FRUIT & VEGETABLES
FOR SUSTAINABLE HEALTHY DIETS

SCIENCE MEETING

DECEMBER 06, 2024
COLOMBO, SRI LANKA

# Mitigation of Food Loss in Fruit and Vegetable Value Chains: ACIAR's Journey


*Institute of Policy Studies,*
*University of Peradeniya,*
*University of Wayamba,*
*The Open University of Sri Lanka*

**Darshani Weerahewa**
**Professor in Botany**


THE OPEN UNIVERSITY OF SRI LANKA

# Developing Food Loss Reduction Pathways through Smart Business Practices in Mango and Tomato Value Chains in Pakistan and Sri Lanka

## Sri Lanka Activities & Progress

- Develop a comprehensive understanding of the current state of food loss, identify and assess intervention needs, and implement interventions.
- Collect data (using mixed methods approaches, including load tracking, FGDs, KIIs, questionnaire-based surveys, and different sampling and quality assessment methods) and Data analysis
- Working closely with value chain partners, prioritizing ways to remove barriers, and making practice change worthwhile

Agribusiness

# Developing food loss reduction pathways through smart business practices in mango and tomato value chains in Pakistan and Sri Lanka

**Last updated:** 28 April 2023

Print page

## Key details

**Location**
Pakistan, Sri Lanka

**Duration**
**Start** Aug 2022 **End** Jul 2025

**Budget**
AUD 1,100,000

**Commissioned organisation**
Quaid-i-Azam University

**Partners**
- Mallawa Insights, Australia
- Bahauddin Zakariya University, Pakistan
- Fortunate Agribusiness, Pakistan
- PMAS-Arid Agriculture University, Pakistan
- Quaid-i-Azam University, Pakistan
- Institute of Policy Studies of Sri Lanka
- The Open University of Sri Lanka
- University of Peradeniya, Sri Lanka
- Wayamba University, Sri Lanka

**Project Leader**
Dr Anwar Shah

**Program**
Agribusiness

**Project code**
CS/2020/193

## Overview

**This project aims to use mango and tomato as focal product lines to assess the nature, extent and the underlying causes of food loss, and demonstrate the effectiveness of a set of innovations in driving behavioural change that results in loss mitigation.**

In Pakistan and Sri Lanka fresh fruits and vegetables are valued for their superior nutritional and social values, and as sources of cash income for farmers. They are also regarded as a foundation for new agribusiness value chains, bringing benefits to both rural and urban communities.

Maintaining the quality and freshness of fruits and vegetables under humid tropical conditions in these countries is a challenge. Improving supply chain practices that avoid large food losses during seasonal gluts, and during transport, storage and handling, can improve farmer incomes and deliver benefits across the value chain including to consumers.

Progress towards modern food systems in both countries is continuing. However, the gap between desired change and current practices is large. In many countries, production practices that create greater value for consumers are presenting new opportunities for farmers. This can be achieved by working closely with value chain partners, prioritising ways to remove barriers, and making practice change worthwhile.

Extending such an approach can help farmers gain more stable incomes, adapt to change including climate change, increase investment in modern value chains, and improve food quality and diversity for consumers. The ensuing reduction in food loss and waste can improve environmental outcomes and decrease the costs for value chain participants.

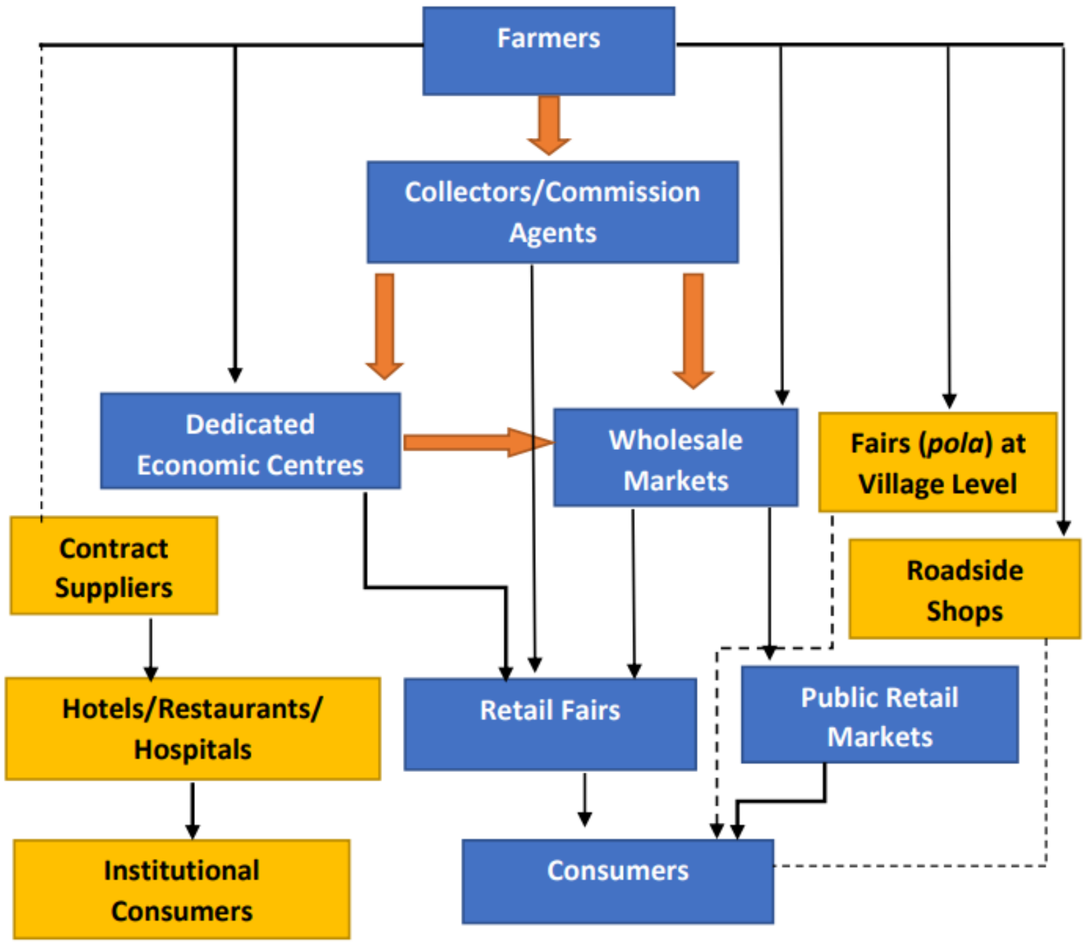
Using mango and tomato as focal commodities, this project aims to develop the capability to model cost-productivity trade-offs in loss reduction at primary production to processing stages. It will simultaneously capture the response drivers of food security (availability, accessibility and utilisation of food), business competitiveness (stability and profitability) and sustainability (greenhouse gas emissions, input use intensities, and relevant Sustainable Development Goal indicators) in representative regions in Pakistan and Sri Lanka.

The project will collect data and assess interventions—potentially including e-commerce—using mixed methods approaches, including load tracking, focus group interviews, questionnaire-based surveys, and different sampling and quality assessment methods. This will develop a comprehensive understanding of the current state of food loss, identify intervention needs, and assess interventions by region, supply chain stage, and sectors.

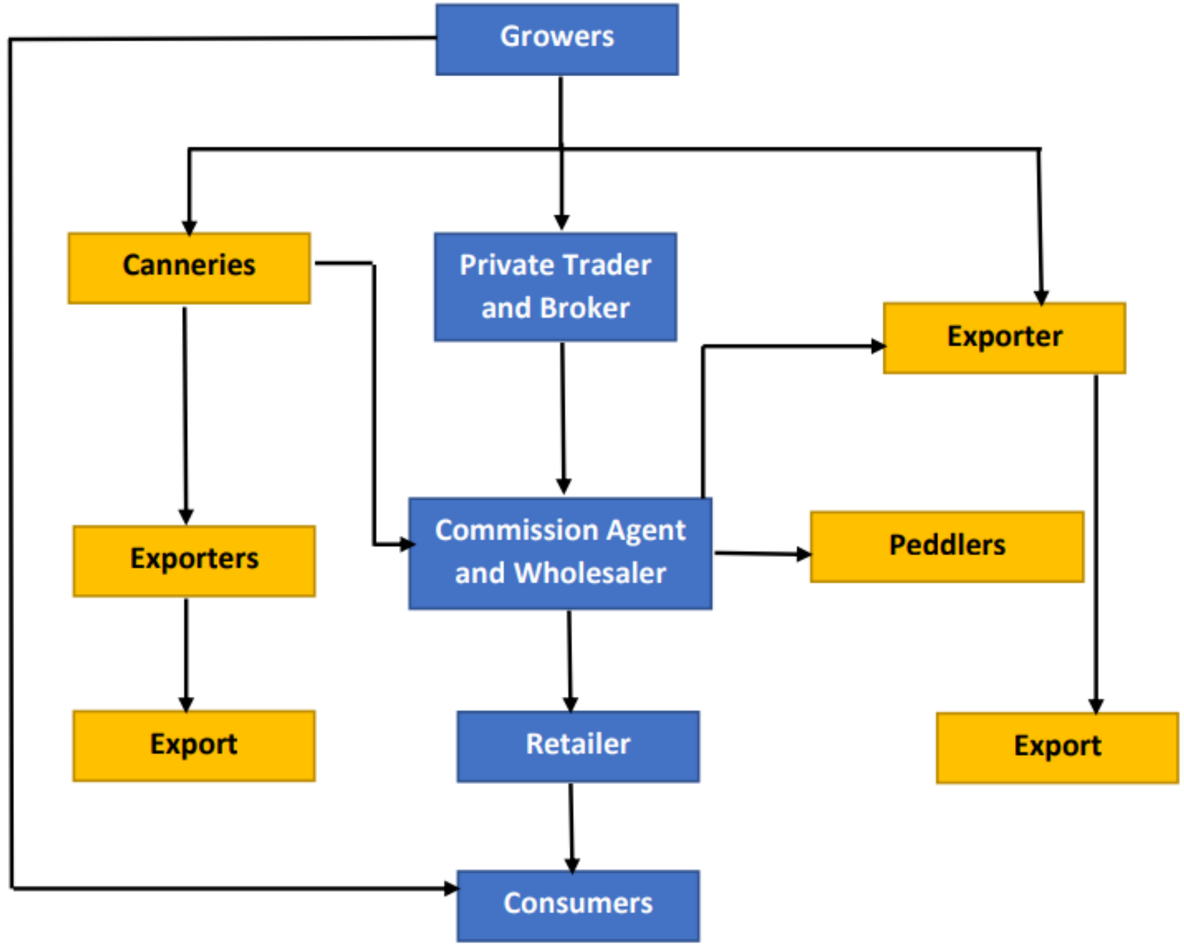
This project is part of the Food Loss Research Program—a partnership between ACIAR and Canada's International Research Development Centre. The program works with partners in developing countries to address food loss through innovative, locally driven solutions.

# Understanding the Current State of Food Loss

Tomato Supply Chain




Mango Supply Chain




Loss: 30 – 40% of the total production, with approximate loss of LKR 13 billion i.e. approx. US$ 72.2 million.

# Losses at the Farmer Level

**Improper pre-harvest practices**
(Low quality planting material/seeds, No enough spacing, excess pesticides, No training or pruning, No bagging

**Improper harvesting**
(One-time harvesting, immature stage or over-ripen stage, Using a picker/ shaker)

**Improper post-harvest practices**
(Collection on the ground, Using polluted water for washing/ latex removal, Marketing the produce without sorting and grading, Packing in wooden boxes/ gunny bags)

# Losses at the Marketing Stage

Poor adoption of modern technology including proper storage and transport infrastructure

Overpacking, overloading, and use of below-standard packaging and transporting vehicles

Long and complex supply chains with large numbers of intermediaries/ High food miles

Poor coordination between stakeholders/ limited backward-forward linkages

Lack of attention to the quality signals

Lack of processing and value addition

# Mango Farmer Training Program (MFTP)

**To fill the Knowledge gap between recommended and currently practiced pre and postharvest practices**

- Awareness creation, training, and extension

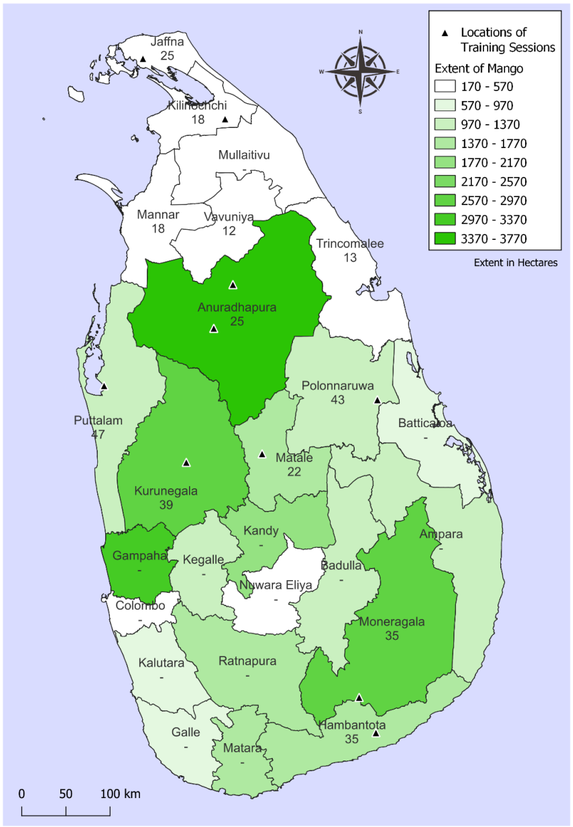
**Module Experts**

**Master Trainers**

| Module 1: Best Agronomic Practices (Dr. Sujatha Weerasinghe) | Module 2: Orchard Management (Mr. Weerasooriya Bandara) | Module 3: Mango Pest Management (Dr. Premeratne Bandara) | Module 4 : Phytosanitary requirements (Dr. W. Wickramaarachchi) | Module 5: Postharvest Handling (Dr. K. H. Sarananda) |
|---|---|---|---|---|
| • Mr. U.J. Mohottige, General Manager MCT<br>• Mr. N.M. Riswan, Agriculture Instructor DOA<br>• Ms. G.W.S. Nilmini, Officer Resource Centre DOA | • Mr. K.A.D.A. Kodagoda, Agriculture Instructor DOA<br>• Mr. B.T.V.E. Bambarabotuwa, Field executive ELH<br>• Mr. M.G.W.S. Kariyawasam, Agriculture Instructor DOA | • Mr. M.M.B.N.P. Madurasingha, Agriculture Instructor DOA<br>• Mr. R.M.B.H. Istaweera, Agriculture Instructor DOA<br>• Mr. A. Karunarathne, Agriculture Instructor DOA | • Ms. E.H.M.C. Madushani, Manager ELH<br>• Mr. S. Rajeshkanna, Assistant Director of Agriculture DOA<br>• Mr. S.K.B.S. Kumara, Agriculture Instructor DOA | • Mr. W. Gunadasa, Deputy Director DOA<br>• Mr. S.H. Burhanudeen, Science and Technology Officer DOA<br>• Ms. J.M.M.M.Kumari, Certification Executive ELH |

**Trainees**

- Farmers (293)
- Other Stakeholders (51)




# Women Empowerment & Market Linkage Building

- **Capacity Building and Training:**
  - smart production techniques, including polytunnel care and maintenance, crop management, addressing climate risks, efficient use of resources
  - empowering women with negotiation skills and marketing strategies.

- Facilitate women farmer access to supermarket chains like Cargills , through certification, quality assurance and supply reliability

- Introduce green corners in Coop City Super Markets with a supply chain model that ensures timely delivery and fair pricing for farmers

- Facilitate women farmers partnerships for collective bargaining, resource sharing, and mutual support

# Mango and Tomato Transport Loss Trials


- Spray method
  - Conventional corrugated fiber board boxes
  - Modified corrugated fiber board boxes
- Ripening Chamber
  - Conventional corrugated fiber board boxes
  - Modified corrugated fiber board boxes

**Mango**

- Transport
  - Traditional Wooden box
  - Modified wooden box
  - Plastic crates

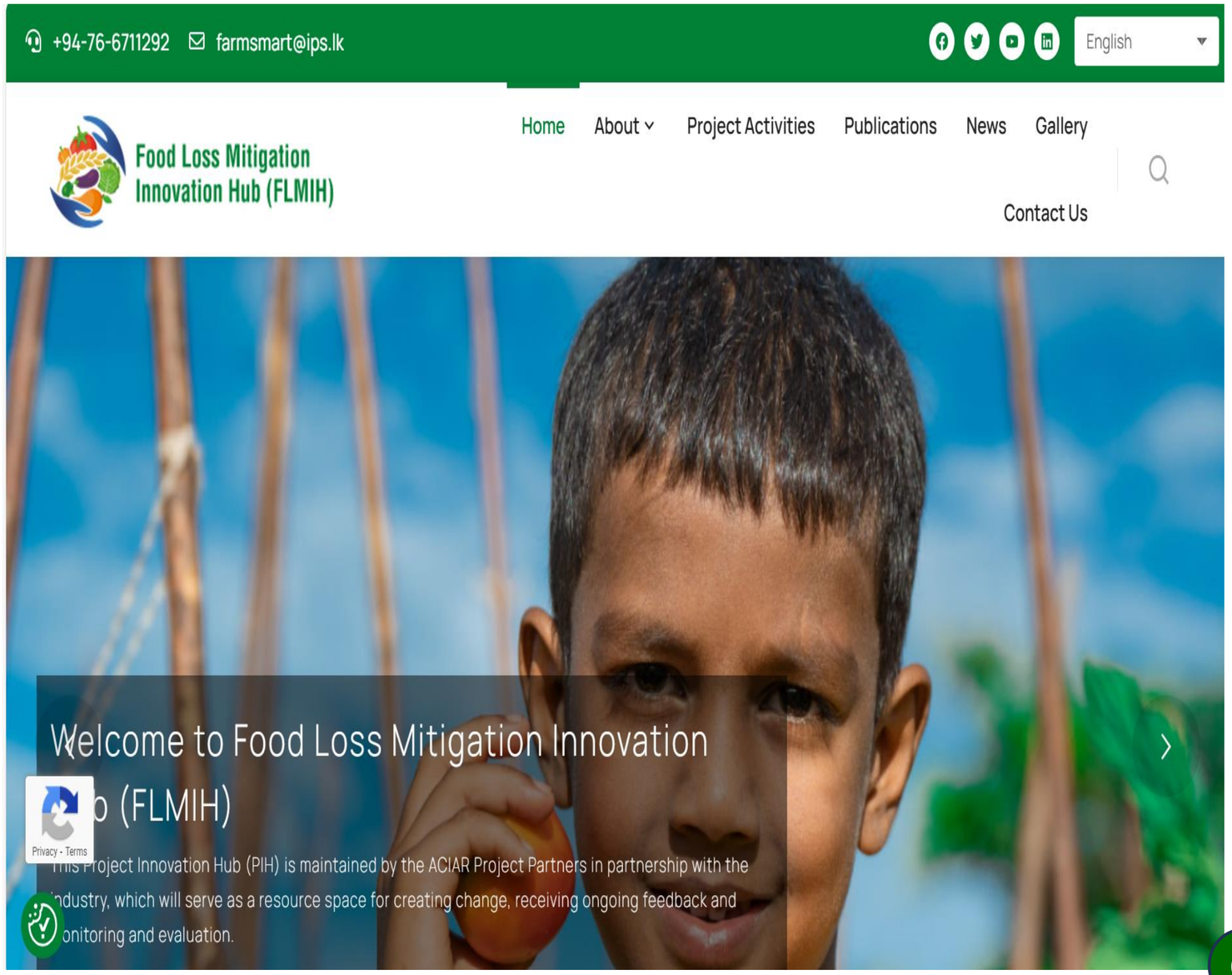
**Tomato**

FRUIT & VEGETABLES FOR SUSTAINABLE HEALTHY DIETS SCIENCE MEETING DECEMBER 06, 2024 COLOMBO, SRI LANKA

# Food Loss Mitigation Innovation Hub (FLMIH)

- A source of advocacy and innovation that will showcase knowledge-to-practice links and results of practice change.

- Resource space for creating change, receiving ongoing feedback and monitoring and evaluation.




FRUIT & VEGETABLES FOR SUSTAINABLE HEALTHY DIETS SCIENCE MEETING DECEMBER 06, 2024 COLOMBO, SRI LANKA

# Development of a Non-Destructive Quality Assessment Application

## Overall Objective

Reducing post-harvest losses of mango by introducing a non-destructive quality assessment application to identify the table ripe stage and ensure superior quality mangoes for the consumer while enhancing profit of stakeholders in the mango supply chain.

**Application: A QR code system (later may be converted to a smartphone application)**

- The system can alert consumers to what is the perfect time to eat mango, preventing waste from buying overripen fruits.
- By scanning the qr code consumers can receive detailed information about the quality of the mango and its ripeness stage (unripe, ripe, overripe) from a web page/ smartphone application.

**Database Design**
**(Harvesting date/ Expected Table ripe date/ External and Internal quality attributes/ Farm source Information)**

**QR Code Generation**

**Integration with Retail Systems**
**(Testing for validity)**


Consumer Scans QR Code

Web Page Displays Information
(" Ready to eat Today "/
"will Be ripe in 3 Days" )

(Mango Grade / Predicted table ripe data/
Current quality attributes / Farm source and traceability information

Consumer Makes the Decision

FRUIT & VEGETABLES FOR SUSTAINABLE HEALTHY DIETS
SCIENCE MEETING
DECEMBER 06, 2024
COLOMBO, SRI LANKA

# Research Contributions of University of Peradeniya: Value Chain Analysis

## Strand 1: Food Loss Epidemiology

- *Studies: Hidden Middle's Impact on Post-Harvest Losses, Determinants of Post-Harvest Losses, Behavioral Strategies*
- Systematic assessment of food losses through qualitative and quantitative approaches
- Key Findings:
  - Total post-harvest mango losses: 29-33% across value chain
  - Tomato losses: 5% daily average at retail level and LKR 75/kg economic impact
  - Storage identified as largest contributor (13.5% for KC mango)
- Validated food loss pathways through retailer and intermediary surveys


## Strand 2: Agri-food Value Chains Assessment

- *Studies: Cultural Elements of Karuthakolomban Mango, Contract Types Analysis, NTM Impact Assessment*
- Comprehensive situational assessment through:
  - Cultural consensus analysis of collector behavior
  - Contract type evaluation and outcomes
  - Export barrier assessment (NTMs)
- Identified key value chain vulnerabilities and opportunities

## Strand 3: Causal Links Through Experiments

- *Studies: Experimental Auctions, Social Experiments with Retailers, Production Practice Assessment*
- Conducted field surveys and experiments:
  - Social experiments with 27 retailers
  - Experimental auctions for packaging solutions
  - Assessment of production practices impact
- Established evidence-based loss prevention strategies

Figure 1 - Sorting and packaging of mangoes

Figure 2 - Way of transportation of mangoes

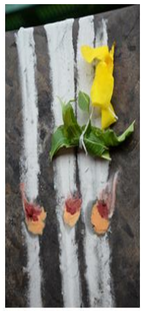


Figure 3 - Rituals related to mangoes

# Research Contributions of University of Peradeniya: Economic Analysis & Transformational Change

## Strand 4: Transition Costs & Incentives

- *Studies: Packaging Methods Cost Analysis, Willingness to Pay Studies, Quality Attributes Analysis*
- Economic analysis of mitigation options:
  - Comparative cost analysis of packaging methods
  - WTP assessment for improved technologies
  - Cost-benefit analysis of quality improvements
- Key Findings:
  - Plastic crates most cost-effective (LKR 148.73/kg total cost)
  - Significant WTP increase with information provision (71% higher)

## Strand 5: Transformational Change

- *Studies: Women-led Farming Impact, Standards Implementation*
- Created sustainable change through:
  - Formation of production clusters and Implementation of quality standards
- Stakeholder Engagement:
  - 396 mango producers across regions, 532 value chain actors, and 122 retailers in systematic studies
  - Multiple institutional partnerships
- Policy Impact:
  - Developed evidence-based recommendations
  - Influenced agricultural extension services
  - Enhanced value chain coordination

# Development of an Ethylene and Volatile Organic Compounds (VOC) adsorbent to be included in Tomato Packaging

Wholesale markets/ DEC


Supermarkets

Export


Fruits and Vegetables in Sri Lanka

**In enclosed packaging, Fruits are subjected to,**

- Accelerated ripening
- Physiological changes
- Quality deterioration
- Increased postharvest losses

**Reason?**

Ethylene and Volatile Organic Compounds build up

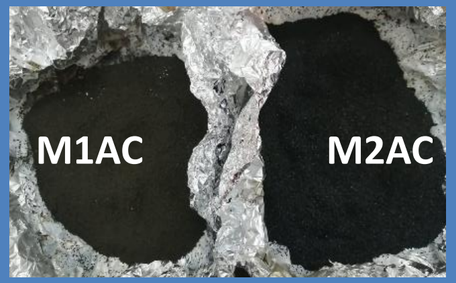
**Objectives**

- Develop an efficient, cost-effective ethylene adsorbent (GA) using available materials
- Optimize formulation for maximum adsorption capacity and longevity
- Evaluate adsorbent's effectiveness in delaying ripening and senescence
- Assess feasibility, scalability, and food safety for commercial use

# Gas adsorbent development by trial-and-error method

**Objective** – To check the effectiveness of impregnating base substance (activated carbon)

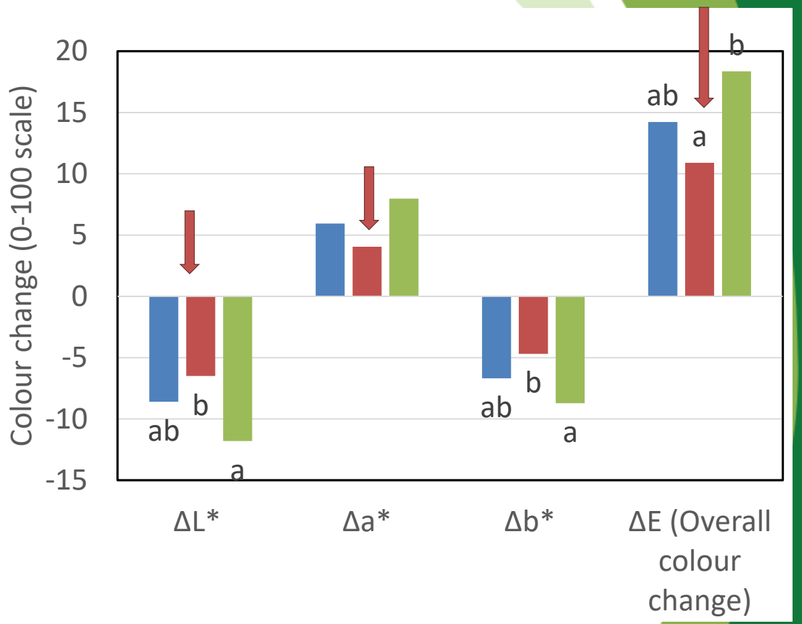
Different substant ratios



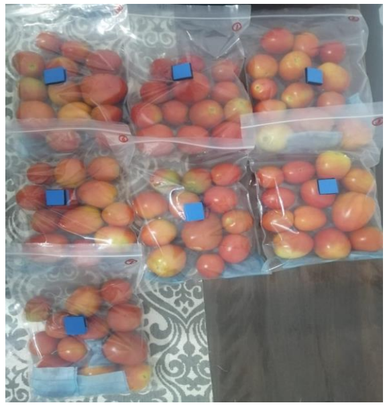

Store in Gastight bags

**M1AC** **M2AC** **Control 1**

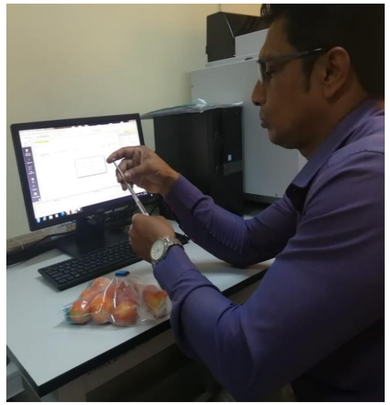
Quality evaluation after 3 days storage in room temperature/ cold storage



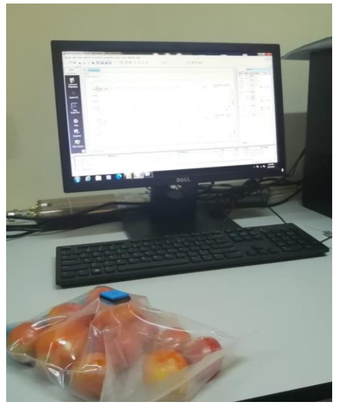

## Effectiveness of GA using Gas Chromatography



500g Tomato was enclosed with GA for 3 days



Gas samples drawn from polythene bags and injected to GC



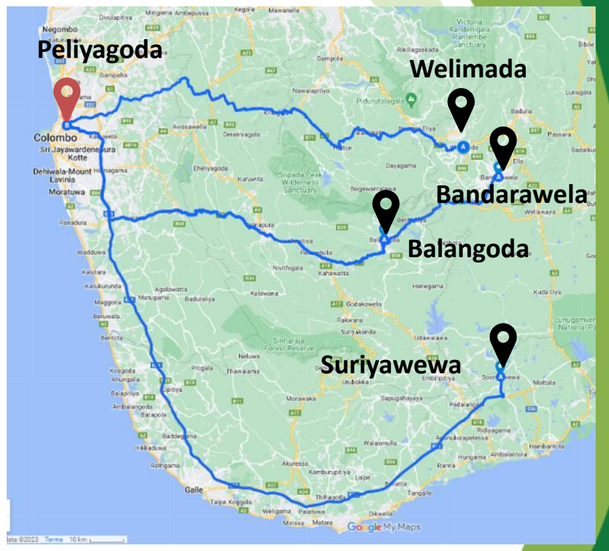
Different levels of gas present in the bag is given in the graph

- GA managed to reduce ripening as represented by colour
- Next steps,
  - Food safety concerns
  - Commercialization steps

# Commodity Systems Assessment of Tomatoes in the Wholesale Market

**Objectives:**

- To recognize the quality variation of the tomatoes in the wholesale market
- To recognize which origin provide best quality tomatoes/ worst quality tomatoes
- To recognize the reasons/postharvest practices affecting such differences (traceback)
- Recognize the parameters that contributed to the postharvest loss




**Methodology**

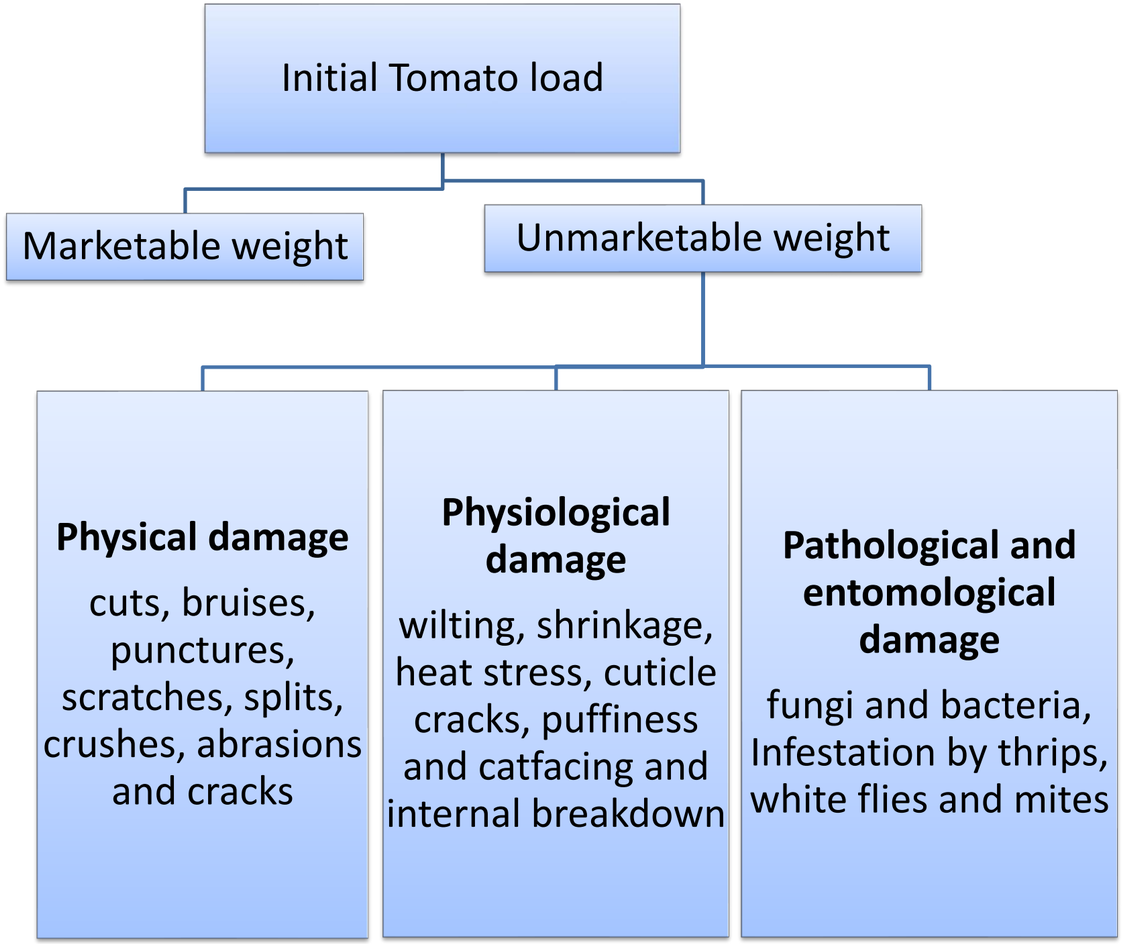
Note background information of the loads through the questionnaire

- The weight/volume of tomato received per day
- The locations (Suriyawewa, Jaffna, Ratnapura, Puttalam, Badulla,Any other)
- Mode of transportation (Lorry, Van,Trucks)
- Packaging (Wooden crates, cardboard boxes, gunny bags)
- Storage at wholesale (cold storage, room temperature, Shady place, Exposed to sun)
- Length of time at wholesale market (Hours)
- Distributions from wholesale market( to retailer, consumer, supermarket)

❑ **Sample random tomato boxes from each channel, in the wholesale market (Peliyagoda) for quantitative and qualitative evaluation of loss**

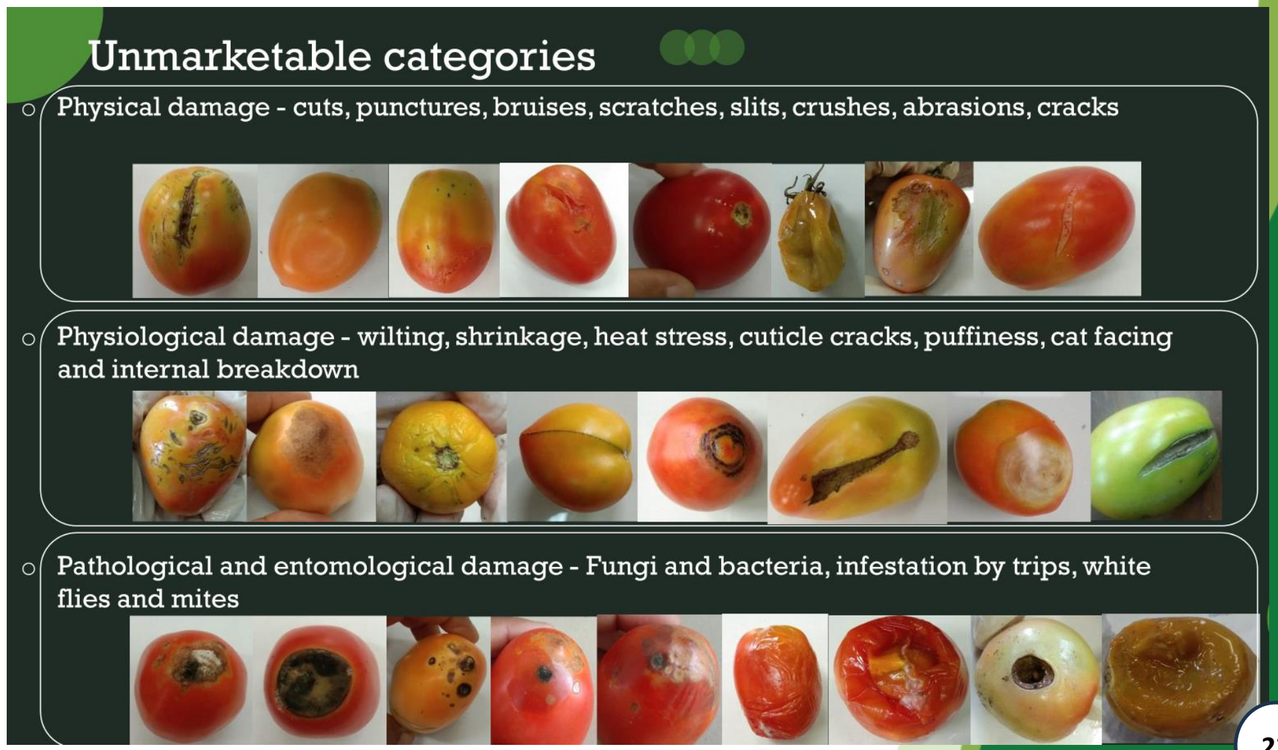
FRUIT & VEGETABLES FOR SUSTAINABLE HEALTHY DIETS SCIENCE MEETING DECEMBER 06, 2024 COLOMBO, SRI LANKA

# Sorting of tomatoes…




**Unmarketable**


**Marketable**




FRUIT & VEGETABLES FOR SUSTAINABLE HEALTHY DIETS SCIENCE MEETING DECEMBER 06, 2024 COLOMBO, SRI LANKA

Quantitative assessment

| | Box 1 (Suriyawewa) | Box 2 (Balangoda) | Box 3 (Kurunegala) |
|---|---|---|---|
| **Average fruit weight (g)** | 35.82[a] | 68.019[b] | 30.89[a] |
| **Marketable %** | 78.30% | 67.30% | 66.98% |
| **Mature green** | 0.50% | 0.85% | 1.64% |
| **Breaker** | 2.67% | 23.65% | 25.02% |
| **Turning** | 14.36% | 16.54% | 16.43% |
| **Pink** | 29.72% | 15.31% | 20.32% |
| **Light red** | 13.69% | 8.95% | 3.45% |
| **Red** | 39.07% | 1.95% | 0.11% |
| **PHL %** | 21.70% | 32.74% | 33.02% |
| **Physical damage %** | 19.03% | 17.89% | 20.40% |
| **Physiological damage %** | 0.66% | 12.76% | 10.88% |
| **Pathological damage %** | 2.00% | 2.08% | 0.92% |

Qualitative assessment

| | | Box 1 | Box 2 | Box 3 | Significance | | |
|---|---|---|---|---|---|---|---|
| | | | | | (B) | (S) | (B*S) |
| **Color** | **L*** | 38.50[a] | 47.38[b] | 40.84[a] | * | * | * |
| | **a*** | 24.14 | 20.95 | 25.90 | ns | * | * |
| | **b*** | 44.37 | 45.54 | 44.05 | ns | * | * |
| | **a/b** | 0.59[a] | 0.45[b] | 0.62[a] | * | * | * |
| **Firmness** | **$F_s$** | 4.77 | 5.37 | 5.54 | ns | * | ns |
| | **$F_f$** | 3.03 | 3.40 | 3.06 | ns | * | ns |
| **TSS** | | 4.69 | 4.62 | 4.74 | ns | * | * |
| **Shelf life** | | 11.85[a] | 12.98[b] | 13.16[b] | * | * | * |

## Conclusions and Recommendations

- Differences in the quantitative loss - Box 1 showing the highest marketable percentage,
- Implies potential influences of local weather conditions in tomato production on physiological damage

- Sorting practices and fruit maturity significantly affect qualitative postharvest losses, affecting attributes such as tomato color, firmness, TSS levels, and ultimately shelf life.

- Higher average fruit weight in Box 2 from Balangoda suggests potential disparities in tomato cultivars among regions as a contributing factor.

- Future studies should encompass the entire value chain, tracking tomatoes from the farm level to the wholesale market over an extended time period

- Load tracking methodologies are challenging due to economic constraints

- Obtaining more representative samples could be helpful in drawing insights on the root causes of postharvest losses

# Impact of Varietal choice on the postharvest quality of Tomato

**Objectives:**

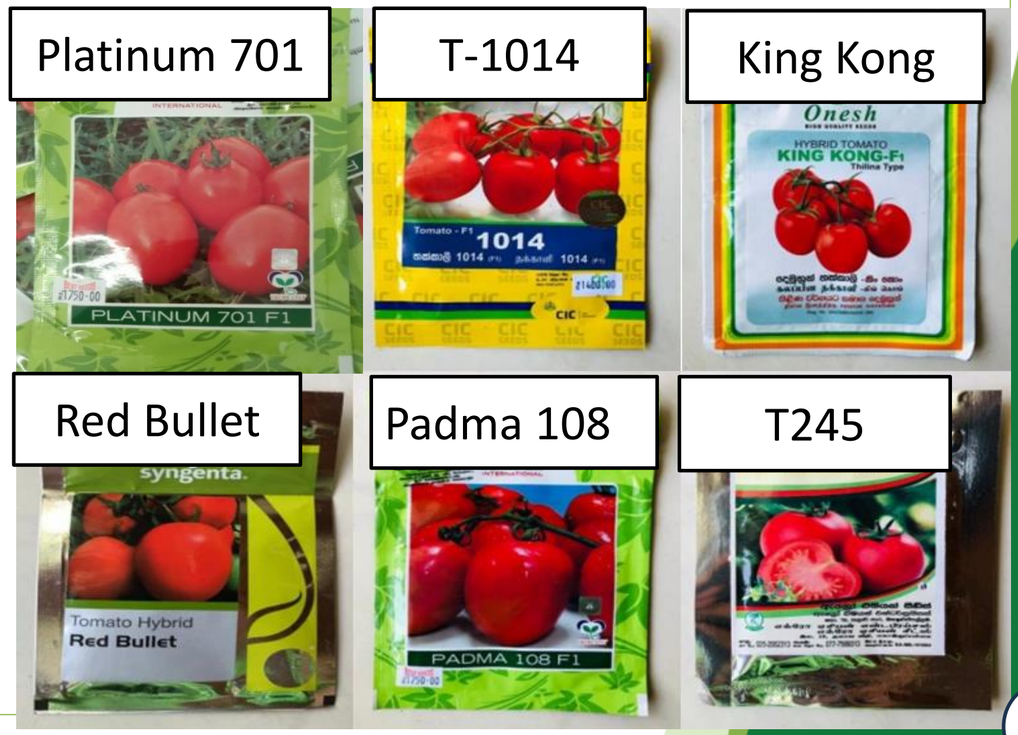
- To recognize varieties that could keep optimum quality during postharvest life
- To recognize which quality parameters affect the extension of postharvest life

## Methodology

- ❑ Establishment of a nursery for 6 varieties (King Kong, Tomato 1014, Red Bullet, Padma, Platinum, T245)
- ❑ Tomato fruits in color breaker stage were harvested and following parameters were evaluated

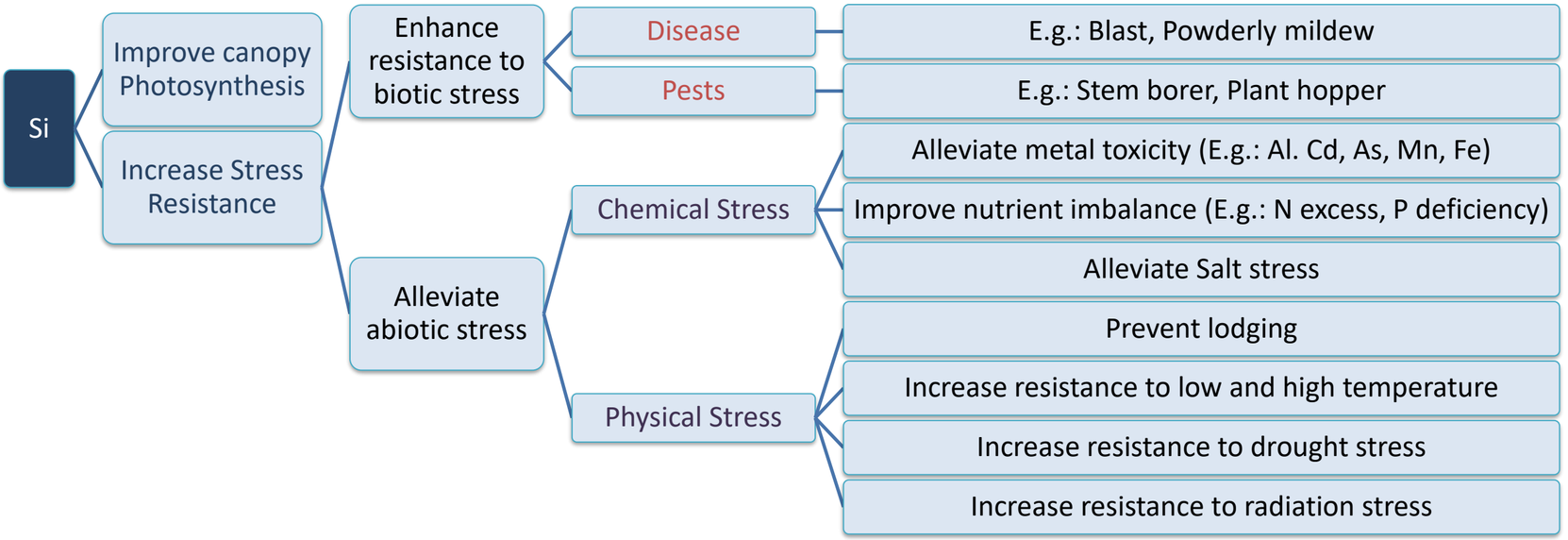
- ❑ Yield parameters
  - Total No of fruits
  - Disease incidence
- ❑ Quality performances
  - Fruit weight
  - Diameter
  - Color
  - Firmness
  - TSS
  - pericarp thickness

❖Conducted the storage and shelf life test for the six varieties



# Assess the impact of preharvest silicon application on the postharvest quality of tomatoes

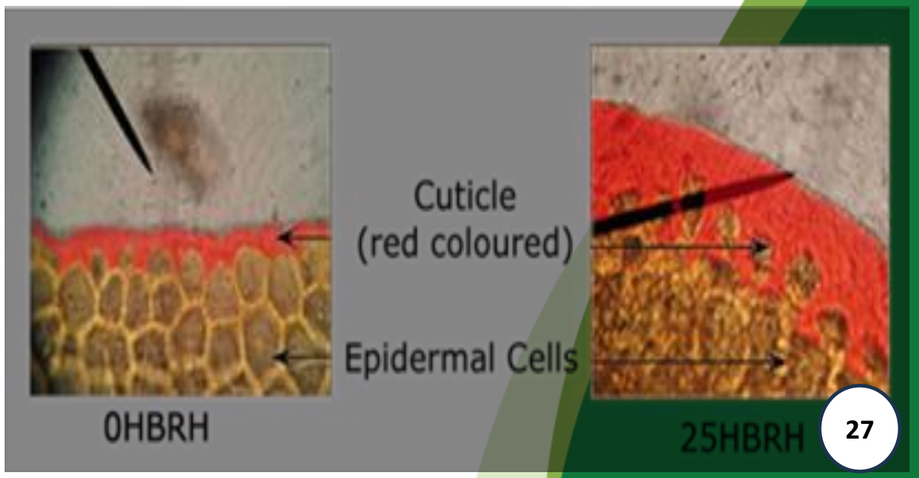
## Introduction




### Why Partially Burnt Rice Hull?

- A rich source of Silicon
- Enhance plant growth in nutrient less soil.
- Enhance overall plant health and productivity →Improve crop yield

**Cuticle thickness of tomato fruits from the partially burned rice hull treatment**




### Objectives

1. To recommend an optimum dosage of partially burnt rice hull application for tomato plants
2. To distinguish quality improvement by the application
3. To distinguish postharvest quality and shelf life of the treated fruits with other handling practices

Identification of Prospective Locations for field trials and get consent from Farmers to apply treatments
**Location - Hambanthota**

Tomato Nursery establishment, maintenance, and transplant in the fields – Few farmer fields

Application of Recommended Doses of PBRH (R0 – No PBRH, R1 – 1kg/3m$^2$ plot, R2 – 2kg/3m$^2$ plot)

Apply DOA recommended fertilizer practices

Planting the tomato plants in the Si treated and non-treated fields

Measurement of yield parameters in treated and non-treated fruits

Test 1 - Colour breaker stage fruits were harvested

Transportation of treated and non-treated fruits to the laboratory

Measurement of quality parameters – Weight, Color, Firmness, TSS, Shelf-life

Storage study – Cold storage

GA study for treated and non-treated tomatoes

Drop test and Shelf-life

Location selection at Sooriyawewa, Hambanthota

Nursery Establishment, Land Preparation

Application of PBRH (R0 – No PBRH, R1 – 1kg/3m$^2$ plot, R2 – 2kg/3m$^2$ plot)

Application of DOA recommended fertilizer practices

Evaluation for Storage Study (Cold/RT), GA study and Drop Test with Shelf life


Measurement of Quality parameters (Color, TSS, Firmness, Weight, Shelf life)

Measurement of yield parameters and Harvesting at breaker & Pink stages of tomatoes

Transplanting in Si treated and non Treated fields

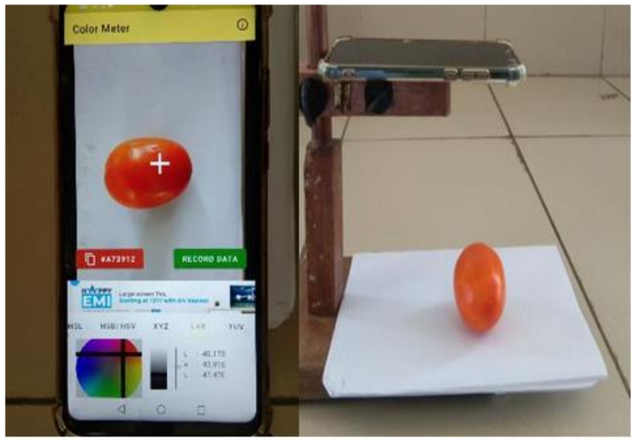
# Analysis of Quality Parameters (Method 1)

- 15 marketable fruits each from breaker and pink maturity stage per each treatment (Five fruits per each replicate from one treatment) were randomly selected and analyzed for the following quality parameters

Fruit Diameter

Fruit Weight

Firmness.




Fruit Color (L*, a*, b*)

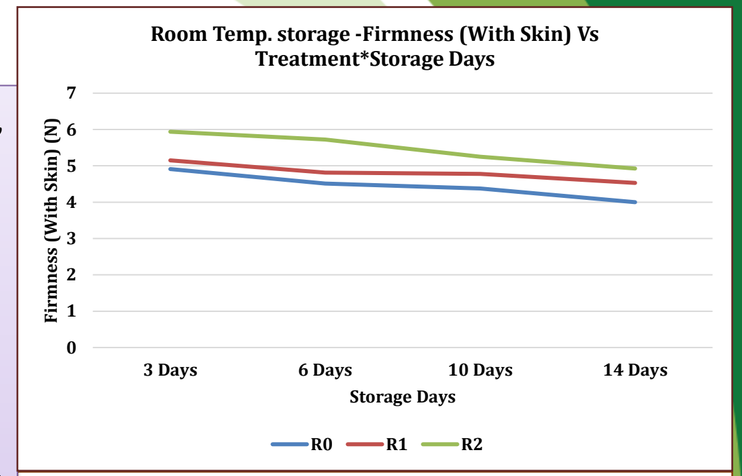
Shelf Life up to 14 days

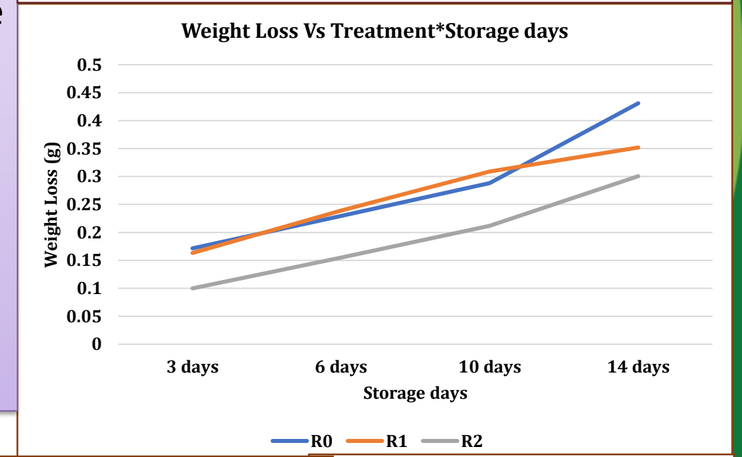
Total Soluble Solid

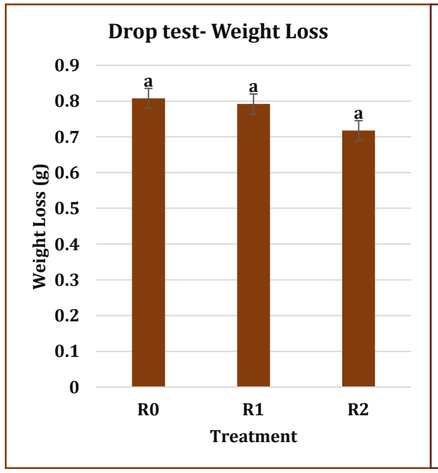
FRUIT & VEGETABLES FOR SUSTAINABLE HEALTHY DIETS SCIENCE MEETING DECEMBER 06, 2024 COLOMBO, SRI LANKA

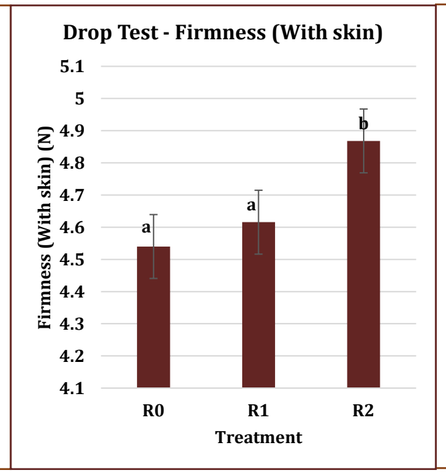
# Results (Method 1)

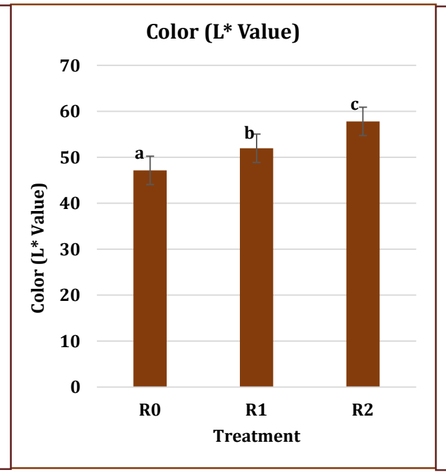
- No Significant difference in treated and non-treated tomatoes in terms of Average fruit weight, TSS and fruit diameter.
- Higher L* and b* values in R1 & R2 → Redness is low and lightness is high (Less ripening)
- Significantly higher ($p<0.05$) firmness with and without peel (Treatment R2)
- Significantly higher shelf life in R2 (More than 13 days)
- R2 → After drop test, Comparatively lower weight loss upon 3 days of storage
- Si treated tomatoes - Significantly higher firmness even after the drop test
- Even though the Si treated tomatoes are dropped from 1m and 0.5m distances – longer shelf life (More than 9 days)
- R2 – Marketable tomato % was higher after the drop test
- After 14 days of storage at room temperature conditions, Treatment R2;
  - Significantly lower weight loss and Comparatively higher peel firmness
- After 14 days of storage at refrigerated conditions, Si treated tomatoes;
  - Significantly lower weight loss and Comparatively higher peel firmness
  - Cold storage – Quality is higher than ambient temperature conditions

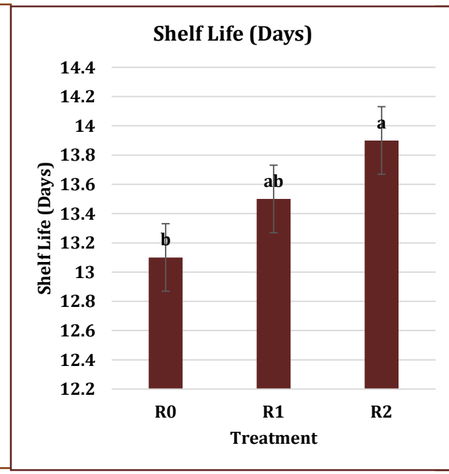


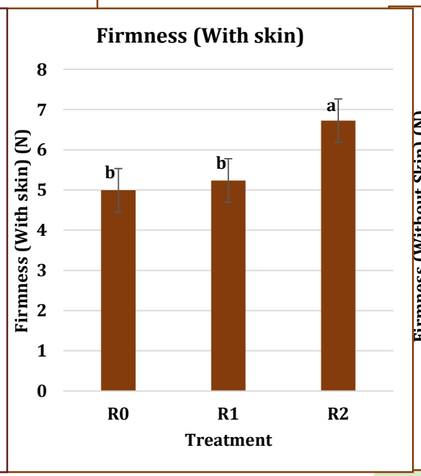



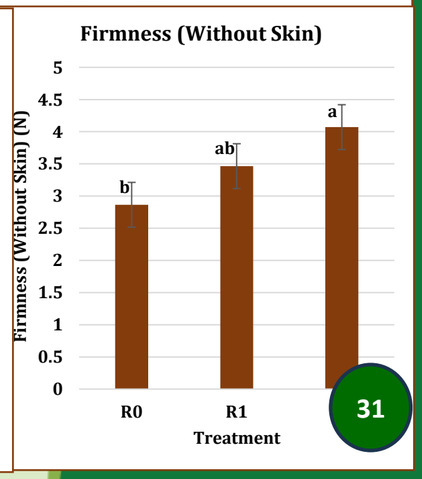



# Conclusions (Method 1)

- Best Si treatment → R2
  - ➢ Higher peel firmness
  - ➢ Longer shelf life
  - ➢ Higher keeping quality in storage (Lower weight loss and high peel firmness)
  - ➢ Resistant to the adverse conditions during transportation and postharvest handling
- Additional cost for a farmer for growing tomatoes 50$m^2$ land area by applying PBRH is around LKR 1,200
- Si treatment;
  - – Increase the marketability compared to non- Si treated tomatoes
  - – Delays the ripening of tomatoes – ideal for postharvest handling and improve the visual quality too
  - – Si helps strengthen fruit cell walls and improves the outer cuticle thickness of the fruits – Increase the peel firmness
  - – Helps to Retain firmness after 14 days of ambient and cold storage and have a longer shelf-life → Suitable for exports
  - – Reduce the postharvest losses and cost effective

**Future Studies**

- Quantitative assessment of Si treated tomatoes (Next trial - Anuradhapura)
- Evaluate the effect of Si treatment for compression damages
- Evaluate the combined effects of Gas adsorbent incorporation and evaluate the Ethelene absorbance

# Methodology 2



Identification of Prospective Locations for field trials and get consent from Farmers to apply treatments

***Location – Adhikarigama, Hanguranketha, Central Province, Sri Lanka***

Tomato Nursery establishment, maintenance and transplant in the fields – 10 farmer fields

Application of Recommended Doses of PBRH (R0 – No PBRH, R1 – 100g/hole, R2 – 150g/hole)

Apply DOA recommended fertilizer practices

Planting the tomato plants in the Si treated and non-treated fields

Measurement of yield parameters in treated and non-treated fruits

Test 1 - Color breaker stage fruits were harvested

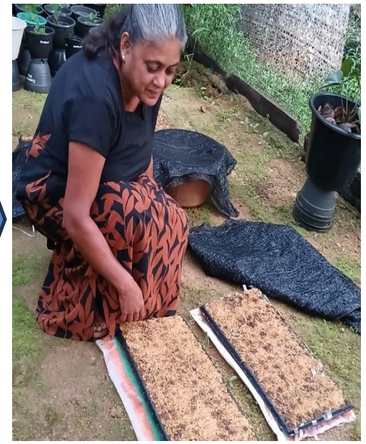
Transportation of treated and non-treated fruits to the laboratory

- Measurement of quality parameters – Weight, Color, Firmness, TSS, Shelf-life
- Storage study – Cold storage
- GA study for treated and non-treated tomatoes
- Drop test and Shelf-life


Location Selection

Farmer Inaguration & Land Observation

Seed and seed tray distribution



Seed tray preparation

Seedlings after 7-14 days

Land preparation

PBRH preparation


Application of PBRH two weeks before transplanting

Transplanting 21 days old seedlings

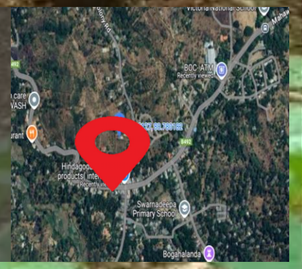
14 days after transplanting

FRUIT & VEGETABLES FOR SUSTAINABLE HEALTHY DIETS
SCIENCE MEETING
DECEMBER 06, 2024
COLOMBO, SRI LANKA

# Flowering Stage- work in progress (Method 2)

(21 days after transplanting)

Adikarigama (Balagolla), Hanguranketha, Central Province, Sri Lanka
Latitude: 7.215127° N, Longitude: 80.780182° E



Acknowledgement-This work was supported by the Australian Centre for International Agricultural Research (ACIAR) under Grant CS/2020/193

## OUR TEAM –SRI LANKA & PAKISTAN

FRUIT & VEGETABLES FOR SUSTAINABLE HEALTHY DIETS SCIENCE MEETING DECEMBER 06, 2024 COLOMBO, SRI LANKA

FRUIT & VEGETABLES
FOR SUSTAINABLE HEALTHY DIETS
SCIENCE
MEETING
DECEMBER 06, 2024
COLOMBO, SRI LANKA

# Thank You


hlwee@ou.ac.
**[email address]**

Website
**[website link]**



*We would like to thank all funders who support the FRESH Initiative through their contributions to the CGIAR Trust Fund: www.cgiar.org/funders.*