ASSESSMENT OF POST-HARVEST LOSSES FOR
HORTICULTURAL CROPS IN THE CARIBBEAN

PATRICK E. CORTBAOUI
PHD. CANDIDATE, MCGILL UNIVERSITY

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TRINIDAD & TOBAGO
OUTLINE

• Justification of the research
• Measurement of post-harvest losses
  • Subjective analysis
  • Objective analysis
    • Description of participants
    • Qualitative parameters
    • Quantitative parameters
    • Results
    • Marketing gaps
    • Post-harvest losses map
• Conclusion and recommendations
The post-harvest period begins when the commodity item is separated from the medium of growth or its parent plant and ends when the commodity goes into the process of preparation for final consumption.
JUSTIFICATION OF THE RESEARCH

• **Problematic in CARICOM:**
  • Inefficient pre- and post-harvest practices
  • Post-harvest losses and major issues of food quality
  • Losses from 20 to 50%

• **What to do:**
  • To determine, identify and measure post-harvest losses throughout the distribution chain
  • To establish and develop best post-production practices and appropriate technologies that would minimize loss of quality and quantity of fresh produce
SUBJECTIVE ANALYSIS

- **Study sites:**
  - Guyana, St. Kitts & Nevis, Trinidad & Tobago and St. Lucia

- **Method for collecting data:**
  - Producer household surveys (PHS)

- **Participants:**
  - 600 households

- **Study crops:**
  - All crops
TYPE OF CROPS HARVESTED DURING THE LAST 12 MONTHS PERIOD

Guyana: Vegetables and Melons, Fruits and Nuts, Oilseed Crops, Root and Tuber Crops, Beverage and Spice Crops, Leguminous Crops

St. Lucia: Vegetables and Melons, Fruits and Nuts, Oilseed Crops, Root and Tuber Crops, Beverage and Spice Crops, Leguminous Crops

St. Kitts: Vegetables and Melons, Fruits and Nuts, Oilseed Crops, Root and Tuber Crops, Beverage and Spice Crops, Leguminous Crops

Trinidad: Vegetables and Melons, Fruits and Nuts, Oilseed Crops, Root and Tuber Crops, Beverage and Spice Crops, Leguminous Crops
NUMBER OF ACRES PLANTED BY FARMERS FOR CROP PRODUCTION
CROP PRODUCTION DENSITY PER NUMBER OF ACRES

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PERCENTAGE OF FARMERS STORING THEIR CROPS ON-FARM

Guyana: 3% Yes, 96% No
St. Lucia: 10% Yes, 90% No
St. Kitts: 39% Yes, 61% No
Trinidad: 15% Yes, 85% No
PERCENTAGE OF HARVESTED CROPS THAT WERE SPOILED ON-FARM

- Guyana: 0.19%
- St. Lucia: 2.87%
- St. Kitts: 17.64%
- Trinidad: 14.36%
SELLING POINTS OF HARVESTED CROPS BY FARMERS

- Guyana: 86% Farm Gate, 12% Wholesale Market, 2% Retail Market, 2% Supermarket, 0% Hotel/Restaurant
- St. Lucia: 46% Farm Gate, 29% Wholesale Market, 18% Retail Market, 2% Supermarket, 0% Hotel/Restaurant
- St. Kitts: 41% Farm Gate, 24% Wholesale Market, 19% Retail Market, 0% Supermarket, 0% Hotel/Restaurant
- Trinidad: 38% Farm Gate, 39% Wholesale Market, 22% Retail Market, 0% Supermarket, 0% Hotel/Restaurant
TYPES OF CONTAINERS USED FOR HARVESTED CROPS ON-FARM

- Guyana: 76% Bags, 1% Carts, 4% Crates, 9% Trailers, 0% Boxes, 1% Other
- St. Lucia: 57% Bags, 40% Carts, 31% Crates, 22% Trailers, 24% Boxes, 9% Other
- St. Kitts: 65% Bags, 22% Carts, 24% Crates, 15% Trailers, 15% Boxes, 9% Other
- Trinidad: 43% Bags, 9% Carts, 15% Crates, 15% Trailers, 15% Boxes, 9% Other
GRADING ACTIVITY OF HARVESTED CROPS ON-FARM

- Guyana
- St. Lucia
- St. Kitts
- Trinidad

- Always
- Upon Request
- No
OBJECTIVE ANALYSIS

- **Study site:**
  - St. Kitts

- **Methods for collecting data:**
  - Field measurement
  - Laboratory measurement

- **Participants:**
  - 2 farmers
  - 2 small retailers
  - 2 large retailers
  - 1 kitchen center

- **Study crops:**
  - Tomato and string beans
DESCRIPTION OF PARTICIPANTS
COMMERCIAL AND SUBSISTENT FARMERS

• **Commercial farmers**
  - Long farming experience in growing perishable crops.
  - Better understanding of the agronomical requirements of the plants in terms of plantation, pesticides, fertilizers and time of harvesting.
  - Appropriate handling of fresh produce especially when carrying them into their containers to the market.
  - Harvesting on request.

• **Subsistent farmers**
  - Short farming experience in producing "high-value" crops such as tomato and string beans.
  - They were growing mainly sugar canes until 2006 when the government abandoned the production of this plant.
  - Harvesting one day for the whole week.
DESCRIPTION OF PARTICIPANTS
COMMERICAL AND SUBSISTENT FARMERS
DESCRIPTION OF PARTICIPANTS
LARGE AND SMALL RETAILERS

**Large retailers**
- Closed area (Temperature and humidity are controlled)
- Produce is refrigerated (with the exception of tomato in some stores)
- Produce is clean and packed (with the exception of tomato in some stores)
- Displayed on refrigerated shelf and on the floor
- Appropriate handling and storage (overnight)

**Small retailers**
- Open area (Temperature and humidity are NOT controlled)
- Produce is NOT refrigerated
- Produce is NOT clean and unpacked
- Displayed on wood tables and on the street (sometimes not even shaded)
- Inappropriate handling and storage (overnight)
DESCRIPTION OF PARTICIPANTS

LARGE AND SMALL RETAILERS
The kitchen center prepared all primary school meals (~2000 students)

- Closed area
- Clean and proper
- Temperature and humidity are controlled
- Refrigerated storage (overnight)
QUALITATIVE PARAMETERS

**String beans:**
- Pod color
- Length
- Width
- Firmness
- Pod curvature
- String/fiber
- Fresh weight
- Quality index

**Tomato:**
- Color
- Shape
- Size
- Firmness
- Fresh weight
- Quality index
QUANTITATIVE PARAMETERS

- Number of bruised produce
- Number of diseased produce
- Number of rejected produce
QUANTITATIVE RESULTS
TOMATO

PERCENT LOSS (BRUISED)
PERCENT LOSS (DISEASED)
PERCENT LOSS (REJECTED)
QUALITATIVE RESULTS

• Tomatoes at Valuemart were significantly larger than tomatoes at RAMS and other small retailers.
• Tomatoes of large retailers were firmer than those of small retailers.
• Tomatoes at Valuemart had significantly higher quality index than tomatoes at RAMS and other small retailers.
• String beans at RAMS were firmer than those at Valuemart and the small retailers.
• String beans at Valuemart had significantly better pod curvature (straight) than those at RAMS and other small retailers.
MARKETING GAPS

- **No market availability**
  - Local supermarkets are saturated with imported crops, most farmers had no choice than leaving the produce on its mother plants to spoil and become unmarketable.

- **No market support**
  - For those farmers, they lack the opportunity of having written contracts with the retailers that can protect them during severe climatic conditions when losing almost all their yields and assure the marketing of their crops when growing them again.

- **No legitimate policies**
  - Supermarkets impose their own “Quantity and Quality Standards” (size, firmness, color) on local farmers and using their bargaining power to obtain high profits.

=> COMPLETE LOSS
A TRAGEDY
POSTHARVEST LOSSES MAP – ST. KITTS

**SUBSISTENT FARMERS**
- Harvesting once a week (only ripe produce)
- 30% losses for tomato
- 16% losses for string beans
- mainly due to inadequate on-farm storage, diseases, inefficient handling, and limited markets.

**COMMERCIAL FARMERS**
- Harvesting upon request (ripe and unripe produce)
- 20% losses for tomato
- <5% losses for string beans
- due mainly to limited markets

**SMALL RETAILERS** (Street Markets)
- Non refrigerated storage (pick-up trucks)
- up to 40% losses for tomato
- up to 47% losses for string beans
- mainly due to softness (over ripening), physical damages and spoilage.

**LARGE RETAILERS** (Supermarkets)
- Refrigerated storage room (Chillers)
- <5% losses for tomato and string beans on shelf
- 20% rejected for tomato on delivery (given back to farmers)
- mainly due to firmness, color and size parameters
- (DO NOT meet the supermarket standards).

**REGULAR CONSUMERS**

**SCHOOL MEAL CENTER** (Consumers: Children)
- Overnight refrigerated storage
- <1% losses for tomato and string beans
- Quantity received = Quantity used (per week)
CONCLUSION & RECOMMENDATIONS

- Minimizing postharvest losses is crucial to alleviate food security in developing countries.
- Major postharvest losses occurred at the retail level (especially small retailers).
- Significant losses occurred at farm level when no market availability.
- Training sessions should be done at different distribution chain segments - “Good Agricultural and Management Practices”.
THANK YOU