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REPOA Brief

Post-harvest losses in marketed fruits and vegetables: evidence from selected markets in Dar es Salaam

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Key Messages

1. Post-harvest losses are widely spread, with varying levels, among fruits and vegetable traders. Twice as many fruit traders experience losses of at least 10% compared to vegetable traders.
2. Middlemen experience higher losses during transportation, while retailers reported lower losses in the marketplace.
3. Distance from product source to markets, quality of transport infrastructure and product packaging, extreme weather conditions (heat, humidity), poor market infrastructure and human factors such as theft are common factors associated with losses in marketed fruits and vegetables.

Introduction

The Sustainable Development Goal 12.3 aims to halve per capita global food waste at retail and consumer levels and reduce food losses along production and supply chains including post-harvest losses by 2030. Reducing post-harvest crop losses can effectively increase food availability, household incomes, and food and nutrition security without necessarily exerting too much pressure on land and water resources. In recent years, food and nutrition security have increasingly attracted the attention of policy makers following the devastating effects of COVID-19, increasing frequency of adverse weather cycles, and the rise in global commodity prices due supply constraints caused by geopolitical tensions. Since the outbreak of COVID-19, nearly 150 million more people have not had sufficient access to safe and nutritious food, that includes 103 million more people between 2019 and 2020 and 46 million more in 2021 (FAO, 2022). Overall, three in ten people (2.3 billion) globally experienced moderate or severe food insecurity in 2021 (FAO,2022).

Amidst the pressures of population growth, the world is also witnessing more frequent and extreme weather conditions from wildfires, heat strokes and floods to droughts, due to the impact of climate change. This further amplifies the challenge of food and nutrition insecurity. In Tanzania, despite food self-sufficiency,food poverty is high (at 8%) and still widespread amongst Tanzania's rural communities—9.7% (URT, national food self-sufficiency, food poverty is high (at 8%) and still widespread amongst Tanzania's rural communities—9.7% (URT, 2020)— and one third (32%) of children under the age of 5 are malnourished (URT, Tanzania National Nutrition Survey 2018, 2019). It is, therefore, critical to explore all options, including raising farm productivity and reducing food loss and waste.

In recent years, Tanzania has designed and implemented several policy initiatives aimed at raising farm productivity and reducing food loss including the national post-harvest management strategy (2019-2029). In addition, there have also been targeted efforts to improve nutritional health aimed at promoting improved consumption and post-harvest management of non-traditional staples such as fruits and vegetables. This increased interest partly responds to society around the globe becoming more conscious of heathier dietary and lifestyle choices. A growing urban population has also been a source of increasing demand for diversified food products including fruits and vegetables influenced by higher prevalence of non-communicable diseases, rising incomes, and improved public health awareness.

Consequently, fruits and vegetables are amongst the fastest growing subsectors in agriculture. The annual

production of fruits and vegetables in Tanzania has risen from 4.8 to 7.2 million tons between 2012 and 2021, equivalent to an average annual growth rate of 5%. (URT, 2018; URT, 2022). Similarly, the number of households engaged in the production and marketing of fruits and vegetables in Tanzania has grown over the years to 2.9 million from 407,827 between 2007 and 2019 (URT, 2012,2021). Therefore, marketed fruits and vegetables offer great income generating opportunities for farm and non-farm households. However, due to their perishable nature, fruits and vegetable value chains have the highest levels of post-harvest loss and damage.

A large portion of food loss, especially in Africa, occurs at production or during storage and handling stages (Ridolfi, Hoffmann, & and Baral, 2018). Distribution and marketing processes contribute a further 13% of overall food loss and waste (ibid). Post-harvest fruits and vegetable losses experienced during distribution and marketing is still an area which is under researched. This brief aims to contribute to this growing body of literature by examining the extent of and main reasons for fruits and vegetable losses experienced by Dar es Salaam traders.

The data presented herein is part of a survey carried out by REPOA in November 2021 covering nine permanent markets in Ilala, Temeke, Kinondoni, and Ubungo municipalities. The survey involved a sample of 532 respondents comprising of wholesalers, retailers, and middlemen trading in fruits and vegetables.[1] The sample was obtained through a stratified multi-stage sampling method incorporating purposive and convenient techniques.

Findings

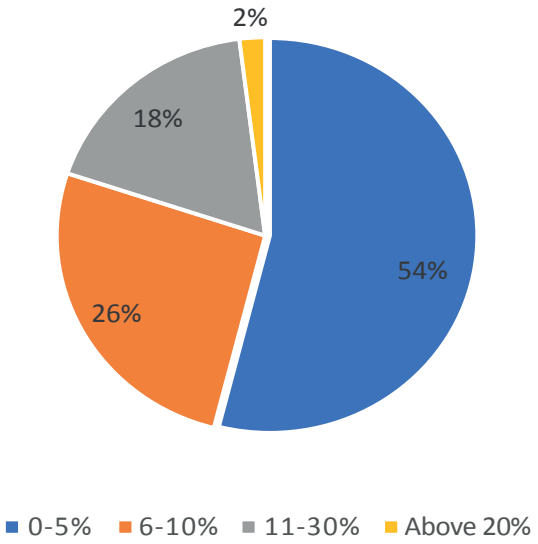
The sections hereafter present results from a survey carried out in nine Dar es Salaam markets.

Loss in marketed fruits and vegetables

Two out of ten traders reported a cumulative loss[2] of more than 10% of their initial stock volume, around one quarter suffered a 6-10% loss, and over half (54%) experienced losses not exceeding 5%.

Overall, fruit traders reported higher average losses than potato and tomato traders. For instance, the proportion of fruit traders who reported losses exceeding 10% of their initial stock volume is twice as much compared to vegetable traders.

Figure 1. Proportion of traders reporting different levels of cumulative losses

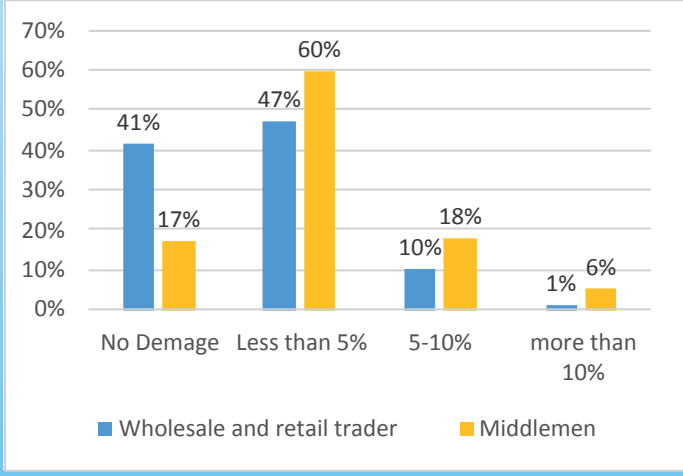


Note: Ranges of cumulative losses experienced by traders are captured in the legend.

Losses experienced during transportation

Results from the survey indicate that, both the prevalence and magnitude of loss incurred during transportation is higher amongst middlemen compared to wholesalers and retailers. For instance, more than 60% of middlemen compared 47% of wholesalers and retailers report varying levels of losses incurred during transportation (see Figure 2). In addition, those trading in fruits and tomatoes report higher losses during transportation than potato traders.

Figure 2. Self-reported quantity loss (% of initial stock) experienced during transportation, by type of trade.



The extent of crop loss at this stage is most likely associated with the time and distance travelled from the product source to the market, the quality of transport infrastructure, the mode of transportation and or type of containers/packaging used when transporting the crops.

1 Fruits category includes watermelons, pineapples, and mangoes, while vegetables comprise of potatoes and tomatoes.

2 Cumulative loss refers to total estimated loss incurred throughout the marketing process, from the time of stock acquisition to making the final sale of fruits and vegetables

For instance, in addition to other sources, all middlemen purchase directly from farmers compared to only 40% of wholesale and retail traders who also procure directly from farmers. This means that middlemen are more likely to travel longer distances to buy and transport their products from farms to markets. In contrast, wholesale and retail traders buy mainly from middlemen located near to or in their own respective markets. Considering that most farming in the country takes place in rural areas, the quality of rural roads also influences the risk of losses in perishable fruits and vegetables.

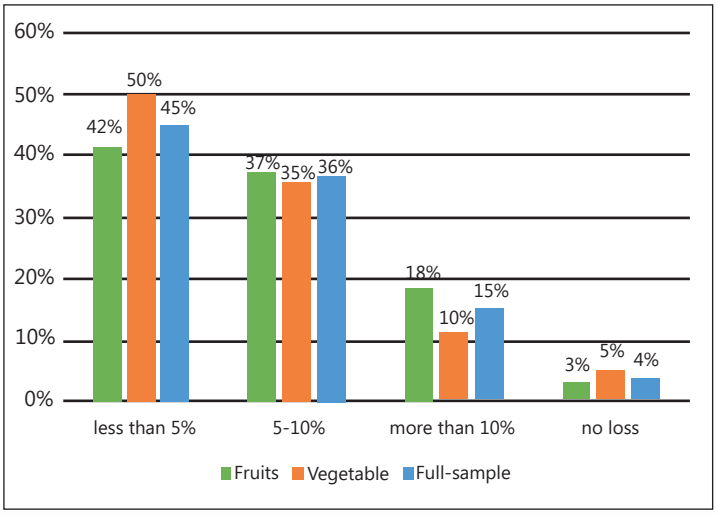
The means of transportation and containers used varies with the size of consignment and type of product in question. Middlemen often use trucks, while wholesale and retail traders use a combination of different means of transportation including large and medium sized trucks (33%), smaller cargo trucks-famously known as 'Toyo' or 'Kirikuu' (24%), physical man-labour (31%), and carts (4%). Furthermore, timber crates and sacks are commonly used to pack tomatoes and potatoes respectively. Watermelons, mangoes, and pineapples are stalked in different modes of transportation. The use of such methods, whilst accounting for the delicate nature of fruits and vegetables in question, can pose greater risk of damage and crop loss at this stage along the value chain.

Loss experienced in the marketplace

Upon arrival at the market, nearly all wholesale and retail traders sort their products for grading and price setting. It was reported that a round of freshly acquired stock can be sold out in 2-4 days. Tomatoes, possibly due to higher demand, are usually sold out faster than fruits and potatoes. However, even within this time frame most traders find themselves selling at a discount price due to declining quality of their produce. This is more common during the main harvest season seemingly due to bulk supply of fresh produce entering the market as well as poor handling and storage. During this time of the year most fruit traders claim to sell their produce for up to approximately 15% below the usual market price.

Nearly all traders (96%) claim to experience some level of losses in the marketplace. Over half the retailers and one third of, both, wholesalers, and middlemen report losses of less than 5% of their stock volume. A much lower proportion of retailers (5%) than wholesalers (22%) and middlemen (31%) reported losses which exceed 10% of their stock volume. Nearly twice as many fruits than vegetable traders estimate losses exceeding 10% of their stock volumes.

Figure 3. Self-reported quantity lost (% of stock volume) during marketing, by type of commodity.



Weather conditions (moisture and heat), animals such as rodents, and theft are cited as main causes of loss experienced at the market. This is no surprise considering the means of storage used by most traders. With only a small number of traders using dedicated storage rooms, over half of them (53%) simply cover their produce on tables or on the ground, and close to two out of ten (18%) keep their products out in the open.

Conclusions and recommendations

This brief set out to discuss the extent and possible causes of crop loss experienced by fruits and vegetable traders in selected Dar es Salaam markets. Results from this study indicate that most traders experience varying degrees of crop loss at the marketing stage. Middlemen, who on most occasions purchase their crops directly from farmers, suffer losses mostly during transportation. Therefore, the study recommends various policy actions and interventions by the Government in partnership with the private sector and other development stakeholders:

Improve the quality of transport infrastructure to reduce time spent on the road and vibrations that affect perishable crops

- Continue to improve road infrastructure especially in rural areas
- Enhance availability of specialised transport containers including refrigerated ones to protect the quality of hortcultural products

Improve market infrastructure to create more space that allows for better ventilation and reduce congestion

- This will also create a better and cleaner environment which protects against destructive insects and animals

Encourage creative packaging of products to add value and to increase access to different market segments

- Traders should also be trained on proper post-harvest handling practices including clean and dry storage

Increase investment in R&D, through TARI and other relevant research institutions

- This includes effeorts to develop seed varieties which are more tolerant towards extreme weather and post-harvest handling conditions

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