSC) was set up in October 2012 on the campus of AVRDC - The World Vegetable Center in Arusha. This pilot project is being used as a model for future proposed projects in many world regions. The PTSC serves as:

- a. a site for extensionists to meet with growers and others to provide training on improved food handling, harvest, packing, cooling, storage, food safety, and processing practices
- b. a location with permanent demonstrations for observing small-scale practices (where local private companies can explain and demonstrate their goods and services related to postharvest handling)
- c. a shop with postharvest tools and supplies, packages, plastic crates, and other goods that can be purchased at reasonable prices
- d. a place where people can come to ask questions or get advice on how to use improved postharvest practices, costs/benefits, and marketing options
- e. a place where growers or traders can pay a small fee for services such as having their produce cooled and/or stored for a few days before marketing, leasing a small, insulated transport vehicle, or using a solar dryer to produce dried fruit or vegetable snack products, etc.



Dr. Lisa and Dr. Diane at WorldVeg Center (then AVRDC), Arusha



**Small Scale Postharvest Handling Technologies Short Course/Study Tour**

**August 2014 in Bali, Indonesia.**

In association with Udayana University and Dr. Made I. Utama, PEF launched a program “Small-Scale Postharvest Horticultural Technologies Short Course/ Study Tour” in August 2014 for 45 participants from 4 countries (the USA, Philippines, Indonesia, and Malaysia) in Bali, Indonesia. Dr. Lisa and Dr. Diane organized this program and were successfully hosted by Dr. Utama.

Instructors: Program leaders plus invited regional and international experts and practitioners.



Dr. Lisa, Dr. Diane, and Dr. Utama with participants in Bali, Indonesia



## **Evaluation of a model postharvest training and services center. 2014-15.**

### **Funded by USAID TOPS, managed by WFLO**

A pilot Postharvest Training and Services Center (PTSC) was launched in October 2012 in Arusha, Tanzania as part of a USAID-funded project. WFLO submitted the final project report for the Horticulture CRSP project in May 2014. The evaluation team (PEF and WFLO) reviewed the final report, and the objectives for an ex post facto evaluation of a completed postharvest extension project were set in cooperation with USAID/TOPS, and the data collection and analysis methods were planned during the proposal phase of the project. The five key components of the PTSC are (1) training of postharvest trainers, (2) postharvest training and demonstrations for local small-scale clientele, (3) adaptive research, (4) postharvest services, and (5) retail sales of postharvest tools and supplies. During the years 2011–2012, a one-year e-learning program was provided to 36 young horticultural professionals from seven Sub-Saharan African countries.

These postharvest specialists went on to train more than 13,000 local farmers, extension workers, food processors, and marketers in their home countries in the year following the completion of their course. Evaluators found that these specialists had trained an additional 9300 people by November 2014. When asked about adoption by their local trainees, 79% reported examples of their trainees using improved postharvest practices. From 2012–2013, the project supported 30 multi-day training programs, and the evaluation found that many of the improved practices being promoted were adopted by the trainees and led to increased earnings. Three PTSC components still require attention. Research activities initiated during the project are incomplete, and successful sales of postharvest goods and services will require commitment and improved partnering.

**Extension of Small-Scale Postharvest Horticulture Technologies—A Model Training and Services Center.** Lisa Kitinoja and Diane M. Barrett, *Agriculture* 2015, 5, 441-455; [https://ucanr.edu/sites/Postharvest\\_Technology\\_Center\\_/files/363307.pdf](https://ucanr.edu/sites/Postharvest_Technology_Center_/files/363307.pdf)

PEF's international projects and postharvest training workshops are often planned and implemented by the Board of Directors with the assistance of our local or regional e-learning graduates. Their ability to speak the local languages and communicate directly with trainees, tour hosts, and logistics operators (transport, lodging, venues, catering, etc.) is invaluable as training assistance and ensure that PEF training programs meet the needs of target audiences.



### **Small-scale Postharvest Handling Technologies Short Course/Study Tour**

**February 2015 in Arusha, Tanzania.**

In association with local partners, we launched a program “Small-Scale Postharvest Horticultural Technologies Short Course/ Study Tour” in February 2015 for 40 participants in Arusha, Northern Tanzania. This program was successfully completed in February 2015.

Instructors: Program leaders (Lisa Kitinoja, Diane Barrett, and Lizanne Wheeler) plus invited regional and international experts and practitioners.

Invited speakers: Jacqueline Mkindi (TAHA, the Tanzania Hort Association), Bertha Mjawa (MIVARF), and Ngoni Nenguwo (AVRDC - East and South Africa Region).



Instructors and participants at Arusha, Tanzania





## **All-Africa Postharvest Congress and Exhibition (AAPHCE)**

**2017, 2019, 2021, 2023**

In 2015, ADMI hosted the 1<sup>st</sup> Postharvest Congress in Rome, under the auspices of the UN FAO. In 2017, Dr. Charles Wilson of the WFPC took the reins, and working with Dr Jane Ambuko of the University of Nairobi hosted the 1<sup>st</sup> All-Africa Postharvest Congress and Expo in Nairobi, Kenya. PEF provided funding and planning support and was able to sponsor 6 Africa-based participants with travel support provided by ADMI. The African Union took the role of hosting the organization from 2019 onward, and the 5<sup>th</sup> All-Africa Postharvest Congress and Exhibition (AAPHCE) is expected to be held at AU headquarters in Addis Ababa, Ethiopia in September 2025.

PEF board members have served on planning and support committees for each of these events, and Dr. Lisa Kitinoja, President Dr Vijay Yadav Tokala, and many PEF e-learning graduates have been invited speakers.



Dr. Lisa, Dr. Vijay, and PEF E-learners attended the 2<sup>nd</sup> AAPHCE 2019 at the African Union HQ



## **Reducing Postharvest Losses in Rwanda Project 2016-19.**

**Funded by the Hort Innovation Lab at UC Davis.**

**Project leader G.S. Gill, Agribusiness Associates Inc.**

This project had three major objectives:

1. Gaining an understanding of postharvest losses, constraints, and opportunities in four horticultural crop value chains: The project team measured postharvest losses using a modified commodity systems assessment methodology (CSAM). The team also conducted a value chain analysis to identify constraints and an environmental assessment to understand farm resource use efficiency. After consulting with stakeholders, the team focused on four value chains: green chili for export; tomato for regional domestic markets; sweet potato for local markets; and banana for local markets.
2. Determining the benefits of introducing postharvest practices and technologies in partnership with three institutions: The team set up Postharvest Training and Service Centers (PTSC) at three sites with the University of Rwanda, the Ministry of Agriculture and Animal Resources and Rwanda Agriculture Bank, and the National Agriculture Export Board. The team made recommendations on how to reduce postharvest losses and tested these recommendations through experiments at the three PTSC sites. The intervention plan was vetted by an industry council, for market-based leadership, and also reviewed by a steering committee, to ensure up-to-date postharvest technology and tools are used. So, all local stakeholders are involved in the decision-making process. The project also trained graduate students in postharvest education, research, and extension practices.
3. Building entrepreneurial capacity in stakeholders across the value chain: The project worked with farmers and small horticultural business owners to develop their agri-businesses and entrepreneurial capabilities through a strategic business approach. It convened a postharvest agri-business competition.

<https://horticulture.ucdavis.edu/blog/6-lessons-postharvest-loss-assessments-rwanda>

<https://horticulture.ucdavis.edu/blog/rwanda-postharvest-week-incubates-visionary-postharvest-solutions>



PTSC signage in Rwanda



Vincent Gasasira providing training at the PTSC in Mulindi, Rwanda

## **Accelerating the Global Shift to Energy-Efficient and Climate-Friendly Appliances and Equipment, African Center for Sustainable Cooling and Cold Chain (ACES)**

### **2023, Kenya and Rwanda**

PEF worked along with Global Cold Chain Federation (GCCF) and Global Cold Chain Alliance (GCCA), USA to develop a foundational training program based upon the strategy to deliver cooling as a service through innovative business and financing models that will stimulate economic and social development in rural communities of Kenya and Rwanda.

Instructors: Vijay Yadav Tokala, Lisa Kitinoja, Eng. Samuel Njuguna Ndirangu, Florence Gatwiri Kiburi, Robert Nshizirungu, Solange Musanase, Bernard Rwubatse, Alexis Mugisha, Jean Baptiste Ndahetuye



Postharvest Trainees in Kenya with Dr. Vijay Yadav







Postharvest trainees at the University of Rwanda campus







## 7. BOARD OF DIRECTORS

Since its founding in 2011, PEF has had professionals from more than 10 different countries who have served as voluntary board members and actively participated in the organization's activities.

### Present Board of Directors (2024-25)

 <p><b>Dr. Vijay Yadav Tokala</b> (India) <b>President</b></p>	 <p><b>Dr. Lisa Kitinoja</b> (USA) <b>Treasurer</b></p>	 <p><b>Dr. Diane M. Barrett</b> (USA) <b>Secretary</b></p>	 <p><b>Gurbinder Singh Gill</b> (USA)</p>
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### Past Board Members:

 <p><b>Dr Deirdre Holcroft</b> (France)</p>	 <p><b>Guy Kodjogbe</b> (Benin)</p>	 <p><b>Dr Aditya Parmar</b> (Malaysia)</p>	 <p><b>Dr Olubukola M. Odeyemi</b> (Nigeria)</p>
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**Dr Majeed Mohammed**  
(Trinidad & Tobago)



**Dr Hala Chahine-Tsouvalakis**  
(Lebanon)



**Dr Devon Zagory**  
(USA)



**Dr E.V.D. Sastry**  
(India)



**Cathy Kitinoja**  
(USA)



**Bertha Mjawa**  
(Tanzania)



**Edoh Ognakossan Kukom**  
(Togo and Mali)



**Symantha Holben**  
(Madagascar)

**Vijay Yadav Tokala**

Dr Vijay has over 10 years of experience and worked as a consultant in areas such as agriculture, livelihoods, capacity building, value chain development, supply chain strengthening, and policymaking for clientele in different regional and international projects. Previously, he worked as an Assistant Professor at Amity University. He also held the position of Teaching Assistant for 4 years at Curtin University, Australia, and as 'Horticulture Officer' in the Government of Andhra Pradesh (India) with duties as a field consultant and extension officer. Vijay holds a Ph.D. in Environment & Agriculture from Curtin University, Perth, Western Australia, with a specialization in Horticulture Postharvest Physiology.

He is well-versed and experienced in the production and postharvest aspects of horticulture crops of different climatic zones. He has edited books on postharvest capacity building and cold chain management, published more than 40 research papers in peer-reviewed journals, and presented papers on several national and international platforms. He holds strong research and consultancy experience in postharvest management and cold chain requirements of the crops, conducts value chain



analysis, and possesses the capacity to work with different international stakeholders along the supply chain.

**Lisa Kitinoja:**

Dr. Lisa is a private horticultural consultant with over 30 years of experience, specializing in postharvest loss assessment and training of postharvest trainers. She serves as the principal consultant for Postharvest Innovations LLC, Founder of The Postharvest Education Foundation, and an independent consultant for the Global Cold Chain Foundation (ACES Project in Kenya and Rwanda, India postharvest loss assessments), among other organizations. Previously, she held positions as Senior Technical Advisor at WFLO, Postharvest Advisor at FES, and Postharvest Expert/ writer for UNFAO. She has completed numerous short-term technical assistance (STTA) assignments for organizations such as GAIN, Agribusiness Associates Inc, icipe (Kenya), TAHA (Tanzania), WFLO (now GCCF), AgLand, Chemonics, DAI, Winrock International, CHF, IARW, Africare, ICARDA, World Bank, USDA TMS, UC Davis, Cornell University, The Ohio State University, GCCA, TPG, and SCS-Group.

Lisa has been involved as a postharvest trainer or consultant in various international horticultural projects, including UN FAO Save Food, Ceres 2030, BD4FS, PACCD, Hort CRSP (Tanzania), Hort Innov Lab (Uganda, Tanzania, Rwanda), WFLO Appropriate Postharvest Technologies Project (for BMGF), ATUT and AERI (Egypt, USAID funded), Indonesian Cold Chain Development and AMARTA (Indonesia), CEDARS and CEDARS-Plus (CHF, Lebanon), ACE and DASP (India).

**Diane Barrett:**

Dr. Barrett is a Professor Emeritus at the University of California, Davis. She has actively engaged with the fruit and vegetable processing industry in California, serving as a technical liaison to numerous key stakeholders. These included the California League of Food Processors, Institute of Food Technologists, Food Products Association, American Frozen Food Institute, Canned Food Alliance, and other industry associations. She also collaborated with commodity and advisory boards, relevant state and federal government personnel, and both farm and home advisors.

Diane's contributions extended beyond liaison activities, encompassing research and the development of extension courses specifically tailored for the fruit and vegetable processing industry. These courses covered a wide range of topics, including Advanced Process Technologies, Better Process Control,



Freezing Technology, Juice Processing, Tomato Processing, Fresh-Cut Products, and Aseptic Processing & Packaging.

### **Gurbinder Singh Gill**

Mr. Gill possesses over 30 years of experience across the agricultural value chain, demonstrating expertise in various areas. These include business development, licensing, managing public-private partnerships (PPPs), corporate affairs (engaging with government and industry associations), and navigating the business cycle (from start-up to turnaround). His primary business, Agribusiness Associates Inc., also has experience in mergers and acquisitions (M&A), encompassing prospecting, acquisition, and integration, both within India and international markets. His experience encompasses developing market entry strategies, project management, leading diverse teams of sales and technical personnel, and successfully managing transitions during integration following mergers and acquisitions.

### **Deirdre Holcroft**

Dr Deirdre Holcroft comes from a fruit farming background in Zimbabwe and studied horticulture at the University of KwaZulu Natal, and postharvest physiology at the University of California, Davis (PhD 1998). Deirdre worked in South Africa and the United States before settling in France. With 20 years of experience in the industry (AgroFresh, Dole Fresh Vegetables) and academia (the University of Stellenbosch, University of KwaZulu Natal, and Michigan State University), she launched Holcroft Postharvest Consulting in 2011.

Deirdre specializes in the postharvest handling of fruits, vegetables, and fresh-cut produce with an emphasis on reducing food loss and waste while improving quality, shelf-life, and profitability. She is a leading resource on cold chain and ethylene management. As an independent consultant, Deirdre has evaluated emerging postharvest technologies, been an active board member of the Postharvest Education Foundation, and a principal participant in the Ceres2030 postharvest team reviewing postharvest interventions to reduce food loss in Sub-Saharan Africa and South Asia.

### **Guy Kodjogbe**

Mr. Guy Kodjogbe, an experienced Agricultural Engineer specializing in Horticulture and Plant Protection, has dedicated his career to addressing agricultural, postharvest, and food safety challenges in West Africa. His extensive experience with organizations including IITA, WFLO, GCCA, ABA, UNICEF, CERTI, and CIRAD has resulted in significant contributions to the sector. He has conducted





comprehensive postharvest loss assessments and CSAM studies, trained numerous extension agents and stakeholders in postharvest management techniques, including the development and implementation of innovative solutions such as Zero Energy Cooling Chambers (ZECC), and focused on improving the safety of traditional dried vegetables. His commitment to the Postharvest Education Foundation as a Board Director (2018-2023) underscores his dedication to empowering communities through knowledge and practical solutions, making him an asset to the postharvest sector in West Africa.

### **Aditya Parmar**

Dr. Aditya is a dedicated postharvest scientist with a passion for improving food security and rural development in tropical and subtropical regions. He brings a wealth of expertise in postharvest biology & physiology, fresh produce quality, and food loss and waste reduction, having worked on numerous multidisciplinary projects addressing these critical issues. He worked for several years at NRI (UK) and is currently serving as a postharvest expert with the World Fish Organization.

Beyond his research, Aditya is committed to knowledge sharing and capacity building. He teaches postharvest technology and coordinates an e-learning module for students in Nigeria, empowering future generations to tackle food security challenges. His experience extends beyond academia, encompassing the coordination of international development projects and collaboration with smallholder farmers, agrifood enterprises, policymakers, and academic partners.

### **Olubukola Odeyemi**

Dr. Olubukola Odeyemi is an Associate Professor in the Department of Horticulture at the Federal University of Agriculture, Abeokuta, Nigeria. She has over 18 years of experience in both industry and academia in her role. Her educational background includes a B.Sc. in Agriculture from Abeokuta, an M.Sc. in Sustainable Agriculture from Coventry University (UK), and a Ph. D in Horticulture from Abeokuta. Dr. Odeyemi's professional journey has spanned various sectors. She served as the Quality Assurance Supervisor at Mr. Biggs, a subsidiary of United Africa Company of Nigeria (UACN), and as Head of the Postharvest unit at the Ogun State Cassava Revolution Programme. Currently, she is actively engaged in teaching, research, and extension services centered around postharvest science and technology. Her research interests focus on critical areas such as cold chain management, edible coatings, produce quality assessment, and minimal processing of horticultural produce.



Dr. Odeyemi's extensive experience has led her to consult for organizations like Agribusiness-Associates Inc (World Bank Group Project), Global Chain Alliance for World Food Logistic Organization (WFLO), ABT for Alliance for a Green Revolution in Africa (AGRA project with support from Rockefeller Foundation), Global Cold chain Alliance, World Food Logistics Organization (WFLO), and GIZ, all to reduce postharvest loss along the value chain of selected crops.

### **Majeed Mohammed**

Dr Majeed Mohammed is a Professor Emeritus of Postharvest Physiology at the University of The West Indies UWI), with over 30 years of experience in teaching, research, and outreach activities. He earned his Ph.D. in Postharvest Physiology at the UWI, M.Sc. in Postharvest Physiology at the University of Guelph, and B.Sc. in Agriculture at the UWI. His research is centered on the physiology and biochemistry of the ripening of tropical fruits, the effects of ethylene antagonists in delaying the senescence of cut-flowers, alleviation of physiological disorders of minimally processed fruits and vegetables and cold chain management, and the development of value-added food products. He has developed four schools of research: one in Postharvest Physiology; another in Commodity Utilization; the third in Food Quality Management and the fourth in Postharvest Extension. His latest work focuses on assisting Caribbean countries with developing sustainable, efficient, and inclusive mechanisms to produce, transform, and deliver healthy and safe food to consumers. He has been Board Director with the Postharvest Education Foundation (PEF), USA, and a member of the UN/FAO Panel of Experts from Latin America and the Caribbean on the Prevention and Reduction of Food Losses and Waste.

### **Hala Chahine-Tsouvalakis**

Dr. Hala is a seasoned postharvest expert with a distinguished career spanning over two decades. Her expertise is evident in her extensive experience working with leading organizations such as the FAO, IICA, WFLO, UC Davis, USDA, ACDI/VOCA, and UN-ESCWA. She has conducted research projects on food loss in various countries, including Lebanon, Egypt, Jordan, Iran, and Costa Rica. Her dedication to capacity building is reflected in her numerous roles as a postharvest trainer in Afghanistan, Tanzania, Georgia, Iraq, and Lebanon. Dr. Hala has also served as a consultant for the Lebanese agricultural sector, focusing on areas such as standardization, promotion, and sustainable agro-industry. She is presently working as an Associate Professor at the Faculty of Agricultural Sciences (FAS) at the Lebanese University (LU).



### **Cathy Kitinoja**

Ms Cathy Kitinoja is a dedicated professional with a Bachelor of Arts in Sociology from California State University, Northridge. She had a diverse career path in primary education and currently works as the Grant Coordinator for project CAMINO, where she effectively manages grant-related activities and supports project initiatives. In addition to her primary responsibilities, Cathy has served as an Administration Support Assistant in the HSCI department and provided project support for PEF.

### **EV Divakara Sastry**

Dr. E.V. Divakara Sastry, Professor and Head, School of Agricultural Sciences, Jaipur National University, Jaipur, has been an academic career for the last 41 years. He has also worked as an Ex-patriate expert on Biometrics at Haramaya University, Ethiopia between 2003 and 2005 under the World Bank-ARTP Project. He is a member of the board of studies of the Institute of Agricultural Sciences, BHU Varanasi, and the University of Nagaland. Was a member of the Research Advisory Council of NRC on Seed Spices, Ajmer. Has published 123 research papers, 53 book chapters, 10 books, and 12 practical manuals. Has guided 13 Ph.D. and 47 M.Sc. (Ag.) dissertation works. Dr. Sastry has supervised several research projects to a successful conclusion in India and abroad and is a regular guest speaker on spices and education technology. Has conducted several National Seminars and Conferences and has been chairman of various sessions at several Seminars.

### **Symantha Holben**

Dr Symantha is a highly accomplished manager with over 20 years of experience in designing and implementing intricate international development programs. She holds a PhD in Cultural Anthropology from the Catholic University of America, USA. Proven success as a Chief of Party and Deputy Chief of Party, with over 10 years of field-based experience leading donor-funded initiatives in environmental policy, biodiversity conservation, and food security. Her expertise spans Southeast Asia, with additional experience in Latin America and Africa, managing teams of 45+ host countries and international staff.

### **Bertha John Mjawa**

Ms. Bertha Mjawa is a national and international consultant with over 35 years of postharvest management research and extension experience coupled with wide knowledge in developing technologies for food crops, crops by-products (non-food – cosmetics & handicraft) and disseminating these technologies in a participatory manner to farmers and entrepreneurs. Ms. Bertha served as a



Value Addition Specialist in the “Market Infrastructure Value Addition and Rural Finance (MIVARF) Support for 29 regions of Tanzania” project. She and her postharvest team have translated the Small-Scale Postharvest Handling Practices manual into Swahili.

### **Edoh Kukom Ognakasson**

Mr. Edoh is a Togolese national with 13 years of experience as a postharvest specialist in agricultural research and development. His expertise lies in the postharvest management of staple crops such as cereals, pulses, tubers, and roots, as well as horticultural crops. He is dedicated to developing business models for postharvest technologies that improve market access and create employment opportunities for producers and processors. Since August 2022, Edoh is serving as a Postharvest Expert at the World Food Programme (WFP) headquarters in Rome, Italy. Previously, he worked as a Production and Postharvest Specialist at the World Vegetable Center in Mali, West Africa, and as a Research Fellow at the International Centre of Insect Physiology and Ecology (icipe) in Kenya, where he contributed to the "Reducing postharvest losses in East African food value chains" project.

Edoh holds an M.Sc. in Food Science and Technology from Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya, and an Agricultural Engineering degree ("Ingénieur Agronome") with a major in Crop Production and Protection from the University of Lomé, Togo. Edoh has also undertaken consultancy assignments with the Natural Resources Institute, University of Greenwich, under the African Postharvest Losses Information System (APHLIS) project, and with the West and Central African Council for Agricultural Research and Development (CORAF/ WECARD).



## 8. WAY FORWARD

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Since its inception in 2011, The Postharvest Education Foundation (PEF) has made significant efforts to combat food loss and waste, primarily through educational initiatives targeting young professionals in developing countries. It has developed a robust e-learning curriculum, underpinned by mentorship and fieldwork, utilizing the Commodity Systems Assessment Methodology (CSAM). The foundation's impact is evident in its network of graduates from over 30 countries and its active engagement on professional platforms. PEF's publications, including the "100 Under \$100" manual, and edited books on postharvest capacity building and cold chain management have become key resources in addressing postharvest challenges. The leaders of PEF often pass requests for consultancies to our trained "Postharvest Specialists" who can address training needs in their own countries and earn a good living as independent consultants. The foundation's commitment to practical training is further demonstrated through workshops, in-person training, and the creation of technical guides, such as those for cold room operations.

Key priorities of PEF towards future endeavors to reduce food loss and waste include:

- **Expand Educational Initiatives:** Continue to develop and enhance educational programs focused on improving postharvest practices, with an emphasis on reaching young professionals in developing countries. Regularly update the e-learning program to be relevant to the evolving needs of the postharvest community.
- **Foster Partnerships and Collaborations:** Seek and strengthen partnerships with international organizations to further the impact of PEF's work and to share best practices on a larger scale. Leverage the Postharvest Training and Services Center model to achieve a holistic approach towards postharvest loss reduction in every farming village and every country.
- **Increase Knowledge Dissemination:** Continue to publish, update, and distribute practical postharvest knowledge resources, such as "100 Under \$100: Tools for Reducing Postharvest Losses" and other manuals, in multiple languages to support the global adoption of best practices.

Dr. Lisa retired in 2024 (but will still be doing volunteer work for PEF). G.S. Gill, who is a new addition to the board of directors will be looking after the PEF activities along with Dr. Vijay Yadav.



# The Postharvest Education Foundation

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