

Factors Affecting Postharvest Losses of Smallholder Tomatoes Farmers in South West Region of Cameroon

Ayuk, E.C., Molua, E.L., Mvodo, E.S. & Meliko, M.O.

Department of Agricultural Economics, University of Buea, P. O. Box 63, Buea

Corresponding author: ayukettacharlotte@yahoo.com

Abstract

This study investigated the postharvest management practices implemented by farmers and determined the economic losses incurred, as well as the factors influencing the choice of management practices employed. Using ordinary least square regressions and descriptive statistics to analyse primary data collected using semi-structured questionnaires, the study found that donations and home consumption, landfill, and grading to sell at low prices were the main management practices used by the respondents with the price of labour, selling price, quantity of harvest, and membership in farmers' cooperative are causes of postharvest losses. It is recommended that the Government should provide workshops and infrastructure to help curtail some of these losses.

Keywords: Cameroon, postharvest loss; tomato production; management; value chain

Résumé

Cette étude a examiné les pratiques de gestion post-récolte mises en œuvre par les agriculteurs et a déterminé les pertes économiques encourues, ainsi que les facteurs influençant le choix des pratiques de gestion employées. En utilisant des régressions des moindres carrés ordinaires et des statistiques descriptives pour analyser les données primaires collectées à l'aide de questionnaires semi-structurés, l'étude a révélé que les dons et la consommation domestique, l'enfouissement et le tri pour vendre à bas prix étaient les principales pratiques de gestion utilisées par les répondants, avec le prix de la main-d'œuvre, le prix de vente, la quantité de récolte et l'appartenance à des coopératives agricoles étant des causes de pertes post-récolte. Il est recommandé que le gouvernement organise des ateliers et fournisse des infrastructures pour aider à réduire certaines de ces pertes.

Mots-clés: Cameroun, pertes post-récolte ; production de tomates ; gestion ; chaîne de valeur

Background

Agriculture is the backbone of Cameroon's economy, employing the majority of its population and contributing to the country's GDP, foreign exchange earnings and budgetary resources (Jocien and Frederick, 2022). Tomato is the world's largest produced vegetable crop, with a total production of around 180 million metric tons a year (Food and Agriculture Organization (FAO), 2020). In Africa, tomatoes, alongside hot peppers and onion, are the most important vegetables in quantity and value because of their daily consumption. (Ali *et al.*, 2021). In Cameroon, tomato is the most extensively cultivated fruity vegetable, grown in all the different ecological zones in the country, and

providing income for most households in the country (Tabe *et al.*, 2020). Tomato production in most cases is commercially driven, as 83% of the produce is intended for sale, and the subsector employs approximately 329,000 people in Cameroon (FAO, 2018). As a result, many communities in Cameroon have been identified as tomato-producing areas, where tomato production serves as a main source of employment for many youths and households. The problem of postharvest loss (PHL) is becoming increasingly important in the agricultural sector because it severely reduces production, contributing to food shortages, lower incomes, and food insecurity. Indeed, PHL is especially high in horticultural crops because of their perishable nature and high-water content, which cause them to decay fast after harvest. Overall, PHL of tomatoes occurs throughout the value chain, from the farm to the final consumer, and can either be quantitative or qualitative, causing environmental, economic, and social effects. Some factors causing PHL include technical awareness and knowledge of postharvest losses (Sarma, 2018), environmental problems, poor market facilities and cultural practices (Barakat *et al.*, 2019), poor transportation services, improper postharvest handling operations and the lack of processing and storage facilities (Stathers *et al.*, 2020).

Tomato production trends in Cameroon have been quite stable and increasing until 2016, after which production has seen some sharp decreases which may be ascribed to the vulnerability of the crop to diseases or wasting (Tabe *et al.*, 2020). Postharvest loss of tomatoes brings about a reduction in both the quantity and quality of fruits supplied and an increase in the price of fresh tomatoes and tomato by-products. Such losses contribute significantly to food insecurity and affect the nutritional status and health of populations due to qualitative and quantitative reduction of nutrients (Ibrahim *et al.*, 2016). Invariably, PHL bring about investment loss and valuable resources and low productivity which slows down business expansion, increases prices and lowers employment prospects. The overall effects are poverty, unemployment, low living standards, and food insecurity. Studies have revealed that Post-harvest options for farmers are inadequate due to the absence of sufficient technologies/infrastructures, inadequate capital, technical knowhow and refusal to adopt appropriate techniques (Shende and Lifter, 2017). It is therefore important to understand the severity of losses at this level and bring forth possible solutions to address the problem.

It is also important to determine the factors that influence the choice of management practice in order to gain insights into farmers' decisions, so as to inform policy interventions towards improving sectorial growth in this area. Success in PHL reduction will offer an important pathway for efficient resource use, availing food, alleviating poverty, and improving nutrition as well as environment. The objective of this study was to investigate post-harvest loss management at the farm level in the Fako division, South West region, Cameroon. Specifically, the study sought to understand the postharvest management practices implemented by farmers, and determine the economic losses incurred, as well as the factors influencing the choice of management practices employed.

Materials and Methods

This study was carried out in the South West region of Cameroon (Buea, Limbe and Kumba). This Region has a surface area of 25,410 km², population of 1,384,286 inhabitants and a population density of 54.5 inhabitants/km²,

with a rural population of 722,199 people (Budi *et al.*, 2021). The Region is made up of six divisions: Fako, Meme, Ndian, Kupe-Maneguba, Manyu and Lebialem. Fako division is situated between latitudes 4° 10' 0" North and longitude 9° 10' 0" East. It had a population of 534854 inhabitants in 2019, and covers a surface area of about 25410 km², with its inhabitants mostly involved in farming, fishing and commerce. To get the sample used in this study, a three-stage sampling technique was employed. In the first stage, the South West region was purposively selected, because of its high tomato production records and due to its accessibility. At the second stage, a simple random sampling technique was used to select Fako division, and three subdivisions (Buea, Tiko and Limbe) were purposively selected because of the intensity of production in these areas. In the third stage, tomato farmers were selected through use of a snowball sampling technique. The study make use of descriptive statistics and ordinary least square regression techniques to analyse the type of management practices used and factors affecting smallholder farmers.

Results and Discussion

All farmers experienced postharvest losses. This is in line with most researchers who report the growing need for post-harvest loss mitigation. Management practices common in the study area included home consumption and donation, grading and selling at lower prices. This is consistent with the findings of Chaboud (2017), who identified food donation and home consumption as the most common destinations of PHL in tomatoes. Farmers faced constraints especially insufficient finance, inadequate knowledge and insufficient time to carry out better yielding PHL management practices (Figures 1 and 2).

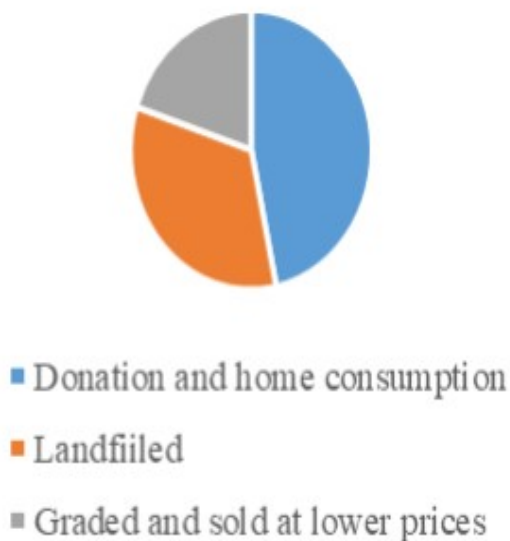


Figure 1. Practices used by farmers in Post harvest management

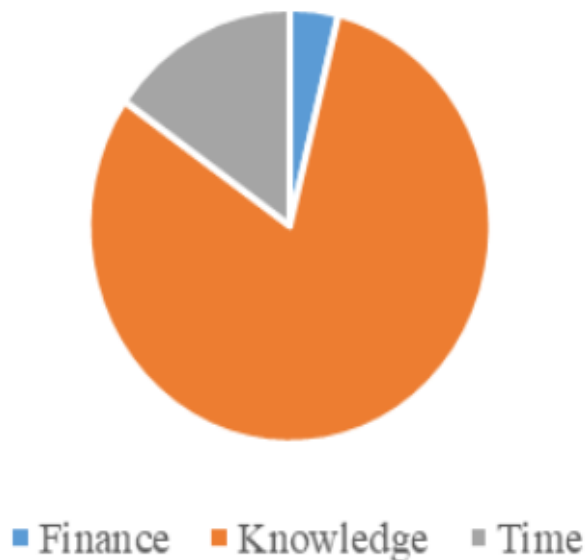


Figure 2: Constraints faced in carrying out tomato post harvest management practices

Discussion

The following factors were statistically significant for causing PHL; price of labor, selling price, quantity of harvest and membership in farmers' cooperative. High price of labor hindered farmers from getting the necessary man power needed to carryout tasks especially during harvesting, leading to loss of fruits. When the selling price is low, farmers are less inclined to invest in proper harvesting techniques, thereby increasing chances of PHL. When tomato is harvested in large amounts, it requires a large labor force which most farmers cannot afford; it also requires ready market which sometimes is not available due to far distance and poor farm to market roads; this results in high PHL. This is especially common during the rainy season where PHL is reported to reach up to 40% in areas with bad roads (Njume *et al.*, 2020). Information is an important factor in solving postharvest problems and information can easily be spread through farm groups such as cooperatives. Sadly, most farmers did not belong to cooperatives, a factor significant for causing PHL.

Conclusion

Notwithstanding the above, tomato production has the potential to improve household incomes and combat food insecurity but PHL pose challenges that are of serious concern. Lost fruits have different destinations most of which result in complete loss of produce. Addressing issues of information spread and training of farmers on adequate management techniques can help partly in solving the problem of PHL. The Government of Cameroon should put in place policies that address the issue of credit availability and accessibility to enable farmers carryout safe practices.

Acknowledgement

This paper is a contribution to the 19th RUFORUM Annual General Meeting and Conference held 28th October - 2nd November 2023 in Yaoundé, Cameroon.

References

- Ali, A., Xia, C., Mahmood, I. and Faisal, M. 2021. Economic and environmental consequences of postharvest loss across food supply Chain in the developing countries. *Journal of Cleaner Production* 323:129146.
- Barakat, M.A.S., Semida, W.M. and Emara, A.E. 2019. Effect of some pre-harvest treatments on tomato fruit quality during cold storage. In: *9th International Conference for Sustainable Agricultural Development*. Fayoum, Egypt.
- Budi, F.T., Fonteh, A.A. and Manu, I.N. 2021. Role of agricultural cooperatives in rural development in the era of liberalization in the North West and South West regions of Cameroon. *Journal of Agricultural Extension and Rural Development* 13 (1):69-81.
- Chaboud, G. 2017. Assessing food losses and waste with a methodological framework: Insights from a case study. *Resources, Conservation and Recycling* 125:188-197.
- FAOSTAT. 2018. Online Statistical Database of the Food and Agriculture Organization of the United Nations (2018). Available online: <http://www.fao.org/faostat/en/#data/TP>
- FAOSTAT Statistical Database, Food Balance Sheets. 2020. <https://www.fao.org/faostat/en/#data/FBS>.

- Ibrahim, U.K., Kamarrudin, N., Suzihaque, M.U.H. and Abd, Hashib, S. 2017. Local fruit wastes as a potential source of natural antioxidant: an overview. In: *IOP Conference series: Materials Science and Engineering* 206 (1):012040
- Jocien, S.K. and Frederick, N. 2022. Agricultural Practices and Environmental Degradation in Santa Sub-division, North West Region of Cameroon. *Asian Journal of Geographical Research* 5 (3):1-17.
- Njume, C.A., Ngosong, C., Kraha, C.Y. and Mardjan, S. 2020. Tomato food value chain: managing postharvest losses in Cameroon. In: *IOP Conference Series: Earth and Environmental Science* 542 (1):01202. IOP Publishing.
- Paul Jr, M., Molua, E.L., Nzie, J.R.M. and Fuh, G.L. 2020. Production and supply of tomato in Cameroon: Examination of the comparative effect of price and non-price factors. *Scientific African* 10:e00574.
- Shende, K.S. and Lifeter, Y.B. 2017. Post-harvest challenges of food crops in Jakairi subdivision, Cameroon. A threat to food security. *International Journal of Agriculture and Environmental Research* 7 (10):2455-6939.
- Sarma, Paresh Kumar. 2018. Postharvest losses of tomato: A value chain context of Bangladesh. *International Journal of Agricultural Education and Extension* 4.1:085-092.
- Stathers, T., Holcroft, D., Kitinoja, L., Mvumi, B. M., English, A., Omotilewa, O. and Torero, M. 2020. A scoping review of interventions for crop postharvest loss reduction in sub-Saharan Africa and South Asia. *Nature Sustainability* 3 (10):821-835.