



What is the future of avocado farming in Kenya?

A short review

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SUMMARY

Avocado farming in Kenya is mainly practiced by small-scale holders for subsistence and income from local and markets. The fruit is popular globally for nutrition and the increasing importance as a source of income for smallholder farmers. The establishment of avocado orchards also increases tree cover, which contributes to environmental conservation. The main varieties grown in Kenya are Hass and Fuerte, with Hass dominating in the export market, especially to the EU. Avocado production from Kenya has increased massively in recent years, surpassing 320,000 tonnes annually. It is estimated that up to 30% of this produce is exported, earning valuable income to thousands of small-scale producers. Kenyan avocado production is projected to reach nearly 450,000 metric tonnes by 2026, representing annual growth of 3.5 per cent. This paper reviews issues of importance as the country moves to increase production.

INTRODUCTION

Avocado grows well in several agro-ecological zones in Kenya, the main production areas are in Murang'a, Thika and Kiambu districts in Central Kenya and Meru and Embu in Eastern region, Taita Hills in the Coast and Kitale in the Rift valley region. Most avocado varieties are adapted to altitudes from sea level to around 2,000M. Avocado plants grow well in a varying range of soil types but are intolerant to poorly drained soils. Alluvial or sandy loam soils that are deep, fertile and well aerated are ideal, soil pH should be neutral or slightly acidic (pH 5 - 7). Good soil structure is important because roots of avocado plant have a high oxygen requirement. Saline soils should be avoided, since avocado plant

roots are highly sensitive. Kenya is estimated to have doubled its avocado production between 2016 and 2021 and is officially the world's sixth-largest avocado producer (FAO; EastFruit, 2023), with a planted area of nearly 26 000 ha and a production of 417 000 metric tonnes in 2021. Exports have doubled in only five years' time, and planted area is expected to grow by around 1,500 hectares a year in five years (RaboResearch, nd). Avocado farming in Kenya has been traditionally dominated by small-scale holders (currently about 70%)(IFPRI, 2020), this represents a decline from a high of 85% a few years ago, largely due to the entry of large scale plantation growers targeting export markets.

Climate change impact on avocado production

Precipitation in the range of 1,000 - 1,200 mm per year is sufficient for avocado cultivation with a lower level of 750mm being sufficient for fruit formation and growth. Most areas in Kenya practice rainfed agriculture, which is acceptable, but where rainfall is inadequate, irrigation is

necessary. Avocado trees are highly sensitive to water stress, it leads to ring necking and drying of fruits, salt burns on leaves, drying of feeder roots and reduced yields. Extended water stress leads to drying of the whole plant especially in young crops.



While the soils may remain suitable for avocado production in the main production regions in Kenya, climate change is likely to impact adversely, especially as rainfall becomes unpredictable and increasingly scarce (Kogo *et al.*, 2021). Where flooding follows occurs, avocado are affected as their root system is not deep, they have generally poor capacity to take up water and are considerably sensitive to low soil oxygen concentrations in the root zone (FAO, n.d.). Overall, warmer temperatures and heat stress are anticipated to inhibit pollination, affect fruit setting and cause changes to the shape and size of avocado fruits. Temperatures over 30 °C cause irregular ripening and darkening of avocado flesh (FAO, n.d.), while over-ripening is common above 40 °C. High solar radiation also causes sunburn on fruits and

Expanding market access for Kenyan avocado

Assuming the positive trajectory in production is sustained, Kenya has to increase efforts to expand market access and sustain its growth. Statistics show that the global avocado market has increased significantly in the last decade, and it continues to grow unabated. According to the report of the Organization for Economic Cooperation and Development (OECD) and the FAO (Agricultural Outlook 2021-2030), avocados will become the most traded fruit by 2030 (EastFruit, 2023). Nearly 60% of Kenya's avocado exports are directed to the EU (mainly the Netherlands, France, and Spain) and demand in the EU, Kenya's largest market, is reported to have tripped (RaboResearch, nd). However, there have been concerns over quality management in the supply chain with calls to take measures. For example, Kenya only exports 10% of its total avocado production; Chile exports 55% and South Africa exports 60% (IFPRI, 2020). These are necessary to effectively meet rising international competition in existing markets, and also as part of the strategy to open up new markets beyond Europe (RaboResearch, nd). To compete in international markets, quality should be on par with other competing avocado sources. Potential markets have been identified in the UAE, Russia, Saudi

Arabia, UK, Egypt, Turkey and more recently in China (RaboResearch, nd). There is a mistaken belief in Kenya at the moment that the largest market for avocado is China. However, comparatively, when China's and Hong Kong's avocado imports totaled 36,000 metric tons in a year, the US imported over 1m metric tons and the EU 600,000 metric tons. This data should help put a proper perspective on where focus should be directed in efforts to secure new markets and safeguard existing ones. The United States of America and the European Union are expected to remain the largest importers with OECD/FAO saying the two regions will gobble up more than 70 percent of global imports by 2030. (Onyango, n.d.). Kenya has made efforts to enter the market in China, but has only been granted access for frozen avocado products. This is a significant constraint since majority of the small-scale growers do not have the capacity to freeze the fruits as expected. Traditionally, avocado production in Kenya was dominated by a few packers working with many smallholder farms. The scenario was characterized by inconsistent quality and yields, with high waste and loss along the chain. However, a new trend has emerged in recent years with increased entry of large-scale growers.



Typically, these companies have been growing the traditional export crops of tea, coffee, floriculture, and have now added avocado to their business. They therefore have much better established capacity for technical management, and use of advanced technology, e.g. irrigation systems, pest management, farm machinery and post-harvest management systems. The entry of

Improving access to quality planting materials

An increasing challenge to Kenya's aspiration to expand avocado production is the poor state of the supply chain for planting materials. While there is little available information on this matter, in particular two things that stand out are high cost of healthy seedlings and the lack of means to verify the authenticity of the seedlings sold as Hass. One may realize after waiting for three years, which the seedling they planted is not true to type, which means wasted time and effort.

The planting materials industry for vegetatively propagated crops is largely unregulated in Kenya, which makes it easy to enter the business

Circularity in the avocado value chain

After consumption or processing, the avocado fruit generates large amount of by products that go to waste with unexploited commercial value. There exists a huge opportunity that is yet to be exploited downstream in the supply chain (RaboResearch, nd) through value addition of the waste to create new products. The market for processed avocados is projected to expand significantly reaching US \$ 2.70 billion by 2024 (Ramos-Aguilar, Ornelas-Paz, Tapia-Vargas, Gardea-Béjar, Yahia, Ornelas-Paz, Ruiz-Cruz, Rios-Velasco, & Ibarra-Junquera, 2021). Of note, processing avocados generates approximately 2.42 million tonnes of by-products including peels and seeds, that constitute about 30% of the fresh fruit weight (Nyakang'i *et al.*, 2023). Avocado contains no cholesterol; it has oils that have therapeutic value and vitamins A and E as well as folic acid which are beneficial to the body. Research suggests that eating avocado lowers the levels of bad

the new more endowed players is expected to significantly and positively impact on the sector as a whole, including providing a pathway for more small-scale growers to enter the export market. IFPRI (2020) found that participating in export markets raises smallholder farmers' incomes by nearly 39%, on account of higher prices offered in international markets.

at low cost. Many unregulated nurseries have been established in rural areas where they propagate and sell seedlings. To safeguard the avocado sector, there is need, without unnecessarily burdening propagators, to introduce a mechanism for assuring the quality of seedlings. The situation relates to other types of fruit trees as well (Evans, 2018). The high cost of seedlings may also cause some farmers to opt for cheaper seedlings that are of lower quality. Support is therefore needed to train not only the propagators, but also the smallholder farmers on crop management, appropriate harvesting, diseases and pests management.

cholesterol by improving lipid profile in human body. Avocado is also associated with reduction of the risk of diabetes, stroke and heart diseases. Some of the nutrients are carried into the waste (Colombo & Papetti, 2019). As such, avocado by-products can be a resource for the production of various high value products. Valuable extracts from the avocado peel include phenolic compounds, including flavanols, anthocyanins, and phenolic acids (Ramos-Aguilar *et al.*, 2021). These extracts can be used in the food industry as preservative as they have high antimicrobial activity, or as natural preservatives to prevent rapid deterioration. Unfortunately, value addition of avocado in Kenya is minimal and has only been introduced in the last decade. Initiatives to increase production should consider establishing capacity for processing and value addition, with a specific attention paid to use of byproducts to extract further value.



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