

Postharvest Practices and Determinants of Potato and Tomato Losses for Appropriate Interventions Design in Ethiopia

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1 Introduction

- Potato and tomato crops are widely produced by smallholder farmers and are strategic commodities considered for ensuring food and nutrition security in the country by the government of Ethiopia.
- Poor postharvest practices occur throughout the produce value chain, especially during farm-level handling and storage [1],[2],[3].
- Postharvest loss reduction, which is among the top priorities of the sustainable development goal (SDG), requires interventions designed based on timely and reliable statistical data.
- However, the lack of loss data and associated factors along the postharvest value chain stages remains a challenge to implement appropriate interventions.
- Therefore, a baseline survey was conducted on potato and tomato crops in the Tiyo and Ziway-dugda districts of Arsi Zone, Ethiopia, respectively, in 2022.

Objectives

- assess socio-demographic characteristics and the extent and causes of postharvest potato and tomato losses
- assess the existing harvest, postharvest handling, storage, and transport practices
- identify the determinant factors of producer-level postharvest potato and tomato losses
- identify postharvest knowledge, skills, and technology gaps and suggest appropriate scale interventions.

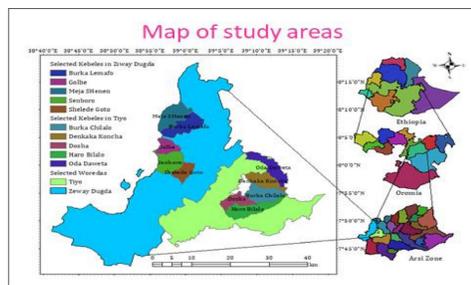


Fig.1: Location of study areas

2 Methodology

- Five potato producing and five tomato producing kebeles in the study areas were purposively selected based on production intensity in the study areas (Fig.1)



Baseline survey: - Simple random sampling

- Cross sectional data
- Semi-structured questionnaire
- Computer-assisted personal interviewing (CAPI)
- Desk review

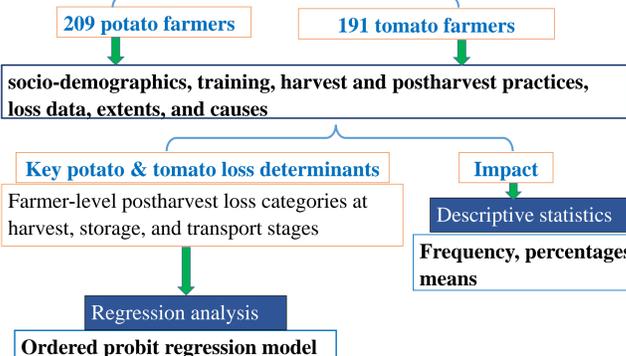


Fig. 2: Research set-up used to assess postharvest practices and losses using producer household surveys

3 Results



Fig. 3: Farmers' harvest and postharvest practices of (a, b) potatoes and (c, d) tomatoes in Arsi Zone in 2022.

Tab. 1: Summary of household socio-demographic characteristics in the 2020/21 cropping season

Variables	Potato (N=209)			Tomato (N=191)		
	Mini mu	Ma xim	Mean± Std. Deviation	Mini mu	Ma xim	Mean± Std. Deviation
Years of experience on production	1	60	13.9±9.88	1	40	6.93±6.92
Economically active family members	1	13	3.54±2.15	1	9	3.34±1.81
Age	19	75	43.41±12.3	16	82	37.9±13.4
Years of schooling	2	15	8.16±2.63	1	19	7.92±3.4
Total area allocated (ha)	0.1	5	0.74±0.69	0.1	8	0.75±1.05

4 Highlights

- At all three farm-level postharvest stages of both potato and tomato value chains, lack of postharvest training had a positive association with produce loss
- Tomato producers lack knowledge of maturity indices, harvesting methods, field handling methods, storage facility, and management, proper packaging and transport
- Elevated loss during harvesting and on-farm potato storage (collectively with an 80% response rate) in the target area is likely to reflect poor harvesting practice, poor field handling, improper packaging and transport, and lack of appropriate storage and temperature management.
- Recommendations include training on handling, innovative storages and simple processing methods targeting determinant factors for each crop

5 Policy suggestions

- Postharvest training to farmers and development agents
- Appropriate packaging (reusable plastic crates)
- Including young and women during interventions
- Demonstration of innovative storages (such as zero energy evaporative coolers) using locally available materials



Fig. 6: Completed (a,b) tomato zero energy bricks evaporative cooler and (c) potato ventilated storage structure in Arsi zone in 2022

- Simple processing methods, such as indirect solar drying, tomato sauce/puree/ketchup processing

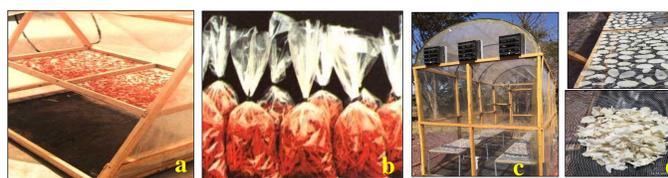


Fig. 7: Processing methods (a) dried tomato slices, (b) dried tomatoes packed in bags, (c) solar power fan assisted greenhouse dryer, and (d) dried potatoes in Arsi zone in 2022

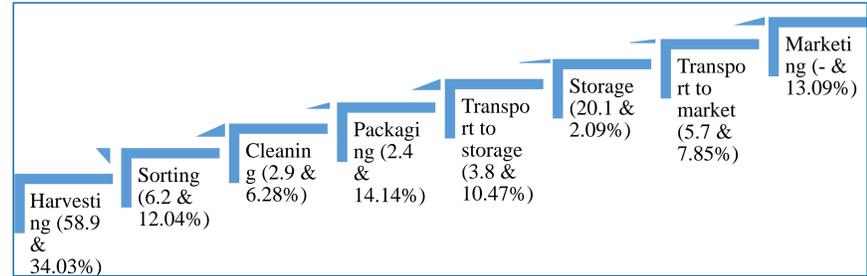


Fig. 4: Extent of losses during different postharvest operations of potato and tomato crops in Arsi Zone in 2020/21

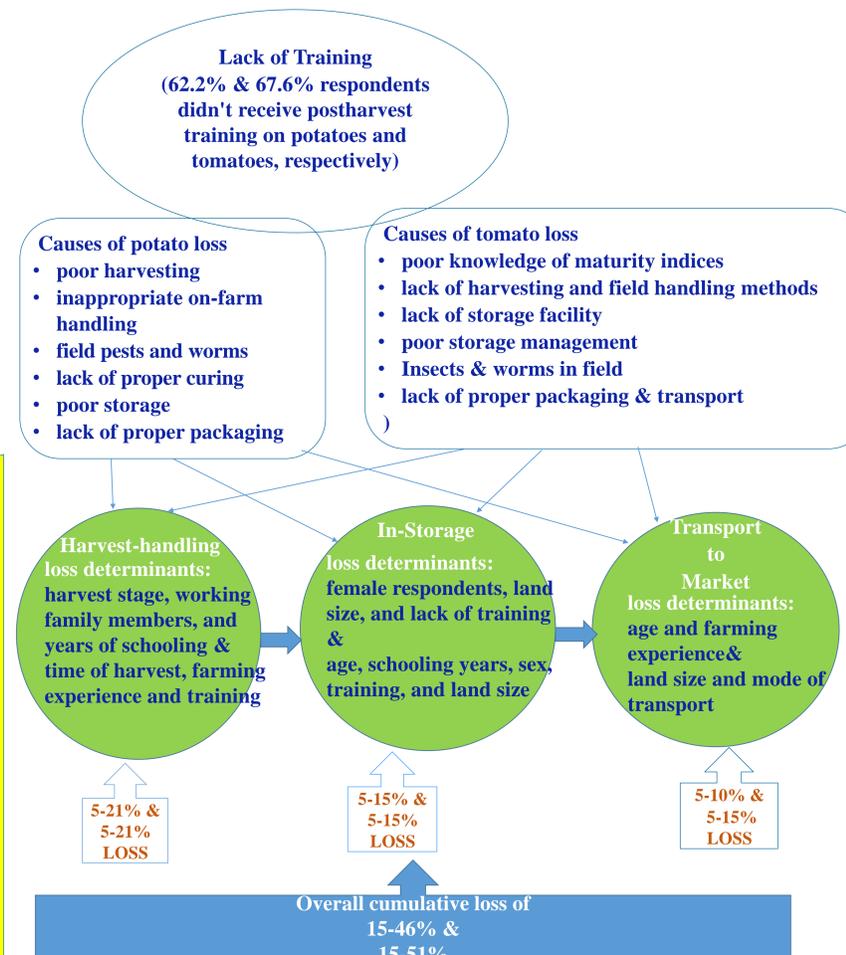


Fig. 5: Postharvest losses, causes of losses and the determinant factors of potatoes and tomatoes in Arsi Zone in 2020/21

6 References

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