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"Competing pathways for equitable food systems transformation: Trade-offs and synergies"

Postharvest practices and determinants of potato and tomato losses for appropriate interventions design in Ethiopia

Samuel Mezemir Yimenu[1], Sisay Yefru[1], Bezawit Seifu[1], Geleta Diriba-Shiferaw[1], Samuel Woldeyohanes[1], Tirfe Zegeye[1], Dekeba Moges[1], Bernd Müller[2], Anis Dzankovic[2]

[1] *Arsi University, Ethiopia*

[2] *Weihenstephan-Triesdorf University of Applied Sciences, HSWT International School, Germany*

Abstract

Postharvest loss reduction is an important strategy for food and nutrition security in developing countries like Ethiopia. In the target survey areas, postharvest losses of potato and tomato crops occur at various stages. Therefore, the present baseline survey was undertaken to identify existing postharvest practices and losses that occurred in the supply chain of potatoes and tomatoes in Arsi Zone, Ethiopia. In addition, responsible determinant factors that influence postharvest losses were analyzed. A multistage sampling procedure, through a combination of purposive and simple random sampling techniques, was adopted in the selection of kebeles and households. A total of 209 and 191 smallholder potato and tomato farmers were interviewed in Tiyo and Ziway-dugda districts, respectively. The survey was undertaken in 2022. Quantitative data collection was carried out online using computer-assisted personal interviewing by programming a semi-structured questionnaire in KoboCollect software for tablets. Descriptive statistics (for socio-demographic, postharvest practices, and loss data) and the ordinal probit regression model (for postharvest loss determinant factors) were used to analyze the collected data. From the perspective of the farmers, the primary causes of losses were poor storage facilities, insects and worms as well poor handling techniques. During the harvest stage, working family members significantly ($p < 0.01$) increased potato loss while years of schooling ($p < 0.05$) and harvesting using leaf color change as a criterion ($p < 0.01$) had significantly mitigated it. In storage, female respondents ($p < 0.05$), land size ($p < 0.05$), and lack of training ($p < 0.1$) had accentuated potato loss. During transport, the household age reduced ($p < 0.1$) potato loss whereas farming experience promoted ($p < 0.1$) it. Similarly, during tomato harvesting, the time of harvest mitigated losses ($p < 0.01$), while farming experience and lack of training increased losses ($p < 0.1$). In storage, age, schooling years, sex, and training mitigated tomato losses ($p < 0.05$), while only land size ($p < 0.01$) accentuated it. During transport, land size ($p < 0.05$) and animal-pulled carts ($p < 0.1$) accentuated tomato losses. The awareness of the farmers on proper operation during harvesting, field handling, storage, and transportation should be increased. Suggested interventions include postharvest knowledge and skill training, simple innovative eco-friendly storages constructed using locally available materials, appropriate packaging, and simple value addition and preservation techniques.

Keywords: Loss determinant factor, ordinal probit regression model, postharvest loss

Contact Address: Samuel Mezemir Yimenu, Arsi University, Dept. of Food Science and Postharvest Technology, 193 Asella, Ethiopia, e-mail: samuelmezemir@arsiun.edu.et