Chapter 15

FRESH PRODUCE VALUE CHAINS IN KENYA: CHALLENGES AND PROSPECTS FOR ENHANCED MARKET ACCESS AND SMALLHOLDER INCLUSION

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Production and marketing of fresh produce provides opportunities for smallholder farmers in low- and middle-income economies to engage and benefit from high-value markets and value chains. Fresh produce markets can be valuable for transforming the food sector in many low-income countries but perishability and difficulties in organizing supply chain logistics mean access remains challenging for smallholders.

Contract farming is one potential mechanism that smallholder farmers in developing countries can use to participate in and benefit from domestic and global value chains (Okello and Swinton 2007; Barrett et al. 2012; Minot and Sawyer 2016; Ruben 2017; Ton et al. 2017). Linking smallholder farmers more directly with national and global consumers should increase both the demand and producer prices for their fresh produce. Increased access to and participation in such value chains increases farm income earned by smallholders. Improvements in inclusion and efficiency of value chains are vital to enhance the effectiveness of contracting models, and to enhance the market access and integration of smallholders. Inclusion is important because large buyers, including processors, modern retailers, and exporters, are often hesitant to engage with small and marginal farmers and may prefer working through brokers, which reduces benefits to farmers. Also, market integration is becoming increasingly important for smallholders in order to avoid marginalization of the less organized sector in the more organized, growing global fresh produce market (Ruben 2017; Ton et al. 2017).

Different types of out-grower schemes have been implemented in Kenya to connect smallholder farmers with high-value markets for fresh produce. Smallholder farmers are typically contracted as out-growers through farmer groups, often organized under common interest groups or cooperatives. A

literature survey by Minot and Sawyer (2016) seems to support the idea that farmers benefit more from contract farming, concluding that "successful contract farming schemes generally raise the incomes of farmers." However, neither participation in such high-value markets nor beneficial gains are guaranteed, particularly for smallholder producers in low-income countries (Minten, Randrianarison, and Swinnen 2009). This is because smallholder producers may not be able to meet the stringent standards to participate effectively in such markets, or large agribusiness firms may exploit smallholder farmers, since unequal bargaining power can result in unfair benefit-sharing outcomes (Little and Watts 1994; Warning and Key 2002).

Contract farming can also contribute to social differentiation, increased concentration of land ownership, and dominance of agribusiness firms in decision-making at the expense of small-scale farmers (Maertens and Swinnen 2007; Subervie and Vagneron 2013). Barrett and colleagues (2012) attribute this in part to firms' preference for larger and more experienced farmers and selective encouragement of participation of wealthier and better-educated producers. Both patterns can lead to limited participation and inclusion of smallholder producers. However, participation in cooperatives and common interest groups could help overcome some the limitations these patterns impose.

Different categories of farmers generally choose the selling mode that works best for them. For instance, very small, often part-time, sellers may be better off selling at local markets. However, many farmers prefer to sell individually by hiring casual workers to pick fruits when they are ready, with local retailers or exporters collecting the harvest from the farm. When the spot market prices are high, this also leads to side selling and breach of contracts. Also, some farmers sell directly to exporters, processors, or local retailers. Over time, though, individual selling has been discouraged because of issues relating to product quality and high bulking costs. For example, contracting in Kenya for avocado may occur through farmer groups rather than individual farmers (Mwambi et al. 2014; Amare et al. 2019), which can limit individual (smallholder) farmer's participation in high-value markets. Thus, contract farming participation has become increasingly important for smallholder fresh produce farmers as an alternative marketing strategy.

As these value chains have become increasingly important in Kenya, the avocado value chain stands out. Avocado now accounts for 17 percent of total horticultural export earnings and more than 50 percent of the export value in the fruit subsector (KEHPA 2015), thanks to strong and growing local and global demand. Increasing international competition, together with increasing demand for food safety and quality standards as well as traceability

and reliability of supply, has made it almost mandatory for smallholders to organize and enter into avocado contract farming through farmers' groups and cooperatives.

This chapter documents contract farming practices and assesses challenges and opportunities in enhancing inclusion and reducing marketing costs for small-scale producers (including youth and women) to improve their access to fresh produce markets in developing countries. The chapter builds on a focused review of selected fresh produce value chains in developing countries and critically examines recent experiences from the avocado sector in Kenya—distilling relevant lessons and policy implications. As the world's third-largest exporter of avocado to Europe, Kenya is particularly suitable for a case study on this product (FAO 2017). The chapter also assesses whether participation of smallholders in modern value chains for fresh produce enhances inclusion and efficiency of contracting approaches and improves their income and livelihoods.

More specifically, the chapter addresses the following questions:

- To what extent and under what conditions do smallholder farmers participate in fresh produce value chains via contract farming?
- To what extent can contract farming be an effective mechanism to facilitate inclusion of small-scale farmers (including women and youth) in modern market channels for fresh produce?
- Does participation in the avocado value chain improve the livelihoods of participating farmers?

The chapter is structured as follows. The next section highlights the challenges to smallholder farmers' participation in value chains for high-value markets. The chapter then presents the methodology used for the case study, highlighting the data type and the analytical approach. Next comes an overview of contract farming for fresh produce in developing countries, with a subsection focused on Kenya. This is followed by the results of the Kenya avocado case study. The concluding section highlights key lessons and policy implications.

Market imperfections and challenges to smallholder farmer participation in value chains for fresh produce

The concept of agricultural value chains as a means to improve smallholders' livelihoods has attracted many scholars, policymakers, and development practitioners in recent times (Barrett et al. 2020). However, for smallholders

to engage in value chains for high-value food products, they must comply with certain standards and market requirements, such as economies of scale, food quality and safety standards, and consistency of supply. Complying with such standards is quite challenging and has made it difficult for small-scale farmers to fully integrate into competitive and globalized food value chains (Eaton and Sheppard 2001).

The requirements generate intense competition for all parties in the value chain. The need to meet the demands of customers, processors, distributors, and retailers imposes ever-increasing obligations on suppliers in terms of quality, timing, handling, and other delivery arrangements. Smallholder farmers require both technical skills and financial investments to meet stringent standards, which are often out of reach for many of them. They also face resource constraints, such as a lack of irrigation water and land, which invariably limit their production and productivity. Likewise, their engagement in high-value markets is deterred by limited access to productive resources and services, including extension, credit, and market information (Coulter, Entwistle, and Gilbert 1998; Barrett et al. 2012).

The production and marketing of perishable fresh produce such as fruits and vegetables for high-value markets require good agricultural practices (GAP) and safe handling to meet phytosanitary standards. This, however, involves specialized production and packaging methods, and refrigerated transport or cold chains. Additionally, many smallholders have limited knowledge on optimal harvesting methods (for instance, for pest management, picking, and harvest). When quality cannot be standardized, smallholder farmers incur significant losses because processors, retailers, and exporters reject their produce for failing to meet private value chain standards. Inadequate exposure to or capacity to implement modern harvesting techniques and other global GAP standards limit the ability of small-scale growers to participate in and benefit from high-value fresh produce markets. Even when farmers have the required knowledge and information about export and quality requirements, they do not always adequately supervise those who pick their produce because of high supervision costs or difficulty in hiring skilled harvesters (PEP 2018).

Availability of market information is another critical factor in farmers' decision to invest in fresh produce production. When farmers are not part of organized value chains or out-grower schemes through contract farming, they rarely receive specific and adequate information in advance from exporters concerning product grading, pricing, and demand in domestic and export markets. Lack of adequate price and market information exposes producers supplying small quantities to informal and less-organized supply chains to seasonal gluts

and price plunges. Other challenges include trust issues among exporters, brokers, and farmers; lack of incentives for upgrading; poor vertical and horizontal linkages within the value chain; and the imposition of strict new rules and market standards in response to rising concerns of consumers regarding food safety (Snodgrass and Sebstad 2005; USAID/Kenya 2008).

These overlapping technical, financial, and market-related constraints discourage smallholders from engaging in the production and marketing of fresh produce—limiting their ability to diversify income sources beyond traditional agricultural activities such as food staples and livestock (World Bank 2008; Amare et al. 2021). Therefore, smallholder farmers have incentive to opt for contract farming, which has potential to overcome some of the underlying market imperfections for perishable and bulky fresh produce, through access to specialized technical support, inputs, finance, and product handling, along with reliable market information that helps buffer producers against extreme price volatility. However, such contracting is available mainly in certain high-potential areas, with adequate growing conditions to meet desired production quantities to supply local or export markets, and where infrastructure is not a limiting factor in the procurement and handling of produce.

Methods

We reviewed the challenges and prospects for enhancing market access and inclusion in developing countries, drawing evidence from the avocado sector in Kenya. The research questions were addressed using both qualitative and quantitative analytical approaches. A key part of the methodology was a structured review of the contract farming literature in developing countries, looking at both the theoretical and the empirical evidence, to examine the prospects, challenges, and way forward in improving the market access and participation of smallholder producers, especially for fresh produce sectors. This broad analytical review was used to assess the evidence and draw lessons from the avocado sector in Kenya. It entailed a comparative review of contract farming models and experiences in developing countries, as well as a deep dive into the literature on the impact of contract farming on livelihood outcomes as related to smallholder fresh produce farmers.

Individual and combined searches were conducted on specific terms including contract farming, out-grower schemes, fresh produce, avocado, smallholders, participation, value chains, livelihood, horticultural production, and developing countries. Three major criteria were considered for inclusion in the review: (1) direct relevance of the articles to the participation of

smallholder farmers in contract farming and high-value fresh produce markets in developing countries, (2) articles published in peer-reviewed journals, and (3) a focus on Africa. In addition to the literature review, the Kenya case study assessed avocado production and export trends using time series data from the Horticultural Crops Directorate (HCD) and Food and Agriculture Organization of the United Nations (FAO) databases. Data were analyzed using simple descriptive tools to assess and visualize trends and growth patterns in the avocado sector in Kenya, relative to other major exporters. Supplemental evidence from unpublished sources including working papers, policy briefs, and technical reports was used to fill evidence gaps and contextualize the findings.

Contract farming for fresh produce

Contracting models for fresh produce

The relevance of contract farming for overcoming market imperfections and incorporating smallholder farmers into high-value markets cannot be overemphasized. Contract farming is conceptualized as a system in which an interested buyer, often an exporter, processor, or retailer, purchases the harvests of independent producers, with the terms of the engagement predetermined through a negotiated contract. The literature on contract farming highlights the diversity of contractual arrangements between contractors and farmers (Bijman 2008; Eaton and Shepherd 2001; Simmons, Winters, and Patrick 2005). This diversity is attributed to the technical skills required for production and the associated transaction costs (Simmons, Winters, and Patrick 2005). Contract farming has been widely adopted in developing countries as a means of reducing the underlying risks for both the producers and the buyers and ensuring consistent throughput levels of known price and quality (Kirsten and Sartorius 2002).

Similarly, the use of various forms of contracts to ensure quality, coordination, and desirable quality is quickly rising in developing countries. However, the prevalence of contract farming and the models adopted differ notably across different categories of buyers, destination markets, and commodities. The variation across commodities could be attributed to differences in perishability, economies of scale in production and processing, quality sensitivity, and seasonality of supply, among other factors. Accordingly, Eaton and Shepherd (2001) highlight five broad models of contract farming: centralized, nucleus estates, intermediary, multipartite, and informal models. Even though these models involve a contract between an agribusiness and farmers, they have distinct structures and management patterns.

The **centralized model** involves large firms contracting a large number of smallholders with predetermined specifics on the quality and quantity of the products to be supplied (Bijman 2008). According to Eaton and Shepherd (2001), this model is suitable for commodities that require significant logistics and processing, such as coffee, milk, tea, and sugarcane. For example, dairy processing companies collect fresh milk of standardized quality from small-scale dairy farmers in many East African countries, including Ethiopia, Kenya, and Uganda, through long-term contractual arrangements.

The second model is the **nucleus estate model**, whereby companies not only contract independent producers but also enter the production node through an estate or plantation. The estate model is typically used to ensure throughput for the final buyer of the produce—but sometimes only for research or breeding purposes. This hybrid model is used mainly for perennial crops (such as oil palm, mango, and citrus), but there are instances where it has been applied in other crops. An example is the dairy sector in Indonesia, where the central estate is used for the rearing of "parent stock" (Eaton and Shepherd 2001).

Under the **intermediary model**, an agro-industrial firm subcontracts engagement with farmers to a third party—an intermediary—who could be a village leader or a farmer cooperative or group. This intermediary then serves as the primary point of contact for farmers (Prowse 2012). The model is common in Southeast Asia and has been applied in Kenya for avocado production (Mwambi et al. 2016). In some cases, buyers may engage in different contracting models. For example, major avocado exporting companies such as Kakuzi maintain their own estates (nucleus estate model) while also contracting avocado farmers (via intermediaries) as out-growers, as part of meeting growing demand in destination markets. An important limitation of the intermediary model is that contractors are at risk of losing control of production in terms of quality and quantity of supply as well as prices farmers receive (Eaton and Shepherd 2001). Given the lack of direct contact between farmers and the contractor, this model has several limitations with regard to vertical coordination and offering proper incentives (Bijman 2008).

The **multipartite model** may involve a joint venture between a firm and an NGO or a public entity and one or two private firms, which enter into a contractual agreement with farmers (Prowse 2012). A multipartite model can develop from a nucleus estate model, for instance through farmers forming cooperatives or the participation of a financial institution. Governments in many developing countries have actively participated in contract farming as part of the liberalization process through joint ventures with private enterprises; this helps improve trust and reduce risks related to the honoring of contracts (Little

and Watts 1994). When public sector players are able to enhance the capacity of producers or mitigate the underlying risks beyond what private companies are willing or able to do, this approach has the potential to enhance the inclusion of small and marginal farmers in value chains.

Lastly, **informal models** are characterized by seasonal arbitrary production contracts with individual traders or small firms (Hung et al. 2019). Contracts are usually on a verbal basis, with a limited number of farmers. This often arises in less organized markets that do not require high standards or where markets are not differentiated based on quality. The greater risk of extra-contractual marketing involved means government support services such as extension and research are required (Eaton and Shepherd 2001).

In the case of fresh produce, contract farming is very common in vegetable and fruit production for export or sale to domestic supermarket chains, with evidence coming from Madagascar, Kenya, and Senegal (Prowse 2012; Ochieng, Veettil, and Qaim 2017; Ogutu, Ochieng, and Qaim 2020). According to Ochieng, Veettil, and Qaim (2017), in place of traditional wholesale markets, large buyers such as supermarkets, export or processing companies, and other agribusinesses serving high-value markets often source fresh and perishable products such as fruits and vegetables directly from farmers through contracts to ensure high-quality products that meet market standards. This rise in supermarket contracts is being driven by rapidly growing urban populations and demand for high-quality fresh produce. Using the case of small-scale vegetable farmers in Kenya, Ogutu, Ochieng, and Qaim (2020) found that such contractual arrangements contribute to sizeable income gains and poverty reduction among smallholders.

According to Prowse (2012), the informal models are best suited to categories of crops that require minimal processing, have limited variability in quality, and rely on standard production techniques. However, this may not be the case for other fresh produce that requires more technical capacity in terms of production and processing. An example is the horticultural sector, where formal models are believed to be more suitable. For instance, Mwambi and colleagues (2016) provide evidence on the use of the intermediary model in avocado production in Kenya. Minot (2011) suggests that informal models may be used for products sold through traditional channels that do not involve any contractual agreements, especially those that can be processed or consumed at home. Horticultural production for export, on the other hand, has specific requirements in terms of quantity, quality, production, timing, and handling methods to meet sanitary and phytosanitary standards, which are better met via a contract.

TABLE 15.1 Features of the different contracting models

Contracting model	Distinct features	Examples of value chain
Centralized	• Involves large firms and a large number of smallholders • Most suitable for commodities that require significant logistics and processing	Coffee, milk, tea, sugarcane
Nucleus estates	• Involves large firms and independent producers • Sometimes used only for research or breeding purposes • Mainly used for perennial crops	Oil palm, mango, citrus
Intermediary	• Contract between a firm and a broker, who represents the farmer • Possible risk of losing control over production in terms of quality, quantity, and prices	Avocado
Multipartite	• Contract between a firm and an NGO or a public entity and private firms	
Informal	• Characterized by seasonal arbitrary production contracts with individual traders or small firms • Contracts usually verbal • Contracts do not require high quality standards	Vegetable and fruits

Source: Authors based on Eaton and Shepherd (2021).

Contract farming for fresh produce in Kenya

The horticultural sector provides an ideal case study for investigating the issues and potential of contract farming in Kenya. The fresh produce-based food economy (including fruits and vegetables) forms a relatively important and dynamic subsector contributing around 36 percent to total agricultural activity, and its gross value is growing at between 15 and 20 percent per year. With growing demand, the Kenyan export market for fruits and vegetables has grown significantly. Notably, avocado production and export in Kenya has trended upward in recent years (HCD 2017), leading farmers in some regions of the country, such as Meru, to shift from traditional cash crops like coffee and tea to avocado.

However, despite the high growth potential, smallholders have not yet realized the full benefits of the sector, owing to various challenges. Kenya's avocado sector has become so lucrative that organized criminal gangs have begun to target growers, forcing them to hire security guards to protect the trees at night. Under the threat of organized cartels, farmers are being forced to harvest early in order to save their crop. Early harvesting, however, significantly reduces the quality and makes the avocado unacceptable for export. Because of quality issues and growing domestic market demand, only about 20 percent of

the harvest is exported. In 2021, these avocado exports earned Kenyan farmers $132 million (Igunza 2022).

Smallholder avocado producers—who account for most of the production—also face challenges related to the traditional nature of the production, marketing, and supply chain. Many have limited access to production technologies, institutional credit, and knowledge, and face high marketing risks that diminish their incentive to participate in fresh produce value chains. Other challenges include poor infrastructure (Omosa 2006), lack of access to current and reliable market information, difficulty in accessing inputs and advisory services, and lack of postharvest handling facilities, including cold chains for the supply of quality produce (World Bank 2008). As result, Kenyan avocado and other fresh produce exporters are increasingly looking at contract farming as a means to address these challenges and improve the integration of the smallholder avocado producers into export value chains.

Several NGOs have made an effort in Kenya to promote contract farming for fresh produce. For example, in 2004, East African Growers (EAG) started providing extension services and training on topics such as manure application, pruning, grafting, spraying, and grading, and arranged for the collection and transport of produce from farmers who sold the avocados to EAG. Indu-Farm Ltd. had signed contracts with farmers to educate them on the Euro-Retailer Produce Working Group for Good Agricultural Practice (EurepGAP) certification, while farmers supplied avocados to the firm. In 2006, the United States Agency for International Development (USAID) funded a program, Kenya Business Development Services (KBDS), which sensitized farmers and developed a spraying regime that met market requirements with farmers.

However, most of these arrangements have not been sustainable in the avocado value chain. In most cases, it is the smallholder farmers who breach contracts, by selling directly to brokers at the farmgate in exchange for cash. In the absence of organized market information systems, and when small farmers need cash for small quantities sold, "spot market" transactions directly with brokers at farmgate reduce product marketing costs and provide liquidity to farmers to meet immediate needs. However, this also may reduce the advantages from aggregation and collective bargaining through farmers groups that contract farming offers. Compared with other developing countries, earlier literature reported a higher failure rate of contract farming schemes in Kenya owing to contract biases against producers and poor enforcement (Singh 2002; Minot and Ngigi 2010; Minot and Sawyer 2016).

Additionally, Ochieng, Veettil, and Qaim (2017) identify high transaction costs, less transparent quality grading, and unfair risk-sharing arrangements as

factors contributing to low farmer participation and high rates of dropout in contractual arrangements. This implies that there is a need for all stakeholders to better understand the challenges and find optimal solutions to make contract farming an attractive and sustainable venture for smallholder farmers. Also, side-selling is a major impediment to contract farming, especially when sellers do not feel well rewarded for their produce or see the long-term benefits of staying in the arrangement. Side selling is a common problem for avocado and less-established buyers. For bigger buyers (for example, export value chains), the difficulty that smaller suppliers face in meeting food safety, quality, and sustainability standards can be a major challenge (Minot and Sawyer 2016; Amare et al. 2019).

Strong public support might also be justified in view of the full social benefits resulting from diversification of cereal-based production systems toward high-value tree crops like avocado. Although empirical evidence is limited, avocado farming as a tree-based, low external input economic activity is more climate-resilient, environmentally sustainable, and nutrition-smart than cereals production, and its higher returns are likely to offer a better path in land-scarce areas for marginal and smallholder farmers to lift themselves out of poverty. In land-scarce dryland regions, farmers growing basic staples under rainfed conditions are less likely to "farm themselves out of poverty" (Harris and Orr 2014). Additionally, the Government of Kenya needs to develop policies and legal frameworks that enable and foster contract farming approaches in avocado farming. Such frameworks should require that contracts be established in a transparent and mutually beneficial manner; smallholder producers are protected from any exploitative practices; and contracts are enforced fairly through the existing judicial system, including mechanisms for third-party arbitration and adjudication of disputes. This requires trust building through repeated engagements, offering competitive prices and timely payments, and standardization of the collection process to reduce rejection of quality produce.

Effect of participation in high-value produce on inclusion and livelihoods of farmers

Inclusion of smallholder farmers and producers in fresh produce value chains through contract farming is expected to generate income benefits and improve their well-being. There is, however, mixed evidence on how smallholders' participation in contract farming affects their livelihoods. Even though there is evidence that access to produce markets via contracting has positive impacts on participants' welfare (Ashraf, Gine, and Karlan 2008; Bolwig, Gibbon, and Jones 2009; Miyata, Minot, and Hu 2009; Bellemare 2012; Bolwig 2012), this has been inconclusive. While significant and positive impacts have been

found on smallholders' incomes (Miyata, Minot, and Hu 2009; Olomola 2010; Bellemare 2012; Ogutu, Ochieng, and Qaim 2020), some authors have found it to be less effective in generating benefits for smallholders (Glover and Kusterer 1990). Some scholars argue that the impact of contract farming on smallholder farmers' inclusion and livelihoods varies depending on the nature of the contract and the category of the firm in question (Gow 2000). For instance, Mwambi and colleagues (2016) found that the intermediary model of avocado contracting in Kenya did not favor producers because the farmers did not know the detailed terms of the contract agreed between the intermediary and the final buyer. These terms were negotiated by the intermediary without the farmers' involvement.

Regardless of the model adopted, fresh produce contract farming in developing countries has generally seen varied results. Positive impacts have been reported in cases where contracts provide productive resources such as technical assistance, credit, improved technologies, and other farm inputs required to increase production and productivity of nontraditional high-value crops and to reduce marketing risks (Glover 1984; Williams and Karen 1985). Birthal, Joshi, and Gulati (2005) examined contract production of vegetables in India, where innovative arrangements were made for production and marketing. Their results showed that contract farmers received higher prices compared with farmers who were not under contracts. This is also consistent with Minten, Randrianarison, and Swinnen (2009), who found that vegetable contract farming in Madagascar yielded positive outcomes, including higher welfare, more income stability, and shorter lean periods for contract farmers as compared with their counterparts who were not under any form of contract.

However, such development impact is not ensured—the right incentives and contracting systems are often required to achieve inclusive and efficient results. In most developing countries, contract farming arrangements that succeeded in engaging and benefiting small-scale producers required the presence of enabling conditions and mutually beneficial agreements between the parties involved. For instance, the positive evidence, in terms of higher incomes for smallholder farmers, from contract farming in horticultural production in Senegal found by Maertens and colleagues (2007) was attributed to guaranteed market access and access to inputs. Similarly, the positive impact reported by Minten, Randrianarison, and Swinnen (2009) could reflect farmers' access to seeds, fertilizer, and pesticides through the contracting firms.

Conversely, other research finds that some contracts favor large-scale farmers, leaving poorer farmers and smallholders out of the development process (Runsten 1992; Little and Watts 1994). Using nationally representative

survey data from six countries, Meemken and Bellemare (2020) find that contract farmers in most countries exhibit increased demand for hired labor, which suggests that contract farming could stimulate local employment, but contract farmers obtained higher incomes than their counterparts without contracts in only some countries. These results challenge the supposition that contract farming indisputably betters welfare. Similarly, Dubbert, Abdulai, and Muhammed (2021) assessed the participation of cashew farmers in contract farming in Ghana and find that participation had negative impacts on use of sustainable farm practices, which could reduce incomes and affect livelihoods. This evidence shows that contract farming experiences for the fresh produce sector vary by countries and commodities and implies that commodity- and country-specific contexts should be explored.

Overall, these findings indicate that contracts that have proved beneficial to the farmers and contractors—and hence promote inclusion—are those that are transparent and developed through a participatory process, managed effectively, and that allow both parties to cultivate trust as a basis for a long-term relationship (Eaton and Shepherd 2001). In such cases, decisions are made jointly with farmers, and the contractor covers only some part of the production and price risks (Key and Runsten 1999). This risk-sharing arrangement fosters active participation of all parties involved, which is an important factor in success. Ineffectiveness in fostering inclusion and farmer livelihoods, on the other hand, has been linked to contracts with unequal terms and a lack of capacity development and coordination among small producers that would enable them to engage and negotiate better bargains (da Silva 2005). For instance, farmers may lose bargaining leverage with the company if they invest in specialized assets and become overly reliant on their contract crops, compelling them to accept exploitative or less attractive contract terms (Warning and Key 2002). The next section summarizes evidence from a case study in Kenya.

Kenya case study: Avocado value chain

Avocado production and exports in Kenya

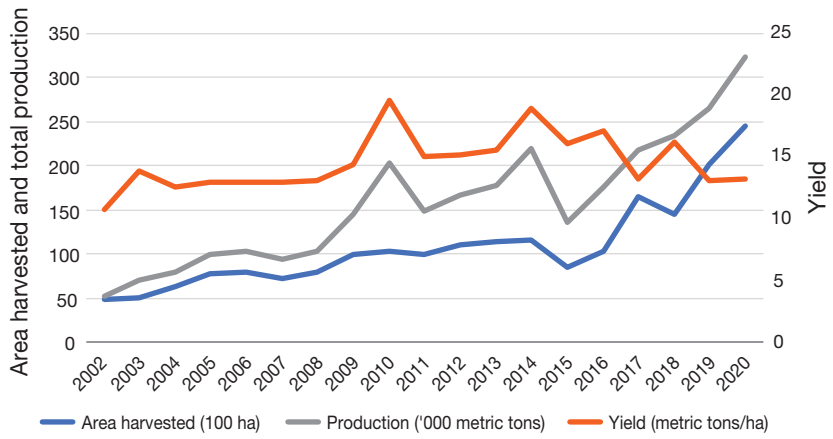
Kenya is one of the fastest-growing fresh produce exporters in the world—and avocado is the world's fastest-growing fruit in terms of popularity (Altendorf 2017; Kathula 2021). Avocados are grown in various agroecological zones in Kenya, primarily by smallholder farmers for subsistence and/or sale in local and export markets. The Central and Eastern regions account for about 70 percent of avocado production in the country, with the former being the leading producer (Johnny et al. 2019). Local varieties account for roughly 70 percent

of overall avocado production in Kenya, while Fuerte and Hass, two improved avocado varieties appropriate for the export market, account for approximately 20 percent and 10 percent, respectively (HCD 2015).

The Hass variety has a dark green and brown skin that is not thick when mature and can easily be removed from the pulp. It has a small seed with a nonfibrous pulp and is often referred to as a "brown skin." It is vigorous and highly productive, with an oil content of over 21 percent (Gupta et al. 2018). The Fuerte variety, referred to as "green skin," has a smooth, green skin with medium thickness. It has a big seed and a buttery pulp. Its oil content is about 16–18 percent (Saenger et al. 2013). Compared with Fuerte, the Hass yields a higher price, attributed to its higher oil content, higher resistance to pests and diseases, and ability to hide bruises. This has led to an increasing shift in production from Fuerte toward Hass.

With increased commercialization, notable growth has been recorded in both total hectares harvested and overall production over the years (Figure 15.1). The total area under avocado in 2013 in Kenya was about 11,000 ha. Area and production more than doubled between 2011 and 2020—increasing by 145 percent and 116 percent, respectively (FAO 2022). Most Kenyan avocado farmers are found in Murang'a, Nyeri, Kiambu, Kisii, Meru, and the entire Mount Kenya region. But avocado is also grown in smaller quantities in other counties, such as Nandi, Bomet, Uasine Gishu, Trans-Nzoia, Bungoma, and

FIGURE 15.1 Trends in avocado area harvested, production, and yield in Kenya



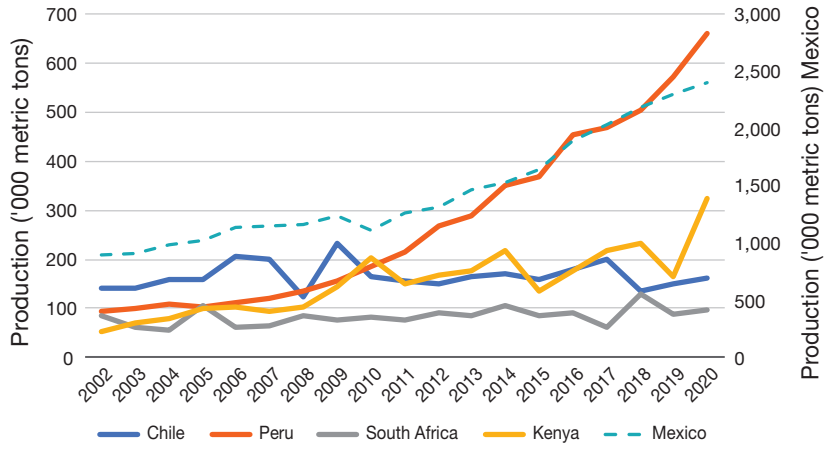
Source: FAO (2022); HCD (2015).

Siaya (Mwambi et al. 2016). Avocado exports to Europe nearly tripled in value between 2013 and 2017, according to the Dutch Centre for the Promotion of Imports from developing countries. This impact is being felt thousands of miles away, on farms in Kenya's highlands, where growers' fortunes are changing.

Avocado has emerged as the major fruit trade in the Kenyan export market in recent years, accounting for more than 7 percent of horticultural exports (HCDA 2015). Kenya is the third-largest producer (behind Mexico and Peru) and ranks eighth in the world on the list of largest exporters (Snel et al. 2021), with production reaching more than 300,000 metric tons in 2020 (Figure 15.2). This position clearly demonstrates the avocado crop's expanding potential and relevance in contributing to numerous aspects of economic development, such as raising rural household incomes, job creation, and export diversification.

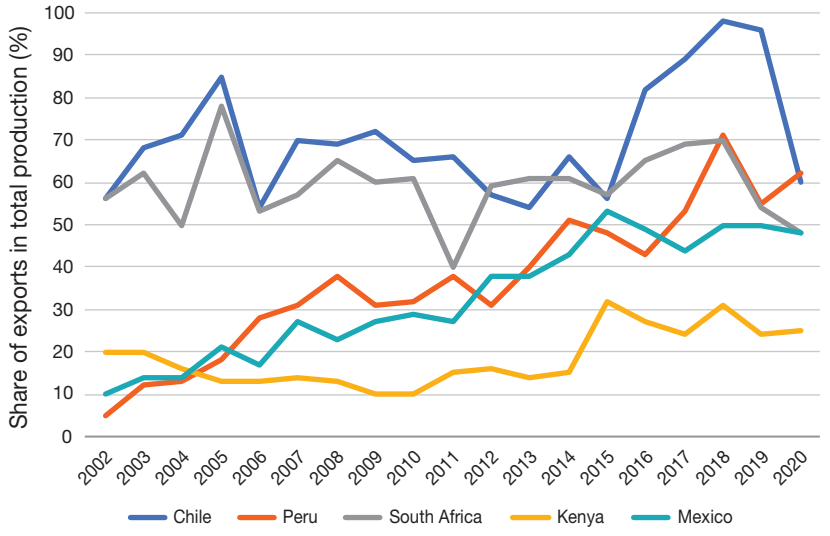
Kenya's share of exports in total production by volume, however, ranks low compared with the other major avocado exporters. Chile and South Africa export about 60 percent and 55 percent of their total production, respectively; Kenya exports only about 20 percent. Moreover, the export share in total production has declined in Kenya over time, showing about a 20 percent decrease between 2015 and 2020 (Figure 15.3). The challenges in increasing the export share of production are often attributed to poor quality, in terms of both size and preferred varieties; lack of regulatory standards; weak institutional capacity of small-scale producers; and inadequate capacity and coordination of fruit

FIGURE 15.2 Trends in avocado production for major producing countries



Source: FAO (2022).

FIGURE 15.3 Trends in the share of exports in total production of major avocado exporters



Source: HCD (2015); FAO (2022).

exports. Poor quality owes primarily to small-scale farmers' lack of knowledge of current production procedures, as they have traditionally produced the fruit for domestic markets or noncommercial purposes, as well as limited distribution and uptake of market-preferred varieties (Amare et al. 2019). Given the weak organization of avocado markets, most smallholder growers market their avocados through brokers, who may be legally certified agents or unofficial actors who take advantage of the unorganized supply chain.

Aware of the underused export opportunities from this sizeable production, Kenya's government has been assisting smallholder farmers by connecting them to exporters via out-grower initiatives such as the Kakuzi scheme for smallholder avocado farmers.[1] Contract farming connects a few small-scale growers to exporters, primarily in Murang'a county in Central Kenya, as well as in Eastern Kenya. Smallholders grow avocado as a new high-value farm diversification option; they keep livestock and produce maize and other fruits and vegetables, except those close to Nairobi city (such as the Kiambu area) (Amare et al. 2019).

1 Kakuzi is a large-scale agricultural enterprise located in Kiambu County, Kenya. It has a number of outgrower schemes, which are partnerships between the firm and smallholder farmers.

Impact of avocado contract farming in Kenya

Evidence from these avocado contract farming experiences in Kenya shows that participation in contracting is not sufficient to enhance the inclusion of smallholders in beneficial value chains and increase their incomes, especially where contract terms are unclear. According to Amare and colleagues (2019), farmers involved in export markets differ significantly from those who are not: their farms are relatively larger; they have had more training and own more Hass avocado trees, which have greater market value; and they tend to be older. Also, there is a positive link between participation in well-functioning avocado farmers' associations and participation in export markets. Participation in avocado export markets is associated with positive impacts on incomes, revenues, prices, and labor inputs.

Evidence shows that, while contract farming facilitates the inclusion of smallholder farmers in avocado value chains, this is skewed more toward farmers with larger endowments and planted areas and less effective in supporting the participation and inclusion of smaller and marginal farmers (Amare et al. 2019). These findings indicate that, when contract farming participating grower associations bring together farmers who own mature trees of market-preferred species, inclusion and beneficial gains are limited to those farmers who are group members. To enhance inclusion, there is a need for additional support and capacity development to organize and support non-benefiting growers to progressively improve their capacity and effectively engage in avocado value chains. This could also further increase the volume of production and expand export markets and, as demand increases, spur efforts to engage more farmers.

Other studies have found similar evidence on inclusion and livelihood impacts at the household level. Mwambi and colleagues (2016) found that, despite a positive and significant effect on avocado income, with a $48–67 increase annually, this did not translate into higher household income, indicating that contract farming triggers some trade-offs between alternative income sources of smallholder avocado farmers. Also, the issues of side-selling and breach of contract were evident, partly because the fundamental aspects of the contract, such as the pricing and grading mechanisms, were not fully explained to the growers. Thus, to make contracts equally appealing and mutually beneficial for all parties involved, it is imperative to consider the conditions necessary to influence participation in contract framing, such as enhancing the knowledge and capacity of producers through education and advisory services, access to credit, and transparency about contract terms.

From a gendered perspective, a recent study by Muriithi and Kabubo-Mariara (2022) on the dynamics and role of gender in high-value avocado farming in Kenya found, contrary to past reports of men dominating cash crop farming, that gender was not a strong determinant of participation in avocado farming, with evidence of increased women's engagement in the suburbs of Nairobi city. However, the gender disaggregation showed that men-headed household participants were younger, had more years of schooling, and had more Hass trees than women-headed households. Conversely, women-headed households were better off in terms of access to finance, while no significant difference was found in terms of social capital and networking. The authors also highlighted the number of improved productive avocado trees as a prerequisite for participating in high-value avocado markets.

Many factors shape the positive impacts of contract farming. For instance, the null effect found among avocado farmers in Kenya has been attributed to the nature of the contract (intermediary model), which exposes farmers to price and production risks, among other factors (Mwambi et al. 2016). Where producers are not directly involved in negotiations, unclear contract terms are likely to negate the benefits of contracting, since incidents of side selling to other buyers offering lower but immediate payments may be common, leading to poor inclusion and lack of impact in terms of improving livelihoods. This indicates that the effects of contract farming on the inclusion of farmers in value chains and impacts on their livelihoods cannot be generalized and should instead be assessed and interpreted based on the specific context and contracting models, to identify and distill the underlying drivers and success factors.

Overall, most of the existing literature finds contract farming to be beneficial in increasing income and improving farmers' livelihoods. Using a gender lens, we see that in comparison with women, the men who participate in avocado contract farming are reportedly younger and more educated (Muriithi and Kabubo-Mariara 2022). Thus, they are likely to be more skillful and make better use of market information, consequently reducing market and other transaction costs.

Conclusions: Lessons and policy implications

Drawing evidence from the avocado sector in Kenya, this chapter has documented contract farming practices and challenges and opportunities in enhancing market access and inclusion for small-scale producers of perishable but high-value commodities in developing countries. To this end, it conducted a comprehensive review of relevant literature and analyzed data on avocado

area and production, using descriptive but informative tools, to understand patterns in avocado production and exports. Results show that, even though participation in fresh produce value chains through contract farming could improve competitiveness and generate positive outcomes for smallholders, their level of participation is still low, explained by significant impediments including lack of technical knowhow, trust, innovations, access to market information, and training to enter and sustain engagements in globally competitive avocado export value chains. The mixed evidence on the impacts of participation in high-value produce on livelihoods is attributed to the varying contract farming models, the nature of firms, and the low level of producers' involvement in the implementation of contracts.

Given the knowledge-intensive nature of the avocado value chain and the potential social benefits to Kenya, public support and incentives to strengthen smallholder capacity and that of small and medium enterprises can play an important role in boosting global competitiveness, inclusion, and the creation of decent jobs in the avocado sector. For individual smallholder growers to access attractive markets and benefit from export opportunities, and make contract farming a successful strategy to transform the avocado economy in Kenya, it is particularly important to address the major impediments to smallholders' engagement and implement policies to strengthen both the incentives for and the loyalty of the contracting partners.

First, there is a need to invest in training on sustainable production, harvesting, and postharvest management techniques, and in the prevention of theft and illegal cartels that force farmers to harvest fruits early. Training on avocado production, harvesting, and handling methods could improve farmers' production techniques, thereby reducing the share of production rejected and increasing sales of high-quality avocados to the market. Also, training on the advantages of quality and advance contracting for accessing competitive markets may discourage side selling by raising farmers' knowledge about the benefits of contract farming and improving their marketing skills. Accordingly, when farmers become aware that they could obtain a higher value through contracts, they may be motivated to sell via agreed channels instead of side selling. Timely payment is critical and may need to be considered as part of contracting. Government may also play a role as part of creating the enabling environment.

Second, to build trust among contracting partners, there is a need to enforce contracts through a third-party such as the HCD, and to establish trust between farmers' groups and exporters. This can be done by disseminating relevant and up-to-date market information, such as on quality requirements and prices, as well as supporting avocado farmers—to improve productivity, quality, and

consistency of supply. Also, there is a need to modernize the avocado sector through digital marketing platforms and e-commerce, to leverage Kenya's strong position in mobile banking and connectivity. Public–private partnerships (PPPs) can bring such innovation as well as best practices to improve the export demand for and competitiveness of Kenyan avocados. This is especially vital given the low proportion of smallholder produce that is exported and the lack of discipline among some exporters, which damages the credibility and reputation of Kenyan suppliers in global avocado markets. These are the noncompliant exporters who ship poor-quality avocados. Several exporters are currently reluctant to cooperate with researchers or provide information to develop and improve the avocado value chain, suggesting a need for PPPs to build trust and bring new ideas to modernize the avocado sector.

Creating an enabling environment for mainstreaming contract farming to strengthen agricultural value chains also requires appropriate legal frameworks, to facilitate contracting that entails clarity of terms, fairness, responsibility, and transparency to build trust in completing transactions between the different parties. Given the unequal market powers between the different parties, a legal framework would bring legal protection, uniformity, and consistency in engaging small-scale producers in the production and supply of products—including how the contracting parties will deal with desired quality, volume, timing, and prices through prior contracting. Legal frameworks can also facilitate access to finance and inputs for small producers when the buyer is willing to give technical advice and loans for contracted activities. This strengthens the bond and builds trust between the two parties. This can facilitate transformation of the fresh produce sector by improving access to productivity-enhancing inputs or upgrading essential infrastructure, such as irrigation; cold storage and transport; or equipment for harvesting, sorting, and grading of produce to meet required standards and reduce food loss for perishables.

Under clear legal frameworks, producer organizations can play a vital role in empowering small producers and in facilitating fair and transparent contracts, helping farmers sell their produce directly to food processors, retailers, or exporters. This has the potential to reduce transaction costs, improve producer prices, and enhance inclusion of small-scale producers, including women and youth. In place of internal economies of scale, reliance on external economies of scale through networking, associations, or other forms of grouping should be promoted. This could be among small enterprises or by linking small growers or enterprises with larger ones that no longer face major market entry barriers.

References

Altendorf, S. 2017. "Global Prospects for Major Tropical Fruits." In *The Food Outlook: Biannual Report on Global Food Markets,* 68–81. Rome: FAO.

Amare, M., J. Kabubo-Mariara, R. Oostendorp, and M. Pradhan. 2019. "The Impact of Smallholder Farmers' Participation in Avocado Export Markets on the Labor Market, Farm Yields, Sales Prices, and Incomes in Kenya." *Land Use Policy* 88: 104–168.

Amare, M., B. Shiferaw, H. Takeshima, and G. Mavrotas. 2021. "Variability in Agricultural Productivity and Rural Household Consumption Inequality: Evidence from Nigeria and Uganda." *Agricultural Economics* 52 (1): 19–36.

Ashraf, N., X. Gine, and D. Karlan. 2008. "Finding Missing Markets (and a Disturbing Epilogue): Evidence from an Export Crop Adoption and Marketing." Center Discussion Paper No. 967. Economic Growth Center, Yale University, New Haven, CT.

Barrett, C.B., M.E. Bachke, M.F. Bellemare, H.C. Michelson, S. Narayanan, and T.F. Walker. 2012. "Smallholder Participation in Contract Farming: Comparative Evidence from Five Countries." *World Development* 40 (4): 715–730.

Barrett, C.B., T. Reardon, J. Swinnen, and D. Zilberman. 2020. "Agri-food Value Chain Revolutions in Low- and Middle-Income Countries." *Journal of Economic Literature* 58: 1–67.

Bellemare, M.F. 2012. "As You Sow, So Shall You Reap: The Welfare Impacts of Contract Farming." *World Development* 40 (7): 1418–1434.

Bijman, J. 2008. *Contract Farming in Developing Countries: An Overview of the Literature*. Wageningen, Netherlands: Wageningen University.

Birthal, P.S., P.K. Joshi, and A. Gulati. 2005. "Vertical Coordination in High-Value Commodities: Implications for Smallholders." IFPRI Discussion Paper 85. International Food Policy Research Institute (IFPRI), Washington, DC.

Bolwig, S. 2012. "Poverty and Gender Effects of Smallholder Organic Contract Farming in Uganda." Uganda Strategy Support Program Working Paper 8. IFPRI, Washington, DC.

Bolwig, S., P. Gibbon, and S. Jones. 2009. "The Economics of Smallholder Organic Contract Farming in Tropical Africa." *World Development* 37 (6): 1094–1104.

Coulter, A., V. Entwistle, and D. Gilbert. 1998. *Informing Patients: An Assessment of the Quality of Patient Information Material*. London: King's Fund.

da Silva, C. 2005. "The Growing Role of Contract Farming in Agrifood Systems Development; Drivers, Theory and Practice." Working paper. FAO, Rome.

Dubbert, C., A. Abdulai, and S. Mohammed. 2021. "Contract Farming and the Adoption of Sustainable Farm Practices: Empirical Evidence from Cashew Farmers in Ghana." *Applied Economic Perspectives and Policy* 45 (1): 487–509.

Eaton, C., and A. Shepherd. 2001. *Contract Farming: Partnerships for Growth*. Rome: FAO.

FAO (Food and Agriculture Organization of the United Nations). 2017. *Major Tropical Fruits: Market Review*. Rome.

FAO. 2022. *Major Tropical Fruits: Market Review—Preliminary Results*. Rome.

Glover, D. 1984. "Contract Farming and Smallholder Outgrower Schemes in Less-Developed Countries." *World Development* 12 (11): 1143–1157.

Glover, D., and K. Kusterer. 1990. *Small Farmers, Big Business: Contract Farming and Rural Development*. New York: St Martin's Press.

Gow, H. 2000. "Restructuring the Agribusiness Sector and the Role of Foreign Direct Investment." In *Agricultural Policy and Enlargement of the European Union*, eds. A. Burrell and A. Oskam, 201–216. Wageningen, Netherlands: Wageningen Press.

Gupta, S.K., P. Singhal, A. Singh, R. Chauhan, and B. Kumar. 2018. "Nutritional and Pharmaceutical Benefits of Avocado Plant." *Journal of Advanced Scientific Research* 9 (2): 4–11.

Harris, D., and A. Orr. 2014. "Is Rainfed Agriculture Really a Pathway from Poverty?" *Agricultural Systems* 123: 84–96.

Hart, C. 2001. *Doing a Literature Search: A Comprehensive Guide for the Social Sciences*. London: SAGE Publications.

HCD (Horticultural Crops Directorate). 2015. *Horticultural Crops Production Report*. Nairobi: Government Printer.

HCD. 2017. *Horticulture Validated Report 2016-2017*. Nairobi: Government Printer.

Hung Anh, N., W. Bokelmann, N. Thi Thuan, T. Do Nga, and N. Van Minh. 2019. "Smallholders' Preferences for Different Contract Farming Models: Empirical Evidence from Sustainable Certified Coffee Production in Vietnam." *Sustainability* 11 (14): 3799.

Igunza, E. 2022. "Kenyan Vigilantes Taking on Avocado Gangs." BBC News, 16 January.

Johnny, E.G., J.K. Mariara, R. Mulwa, and G.M. Ruigu. 2019. "Smallholder Avocado Contract Farming in Kenya: Determinants and Differentials in Outcomes." *African Journal of Economic Review* 7 (2): 91–112.

Kathula, D.N. 2021. "Avocado Varieties and Export Markets for Sustainable Agriculture and Afforestation in Kenya." *Journal of Agriculture* 5 (1): 1–26.

KEHPA (Kenya Horticultural Export Promotion Authority). 2015. *The Kenya Avocado Industry: A Review of the Status and Opportunities*. Nairobi.

Key, N., and D. Runsten. 1999. "Contract Farming, Smallholders, and Rural Development in Latin America: The Organization of Agro Processing Firms and the Scale of Out Grower Production." *World Development* 27 (2): 381–401.

Kirsten, J., and J. Sartorius. 2002. "Linking Agribusiness and Small-Scale Farmers in Developing Countries: Is There a New Role for Contract Farming?" *Development Southern Africa* 19 (4): 505–529.

Little, P., and M. Watts. 1994. *Living under Contract: Contract Farming and Agrarian Transformation in Sub-Saharan Africa*. Madison, WI: University of Wisconsin Press.

Maertens, M., and J.F.M. Swinnen. 2007. "Standards as Barriers and Catalysts for Trade and Poverty Reduction." *Journal of International Agricultural Trade and Development* 4 (1): 47–61.

Maertens, M., L. Dries, F.A. Dedehouanou, and J.F.M. Swinnen. 2007. "High-Value Global Supply Chains, EU Food Safety Policy and Smallholders in Developing Countries: A Case-study from the Green Bean Sector in Senegal." In *Global Supply Chains, Standards and the Poor*, ed. J.F.M. Swinnen, 159–172. Oxon, UK: CABI Publishing.

Meemken, E., and F.M. Bellemare. 2020 "Smallholder Farmers and Contract Farming in Developing Countries." *Proceedings of the National Academy of Sciences* 117 (1): 259–264.

Minot, N. 2011. "Contract Farming in Sub-Saharan Africa: Opportunities and Challenges." Paper presented at a policy seminar, Smallholder-led Agricultural Commercialization and Poverty Reduction: How to Achieve It, April 18–22, 2011.

Minot, N., and M. Ngigi. 2004. "Are Horticultural Exports a Replicable Success Story? Evidence from Kenya and Côte d'Ivoire." IFPRI Discussion Paper 120. IFPRI, Washington, DC.

Minot, N., and B. Sawyer. 2016. "Contract Farming in Developing Countries: Theory and Practice, and Policy Implications." In *Innovation for Inclusive Value Chain Development: Successes and Challenges*, eds. A. Devaux, M. Torero, J. Donovan, and D. Horton, 127–158. Washington, DC: IFPRI.

Minten, B., L. Randrianarison, and J.F. M. Swinnen. 2009. "Global Retail Chains and Poor Farmers: Evidence from Madagascar." *World Development* 37 (11): 1728–1741.

Miyata, S., N. Minot, and D. Hu. 2009. "Impact of Contract Farming on Income: Linking Small Farmers, Packers, and Supermarkets in China." *World Development* 37 (11): 1781–1790.

Muriithi, B., and J. Kabubo-Mariara. 2022. "The Dynamics and Role of Gender in High-Value Avocado Farming in Kenya." *European Journal of Development Research* 34: 2272–2304.

Mwambi, M.M., J. Oduol, P. Mshenga, and M. Saidi. 2016. "Does Contract Farming Improve Smallholder Income? The Case of Avocado Farmers in Kenya." *Journal of Agribusiness in Developing and Emerging Economies* 6 (1): 2–20.

Ochieng, D.O., P.C. Veettil, and M. Qaim. 2017. "Farmers' Preferences for Supermarket Contracts in Kenya." *Food Policy* 68: 100–111.

Ogutu, S.O., D.O. Ochieng, and M. Qaim. 2020. "Supermarket Contracts and Smallholder Farmers: Implications for Income and Multidimensional Poverty." *Food Policy* 95: 101940.

Okello, J.J., and S.M. Swinton. 2007. "Compliance with International Food Safety Standards in Kenya's Green Bean Industry: Comparison of a Small- and a Large-Scale Farm Producing for Export." *Applied Economic Perspectives and Policy* 29 (2): 269–285.

Olomola, A.S. 2010. "Enhancing Productivity, Income and Market Access of Rural Producers in Africa: The Case of Contract Farming in Nigeria." Paper presented at the Inaugural National Science Foundation (NSF) Joint Workshop of the African Economic Research Consortium (AERC) and the International Growth Centre (IGC), Mombasa, Kenya.

Omosa, M. 2006. "Towards Food Security in Africa: Theories Images and Realities." *Eastern Africa Journal of Development Studies* 1 (1): 43–61.

PEP (Partnership for Economic Policy). 2018. *Avocado Contract Farming in Kenya: Does It Work?* NWO/WOTRO project Productive Employment in the Segmented Markets of Fresh Produce, 2014-17. Policy Brief No. 178.

Prowse, M. 2012. *Contract Farming in Developing Countries: A Review*. Vol. 12. Paris: Agence Française de Développement.

Ruben, R. 2017. "Impact Assessment of Commodity Standards: Towards Inclusive Value Chains." *Enterprise Development and Microfinance* 28 (1): 82–97.

Runsten, D. 1992. "Transaction Costs in Mexican Fruit and Vegetable Contracting: Implications for Association and Participation." Paper presented at the XVIII International Congress of the Latin American Studies Association, Atlanta, GA, March 10–12.

Saenger, C. , M., Qaim, M. Torero, and A. Viceisza. 2013. "Contract Farming and Smallholder Incentives to Produce High Quality: Experimental Evidence from the Vietnamese Dairy Sector." Agricultural Economics 44: 297–308.

Simmons, P., P. Winters, and I. Patrick. 2005. "An Analysis of Contract Farming in East Java, Bali, and Lombok, Indonesia." *Agricultural Economics* 33: 513–525.

Singh, S. 2002. "Contracting Out Solutions: Political Economy of Contract Farming in the Indian Punjab." *World Development* 30 (9): 1621–1638.

Snel, H.J., J. Broeze, F.S. Kremer, and E. Osena. 2021. *Opportunities to Reduce Post-harvest Losses in the Kenyan Avocado Sector through Agro-processing and Agro-logistics.* Wageningen, Netherlands: Wageningen Centre for Development Innovation.

Snodgrass, D., and J. Sebstad. 2005. *Assessing the Impact of Kenya BDS and Horticulture Development Center Projects in the Tree Fruit Value Chain in Kenya. Baseline Research Report*. Microreport No. 33. United States Agency for International Development (USAID): Washington, DC.

Subervie, J., and I. Vagneron. 2013. "A Drop of Water in the Indian Ocean? The Impact of GlobalGap Certification on Lychee Farmers in Madagascar." *World Development* 50: 57–73.

Ton, G., S. Desiere, W. Vellema, S. Weituschat, and M. D'Haese. 2017. "The Effectiveness of Contract Farming in Improving Smallholder Income and Food Security in Low- and Middle-Income Countries. A Mixed-Method Systematic Review." Washington, DC: International Initiative for Impact Evaluation (3ie).

USAID (United States Agency for International Development)/Kenya. 2008. *Impacts of the KBDS and KHDP Projects in the Tree Fruit Value Chain in Kenya*. Microreport No. 129. Nairobi.

Warning, M., and N. Key. 2002. "The Social Performance and Distributional Consequences of Contract Farming: An Equilibrium Analysis of the *Arachide de Bouche* Program in Senegal." *World Development* 30 (2): 255–263.

Williams, S., and R. Karen. 1985. *Agribusiness and the Small-Scale Farmer: A Dynamic Partnership for Development*. Boulder, CO: Westview Press.

World Bank. 2008. *World Development Report 2008: Agriculture for Development*. Washington, DC: World Bank.