



# Opportunities to reduce post-harvest losses in the Kenyan avocado sector through agroprocessing and agrologistics

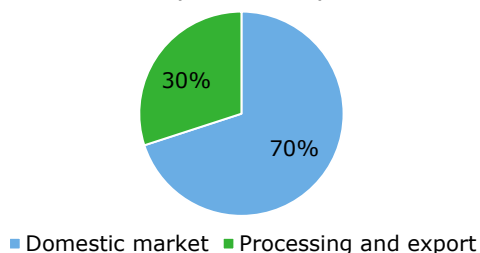
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## Avocado production in Kenya

Kenya is the world's third-largest producer of avocados and ranks eight on the list of largest exporters. In 2018, avocados were being produced on approximately 15,000 hectares of land, producing 318,000 metric tons. The vast majority of avocados (~70%) is consumed domestically, the remainder is exported as fresh product or processed locally and then exported (avocado oil).

This document is a summary of [the full report](#): **A food system analysis of Kenya's mango, avocado and poultry sectors.**

Market destination of Kenyan avocado (total volume)



The export market is quite formal and structured to ensure strict adherence to quality standards, sanitary and phytosanitary requirements and export regulations. The domestic market consumes more than two-thirds of the total national production of avocados and is largely informal.

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## Post-harvest food losses

In the domestic supply system, post-harvest losses are predominantly concentrated during the “first mile”, after harvest (20%), and an additional 10% of losses occur during transport and packaging. Major causes of loss are improper handling, pest and diseases, and product deterioration due to lack of temperature-controlled storage and pre-cooling.

Measures and investments to minimize losses in the export supply chain are fairly common and explain why losses are lower compared to the domestic supply chain.



**Figure 1** Post-harvest loss profile Kenyan avocado supply chain

Figure 1, illustrates the percentages of post-harvest loss that occur at different stages of the supply chain destined for the export market and the supply chain destined for the domestic market. There are numerous opportunities to effectively reduce post-harvest losses in avocado. Addressing the root causes of post-harvest loss requires taking on a food system approach whereby enabling policy conditions are combined with a series of complementary interventions addressing production practices, suitable technological interventions and supply chain integration including post-harvest handling services, value addition and market information systems. Effective reduction of post-harvest losses requires a system approach bundling food system policies, improving collaboration within the sector and creating incentives to invest in post-harvest loss reduction.

## Integrated sector transformation

A combination of supportive sector-wide policies, innovative financing and integrated sector transformation must accompany the specific opportunities in agro-logistics and agro-processing to reduce the post-harvest losses that have been identified.

The desired integrated sector interventions include training of farmers, traders, and vendors as key actors with the potential to reduce losses significantly (Good Agricultural Practice, product handling, Integrated Pest Management), sector coordination (available market information, formal contracts, market linkages), an enabling policy environment (incentives, regulations), stronger producer organizations, improved access to finance, and improved infrastructure, as well as a system of traceability, quality assurance and food safety.

## Business opportunities

The identified business opportunities are selected because they contribute to reducing food loss, generating a positive economic impact on the sector, and meeting the requirements of (Dutch) investors or product suppliers.

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### **Temperature-controlled storage**

Installing cold storage facilities is the most effective mechanism to extend the shelf life of avocados and reduce transport and storage losses by 30-60%. Temperature-controlled storage solutions are divided into three categories, based on scale:

1. Small scale cooling technologies (e.g., charcoal cooler) for local and regional markets.
2. Small to medium scale (container-sized, 20 ft) cooling or cold storage solutions that offer opportunities for mobile cold storage and aggregation at the smallholder farmer group level. Suitable for export or domestic markets.
3. Large, industrial-scale, high-tech cold storage and aggregation centres, feasible for logistical hubs. Suitable for export (mainly EU). Investment ranges between EUR 5-60 million, depending on the size and technological requirements.

### **Aggregation facilities**

Closely related to temperature-controlled storage is aggregation. Aggregation is the sorting, grading, and combining volumes of the same product from different producers. Aggregation facilities can reduce transport and storage losses by 20 percent.

### **Packaging solutions and shelf-life extension techniques**

Packaging can greatly improve product quality and reduce losses. Similar to cold chain facilities, packaging is not a standalone solution as it is most effective in combination with other interventions, most notably storage and aggregation. It has the option to greatly improve product quality and safety and reduce transport and storage losses by 30-40 percent.

Packaging includes crates, coatings, and packaging lines for retail. Investments for large-scale packaging equipment is estimated at EUR 460,000, suitable for large volumes (>100 MT/day).

### **Post-harvest value addition and processing facilities**

Processing adds value to the product and allows for the extension of avocado shelf-life and the consumption of low-quality products. There are several possibilities for processing avocado such as juice (pulp or concentrate), oil, dried products, chips, guacamole. Estimates of the degree of avocados being processed vary greatly ranging from 5 percent to even 50 percent of all avocados. The most common processing methods are extracting oil and drying. Avocado waste can be used as animal feed in its direct form. Avocado waste can also be upcycled into high-quality animal feed by producing black soldier flies, a protein-rich ingredient that can be utilized as animal feed.

## **Recommendations**

1. With the production of avocados expected to increase, the need for professional and efficient production, storage, transport, packaging, and processing increases. The Dutch private sector can assist Kenyan players and enter this emerging region by partnering with financial institutions and with support from the Dutch government.
2. Relevant Dutch companies are recommended to explore the Kenyan avocado export market for the supply of aggregation and packaging solutions to streamline production processes and increase the competitive edge of the country. The same applies to Kenyan private-sector corporations producing juices, pulp, and avocado oil, as they see a largely unfulfilled market. The market focus will be mainly export.
3. Effective and sustainable post-harvest loss reduction requires sector-wide, bundled approaches whereby private and public sector organizations collaborate to jointly advance and professionalize the sector. Full details of the analysis and the identified business opportunities for the mango sector can be found in section 3.3 and chapter 5 of the report.

Details of the analysis and the identified business opportunities for the avocado sector can be found in section 3.3 and chapter 5 of [the full report](#).

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This report can be downloaded for free at <https://edepot.wur.nl/559107> or at [www.wur.eu/cdi](http://www.wur.eu/cdi) (under publications).



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## Summary WCDI-21-185