Reducing Post-Harvest Food Loss in Cassava and Tomato Value Chains in Cameroon

To Cite: Tassah, I. & Kouam, H. (2025). Reducing Post-Harvest Loss and Food Waste in Cassava and Tomato Agro-Value Chains in Cameroon, 24(6) Cameroon Economic Policy Institute, Henri Kouam Foundation.

SUMMARY This policy brief examines the drivers, implications, and strategies to combat post-harvest food loss (FL) or spoilage in Cameroon's cassava and tomato value chains. We survey of 200 smallholder survey in all 10 regions who farm cassava and tomatoes followed by a thematic review of 20 academic papers and articles. The findings show that food loss or spoilage is driven by climate change, diseases, poor infrastructure, and limited technology access. Post-harvest loss in cassava and tomato value chains leads to significant income loss for smallholder farmers and reduced market competitiveness. Current strategies to address this issue include infrastructure development by MIRAP, WFP farmer training, CEPI's green agriculture project training 100 farmers on market opportunities and innovations, IFAD's climate-resilient facilities, and Oikologica's solar-powered refrigeration. The brief recommends suspending import duties on agricultural machinery, farmer training in transportation management, grading rural roads, incentivizing manufacturing near production basins, and connecting farmers with export opportunities. These measures aim to reduce spoilage, improve market access, and boost farmer incomes, ultimately enhancing food security and promoting entrepreneurship & economic growth.

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Introduction

Reducing pre- and post-harvest loss is essential to improving food security. In Cameroon, cassava and tomatoes are staple in every Cameroonian household. Both food types take between 90 days and 8-12 months to mature (Fontem, 2003; Tabe-Ojong et al, 2020). However, up to 35 – 40% of cassava and tomatoes are lost before reaching retailers or markets in urban centers like Yaoundé, Baffousam, and Douala. Food loss (FL) in Cameroon is driven by factors such as climatic conditions, insecurity, poor infrastructure, inadequate storage facilities, and post-harvest management techniques. This exacerbates food price inflation and food insecurity.

This policy brief analyses the drivers of food loss in cassava and tomato value chains in ***Section I***, the economic implications of FL in ***Section 2***, Current Strategies to address food loss in ***Section 3***, and Actionable Policy recommendations in ***Section 4***.

The methodology includes a survey of 1000 smallholder survey who farm cassava and tomatoes across all ten regions and a thematic review of 50 academic papers and articles. Our respondents are members of CEPI's agriculture council – a network of CSO agro-focused organizations.

Section I: Drivers of Food Loss in Cassava and Tomato Value Chains

1). **Uncertain & Changing Climate Conditions:** With over 330,000 growers, Cameroon tomato production increased from 15,800 tons in 1992 to over 1.2 million tons in 2023. Meanwhile, Cassava yields 25-30 tons per hectare, and yield is expected to rise from 6.5 million tons per year to 10 million tons by 2030. However, drought conditions significantly lower food production, especially in the Sudano-Sahelian regions, due to water scarcity and climate change. The Southwest region is hot, the coastal regions are humid, and the North is hot and dry.

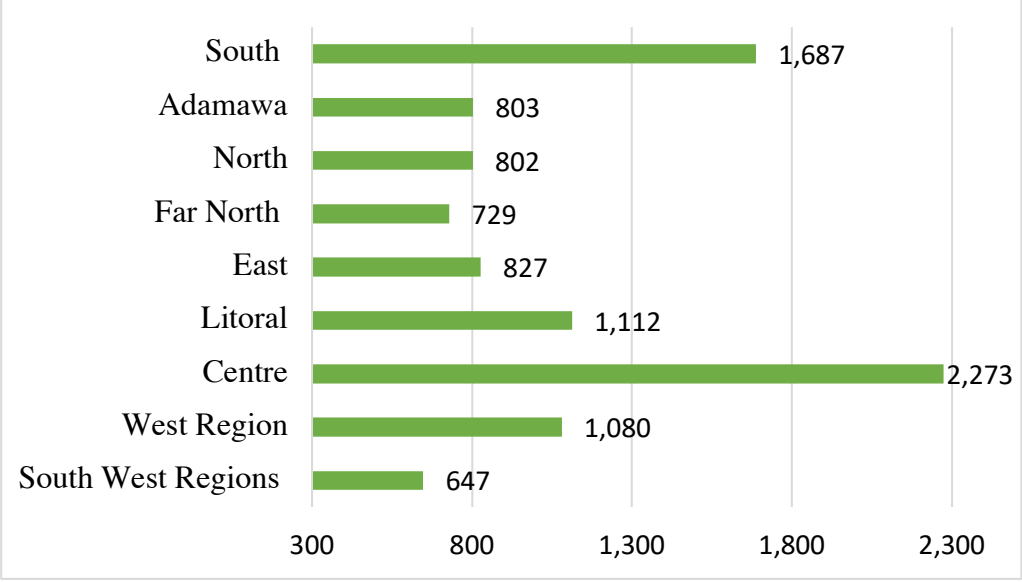
Furthermore, average annual temperatures have risen dramatically over the last 46 years. Temperatures have risen 0.86°C, from 24.28°C in 1974 to 25.14°C in 2020. Most cassava is produced in the South region around Ngoulemakong and Sangmelima, and the South West region produce 1 million tons every year. High temperatures increase moisture in packaging bags while creating a breeding ground for fungi and rodents. As such, extreme heat and rain cause between 5-15% food loss for the 280 farmers we surveyed in the South, South West and North West regions.

2). Diseases Reduce Cop Production: Diseases such as septoria leaf spot, anthracnose, and Verticillium lower tomato yields, causing farmers to use pesticides that have both positive and negative environmental effects. Cassava and tubers are generally impacted by diseases like cassava rot root and the three foliar diseases that threaten cassava production are the mosaic disease. (CMD), bacterial blight (CBB) and anthracnose disease (CAD). These diseases could reduce crop yield by up to 50%, which holds back farmer revenues, increase food prices, and worsen food security.

3). **Poor Transport Infrastructure:** According to the Ministry of Public Works, the total length of Cameroon's road network in 2022 was estimated at 121,000 km, of which 9,387,26 km were paved, representing less than 10% of the network. A mix of bad roads and overloading have equally exacerbated food loss and directly impacted food security challenges in the Northern region. As illustrated in Figure 1, the top producing regions of cassava (South and South West) and tomatoes (SW, Far North & Adamawa) have less than 5000 km of roads graded between them.

Poor roads and very hot temperatures increase food loss/rotting significantly, especially in the northern parts of Cameroon, where temperatures are regularly 35 – 40 degrees. Extreme and variable temperatures exacerbate food loss, exacerbating both food security and inflation across the country.

Figure 1: Graded roads in Cameroon by kilometers (km)



Source: Cameroon Concord News

4). Poor Access to Technology Solutions: Several Cameroonian companies offer refrigerated transport for tomatoes and other vegetables. These include, but are not limited to Eolis Cameroon, and Africa Global Logistics (AGL) while Ruzave and Centrimex are more prevalent among large farming companies and/or cooperatives. However, 80% of farmers are smallholders and cannot afford refrigerated transportation methods without significant capacity building or access to financial resources. As such, while technological solutions exist, socio-economic inequalities reduce access for most farmers.

Section II: Implications of post-harvest food loss on Cassava and Tomato farmers

In this section, we illustrate how post-harvest losses in Cameroon's cassava and tomato value chains significantly undermine smallholder farmers' incomes and national food security.

1. Loss of Farmer Incomes

When farmers lose 30–50% of cassava and tomato yields post-harvest, it reduces income from sales and increases the risk of poverty especially among vulnerable groups – youths and women. In Cameroon's oligopolistic cassava markets, Retailers' inefficiencies from retailers estimated at 14.2% reduce farmgate prices (the prices farmers are paid for their products). In summary, perishability and lack of cold storage intensify losses during peak seasons, disproportionately affecting smallholders.

2. Higher Production Costs

Inadequate drying and cooling technologies raise labor and input costs. Mechanical harvesters for cassava could reduce losses by 20–30%, but adoption remains low. Similarly, inefficient drying systems for cassava increase costs for farmers cause them to diversify into other products. This reduces their ability to scale effectively and holds back Cameroon's total production of tomatoes and cassava.

3. Food Loss Reduces Market Competitiveness

Post-harvest losses degrade product quality and directly limit access to premium markets. In Cameroon, cassava retailers face strict buyer standards due to high market concentration, forcing them to sell at lower prices. Physical damage during transport for tomatoes reduces shelf life and shrinks market opportunities. With fewer valuable suppliers, some companies continue to import locally produced fruits and vegetables to manufacture products.

4. Limitations to Value-Adding Opportunities

Cassava and tomato food loss restricts farmers' ability to diversify into processed products like gari or tomato paste, with significantly higher margins. This highlights the need for scalable technologies to support a fragmented retail market. In summary, food loss translates to lower incomes, greater inequality, and a slower pace of industrialization.

iii. Current Strategies and Policies Designed to Reduce Post-Harvest Loss

1. MIRAP Infrastructure Development

The Consumer Products Supply Regulation Mission (MIRAP) is building cold storage and improving rural road networks that are prone to bad conditions to reduce post-harvest loss, estimated at 25%.

3. WFP Farmer Training Programs

The World Food Programme is training farmers in the Far North to reduce post-harvest loss in maize by 40%. Techniques include moisture testing and gas-tight storage (e.g., mini silos), which could be useful for both cassava and tomato value chains. This will help address climate vulnerability for farmers in the region.

4. IFAD's PADFA II Project

IFAD's is providing climate-resilient storage and processing facilities in a $59.9 million initiative (2020–2026) that focuses on rice and onion value chains. It is building 28 bioclimatic onion houses and rehabilitating irrigation systems to minimize losses, benefiting 32,000 households. The project allocates 50% of resources to women, who are most exposed to post-harvest vulnerabilities.

5. Oikologica's Cold Storage and Solar Solutions

Oikologica is collaborating with ColdHubs to deploy solar-powered refrigeration units in northern Cameroon, targeting perishables like tomatoes. This initiative could reduce spoilage by 40% as it integrates renewable energy into dairy and vegetable supply chains.

6. **Emergency Project to Combat the Food Crisis (2024-2025)**

Backed by the World Bank, this project is executed by the Government of Cameroon and is strengthening the productive capacity of smallholders by teaching them climate-resilient practices to improve food security. The PULCCA project also directly address Post harvest losses through capacity building workshops of producer groups and most especially by promoting

transformation of agricultural output to reduce post-harvest losses. This is through the procurement and distribution of solar powered transformation equipment to producer groups. Equally access to market is being facilitated by creating market networks and matching farmers to bulk buyers.

7. Cameroon Economic Policy Institute (CEPI) Green Agriculture Project

This project brings together over 40 farmer organizations, agriculture CSOs, and private sector companies. We discuss issues and present our findings to policymakers every year. CEPI provides training to at least 100 farmers every year on market innovations to enable them to sell their products quickly and reduce post-harvest loss.

Policy Recommendations

Policymakers should suspend import duties on agricultural machinery for three years to reduce post-harvest loss and make adequate transportation more accessible. This would align with broader efforts to improve domestic production and reduce reliance on imports. Furthermore, three years is enough time to allow innovations to diffuse through the Cameroonian economy and enable more advanced locally made storage and transport solutions to emerge.

Training on post-harvest management should be intensified. More Farmers should be trained on how to collectively manage transportation and transform their products to reduce food spoilage in cassava and tomato value chains. This should be accompanied by matching services in packaging as well as market opportunities that enable them to sell locally and internationally to neighboring countries across Africa. Improving access to adequate transport while exposing farmers to market opportunities in the sub-region, as well as the African Continental Free Trade Area (AfCFTA).

Cameroon should grade a minimum of 1500 km of roads every year to ensure that rural farmers are not excluded from market opportunities due to spoilage exacerbated by climate change. Cameroon should accelerate the development of its rail network and design concrete plans for high-speed rail by 2035.

Manufacturing companies should take advantage of the three-year tax breaks for new companies and create smaller divisions near major production basins for cassava and tomato in the Western, South, and South West regions.

Farmers should be informed and sensitized about export opportunities by pairing them with buyers and exporting companies to enable them to directly participate in the AfCFTA and export their products across Africa. This will create greater incentives to scale local production, leaving them to produce more to satisfy both the domestic and regional markets.

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