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Reducing Post-harvest Losses in Traditional Fresh Produce Supply Chains in South Asia

Rosa S. Rolle, Ph.D

Senior Enterprise Development Officer
Nutrition and Food Systems Division

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Background

- **Low farm gate prices** for tomatoes in local markets.
- High levels of **post-harvest loss** in tomato supply chains.
- **Poor quality** and **limited shelf-life** of tomatoes in local markets.
- **High cost** of tomatoes to consumers

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FAO Response

FAO Technical Cooperation Project: **TCP/RAS/3502** - Reduction of post-harvest losses in horticultural chains in SAARC Countries

- Identify the technical causes of losses
- Pilot solutions with stakeholders
- Build an evidence base to support stakeholder uptake and to inform policy development
- Train stakeholders to implement good practice

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Methodology

- **Stakeholder sensitization** and surveys
- **Market** surveys
- **Training** of trainers
- **Survey of critical loss points** in the supply chains
- **Pilot demonstration** of good practice, measurement and assessment
- Documentation of **results**
- **Dissemination** of results
- **Policy** recommendations for Governments

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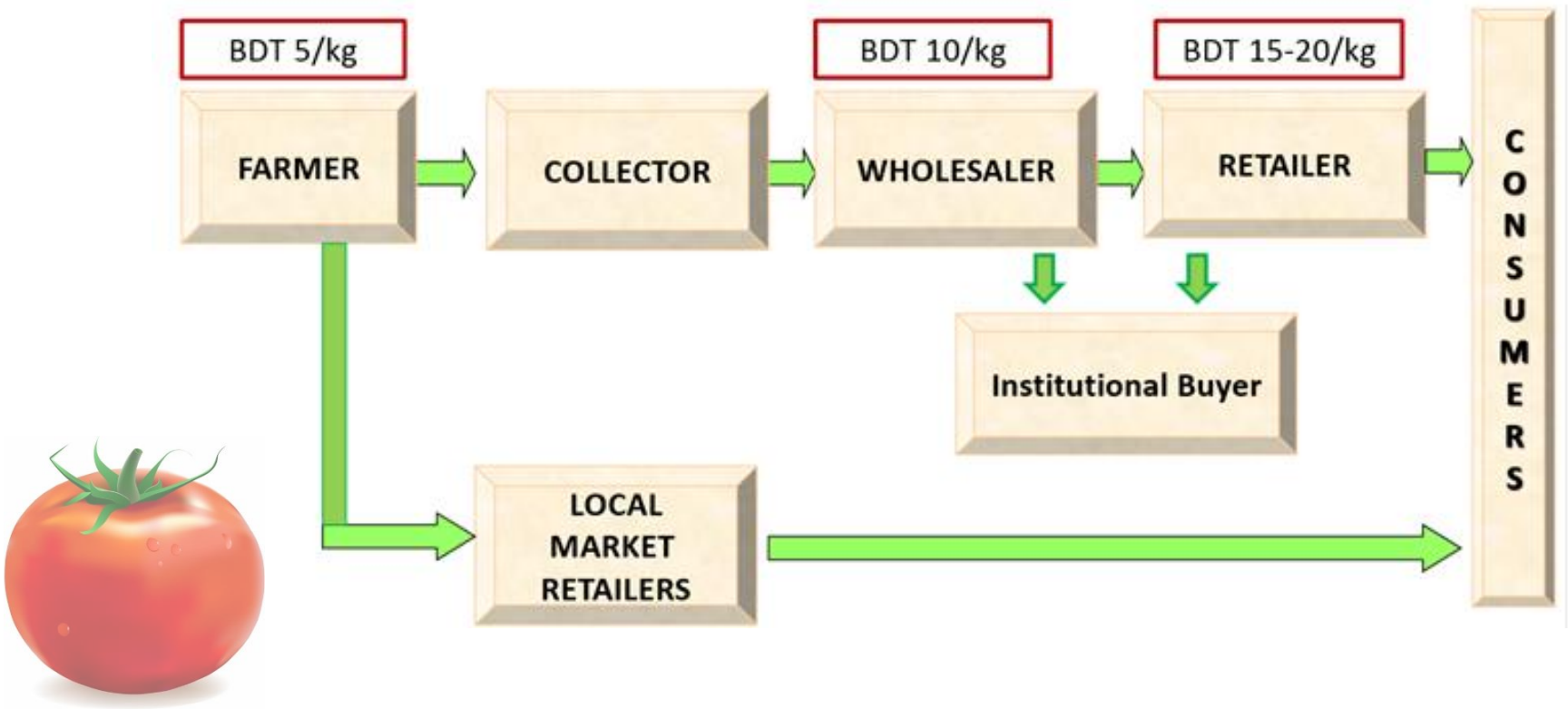
Key stakeholders in the winter tomato supply chains in **Bangladesh**



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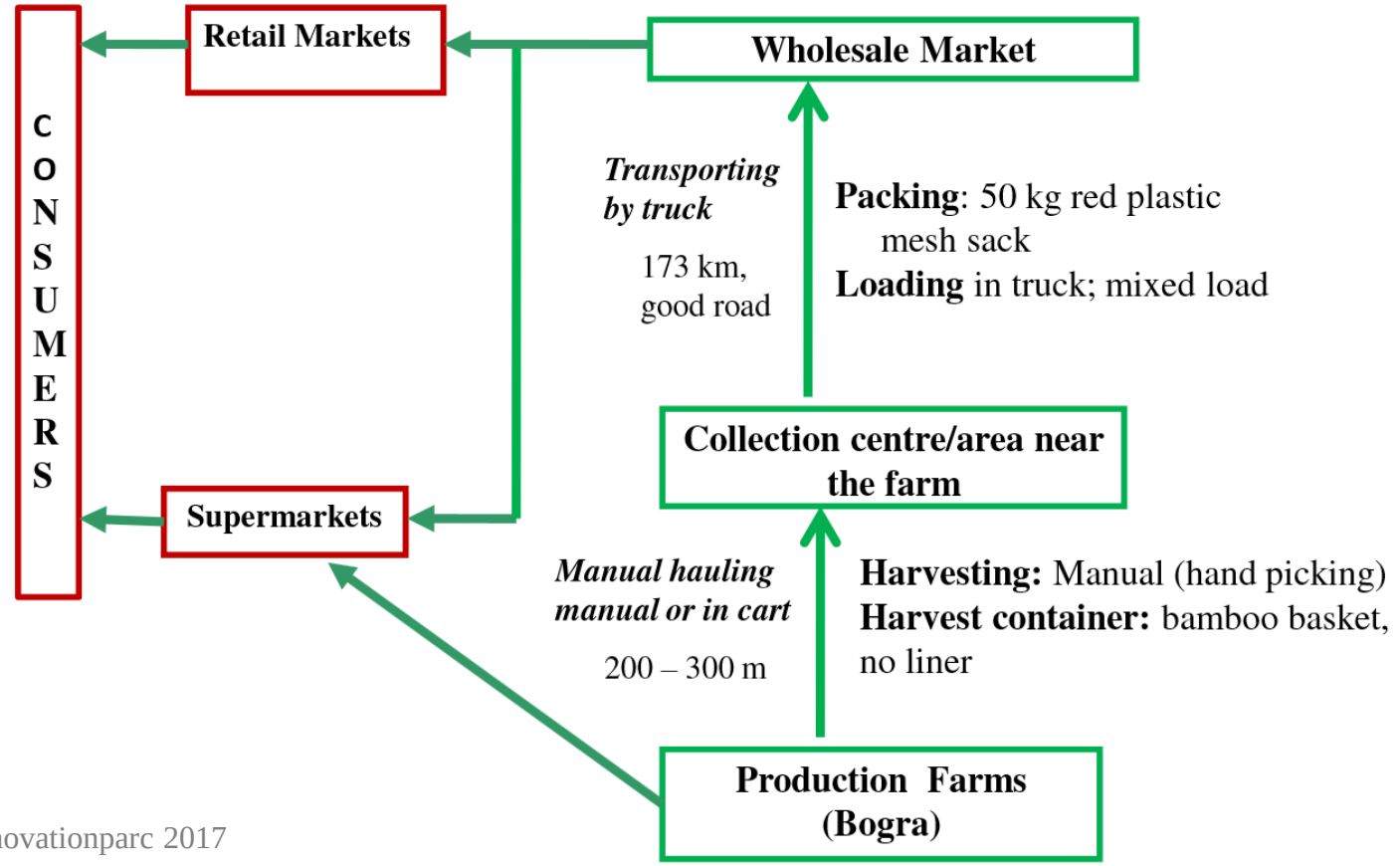
Steps of the **traditional** winter tomato supply chain



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The **traditional** winter tomato supply chain

Field level activities

- Harvesting
- Packaging

  in 50 kg sacks

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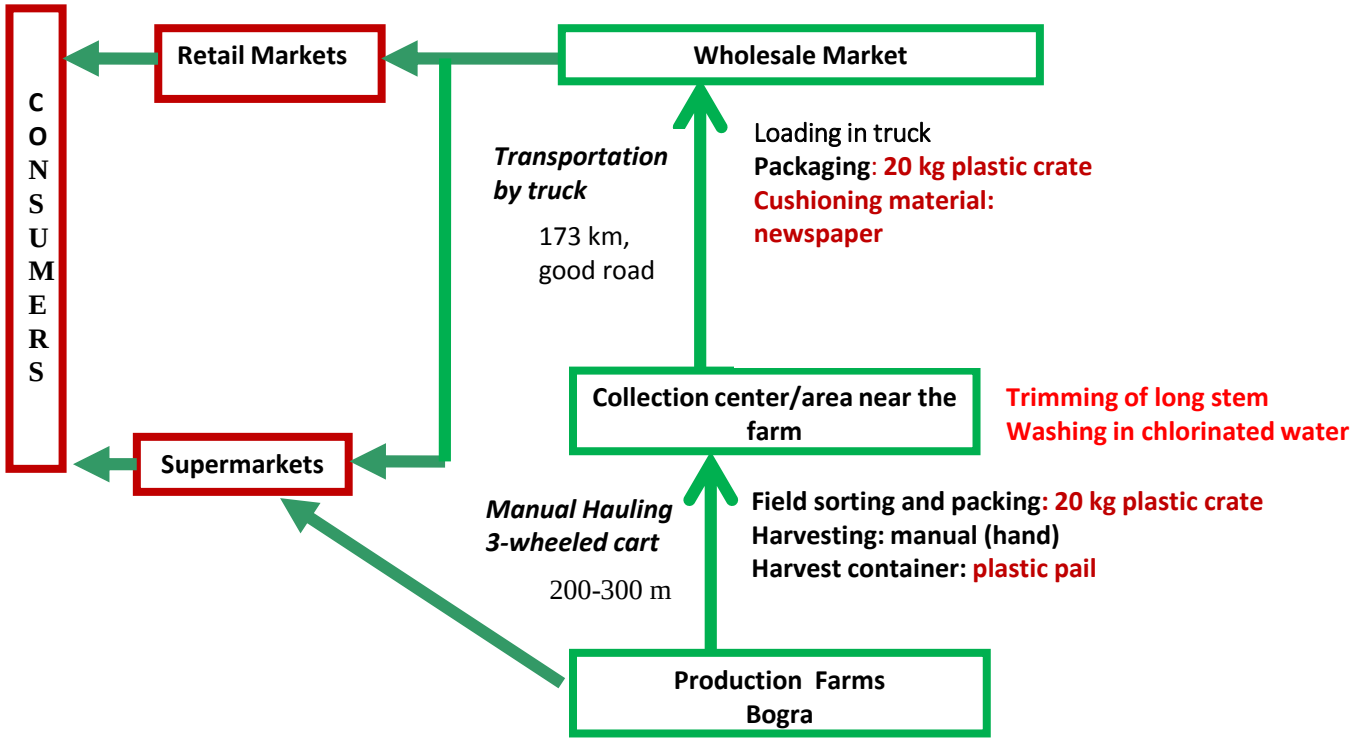
Improvements introduced in the winter supply chain



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Improvements introduced in the winter supply chain

Post-harvest operations and packaging

Summary

Operation	Traditional Practice	Improved Practice
Harvesting	**Bamboo basket** as harvesting container	**Plastic pail or bucket as harvesting container and plastic crates as field containers**
Trimming of stem	No trimming	Trimming using scissors
Washing	No washing	Washing in chlorinated water
Packaging	50 kg **red plastic mesh sack**	25 kg **plastic crate**

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Sampling of tomatoes at the market

Sampling: 10% by weight or count

Assessment: Daily

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Sampling of tomatoes

Moderate compression

Qualitative

Severe compression

Loss

Cracks (non-marketable)

Quantitative

Decay, cracks (non-marketable)

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Recovery of sound fruit at the wholesale level

Top 97.8%	Top 66.7%
Middle 96.7%	Middle 61.1%
Bottom 90.0%	Bottom 30.0%

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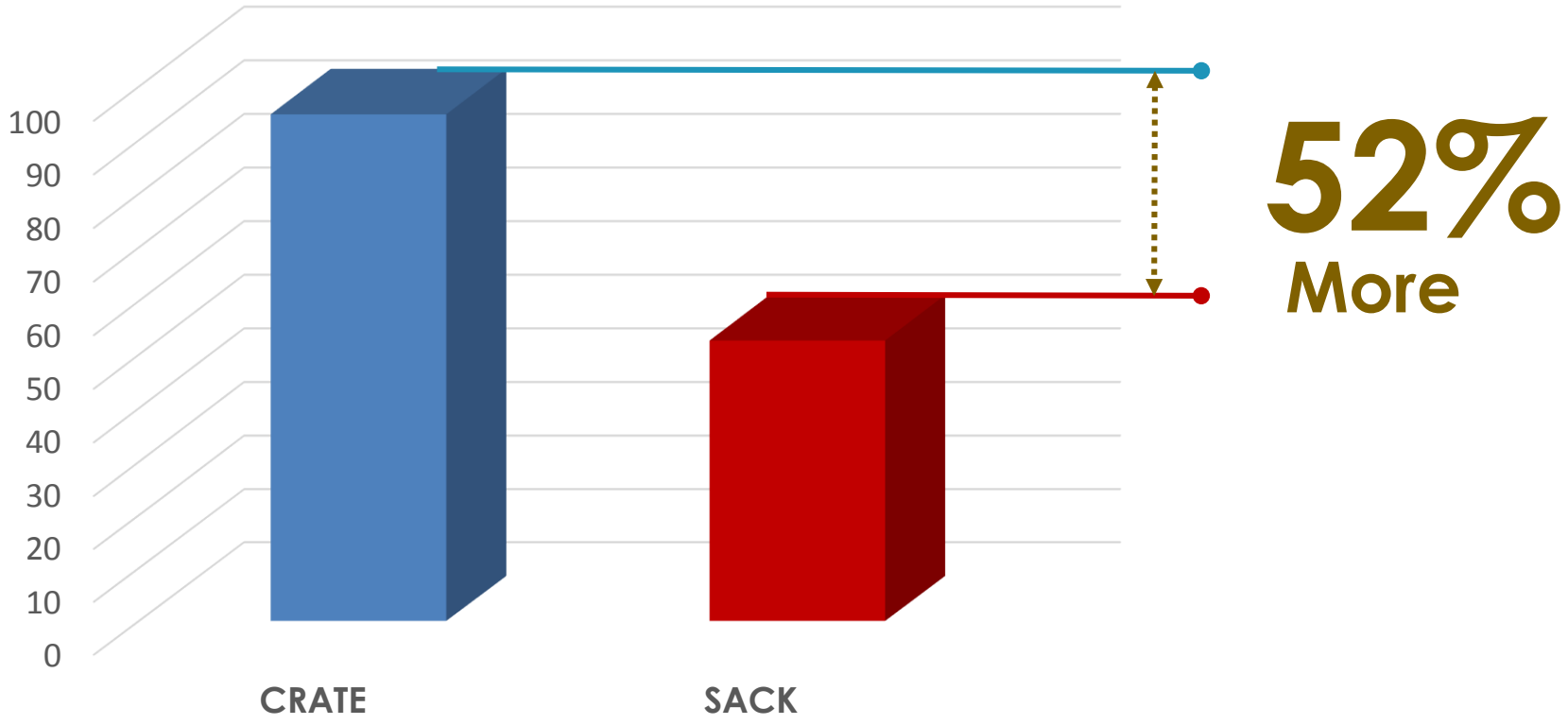
Recovery of sound tomato fruit (%) at the wholesale level



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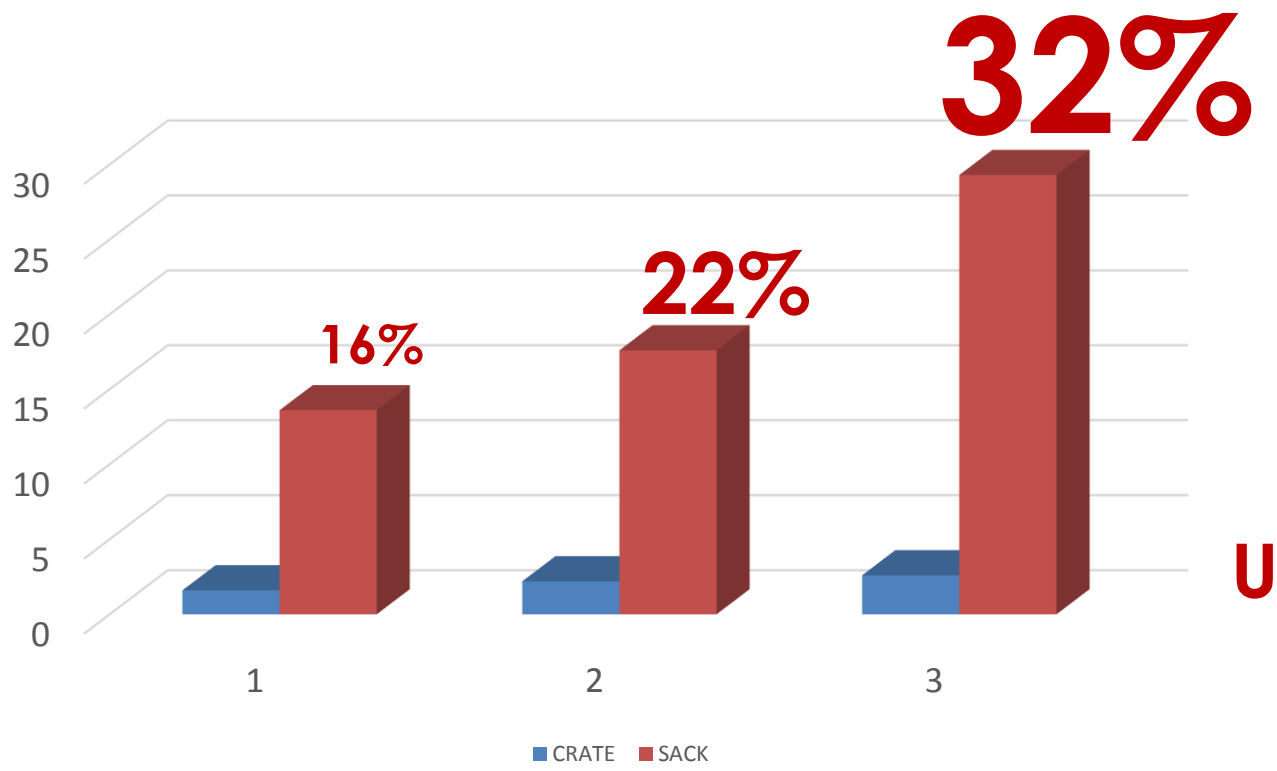
Proportion of unmarketable tomatoes (%) over 3 days in retail



Unmarketable

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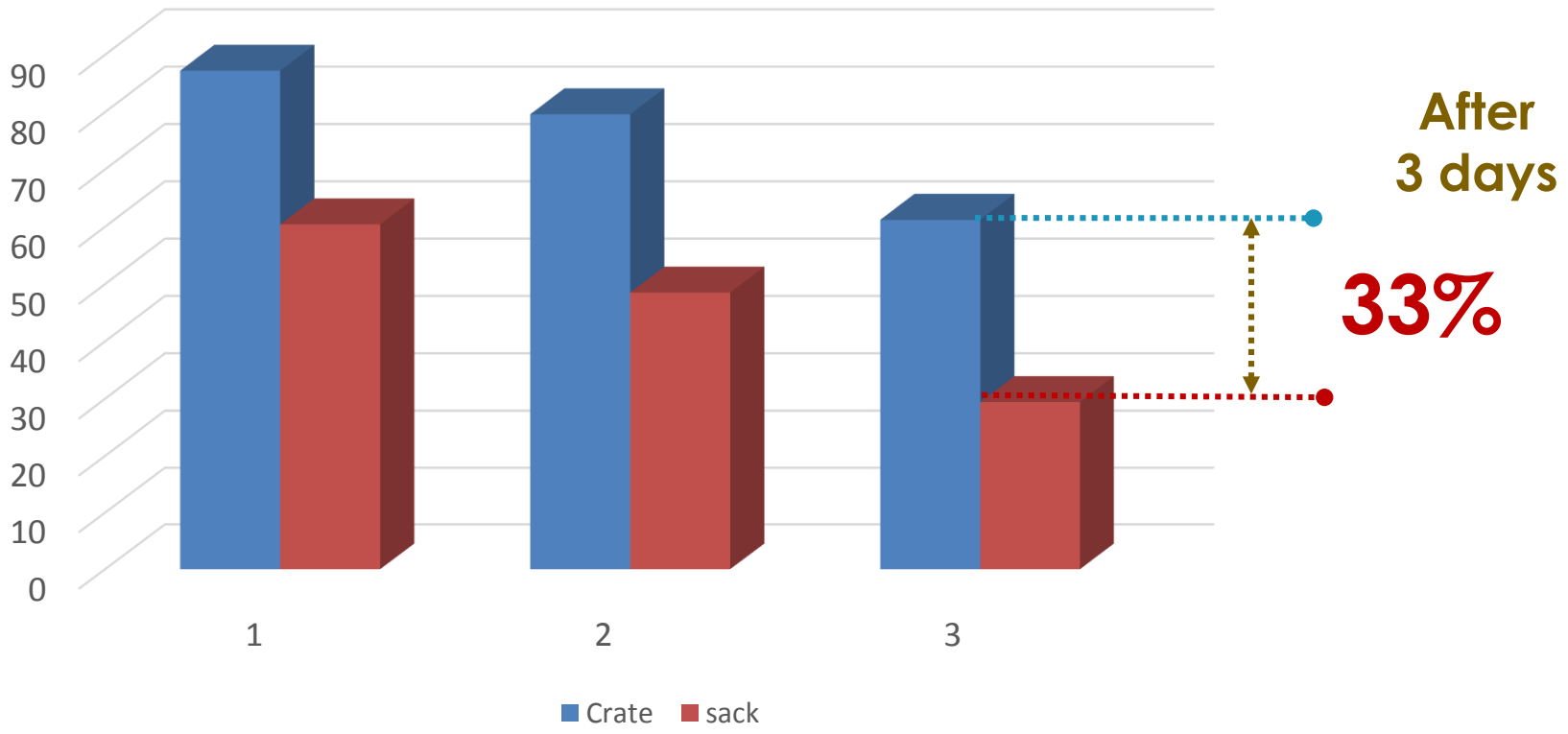
Proportion of fruits fetching a higher marketable price in retail over time (days)



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Economic benefit of using plastic crates for the wholesaler

PARAMETER	Red mesh sack	Plastic crate
Gross returns (Volume sold – loss) x selling price		
(1000 kg – 167 kg) x Tk 10.00/kg	TK 8,330.00	
(1000 kg – 0 kg) x Tk 10.00/kg		10,000.00
Costs		
Depreciation cost of plastic crate	0	24.62
Opportunity cost of capital	0	23.38
Labour for sorting	250.00	0
Subtotal	250.00	48.00
Gross returns - costs	**8,080.00**	**9.952.00**
	Tk 8.08 per kg	**Tk 9,95/kg**

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Economic benefit of using plastic crates for the Retailer

Item	Red mesh sack	Plastic crate
Gross returns (Volume sold – loss) x selling price		
(1000 kg – 293 kg) x Tk 20.00/kg	TK 14,140.00	
(1000 kg – 26 kg) x Tk 20.00/kg		TK19,480.00
Costs		
Depreciation cost of plastic crate	0	24.62
Opportunity cost of capital	0	23.38
Labour for sorting	250.00	0
Subtotal	250.00	48.00
Gross returns - costs	**13,890.00**	**19,432.00**
	Tk13.89 per kg	**Tk 19.43/kg**

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Retail level

Weight loss due to water loss in the **absence of retail packaging**, results in *shrivelling (visual quality loss) and economic loss*

3 DAYS in RETAIL

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Conclusion

- Improvements in packaging resulted in:
  - Better quality produce on the market
  - Improved shelf-life
  - Reduced losses (Qualitative and quantitative)
  - Improved economic returns for supply chain stakeholders
- Increased adoption of plastic crates will contribute to reducing post-harvest losses in fruit and vegetable supply chains, contributing toward reaching the SDG 12.3 goal.

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Contact

Rosa S. Rolle, Ph.D
Senior Enterprise Development Officer
Nutrition and Food Systems Division
Rosa.Rolle@fao.org

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