

Potential Sources and Types of Food Safety Hazards in Selected Tomato Supply Chain of Ethiopia

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Introduction

- Increased consumption of fresh (raw) fruit and vegetables is recommended for a healthy life.
- However, in countries where hygiene standards may be low, the chances of consuming contaminated fresh food, particularly vegetables, are high.
- The objective of this study was to assess the food safety risks of tomato supply chain from area of production of small-scale growers to central markets (Addis Ababa).

Methods

Description of study area

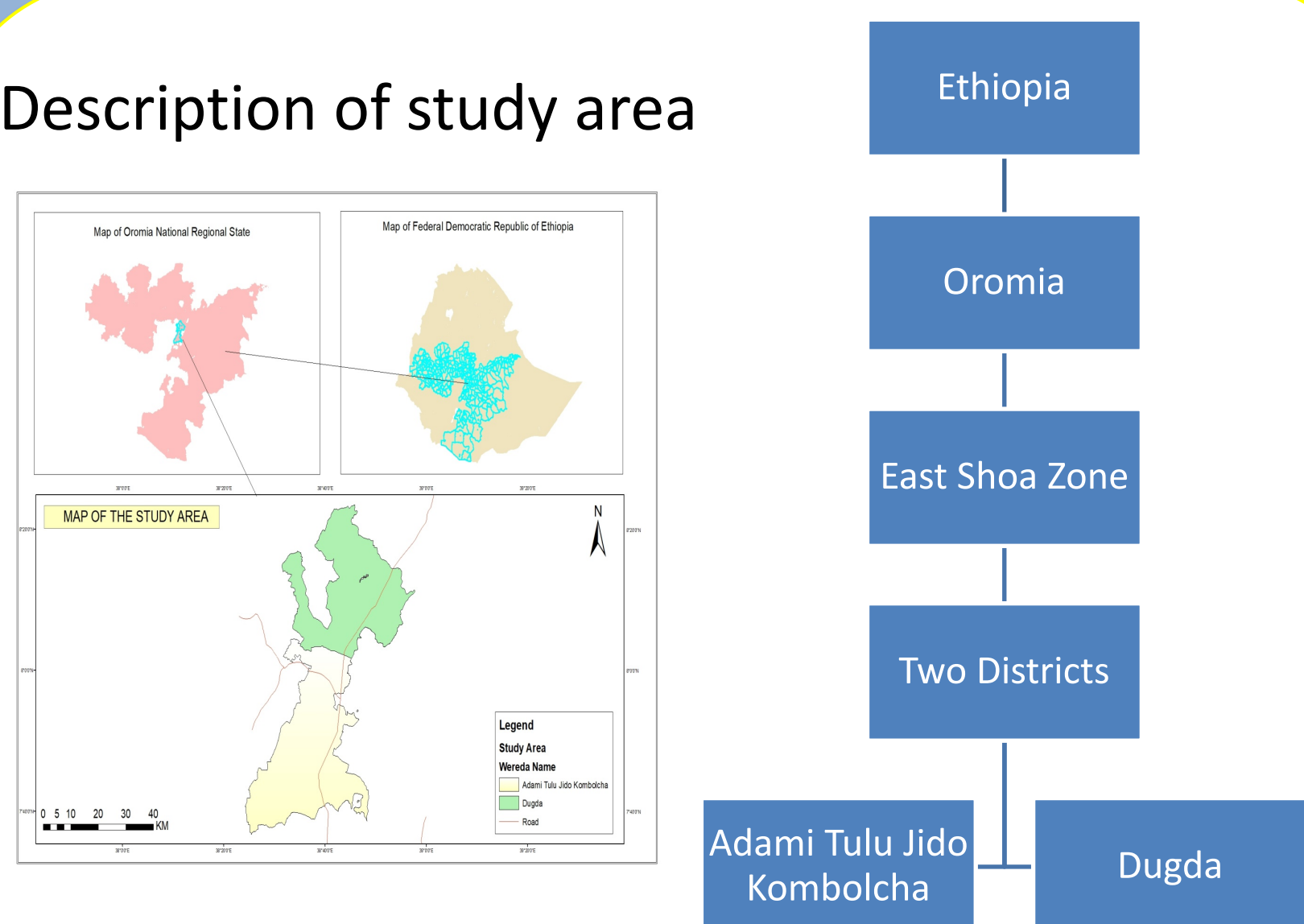


Figure 1: Map of the study area

- Sampling
 - Producers, Wholesaler, Retailers, Transport operators

Yamane's formula:

$$*n = \frac{N}{1 + N(e)^2}$$

Where
 n = Sample size
 N = Population size
 e = Level of precision or Sampling of Error
which is $\pm 5\%$

Reference: Yamane, Taro, 1967. Statistics, An Introductory Analysis, 2nd Ed. New York: Harper and Row.

Sources of Data and Method of Collection

- primary sources
 - survey using a pre-tested structured questionnaire,
 - key informant interviews using checklists and
 - focus group discussions.
 - secondary sources
 - Data from government & NGOs
- Data analysis

Results

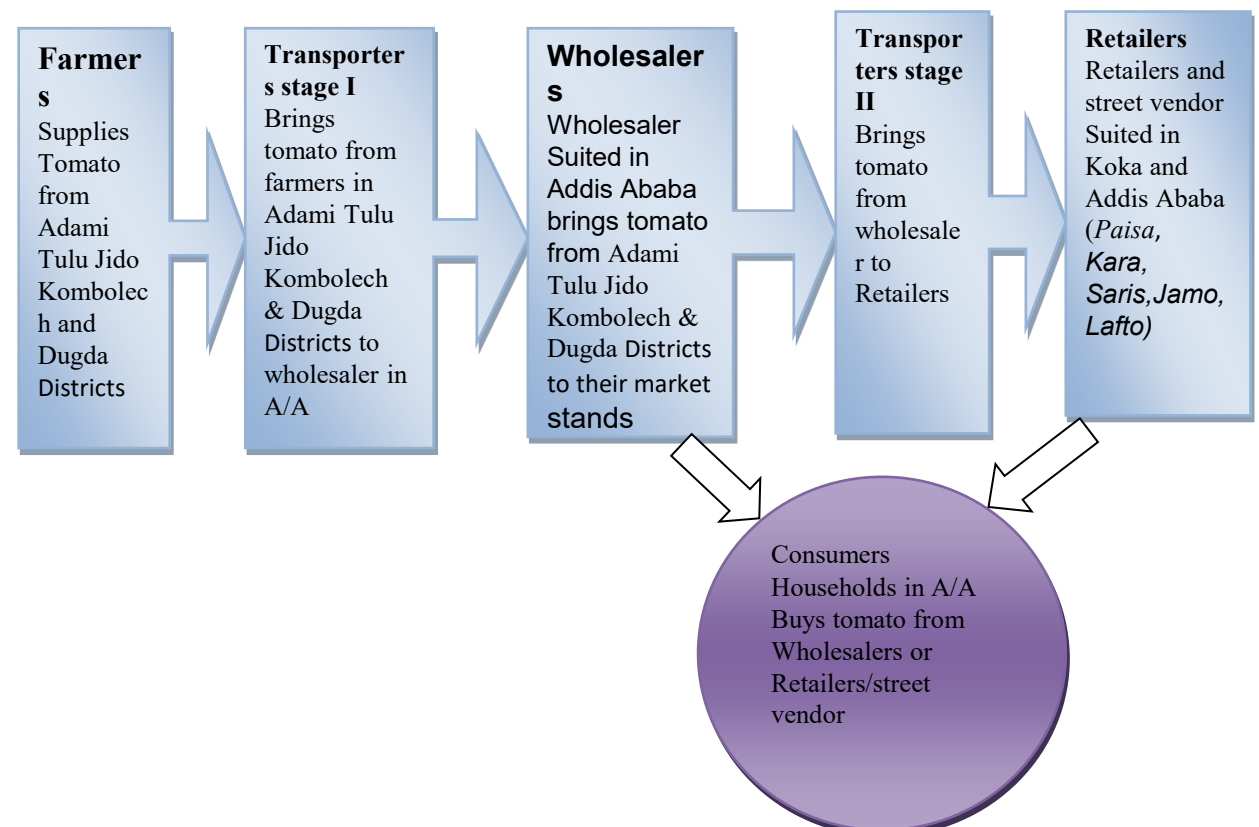


Figure 2: Supply chain of tomato

Characteristics of the respondents

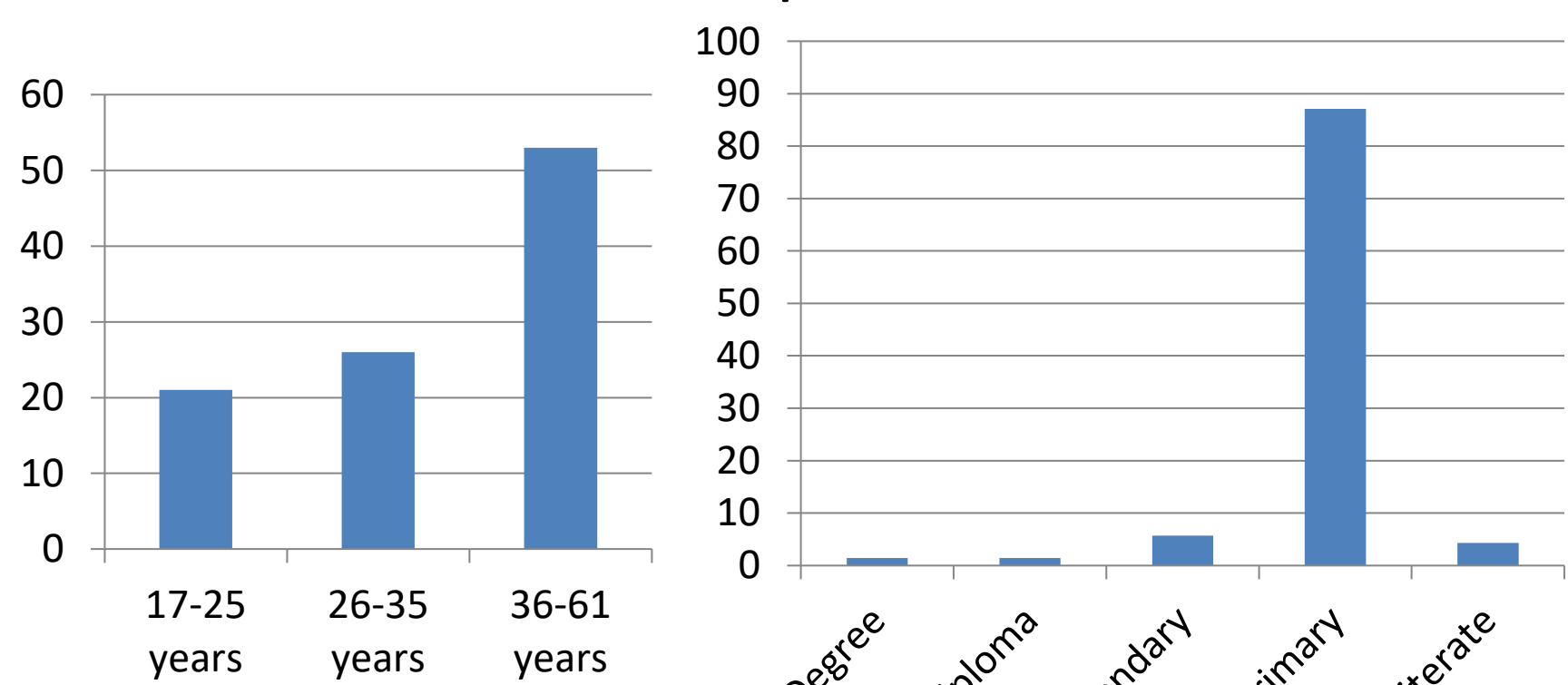


Figure 3: Age of respondents

Figure 4: Educational status

Food safety risks at pre-production stage

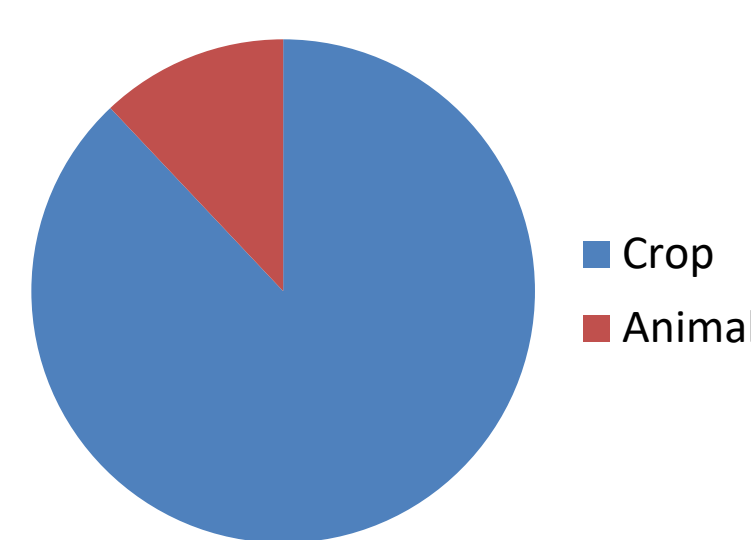


Figure 5: Previous land use

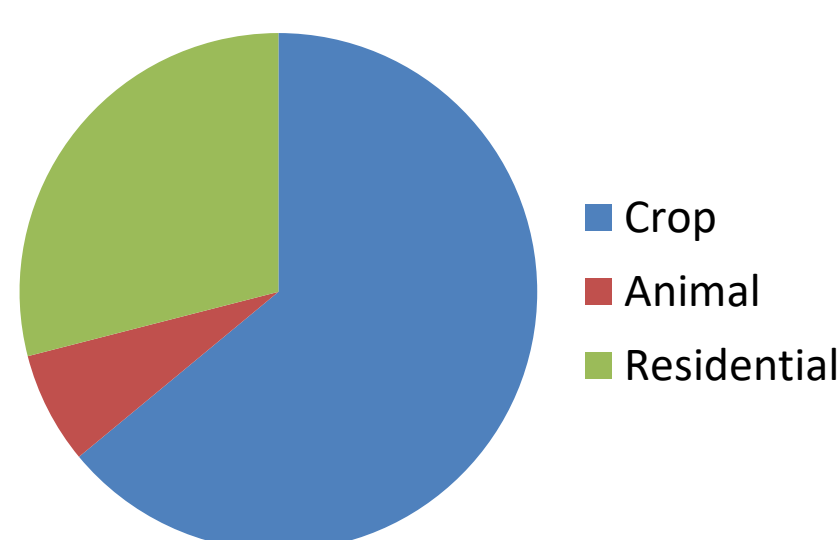


Figure 6: Adjacent land use

Food safety risks at production stage



Figure 7: Poor quality water being used for irrigation

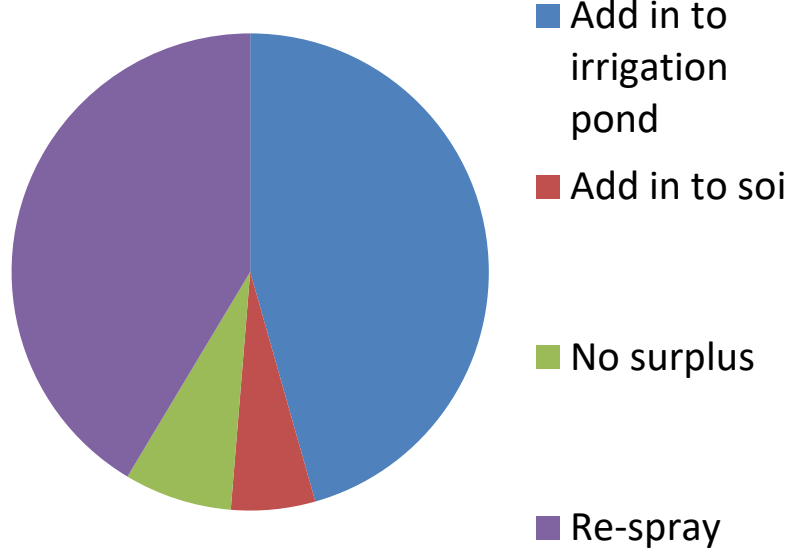


Figure 8: Disposal of excess pesticide



Figure 9: Inappropriate disposal of pesticide packages



Figure 10: Unhygienic toilet



Figure 11: Fertilizer bag being used for tomato harvesting



Figure 12: Inappropriate product handling

Food safety risks at transportation stage

- 75% of the product is loaded with domestic good



Figure 13: Poor handling of produce before transport



Figure 14: Product to be transported with charcoal

Food safety risks at marketing stage

- 75% of product flow zones are not protected from contamination at the marketplace



Figure 15: Sewage line close to a tomato retail market



Figure 16: Animals nearby a tomato retail market

Conclusions

- The food safety systems in the tomato supply chain were found to be inadequate.
- The produce can easily be contaminated by animal feces and human domestic wastes.
- The excess application of pesticides contributes in the accumulation of pesticide residues in tomatoes.

- Awareness creation and training programs for all actors, establishing ethical code & standards, enforcing regulations of food safety is recommended.
- Microbial and chemical loads in tomato fruit need to be studied in the future.

Acknowledgements

