Food traceability in the domestic horticulture sector in Kenya:
An overview
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Introduction
Food scandals and other food safety-related incidents have accentuated the need for consumer protection. Food quality and safety incidences can, apart from being a public health hazard, potentially cause national and international crises in economic and marketing relations. Traceability systems play a key role in facilitating an integrated supply chain management to ensure accountability of food safety and quality at any given point. Traceability systems have three characteristics: identification of units/batches of all ingredients and products; registration of information on when and where units/batches are moved or transformed, and; a system linking this data and transferring all relevant traceability information with the product to the next stage or processing step.

Establishing and implementing a traceability system alone is not sufficient to fulfil food safety and quality requirements in the supply chain, but it should rather be seen as a complementary tool to guide the activities towards achieving quality and safety.

Traceability systems are currently being implemented in the Kenyan horticulture sector, even though most of the smallholder producers do not realize that they exist or even understand the importance of traceability implementation.

This brief gives an overview of the available commercial traceability systems in Kenya (on the basis of their availability, affordability, accessibility, adaptability) and provides options for actors operating in the domestic horticulture sector in Kenya, with the aim of using traceability as a tool to stimulate investments in food safety and quality assurance.

Key messages
Traceability systems play a key role in facilitating an integrated supply chain management to ensure accountability of food safety and quality at any given point.

The traceability systems in this study provide options for actors operating in the domestic horticulture sector in Kenya, with the aim of using traceability as a tool to stimulate investments in food safety and quality assurance.

Key messages based on accessibility, availability, affordability and adaptability:

**eProd:** The most affordable system for larger groups of farmers producing multiple crops as well as dairy. Accessible for multiple products and supply chains, allowing crowdfunding by multiple traders. The system however requires centralised administration to justify the upfront investment cost as well as annual licenses.

**Farmforce:** The most affordable system for small groups of farmers, however, the cost quickly escalates as the number of users grow. It is tailored for horticulture (accessible for horticultural traders and market actors) and is tailored with features that enable confidence in data’s and information recorded.

**Similarities (ePROD and Farmforce):** They operate local offices with capacity for ongoing support. Users however have to travel to Nairobi or pay logistical costs for implementers outside Nairobi. They are flexible allowing for data interoperability and multiple functionality including managing credit, access to inputs and finance, standards compliance as well as product risk management. They can be adapted to interlink with financial and analytical software’s in the market.

**The National Horticulture Traceability System:** It remains the most affordable as users can access a free license and training during the pilot phase and only pay once it is commercialised. Risk is it is not yet clear how the platform will operate, producers are still in a “wait and see” mode.

**Manual paper-based systems:** The most common form of traceability systems. Require knowledge on how to organise documentation and record keeping at all levels of the chain. Most affordable with regard to set-up and maintenance costs. Most accessible as capacity to implement traceability has been built in the export market segment over time. However, their limitation is in the ability to organise multiple actors to keep and share reliable data. Within the domestic segment, also the most unreliable when it comes to tracking back lots that may require reliable information on origins due to the fragmentation and information asymmetry in the supply chain. They are therefore difficult to adapt because data is hardly aggregated and organised to provide information for management.
Available Commercial Traceability Systems in Kenya

Three traceability systems were found to be commercially available in Kenya including ePROD, Farmforce and the national horticulture Traceability System.

a) ePROD

The ePROD system was launched commercially in the market in 2015 from its roots as a private system by a chilli pepper consolidator into a commercial enterprise so far managing over 240,000 farmers across the eastern Africa region through 64 active licenses in diverse agricultural sectors both in domestic and global markets. The system is available to any actor in the supply chain and is installed on a PC as a license with the option of creating cloud-based back-ups. Licensees pay an annual fee of €2,500 for up to 5,000 farmers and €4,000 for unlimited number of farmers. ePROD allows tracking and tracing of lots from seed to the market through creation of comprehensive farmer profiles, registration and monitoring of internal farm operations and productivity, management of credit systems for inputs and finances as well as compliance and impact measurement. The data which is registered in the system is owned and managed by the licensee who also control the kind of reports that can be extracted from the system and their accessibility.

b) Farmforce

Farmforce was initially developed by Syngenta Foundation in 2013 and later sold to Farmforce AS of Norway. Farm Force software is mainly cloud based and is linked to a mobile app that allows for offline data collection. The system is mainly tailored for horticulture. It is not clear how many licenses Farmforce has issued although it was reported to be active within the horticultural sector in Kenya. The cost of implementing Farmforce is dependent on the number of users with a one-off set up cost being €1,650 with an additional fee of €460 per user per year.

c) The National Horticulture Traceability System

The National Horticulture Traceability System (HTS) was established through a project of the Horticultural Crops Directorate of Agriculture and Food Authority (AFA-HCD) with support from USAID Kenya Agricultural Value Chain Enterprises (KAVES) programme and is intended for improving information utilization relating to the production and handling of fresh produce in Kenya. The HTS has not yet been commercialized as it still is in piloting phase. For this reason, related costs have not been set yet and no insights have been drawn from the piloting. Awareness of the HTS is only among the horticulture exporting companies. The HTS has been fitted with a module that enables the horticultural crops directorate (HCD) to monitor and regulate the supply chain players (farmers, consolidators, markets etc.).

Comparative costs

The full one-off set up costs and first year cost of implementation of the selected traceability systems in Kenya was found to be €37,000 for the National Horticulture Traceability System, €39,750 for ePROD, and €49,650 for Farmforce. These costs take into account the required hardware, training and personnel supporting up to 5,000 farmers.

Other systems studied include the paper-based systems as well as those not currently available in Kenya e.g. AgriPlace, SourceTrace, Farmsoft, and IBM Blockchain. The IBM Blockchain has recently entered the Kenyan market through a business-to-business logistics company that works with more than 2,500 vendors of fresh fruits and
vegetables (bananas, onions, tomatoes, and potatoes). With the technology, the company is able to efficiently offer micro-lending services to the vendors to boost their working capital. There is a potential for the technology to be expanded to become a traceability system.

**Key Findings**

a) Availability

The export platform has already adapted traceability systems (manual and electronic) that provide a learning platform for the domestic market. The most common form of traceability systems even for the export segment are manual. These require knowledge on how to organise documentation and record keeping at all levels of the chain. Among the e-traceability stems, ePROD is already being used by dairy processors in the Kenya domestic market as well as sesame consolidators in Ethiopia to manage their supply chains. The domestic market segment for horticulture could learn from the segment that has already taken up traceability systems how the same can be tailored for use towards the domestic market. Farmforce is tailor made for horticulture and is tailored with features that enable confidence in data’s and information recorded.

b) Affordability

Manual paper-based traceability systems remain the most affordable systems with regard to set up costs and cost of maintaining the system. However, e-traceability systems enable multiple functionalities and increased utility value of the data that is recorded for purposes of traceability enabling payback for the upfront and annual investments through data inter-operability and sharing capabilities. The HTS remains the most affordable as users can access a free license and training during the pilot phase of the system and only pay for the same once it is commercialised. The risk in this is that since it is not yet clear how the platform will operate, producers are still in a “wait and see” mode.

Farmforce is the most affordable system for small groups of farmers, however, the cost quickly escalates as the number of users grow. ePROD is the most affordable system for larger groups of farmers producing multiple crops as well as dairy. The system however requires centralised administration to justify the upfront investment cost as well as annual licenses.

c) Accessibility

The manual paper-based traceability system remains the most accessible as capacity to implement traceability has been built in the export market segment over time. However, its limitation is in the ability to organise multiple actors to keep reliable data and to share the same if an issue is noted that requires traceability. Within the domestic segment, paper-based traceability systems will be most unreliable when it comes to tracking back lots that may require reliable information on origins due to the fragmentation and information asymmetry in the supply chain. ePROD is accessible for multiple products and supply chains, allowing crowding in by multiple traders. Farm Force is accessible for horticultural traders, as well as market actors. Both ePROD and Farmforce operate local offices with capacity for ongoing support. Users however have to travel to Nairobi or pay logistical costs for the implementers in the event that they are based out of Nairobi.

d) Adaptability

Manual paper-based systems are difficult to adapt especially as data is hardly aggregated and organised to provide information for management. However, ePROD and Farmforce are both flexible allowing for data inter-operability and multiple functionality including managing credit, access to inputs and finance, standards compliance as well as product risk management. The systems can be adapted to interlink with financial and analytical software's in the market.

**Recommendations**

We make the following recommendations regarding the currently available automated systems:

- eProd system is best suited for a large producer group or a firm in the value chain that intends to improve the efficiency of the operations and would like to offer safer and higher-quality products;
- Farmforce, on the other hand is suitable for a smaller producer group, or even individual farmer who wishes to simplify the management of the business and have access to more formal markets;
- The HTS system has not been tested sufficiently and is yet to be implemented by value chain actors supplying to the domestic market, it is very promising for uptake by the domestic sector as long as the cost of acquisition is kept low and implementation made voluntary and driven by the supply chain.

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**3R Kenya Project**

This brief is a product from the 3R Kenya project. The 3R Kenya (Resilient, Robust, Reliable. — From Aid to Trade) project is a learning initiative supported under the Agriculture and Food and Nutrition Security (FNS) program of the Embassy of the Kingdom of the Netherlands.

3R Kenya seeks to assess evidence and lessons from FNS and other related programmes that support competitive, market-led models in spurring agricultural development. It focuses on the aquaculture, dairy and horticulture sectors. 3R Kenya is executed at a time when Dutch government’s bilateral relations in Kenya are transitioning from a focus on Aid to Trade to enhance the development of agri-food sectors. Through evidence generation and stakeholder dialogue, 3R seeks to contribute to an understanding of effective conditions for sustainable inclusive trade for transforming resilient, robust and reliable agri-food sectors.
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