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REPUBLIC OF UGANDA

GLOBAL ALLIANCE FOR TRADE FACILITATION

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UGANDA'S SANITARY AND PHYTOSANITARY (SPS) INSPECTION PROCESS FOR THE EXPORT OF FRESH FRUITS AND VEGETABLES

Delivering valuable information to exporters and government through SPS process improvement and data analytics

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Executive summary

This paper focuses on the data collected and analyzed from May until end-October 2022 from process improvement of Uganda's SPS manual inspection process at the packhouses and at Entebbe Airport. A key goal of the improvement interventions was to promote efficiencies that would lead, in the long-term, to reduced time and cost for exports.

SPS Inspection process findings

The NPPO continues to conduct 100% inspections, which are time and cost-consuming. At the start of the project there was clear sectoral fragmentation, information asymmetry, lack of quality data and analytics and a perceived lack of trust and collaboration between exporters and agricultural inspectors. This created significant time and cost concerns for both exporters and the NPPO, as well as a lack of transparency and information that could facilitate better sectoral performance and decision-making.

Export highlights: The primary commodities exported during the period of analysis were avocadoes, sweet potatoes, garden eggs, bananas, and sugarcane. Hot pepper and chillis are exported in significant volumes between November and January but do not constitute more than 20% of total F&V exports.

SPS Inspection time and planning: Baseline data indicates that inspection time at the packhouses lasts 2.5 hours and between 1–2 hours at the airport. Primarily, due to the lack of cold storage infrastructure, 77% of inspections take place on the day of shipment, and 22% on the previous day.
SPS non-compliance: The project team collected data on product wastage and rejection, particularly at packhouses. This data is critical for assessing potential losses incurred by exporters and farmers due to products that are not exported. Commodity wastage and rejections frequently occur at the packhouse. Wastage (fresh produce that is not selected for export by quality controllers) amounted to around 5% of total consignments. Rejections (commodities not passed by agricultural inspectors after the first three stages of inspection) represented less than 1%. During the intervention period, only one interception was reported at the airport – relating to a consignment of hot peppers that contained a live quarantine pest. This represented less than 0.5% of SPS non-compliance/failure of total consignments (270) through the airport.

Time and Cost: Although companies were focused on improving their bottom lines, primarily by driving down supplier prices, none of them indicated any detailed assessment of the time and cost involved in fulfilling export procedures. This study essentially offers insights on new knowledge and understanding in this regard. It can enhance the future profitability of the sector.

On average, it takes 15.2 hours to prepare a consignment for export, translating to 910.26 hours a year, or 38 working days. Of this time, 56% is spent per consignment on inspection and product sorting. Sorters are paid by the hour and this task is done manually. Exporters incur, on average, US$ 88.06 per consignment to prepare for export, amounting to US$ 8,597 a year per exporter, with 90% of this cost comprising payments to agronomists, sorters, and quality controllers at packhouses.

Losses incurred due to SPS inspection process inefficiencies

The study found that wastage and rejection at packhouses cost almost US$ 300,000 a year, or US$ 4,477 per exporter. Wastage and rejection were also costing farmers around US$ 72,054 due to products not being exported.

Also, 39% of export consignments were subject to testing for Maximum Residue Levels (MRLs) at destination markets – particularly in the European Union – translating to annual costs of US$ 70,000.

RUSH Project intervention intermediate outcomes

The project developed three key interventions to improve the manual SPS Inspection process: This 'soft re-engineering' focused on:

- Planning: Deployment of a pre-inspection planning tool at the pre-packhouse inspection stage of the process to address coordination gaps. The outcome was better coordination between the key actors i.e., quality controller and Government inspectors, and more predictable scheduling of inspection times.
- Data collection: Existing inspection checklists at the airport and the packhouses were redesigned to address SPS-critical data collection gaps. The outcome was an ability for both exporters and inspectors to see and quantify the extent of wastage and rejections, as well as the economic impact on farmers and exporters. 90% of exporters adopted the redesigned checklists and more than 80% of these stated they were satisfied with them, reflecting high exporter confidence in this intervention.
- Capacity building: Training focused on improved fresh produce handling and inspection readiness was conducted for quality controllers and agronomists at selected packhouses.

Key conclusions and recommendations

1. Farmers bear a disproportionate burden of loss, mainly arising from wastage at the time of sorting.
2. The high proportion of manual processing means a continued failure to capitalize on digitalization opportunities. It would be possible to digitalize more processes beyond the electronic phytosanitary (ePhyto) certificate. Deeper digitalization will enable further efficiencies, time, and cost reductions, and increased transparency, all of which will improve sectoral performance and decision-making.
3. There are substantial data gaps in the SPS inspection process. It is important to grow capacity to gather and analyze data to inform key decision-making by both the public and private sectors.
4. We noted a reduction in inspection times between April-October 2022. It would be important to study whether this might be explained by the soft process re-engineering elements of this project and if so, then how these might be scaled up. However, the occurrence is likely due to reduced export volumes during the period.
5. With better data compilation and usage, the NPPO can make efficient and optimal deployment of its limited number of inspectors to better address where inspection need is greatest. The private sector could also use this data to meet SPS compliance requirements cost effectively, lowering export costs.

Focused recommendations: Farmers

- The adoption of smarter inspection and sorting techniques, not only at the packhouses but also at the production area (in the farms), would significantly reduce product wastage.
- Improved product sorting and post-harvest handling: farmers can increase their incomes through improved post-harvest handling and reduced instances of product wastage due to physical damage or over-ripening.
- Collaboration with exporters: improved cross-cutting collaboration between exporters/traders especially in transportation, handling and storage of fresh produce can improve farmer revenues.

Focused recommendations: Exporters

- Technology and Big Data: Exporters should adopt digital approaches that allow for better monitoring of value chain costs, inspection preparedness, and avoidance of inefficiencies that lead to significant losses. Data can also be leveraged to improve farm and production monitoring.
- Farm/production management: Exporters that closely monitor on-farm activities, especially handling, transportation, and pesticide/chemical usage, can realize efficiencies and savings when exporting.

Focused recommendations: NPPO (regulator)

- Technology/digitalization: Digital approaches in the SPS inspection process have shown to significantly improve efficiency and ensure time and cost savings for exporters and agricultural

inspectors. Such gains should inform an optimal digital solution to hasten efficiencies in the inspection process.

- Risk-based approaches and data-driven decision-making: The intervention period data indicates that applying data would allow the Regulator to identify exporters and products that are more susceptible to high-risk SPS non-compliance. Risk-based approaches can guide the Regulator to focus inspectors' times on high-risk consignments. This would save the NPPO nearly US$ 23,307 a year in additional budget required to recruit more inspectors.
- Labor optimization: To ensure greater efficiency, the Regulator should optimize inspections to focus at the packhouses and the airport on days when high export volumes are expected.
- Regular training: The NPPO and private sector fruit and vegetable export associations should collaborate in regular, continuous, refresher training on improving handling of fresh produce, inspection readiness, and better processes at packhouses.
- Collaboration and exchanges: The NPPO should pursue more collaboration and exchanges, especially with key export markets. These exchanges should focus on identifying key areas for improvement and collaborations to improve fresh produce handling and phytosanitary compliance.

1. Understanding Uganda's fruit and vegetable sector

1.1. Fruit and vegetable production

1.1.1.Conceptualizing agricultural production

Agriculture is a core sector of Uganda's economy, contributing 23.8% (Uganda, 2022) to the country's Gross Domestic Product (GDP) in 2021. Nearly 60% (Uganda, 2022) of the adult and working population is involved in some form of agriculture (including forestry and fishing) and therefore, it stands out as a key socioeconomic driver of the country's growth. Agricultural products constitute nearly 80% (Economics, 2022) of Uganda's exports; primarily coffee, tea, cotton, flowers, and fish. However, in dollar terms, for the past 50 years, gold has been the country's top export.

Horticulture production is dominated by flowers and cuttings. With a production focus on roses and cuttings, floriculture is Uganda's third-largest, non-traditional export after gold and fish (Asoko Insight, 2019). The fledgling sector – supported by the Uganda Flower Exporters Association (UFEA) is relatively small, with just over 20 firms involved in the value chain from production to export. Barriers to entry include significant set-up costs but incomes are significant. The three leading companies in the flower sector have a turnover of between $10 million and $25 million a year, while eight players have a turnover of between $5 million and $10 million. Reflecting the underdeveloped nature of the sector, half of the companies earn less than $5 million, with one of these earning less than $1 million (Asoko Insight, 2019).

Production in Uganda is predominantly non-mechanized. Except for floriculture (again, largely due to financial barriers to entry), most production is driven by smallholder farmers, working on family-owned land. There has been an influx of independent and commercial investment into cash crop production, but output remains largely limited to local markets and supply of raw commodities to local small-scale processing industries. Fruits and vegetables are no exception.

1.1.2.Why fruits and vegetables?

Uganda ranks third in the East Africa Community (EAC) in production of fruits and vegetables, with a total of about 5.7 million tonnes, according to FAO 2019 statistics.

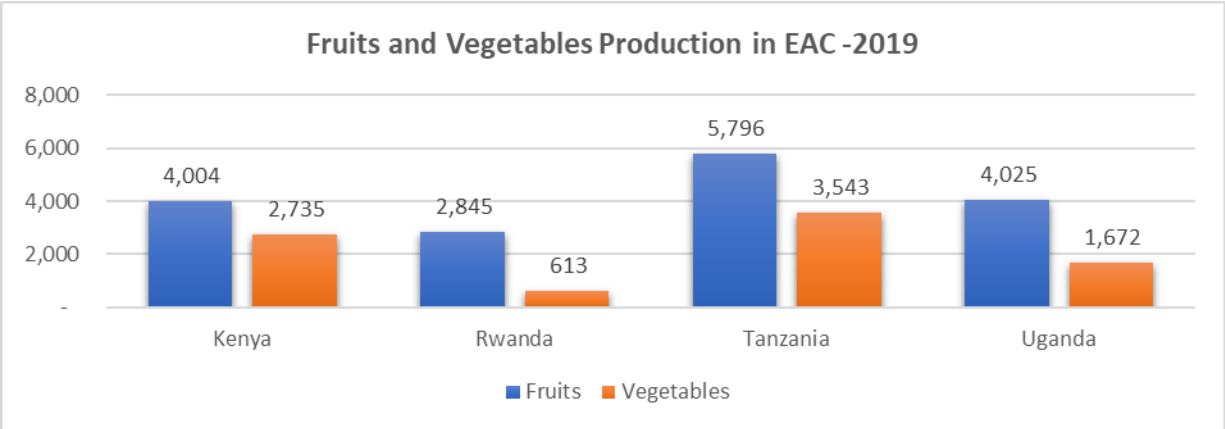


Figure 1:F&V Production levels in EAC with data from FAO Statistical Yearbook 2022

However, detailed production figures for Uganda's fruits and vegetables sector is limited. Every district in Uganda grows fruits and vegetables in significant quantities but there is no reliable data on the approximate number of farmers involved in production, income, and local market supply trends.
Additionally, surveys show that most farms are rain-fed and cannot provide consistent, year-round output. Inconsistent supply affects local market availability and pricing. It also significantly affects export capacity. Government priorities in terms of funding, extension of services, and market supply are focused on traditional export cash crops[1]. Fruit and vegetable production has benefited from Government and third-party (donor and non-profit organization) support for inputs such as seeds, fertilizer, and training but market supply and export promotion have remained largely the preserve of individual exporters.

1.1.3.Importance of horticulture to the Ugandan economy

The horticulture sector is very important to Uganda:

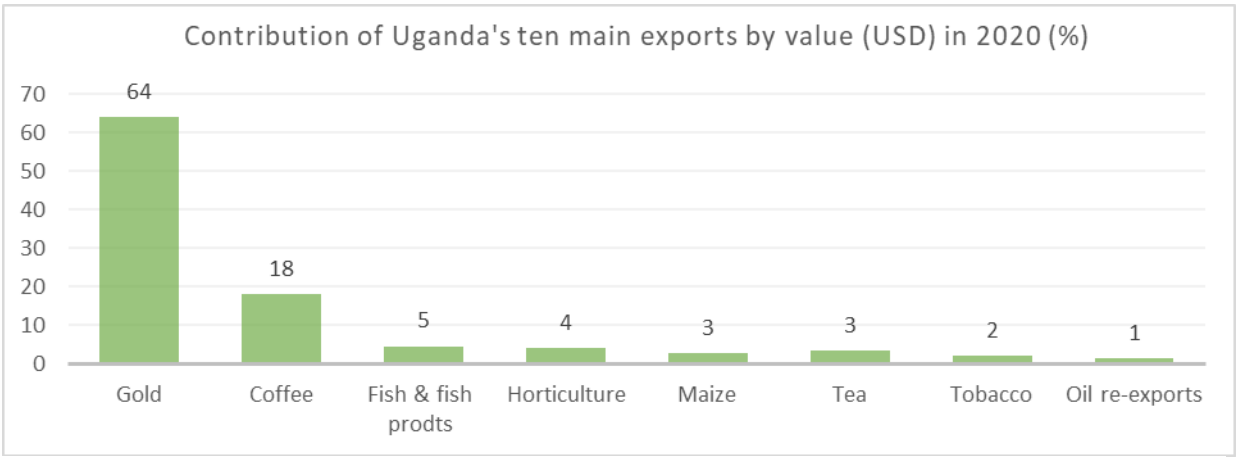


Figure 2:Contribution of Uganda's ten main exports by value in US$ (2020) Source: Bank of Uganda annual report

- It is among the Top Five export revenue earners, with annual growth of 13%.
- It is a major employer of women (70% of the workforce) with many women-owned/co-owned MSMEs (30% of firms).
- The sector is dominated by MSMEs (97% of firms), making it a key driver of economic growth

The baseline study shows that horticulture firms remain largely male-owned. Also, informal horticulture exports represent nearly 16% of total sector exports. Although quality is well regarded generally, inconsistency of supply cannot satisfy market demand.

[1] Traditional export cash crops include coffee, vanilla, cotton, and tea. For over 30 years, , the government's primary focus has been to ensure that Uganda earns steady foreign exchange from the export of these crops while sustaining smallholder farmers that dominate production.

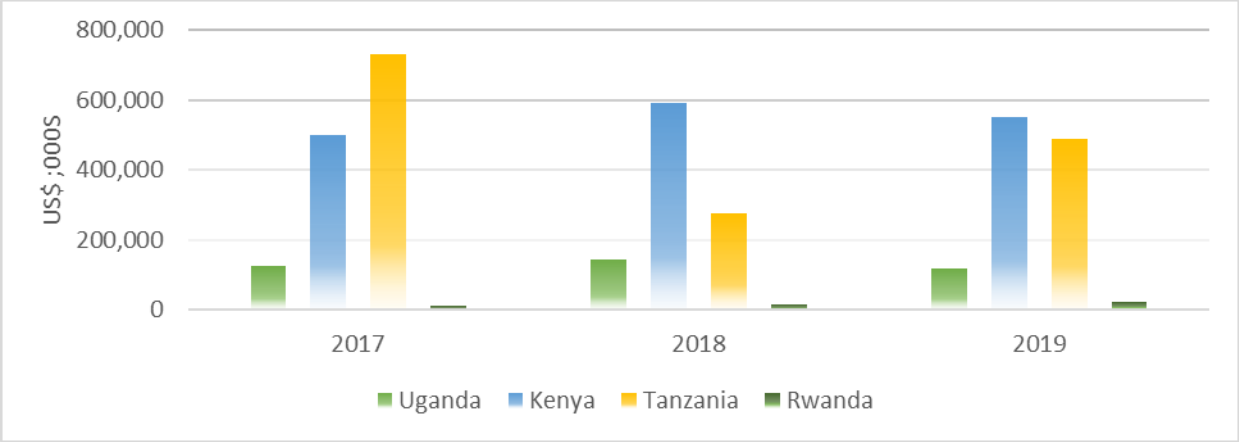


Figure 3:Comparison of US$ values of horticulture exports for East African countries Source: Trading Economics (2020)

Currently, only 20% of Uganda's fruits and vegetable products are exported. The data clearly shows that:

- There is high potential for the sector in terms of export quantity and value.
- Current export volumes and earnings remain relatively low.
- Export value of horticulture produce is less than 25% of the exports from Kenya and Tanzania (2019)
- If Uganda could increase the value of its horticultural exports to even 50% of Kenya or Tanzania, it would contribute almost US$ 259 million to the economy. To put this in perspective, this figure represents 40% of the earnings from coffee, the country's most valuable export crop.

1.1.4.Market analysis: what are we eating?

Uganda is a landlocked country in east-central Africa, situated north and northwest of Lake Victoria, Uganda has a total area of 236,040 sq km (91,136 sq mi), of which 36,330 sq km (14,027 mi) is inland water[2]. The country experiences moderate temperatures throughout the year, around 22.8°C, with monthly temperatures ranging between 21.7°C (July) and 23.9°C (February). During this period, total annual average precipitation is 1,197 mm, and mean monthly precipitation of the country varies from 39.6 mm in January to 152.7 mm in April[3]. Overall, it has well-distributed rainfall and a moderate climate capable of producing most tropical and sub-tropical fruits and vegetables, herbs, and spices, and even temperate fruits and vegetables at higher altitudes. Uganda mostly exports agricultural products (80 percent of total exports). The most important export is coffee (22 percent of total exports) followed by tea, cotton, copper, oil and fish. Uganda's main export partners are Sudan (15 percent), Kenya (10 percent), DR Congo, Netherlands, Germany, South Africa, and UAE[4]. Regarding Fruits and Vegetables, the sector relies heavily on imported seeds for vegetables such as okra and hot pepper (part of the Capsicum family).

Uganda produces a wide variety of fruits and vegetables, with onions, tomatoes, beans, bananas, pineapples, avocadoes, and mangoes the most common. An analysis of FAO data on production from Uganda reveals a continued upward trend in the production of fruits and vegetables.

[2] Read more: https://www.nationsencyclopedia.com/Africa/Uganda-LOCATION-SIZE-AND-EXTENT.html#ixzz83pvTF22z
[3] https://climateknowledgeportal.worldbank.org/country/uganda/climate-data-historical
[4] https://tradingeconomics.com/uganda/exports#:~:text=Uganda%20mostly%20exports%20agricultural%20products,Germany%2C%20South%20Africa%20and%20UAE.

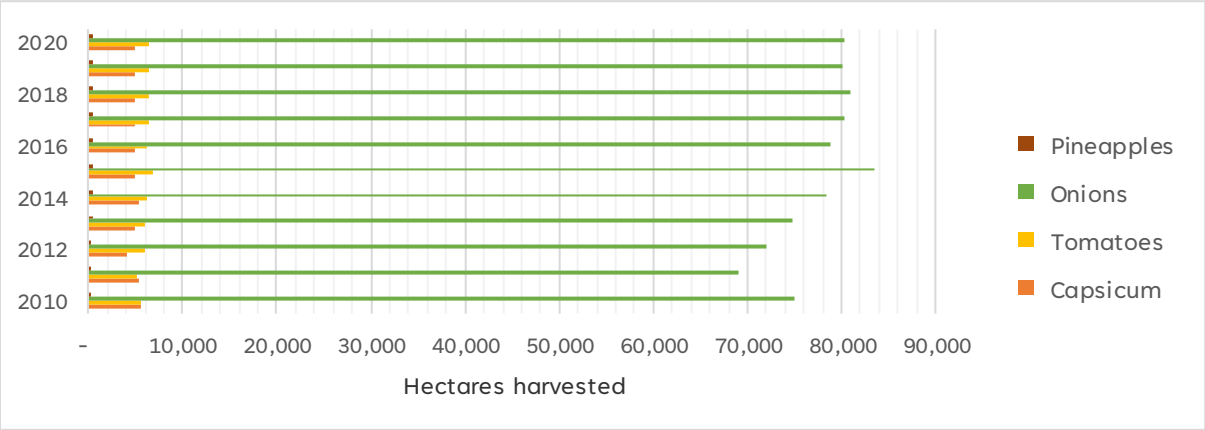


Figure 4:Harvested acreage of selected products between 2010 and 2020

However, most data (e.g., FAOSTAT/MAAIF[5]) is widely regarded as inaccurate because it relies on estimates instead of data collected on the ground. Also, it does not accurately disaggregate and consider the many other fruit and vegetable varieties in production.

In the figure above, we analyzed FAO data to understand acreage and production trends for selected fruits and vegetables over 10 years. According to this data, onion production and consumption is high and widespread. Tomato production for local consumption and export is increasing, while capsicum production (pepper and chili) is relatively stable, with most capsicum exports going to European Union (EU) markets.

[5] FAOSTAT: Food and Agricultural Organization of the United Nations Statistics. MAAIF: Ministry of Agriculture, Animal Industry and Fisheries.

1.2. The fruit and vegetable value map

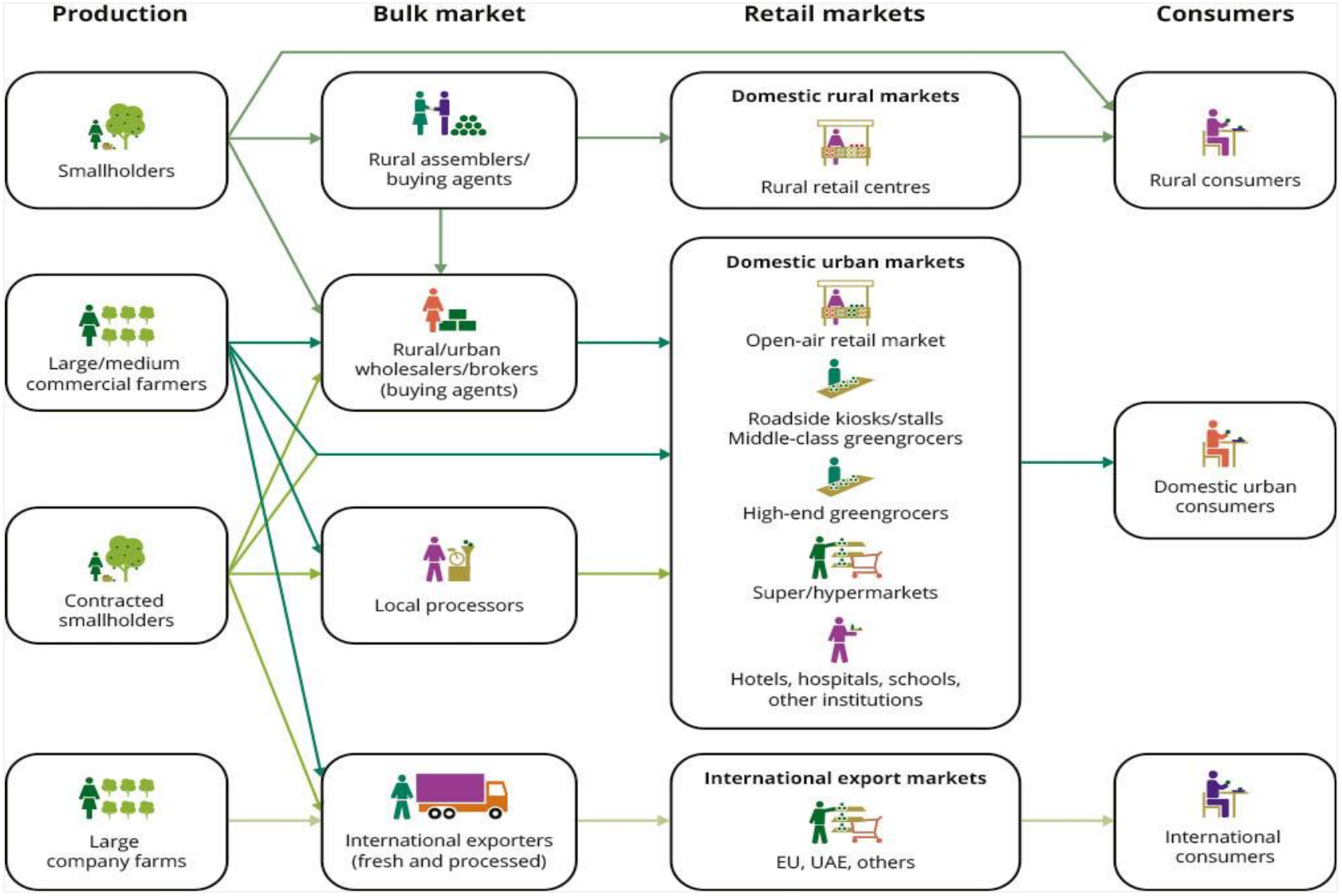


Figure 5:The fruit and vegetable value map (UN Food and Agricultural Organization (FAO), 2021)

1.2.1. Farmers: at the heart of industry

Smallholder farmers are at the heart of production. Research shows that seeds and fertilizer are generally supplied independently – although a few government and donor-funded projects have intervened occasionally to support in harnessing output. At the national level, acreage data is limited, although some large-scale exporters collect key data on the farms they manage. Farmers generally supply any buyer (there are limited contractual agreements in place) for both local and export markets.

1.2.2. Wholesalers and retailers are largely fragmented

Wholesalers and retailers generally operate independently. Farmers principally supply retailers that operate in domestic markets. Wholesalers typically buy produce for export markets. Unlike traditional cash crops, fruits and vegetables farmers do not generally operate in cooperatives. Farmers are typically paid in cash. Larger-scale suppliers may extend credit, accepting payment after the exporter has been paid for selling the produce. The main representative associations are dominated by private sector exporters.

1.2.3. Exporters control market quality

MAAIF records indicate there are over 100 companies registered to export fruits and vegetables from Uganda but only around 40% of them actively do so and most organizations representing exporters are buyers rather than producers.

When it comes to selling produce into overseas markets, exporters control quality, working with selected farmers to ensure traceability and quality control throughout the value chain. There are several organizations representing exporter interests, including The Horticulture Exporters Association Uganda Limited (HORTEXA), The Uganda Fruits and Vegetables Exporters and Producers Association (UFVEPA), and HortiFresh Uganda.

1.2.4. Processing and value addition

There is limited data on the amount of value-added processing of vegetables and products such as fruit juices and chili oils.

1.2.5. Market structure

A network of wholesalers and retailers ensures that produce reaches consumers through roadside markets, supermarkets, kiosks, and shops. Distribution is informal, primarily based on demand. There is little reliable data on the volume and value of produce sold at the local level. Export data from the Bank of Uganda shows that the country exported approximately US$ 34 million of fruits and vegetables in 2021, amounting to 5.8 million tonnes of produce.

Key export markets are Kenya, Rwanda, the EU, the Gulf states, such as the United Arab Emirates and Saudi Arabia, and the United Kingdom. Flower exports amounted to US$ 55 million, dwarfed by coffee, which brought in US$ 862 million.

1.2.6. Governance

MAAIF is responsible for regulatory oversight of fruit and vegetable production for local and export consumption. The MAAIF Directorate of Crop Resources[6] is responsible for the overall coordination and regulation of crop production, functioning under three departments:

- Department of Crop Inspection and Certification (DCIC): consisting of three divisions - the Phytosanitary and Quarantine Inspection Services Division (PQIS); the National Seed Certification Services Division (NSCS); and the Agro-chemicals Control Division (ACC). The department houses the key inspection role for all crops produced in Uganda.

[6] The Department of Crop Resources also operates as Uganda's National Plant Protection Organization (NPPO).

- Department of Crop Protection: Responsible for controlling crop pests and diseases to improve food security and household incomes.
- Department of Crop Production: Responsible for supporting, promoting, and providing guidelines on sustainable market-oriented crop production, value addition, and quality assurance.

1.2.7. Sanitary and Phytosanitary (SPS) Requirements and Compliance

Uganda is one of the founder members of the World Trade Organization (WTO) and a signatory to multilateral agreements, including the Agreement on Technical Barriers to Trade (TBT) and the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS)[7].

Uganda is also a signatory to a number of Regional Economic Communities (RECs) including the East African Community (EAC), Common Market for Eastern and Southern Africa (COMESA), EAC, COMESA and SADC Tripartite agreement and the African Continental Free Trade Agreement (AfCFTA). It has also negotiated several bilateral agreements, including the EAC-US Cooperation Agreement on Trade Facilitation, SPS and TBT and Economic Partnership Agreements. All the RECs contain protocols on SPS and TBT. A draft national SPS policy is currently under discussion.

Under MAAIF, through a network of agricultural inspectors, the DCIC is responsible for ensuring SPS compliance by producers, retailers, and exporters. Inspectors are assigned to fields and farms, export packhouses, and all exit and entry points throughout the country. SPS compliance ensures that produce consumed on the local and export markets is free of any visible quarantine pests and that it meets Maximum Residue Levels (MRLs)[8] in the domestic market and in overseas jurisdictions.

SPS compliance inspection is conducted using a series of global best practices, although the SPS agreement allows Uganda – through the DCIC - to design and implement fit-for-purpose inspection procedures.

[7] The Agreement on the Application of Sanitary and Phytosanitary Measures (the "SPS Agreement") entered into force with the establishment of the World Trade Organization on 1 January 1995. It concerns the application of food safety and animal and plant health regulations. The Agreement builds on previous GATT rules to restrict the use of unjustified sanitary and phytosanitary measures for the purpose of trade protection. The basic aim of the SPS Agreement is to maintain the sovereign right of any government to provide the level of health protection it deems appropriate but to ensure that these sovereign rights are not misused for protectionist purposes and do not result in unnecessary barriers to international trade.

[8] A maximum residue level (MRL) is the highest level of a pesticide residue that is legally tolerated in or on food or feed when pesticides are applied correctly (Good Agricultural Practice).

1.2.8. Snapshot of the SPS inspection process at packhouses/packing facilities[9]

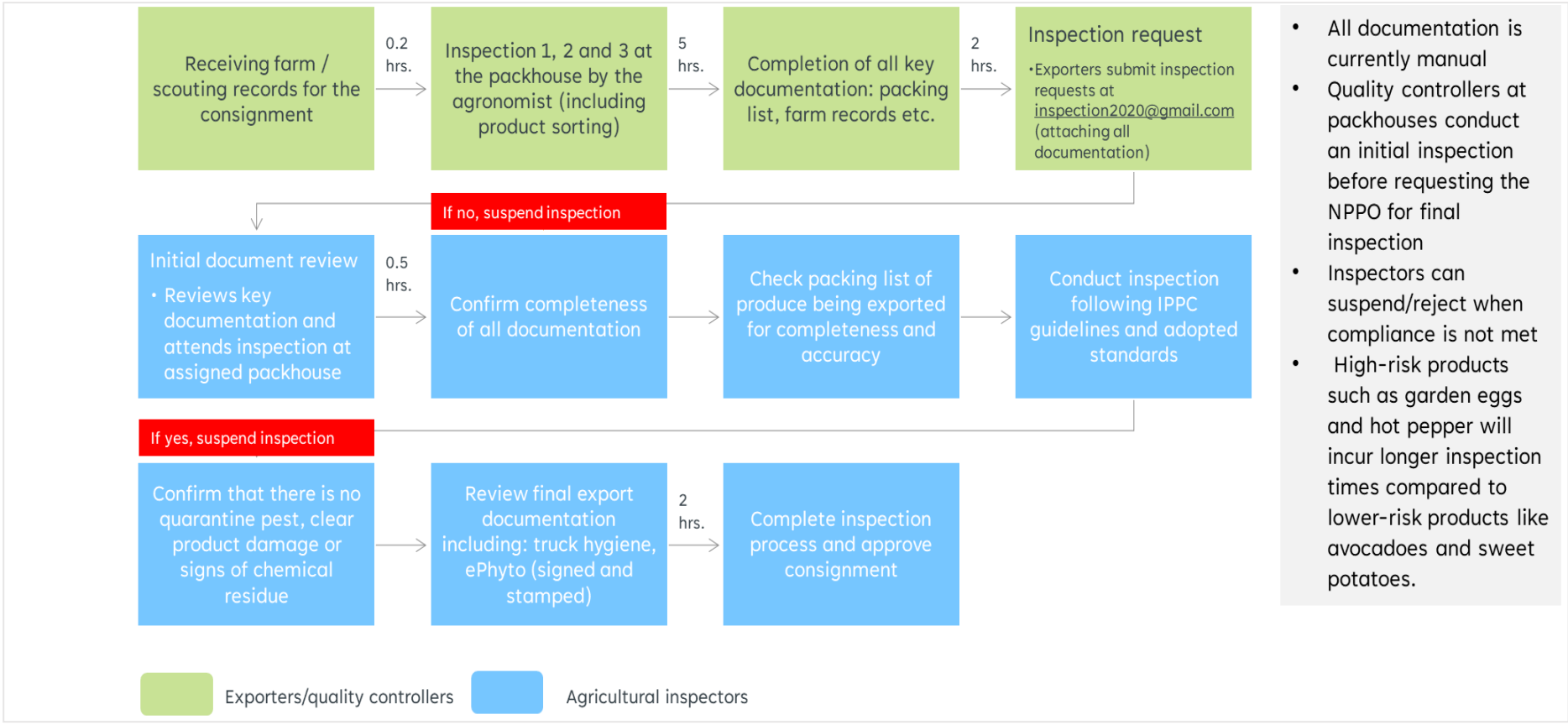


Figure 6: SPS inspection process workflow at packhouses Source: Authors' own illustration with information from the Business Process Analysis

[9] A packing house is typically a facility where fruit and vegetable are received and processed prior to distribution to market. Produce received from the farm is packed by hand, before being pre-cooled (in more modern facilities) or trucked directly to the airport for export.

1.2.9. Snapshot of the SPS inspection process at the airport

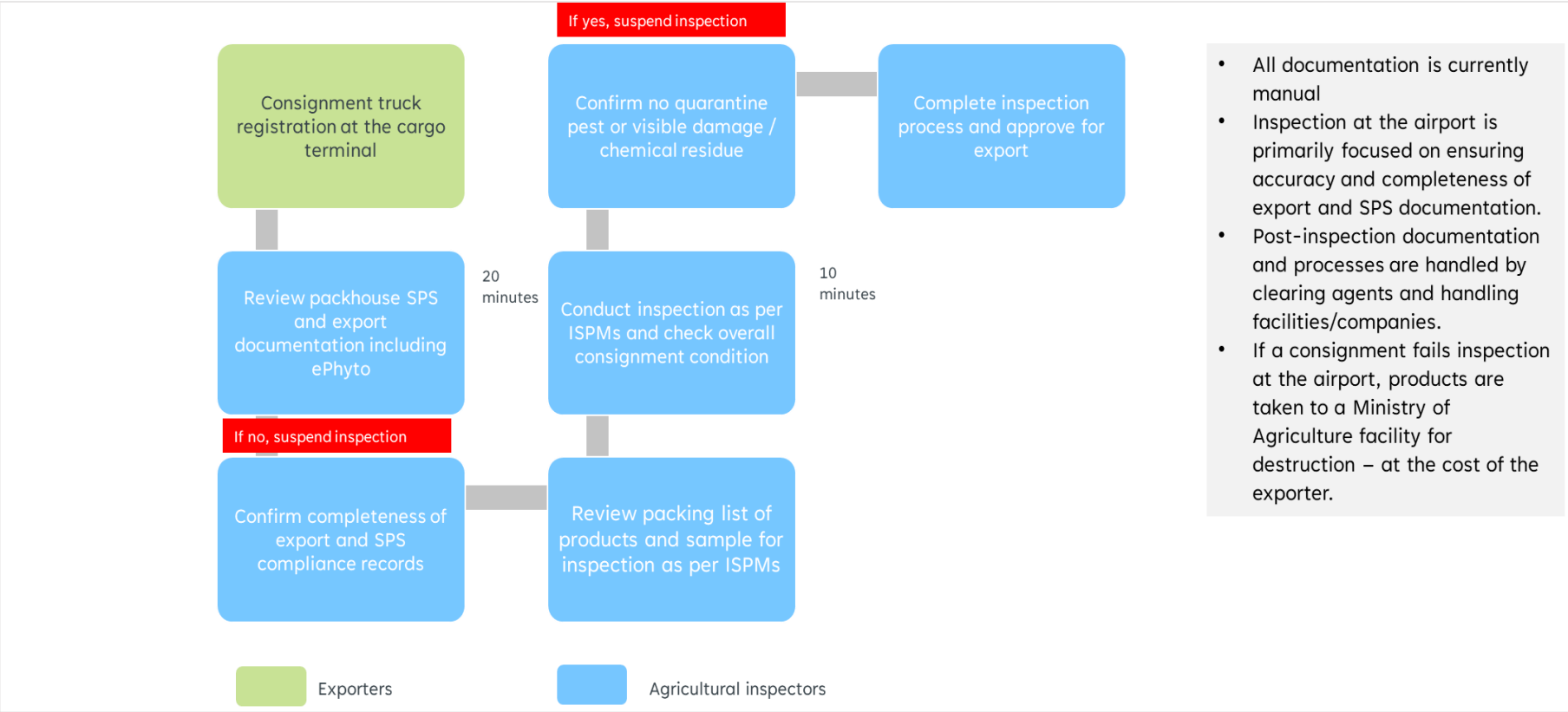


Figure 7:SPS Inspection process workflow at the airport Source: Authors own illustration with information from the Business Process Analysis

2. RUSH Project background

2.1. Project brief

In July 2021, Uganda began implementing a 21-month project supporting the country to improve the SPS inspection processes for horticulture exports, mainly focusing on fruits and vegetables. The project is being implemented by the Global Alliance for Trade Facilitation (the Alliance), in cooperation with Swisscontact and in partnership with MAAIF, the Ministry of Trade Industry and Cooperatives (MTIC), and various private sector representative associations. The project harnesses the power of the private sector to improve inspection processes by integrating key companies and organizations as project partners. These partners provide critical insights into SPS process improvement, and opportunities for self-regulation, allowing the private sector to generate more self-reliant and collaborative solutions to problem-solving. The project's overarching goal is to reduce the time and cost of exporting horticultural produce by re-engineering the inspection process and improving the capacity of the sector's stakeholders - both public and private - to manage exports more efficiently.

The project is anchored on three main workstreams:

- Process review and soft re-engineering to improve the manual SPS inspection process at the packhouses and Entebbe International Airport.
- Pursuit of more digitalization export procedures to improve SPS speed and documentation as well as providing sufficient information for exporters through the national trade facilitation portal.
- Supporting stakeholder engagement and coordination via public-private dialogue and delivery of appropriate, sustainable capacity-building to support export processes.

2.2. The trade facilitation challenge

The project is primarily a trade facilitation-focused initiative, seeking to introduce innovative solutions to export challenges. The focus is on reducing the time and cost of exporting fruit and vegetables by making export processes more efficient.

MAAIF/NPPO is responsible for ensuring compliance with SPS measures, but the current SPS inspection process is manual, and many exporters find it unnecessarily costly. The main challenges with the current SPS inspection process include:

Inadequate and cumbersome inspection process:

- Lack of training for key personnel handling delicate horticulture exports, coupled with a shortage of inspectors in a sector showing steady growth in production and export volumes.
- Repetitive, manual SPS inspections at the airport cause delays. SPS inspections at packhouses are duplicated at the airport.
- Use of manual checks on sealed boxes destined for export markets. Failure to re-seal properly increases the risk of contamination, spoilage, and non-conformity with packaging requirements.
- Poor facilities for SPS inspection, including lack of shelter from the elements and no bespoke inspection tables increase the risk of product contamination and quality deterioration.
- Due to lack of risk management, cargo is randomly inspected.
- Global or EU standards are not applied, yet local Good Agricultural Practices (GAP) are not yet developed.

Use of manual systems and Information asymmetry:

- Multiple manual records held at packhouses and the airport delays data consolidation and mining to support monitoring and accountability. The practice also hinders the development of a risk management plan (RMP).
- The trade information portal is not kept up to date. Limited information is available on the horticulture sector, including export requirements and standards.
- Databases are seldom updated, and inquiries are not routinely escalated or addressed.

Weak, uncoordinated stakeholders:

- Border agencies and ministries involved in horticultural trade facilitation is not well coordinated, and there is limited sharing of information.
- Private sector associations are weak and fragmented with limited powers to effect policy change or to support MSMEs, women and new exporters.
- The National Trade Facilitation Committee (NTFC), and Horticulture sector Task Forces are weak and do not meet regularly.

2.3. Project interventions

The project aimed to help tackle these challenges by collaborating with the NPPO and the private sector in identifying solutions using the following criteria:

- **Planning**: The inefficiency of Inspection planning caused significant delays because of insufficient time to prepare and conduct effective checks, particularly at packhouses.
- **Documentation**: Previously, Inspection checklists failed to provide sufficient information to generate a well-informed outcome. Furthermore, information asymmetry between exporters and inspectors led to insufficient use of available documentation. As a priority, the project focused on reforming inspection checklists and documentation, and, where applicable, on introducing new ones.
- **Data**: The inspection process lacked sufficient data to inform continued improvement and risk assessment. The project re-engineered checklists to ensure that data collection was at the forefront.
- **Capacity building**: the project identified opportunities to provide capacity building and topical training to agricultural inspectors, quality controllers, and agronomists at export companies. Modules included training on Hazard Analysis Critical Control Point (HACCP)[10] as well as Training of Trainers (ToT). The trainings focused on sharing knowledge and information necessary to address inspection gaps and challenges that were identified during the mapping of the SPS process in Uganda.
- **Digital and technology**: A robust, comprehensive technological approach to inspection challenges comprised the digitization of inspection documentation; the creation of a database of inspection details and outcomes; real-time information exchange between packhouses and the airport; and updating the national trade information portal with relevant information on fruits and vegetables. At the time of publication, digitalization is not yet complete, but the trade portal updates, including fruit and vegetable modules, are live.
- **Risk management**: Deploying a risk-based inspection solution to ensure inspections are focused on high-risk products and exporters will optimize the capacity of agricultural inspectors at the NPPO,

[10] According to The Food Alliance, HACCP is a management system in which food safety is addressed through the analysis and control of biological, chemical, and physical hazards from raw material production, procurement and handling, to manufacturing, distribution and consumption of the finished product

ameliorating personnel constraints. This report provides some data that will inform the development of a risk-based approach.

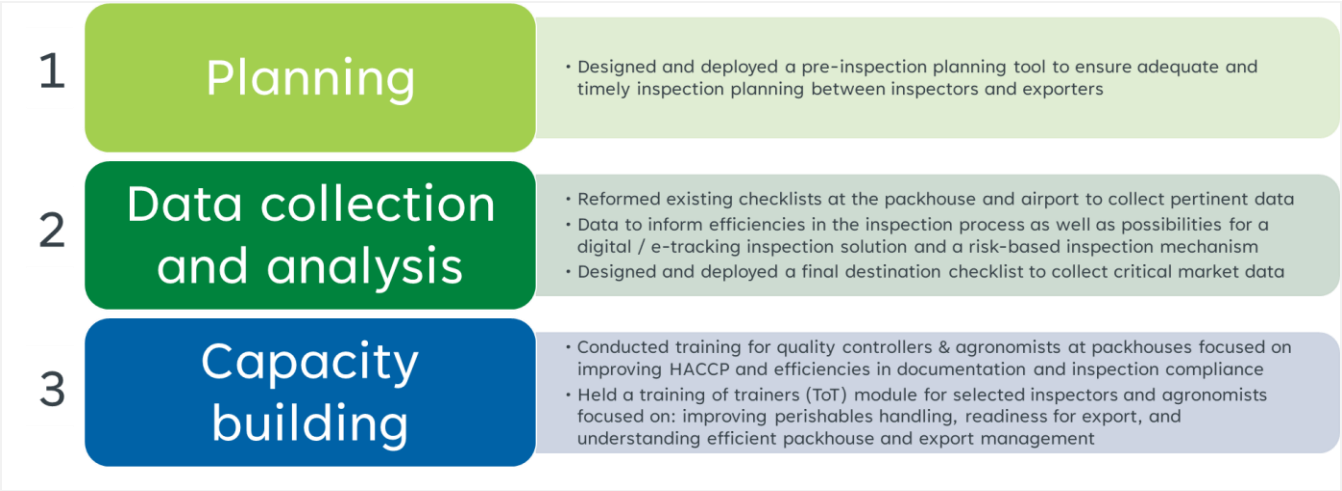


Figure 8:Three-pronged intervention approach by the project

3. Study methodology

3.1. Exporter survey and quasi-baseline study

The project team discovered relatively early in implementation the non-existence of consolidated, accurate export data relating specifically to fruits and vegetables. This made it difficult to quantify the direct variables affecting the time and cost of exporting. Further, the team also found that this lack of information extended to indirect costs.

The project team worked with MAAIF to select 23 companies, accounting for 80% of all fruit and vegetable exports, based on activity and frequency, to take part in a quasi-baseline study[11], focused on establishing time and cost drivers. The critical mass ensured representative figures for Total Transport and Logistics Cost (TTLC) methodology[12].

The Alliance uses TTLC methodology to measure both direct and indirect transport and logistics costs. It also encompasses time measurement as a factor of export activities. The TTLC study considered time and cost factors such as:

- human resource costs involved in the preparation of a consignment for export.
- documentation preparation time and approval.
- time and cost of inspections (at both packhouses and the airport).
- time and cost drivers in sorting produce received from farms for export.
- time spent at the airport before export.

Data was collected between March-May 2022 and aimed to identify the challenges that might be addressed relatively quickly. It involved a combination of surveys/questionnaires and online interviews. Questionnaires were distributed during project workshops held in April 2022 and at a meeting of agronomists and quality controllers of various packhouses in May 2022. A few questionnaires were also completed with selected exporters online.

Broadly, the aim of the study was to collect data on key parameters:

- Assessment of current export cost scenarios – factoring in movement of consignments from farm to export destination.
- Assessment of time spent in preparing a consignment for inspection and export (including the packhouses and the airport).
- An assessment and examination of interceptions, rejections, and wastage of export produce at packhouses, the airport and destination markets.
- Major challenges within the export process in relation to SPS inspection.
- Other socio-economic variables such as employment levels, gender dynamics etc.

[11] We denote this as a quasi-baseline study because it was conducted without random assignment of exporters/participating companies. The few exporting companies dominate the space in terms of volumes and earnings, and it was therefore difficult to establish random assignment, without creating an unintentional bias in the nature of samples. The intervention and control groups were therefore similar companies.

[12] An elaborate description and detailed design of the TTLC is available at https://www.tradefacilitation.org/content/uploads/2020/09/alliance-ttlc-methodological-note.pdf. In addition, an example of the application of the TTLC by the Alliance in Morocco on a project to replace paper phytosanitary certificates with ePhyto solution can be accessed at https://www.tradefacilitation.org/project/measurable-agri-food-trade-efficiencies/.

A random sampling technique was used to collect this primary data. The project team was responsible for the collection of data from the 23 companies, all of which are subject to SPS inspection at every port. The respondents were both in the category of those that will receive the intervention and those that may not. The list of registered fruit and vegetable exporters on the MAAIF website[13] indicates over 60 companies. However, interactions with agricultural inspectors revealed that there are fewer more 'active'[14], (See appendices), exporters from whom reliable data could be obtained. The sample was therefore comprised primarily of companies that the NPPO identified as more active exporters.

Simple statistical techniques were used to tabulate the results of this study. Data collected was cleaned and coded and later an EpiData[15] entry screen was designed and used for data entry. Data was later analyzed using Excel pivot tables, generating various descriptive statistics and correlation.

[13] Accessed at https://www.agriculture.go.ug/registered-exporters-of-horticultural-products/

[14] Active, in this case, refers to exporters that carry consignments all year round and are in regular interaction with the NPPO. We also focused on companies that predominantly export fruits and vegetables and no other products.

[15] Epidata is a group of applications that is used in combination, for creating documented data structures and quantitative data analysis. It's suitable for both small and large datasets. It also uses open standards such as HTML where possible. The project used epidata version 3.1, during the baseline assessment.

4. Findings of the study

4.1. Baseline/exporter study findings

The tables and figures below detail the findings of the baseline study relating to assessment of time and cost drivers of fruit and vegetable exports. These findings are limited to a study conducted with 23 companies at the packhouses and the airport.

Although companies were focused on improving their bottom lines, primarily by driving down supplier prices, none of them indicated any detailed assessment of the time and cost involved in fulfilling export procedures. This study essentially seeks to develop new knowledge and understanding in this regard. It can enhance the future profitability of the sector.

4.1.1.Baseline results: Time indicators

Time bracket (s)	Detail	Time driver(s)	Time owner	Average time in hours per consignment	Average time in hours per year
Documentation	Completing documentation for export	Quality controller time to complete all key documents	Exporter	2.32	130 (*5.4 days*)
Inspection	Inspection time at the packhouse	Time spent by agricultural inspector	NPPO	2.5	116 (*4.8 days*)
	Inspection time at airport	Time spent by agricultural inspector	NPPO	0.45	44.22 (*1.8 days*)
	Inspection 1, 2 and 3	Agronomist time	Exporter	2.00	243.64 (*10.15 days*)
Sorting	Time spent sorting consignment	Sorter time to ensure SPS compliant products	Exporter	6.00	292.36 (*12.18 days*)
Airport	Clearance time for consignment	Security, handling	Private sector	1.00	83.53 (*2.6 days*)
Total				**15.2**	**910.26 (*38 days*)**

Table 1: Baseline time indicators for SPS inspection

Documentation: this includes all key documents that have to be prepared for export including scouting and spray records from supplying farms, inspection requests and other such documents. The exporter's quality controllers also invest a significant amount of time completing the electronic phytosanitary certificate (EPhyto)[16] which is mandatory for all fresh produce export.

Inspection: is conducted by the agricultural inspector at both the airport and the packhouse. Inspectors work within the mandate of the International Standards for Phytosanitary Measures (ISPMs)[17] that provide

[16] ePhyto is short for "electronic phytosanitary certificate". An ePhyto is the electronic equivalent of a phytosanitary certificate in XML format. All the information contained in a paper phytosanitary certificate is also in the ePhyto.

[17] ISPMs are standards adopted by the Commission on Phytosanitary Measures (CPM), which is the governing body of the International Plant Protection Convention (IPPC). The first International Standard for Phytosanitary Measures (ISPM) was adopted in 1993. As of April 2022, there are 46 adopted ISPMs (ISPM 30 being revoked), 31 Diagnostic Protocols, and 44 Phytosanitary Treatments. These international standards: Protect sustainable agriculture and enhance global food security, Protect the environment, forests and biodiversity, Facilitate economic and trade development

guidance for inspection requirements and samples. In addition, quality controllers at packhouses conduct an initial inspection (Levels 1, 2 and 3) to ensure minimum risk of inspection failure.

Sorting: staff at the packhouse conduct detailed product sorting for quality. This process requires an average of 10–15 sorters per consignment.

Airport processes: involve clearance of the consignment for export through document review and approval, as well as security checks and handling.

4.1.2.Key notes on time indicators

The study indicates that 60% of exporters' time per consignment is spent sorting produce and conducting inspections 1, 2, and 3. Most companies however reported that the documents required for these inspections do not provide any value for SPS compliance since inspection assurance is conducted by agricultural inspectors.

- An exporter spends an average of 15.2 hours per consignment preparing for export. This excludes the time spent transporting produce from farm to packhouse.
- Total inspection time at the packhouse and airport per consignment averages 3.15 hours. This can be significantly reduced through labor resource optimization and by focusing on efficiencies and risk management.
- Inspection Levels 1, 2 and 3 are conducted by quality controllers at packhouses (before requesting NPPO inspection). Quality controllers are required to document their findings from Level 1, 2 and 3 inspections. Exporters noted that agricultural inspectors rarely check this documentation, and it is arguable whether the time spent conducting this inspection and documenting outcomes produces any significant value for exporters or the Regulator
- Exporters indicated that sorters are employed on a day-to-day basis, and therefore paid when work is available. Average sorter costs range from US$ 2–4 a day. Sorting time is significant and is done manually. In principle, better quality management at the farms could reduce these sorting times.
- All documentation, aside from the ePhyto certificate, remains manual. Exporters indicated that digitalization efforts may reduce time and cost by enabling consolidation of key inspection and export data.
- Consignment exports are generally planned with airline departure times in mind. In this regard, companies 'work backwards' to ensure they meet their planned flight times. However, due to the unpredictability of delivery times from farmers and the constraints in preparing for export, better planning is critical.

4.1.3.Baseline results: Cost indicators

Cost bracket (s)	Detail	Cost driver (s)	Key stakeholder	Average cost per consignment	Average cost per year
Human resources	Preparing documentation for inspection Supervision and completion of inspections 1, 2 and 3	Based on daily / hourly cost of agronomist	Exporter	$ 9.58	$ 2.594.59
	Sorting and cleaning products	Daily cost of sorters to complete a consignment	Exporter	$ 62.65	$ 5.167.08
E-phyto certificate	Phytosanitary certificate	Cost of ePhyto certificate	Exporter	$ 1.35	$ 78.62
Documentation	Cost of obtaining documentation	Internet / communication cost with farmers & agronomists	Exporter	$ 0.50	$ 29.09
Inspection	Consignment inspection	Transport and other associated costs to the inspector to conduct inspection	Exporter	$ 14	$ 727.36
Total				**$ 88.06**	**$ 8,596.75**

Table 2: Baseline cost indicators for SPS inspection

Human resources: this includes the cost of sorters, agronomists, and quality controllers as well as other supervisors involved in the processes required to complete a consignment for export. The project team computed the hourly cost per staff member, averaging this against the time required to complete each process.

ePhyto certificate: cost of obtaining approval for a phytosanitary certificate.

Documentation: Expenses covering all key documents, especially from supplying farmers (e.g. spray records, etc.) is received in time for consignment completion.

Inspection: cost of facilitating inspectors to conduct consignment inspection and approval at the packhouse.

4.1.4.Key notes on cost indicators

The study indicates that 90% of exporters' costs for SPS compliance relate to human resources (agronomist, quality controllers, and sorters' costs).

- Like sorting times, sorting costs constitute the largest percentage of cost drivers for exporters. From a practical viewpoint, these are particularly difficult costs to control as the process of sorting remains largely manual.
- Agronomists and quality controllers are predominantly hired on a consulting basis, per consignment. They are paid an hourly or day rate to ensure consignment readiness for export.

There are currently 20 inspectors for over 60 fruit and vegetable exporters and approximately 120 in total in the country. By contrast, in Kenya, the regulator employs over 1,000 agricultural inspectors. The current need reflected by the NPPO is to have at least 35 inspectors. This would equate to a cost increase of US

$23,306.5[18] per year which the regulator's budget cannot support. There are opportunities for labor efficiencies and optimization within the current resource envelope available to the NPPO.

The case studies indicate that SPS compliance costs measured against the invoice revenues of two large exporters are less than 2%. However, companies do not generally compute these and other SPS compliance costs.

To assess cost drivers accurately, the project team took a deep dive into other 'hidden' indirect costs incurred by exporters. Among other factors, the team assessed the cost of wastage and product rejection at the time of inspection, destruction costs in cases of consignment interception, and overall costs due to time lost during the export process. These assessments were driven by extensive data collection during the improvement of the manual processes. The results are analyzed in section 4.2 following.

4.2. SPS Process Improvement outcomes – What the data tells us

4.2.1. Key Interventions - Improving the manual inspection process

The team noted that there is a significant paper element involved in the inspection process, at the packhouses and airport. Documentation - a critical part of the process - takes up significant time for both inspectors and exporters. We found there was no benefit to either private or public sector stakeholders in continuing documentation in its current state. Nevertheless, the documentation does contain important data to inform future improvements.

The solution involved reviewing and redesigning key documentation in the inspection process (at packhouses and the airport); deploying new data-based checklists (*See appendices*); and using these checklists to collect relevant inspection process improvement data. The key checklists in reference are as follows:

1. **Pre-inspection planning schedule**: This did not exist prior to the intervention and was regarded as optimal for better and quicker coordination and preparation for inspection. It enables inspectors to receive information and data on planned shipments by the packhouses in good time to schedule inspections.
2. **Packhouse Inspection Checklist**. This tool was introduced to gather critical data to constantly inform the inspection process (especially on start and end times), wastage and rejection occurrences at the packhouses, frequency of SPS inspections etc. For inspectors and quality controllers, it highlights where improvements are needed. In future, it may also help the NPPO to make evidence-based, data-driven process reforms. The tool would also capture data and information on risk levels – this could also be used to inform an appropriate risk-based inspection strategy.
3. **Airport Inspection Checklist**: Like the packhouse inspection checklist, this tool was introduced to gather critical data required to constantly inform the inspection process at the airport.
4. **Destination/market checklist**: Introduced to gather key market and export data such as quantities of produce received and accepted by clients and the percentage of products tested for chemical residue, as well as any other comments or outcomes of the export that could be relevant for SPS assessment.

The checklists were designed in consultation with the NPPO and exporters. We assessed existing documentation, where applicable, and identified key points for improvement, as well as inputs that could

[18] This is an estimate by the NPPO based on the monthly salary of an inspector

provide relevant and critical data to inform improvements to the inspection process and overall export facilitation.

The re-engineered checklists focused on transitioning the NPPO's procedures towards data-driven decision-making. Data is critical to informing process efficiencies as well as assessing possibilities for a digital and more technologically aligned inspection process. The findings from these studies are detailed in Section 4 of this report.

The primary objective of implementing the manual process interventions was to identify critical efficiency elements. The interventions set out to address the following scenarios:

- If inspection documentation is improved, does it make the inspection process more predictable and therefore more efficient?
- Does better documentation provide credible data that can be harnessed to identify efficiency gaps and improvements to the agricultural value chain?
- How do targeted trainings and effective data collection on value chain processes impact export compliance and collaboration between exporters and inspectors?
- Can improved documentation be harnessed to identify other outliers and variables that affect inspection and SPS compliance?

Intervention design: The design was based on improving existing inspection checklists and introducing new ones (where applicable), and on creating a working structure for effective collaboration, planning, and communication between exporters and agricultural inspectors.

Application of checklists: A group of 30 selected companies applied for the new checklists and 19 agricultural inspectors at packhouses and the airport also agreed to adopt them. The project team received daily data via the checklists electronically and used these to create a detailed database of inspection and export data. In addition, the project team regularly visited and consulted with exporters and inspectors to ensure data credibility.

4.2.2 Product matrix

Data derived from the checklists indicate that a total of 68 products were exported during the period, with a total gross weight of 1,998 million kilograms. The product matrix indicates that avocadoes comprised 26% of total exports, as detailed in the graph below.

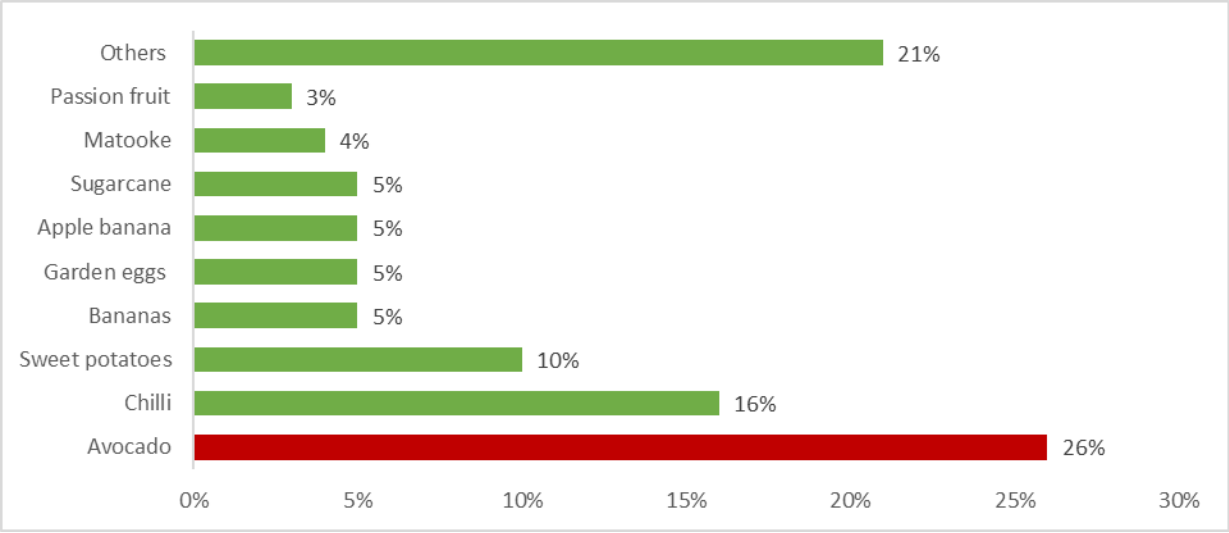


Figure 9:Matrix of exported products as percentage of total exports during the intervention period

Avocado and chili are in particularly high demand in the EU, United Kingdom (UK) and Gulf markets. Chili is generally a seasonal product, peaking in demand between August and April. Pineapple exports constituted 2% of total exports in the period.

4.2.3 Adoption of process improvement (soft re-engineering) interventions and Satisfaction levels

An analysis of the data indicates that the target pilot companies in the project embraced and adopted pre-inspection planning forms/tool and other checklists and considered them essential for enabling early planning for inspection. As illustrated in the figure below, 90% of participating companies adopted the forms and used them regularly, rather than previous ones.

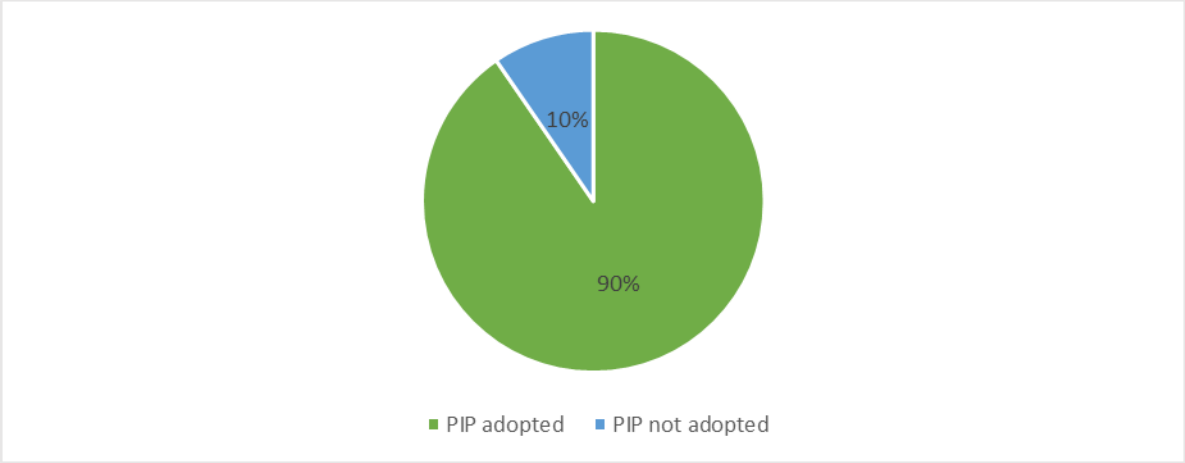


Figure 10: Rate of adoption of pre-packhouse inspection planning tool and the new checklists

10% of the selected companies did not adopt the forms and continued to use existing NPPO documentation. When asked why this was the case, these companies cited insufficient support from inspectors attached to them as the main reason. Also, pre-inspection planning and adoption remained optional during this phase of deployment to allow companies to voluntarily assess the value to them from the intervention.

The project team conducted a snapshot survey involving company managers and quality controllers to find out the level of satisfaction with the pre-packhouse inspection planning tool and the rest of the checklists[19]: 75% of exporters expressed satisfaction with the pre-packhouse inspection planning tool and new checklists.

"Previously planning for an inspection was tedious, but now, you just send the weekly schedule and call the Inspector and alert them of the inspection date" - Exporter

Exporters gave various reasons for their satisfaction, with the majority indicating work simplification, predictability of process, and transparency of scheduling.

[19] Checklists were for gathering data while the pre-packing house inspection planning tool was intended for timely scheduling of inspections

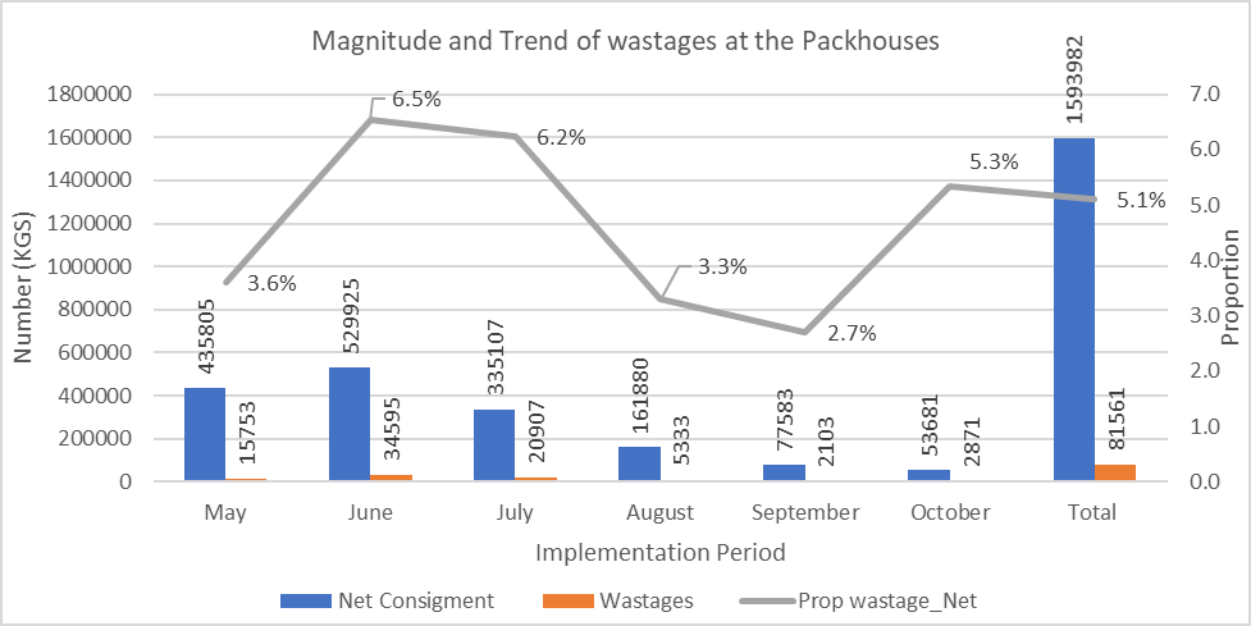
On the downside, some exporters expressed dissatisfaction, citing the additional time and effort required to complete the new checklists.

Considering that no pre-inspection planning existed previously, other than by email notification, this level of adoption is significant and suggests that it should be rolled out beyond the selected companies.

4.2.4 Product wastage and rejection at the packhouse

Wastage, in this regard, relates to produce from the farm that is not selected for export during sorting (before agricultural inspection). Such products are typically of poor quality and fall short of market standards. Quality controllers at packhouses manage this process. Figure 11 illustrates the magnitude of such wastage, with June, July and October returning rejection rates of over 5%. Overall rejection during the study period was 5.1%

Figure 11: Wastage Trends with data gathered during the period.



As Figure 12 below illustrates, avocados, sweet potatoes, garden eggs, apple bananas, sugar cane and hot pepper (part of the Capsicum family) represent the bulk of the wastage during the period. These high-volume products are also very susceptible to physical damage, particularly during transportation and handling. Product wastage was of specific concern to the NPPO – given that disposal is not properly documented or verified. Exporters indicated that most of the product is sold in local markets, but concerns arise regarding the quality of such products, as well as potential chemical and pest contamination and residue. Given this situation, the design and implementation of traceability should be imperative.

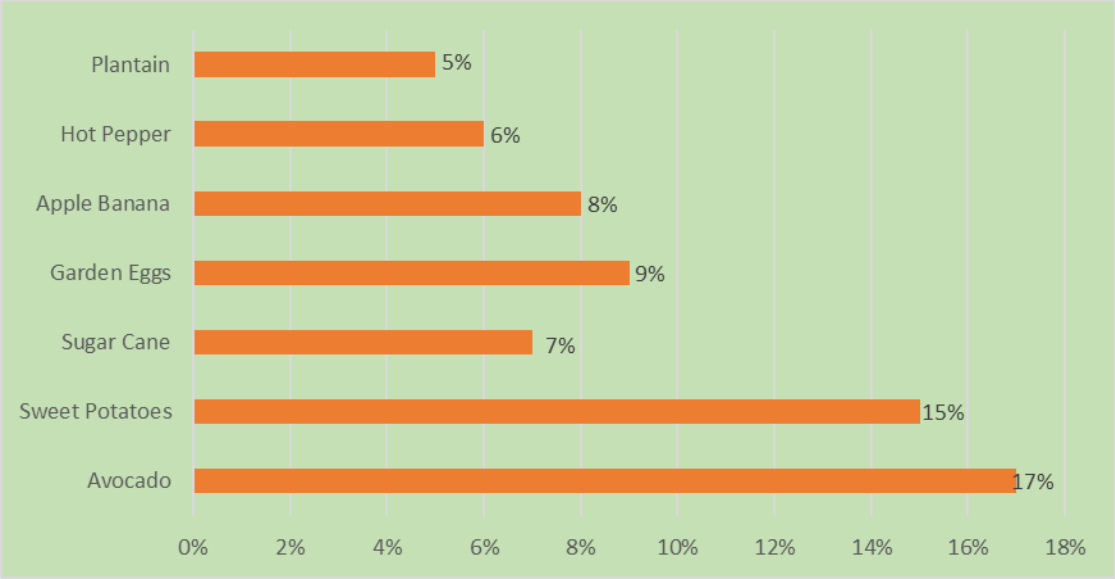
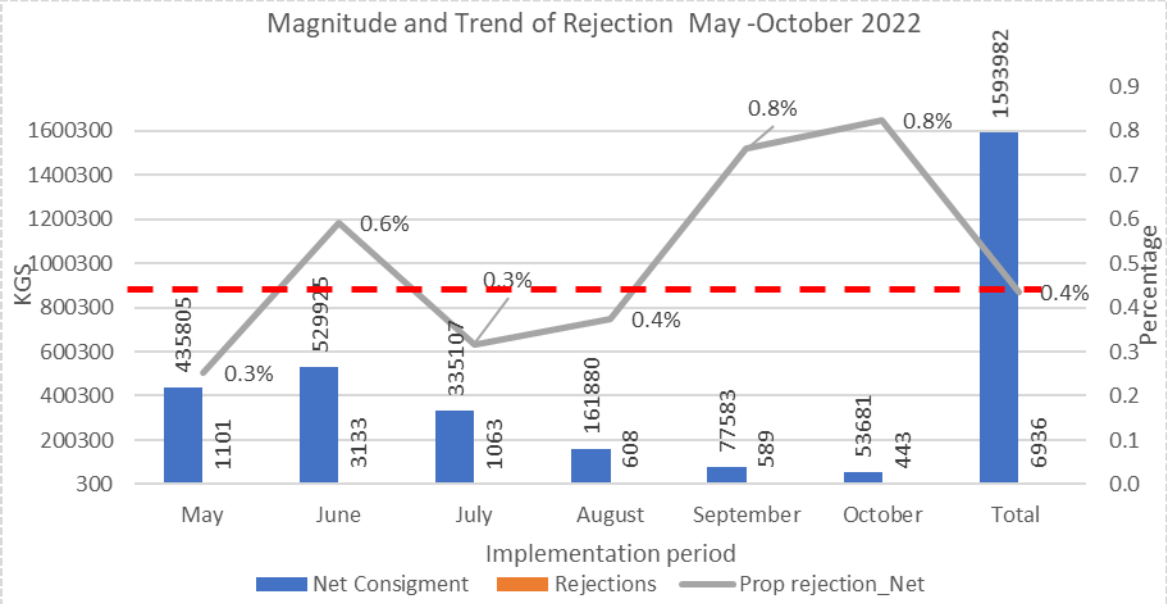


Figure 13: Product wastage indicators at packing facilities during the intervention period

Rejection, on the other hand, occurs when inspectors deem a product is not export quality. As illustrated in Figure 13, the rejection rate was 0.4% during the study period. Rejection volumes fell between August-October, not necessarily because of improvements in compliance with the SPS regulations, but because of a reduction in fruit and vegetable production due to a dry spell.

Figure 12: Rejection Trends during the period



A deep dive into the reasons for product rejection showed a risk-based approach to inspection would bring improvement. In Figures 14 and 15, we singled out garden eggs and chilis to represent products considered at high risk of pest infestation and chemical residue. Various reasons for rejection included over-maturity, physical damage, phytosanitary non-compliance, and poor quality.

Figure 14: Rationale for wastage (Garden Eggs)

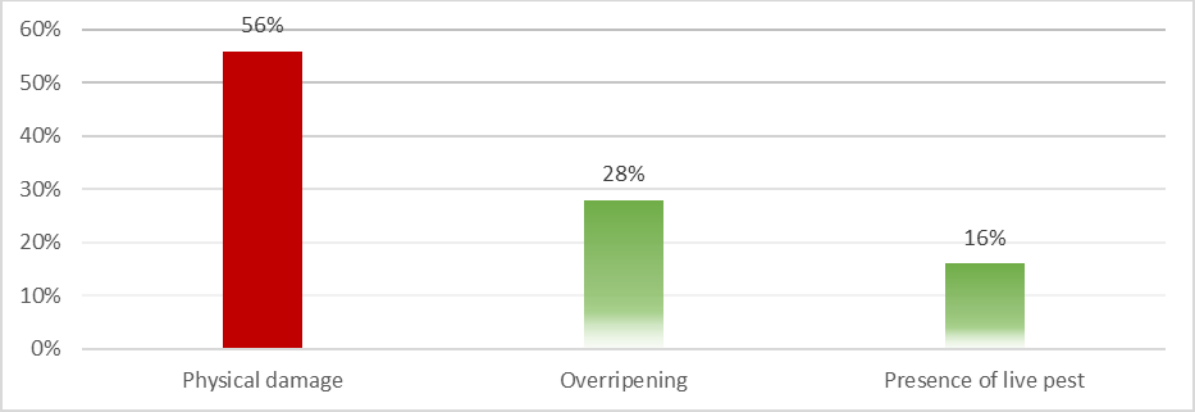
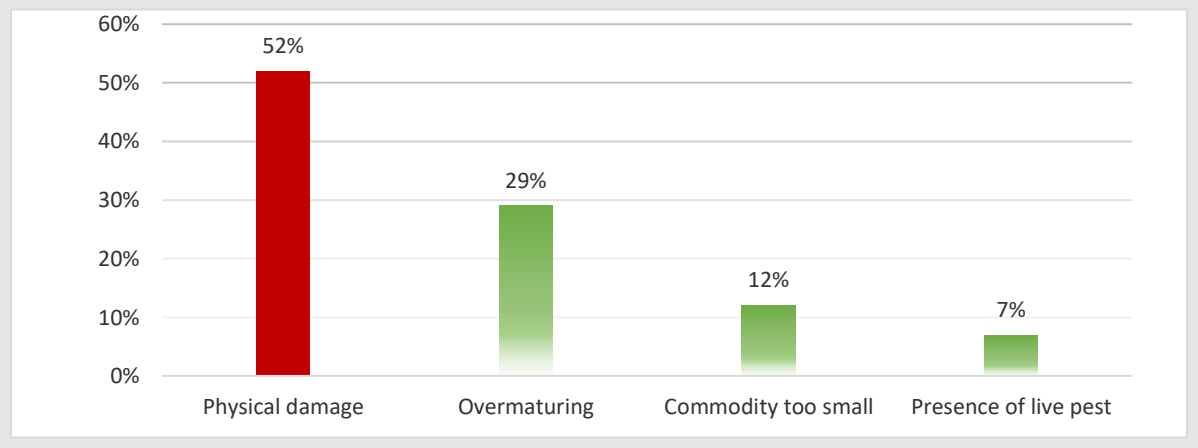


Figure 15: Reason for wastage (Chilis)



Figures 14 and 15 show the main reason for commodity rejection is physical damage, rather than phytosanitary deficiency. The main determinant of phytosanitary insecurity, the presence of pests and diseases, is not a frequent cause for rejection. There are opportunities to focus inspectors' efforts and time on high-risk packhouses and farms for more process efficiency.

4.2.5 Inspection Time Trends at the packhouse

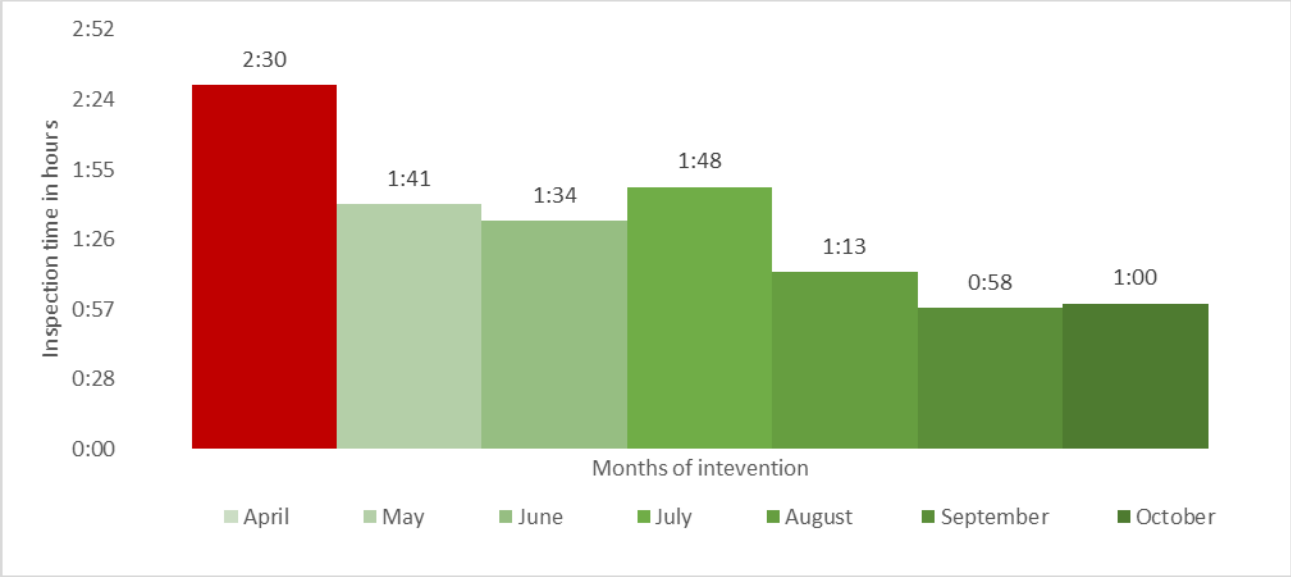


Figure 16: Inspection times at packhouses during the intervention period

The team collected data on 430 consignments. After the introduction of improved checklists, inspection times at the packhouses remained under two hours. Inspection times can vary for a number of reasons, such as the size of the consignment and nature of the product (higher or lower risk of quarantine pests). Inspectors can elect to increase inspection samples where there is a clear risk of poor sorting by the exporter.

Further analysis is required to determine whether the new checklists have changed export practices, contributing to a sustainable reduction in inspection times. As is, the recorded time reduction may be explained by a fall in the number of consignments and total export volumes, as illustrated in Figures 17.

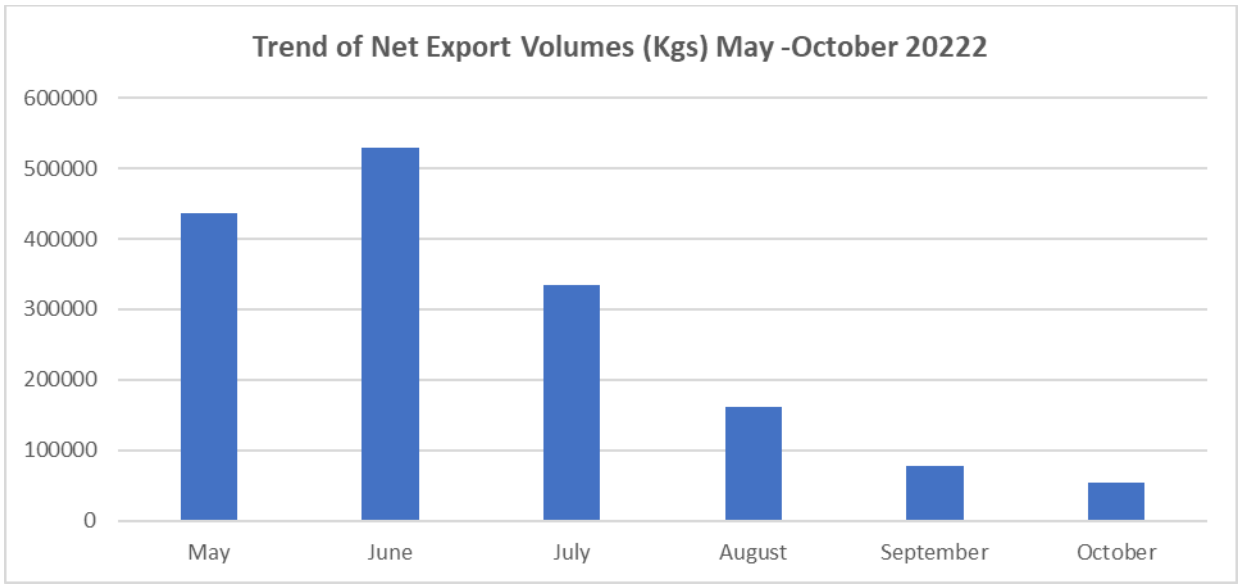


Figure 17: Trend of export volumes during the study period

4.2.6 Inspection & interception at the airport

The study analyzed inspection data and outcomes at the cargo terminal over the intervention period. Figure 19 illustrates the trend.

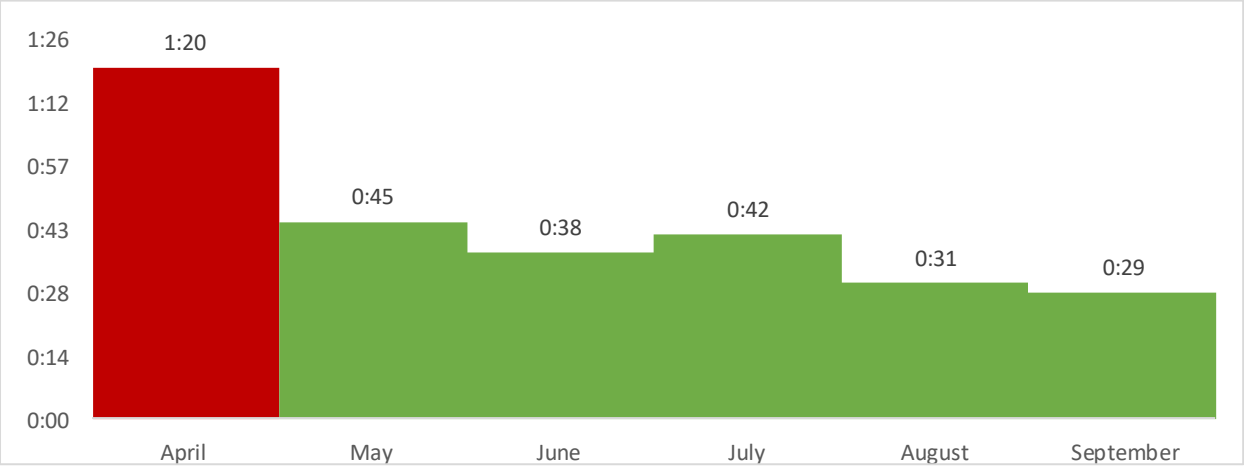


Figure 18: Inspection time trends at the airport during the study period

Following the introduction of the new checklists, the average inspection time at the airport fell to 29 minutes. Inspectors spend 60% of this time reviewing key documentation, such as the ePhyto certificate, the packhouse inspection checklist, the packing list and flight details. Compared with their colleagues at the packhouse, Inspectors at the airport face space and time constraints.

During the study period, we noted only one case of interception at the airport. A consignment of chilies contained a live quarantine pest, leading to confiscation and destruction at a government facility, paid for by the exporters.

Questions have been raised about why interceptions at the airport are very low, considering reports of increased interceptions at destination ports. At a workshop to review this study with stakeholders held in April 2023, several factors were highlighted, including:

- Late arrival of cargo from packhouses, leaving little room for adequate airport sampling
- Infrastructure inadequacies at the airport to support rapid, robust sampling and inspection
- Transportation and handling challenges (offloading can coincide with inspections, for example).

Conclusion on time trends at packhouses and the airport:

There are also benefits beyond time and cost savings. Improved coordination between quality controllers and agricultural inspectors has the potential to deepen appreciation of the roles played by both parties in the export process.

The team gathered anecdotal evidence of this during the project intervention, backed up by statements from quality controllers (Text box 1). The team is also confident that training delivered to quality controllers on better management of the inspection process and exposure to modern cargo inspection and handling will likely further these gains.

"The inspectors are more approachable than how the situation was before." Emmanuel Bwire from ROKI fruits and vegetables

"…the inspectors are now more organized and there is better information flow, with them being more aware of our schedules…" Rebecca Nakakinda, FFP/Icemark

Textbox 1: Qualitative feedback from some quality controllers at different packhouses

In view of the above:

- Digitalization of documentation and adoption of technology should be used to streamline inspection practices at the packhouses and the airport. Building a digital e-tracking tool (web and mobile compatible) to digitize documentation will make the process more efficient for both inspectors and exporters. The checklists provide a strong basis for an easier, faster digital approach.
- There are opportunities to empower inspectors to be more efficient, particularly considering the current shortfall in numbers.
- There is currently insufficient inspection space and infrastructure at the airport to conduct effective consignment reviews.

4.2.7 Post-export feedback

The project created a 'final destination' checklist for collecting post-export feedback, including packages accepted and rejected (and the reasons for rejection), the status of chemical testing on arrival at the final destination, and, where available, status on customer payments.

Some 39% of consignments underwent chemical testing at a destination country, compared to under 4% in Uganda itself. This underscores the continuing concerns over product quality. However, the majority of product rejections were due to over-ripening before market delivery. A review of the European Commission's (EC) plant health and biosecurity data (European Commission, 2022) indicates that there was a total of 15 interceptions of Ugandan fruits and vegetables between May and September 2022, an average of three a month. In 2020 and 2021, as many as 10 interceptions were reported in a single month.

4.2.8 Document compliance

As previously stated, inspectors at the airport spend most of their time conducting document reviews and on compliance. As indicated in the figure below, during the intervention period, there was only a single case of document non-compliance.

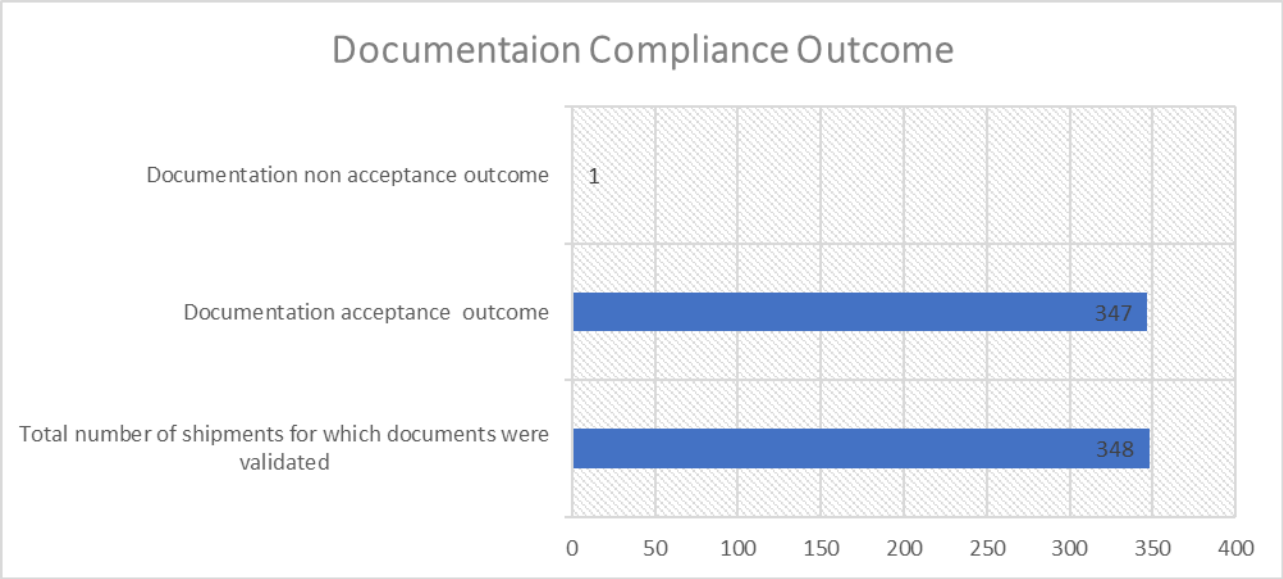


Figure 19: Document compliance outcomes at the airport

a strong indication that time spent by inspectors at the airport can be better used if reallocated to packhouses, particularly under a risk-based mechanism.

4.2.9 Risk assessment

Data analysis highlights opportunities for risk-based application of inspection procedures. The team identified riskier products, based on frequency of rejection and wastage, likelihood of identification of a quarantine pest, chemical testing at the export market, and spoilage or risk of overripening at the destination market.

Table 3 below presents risk ratings as factors for product wastage and rejection, considering the predominant reasons for failure, based on outcomes of the data collection during the intervention period.

Product name	**Average %age wasted**	**Average %age rejected**	**Key reasons for rejection/wastage**
Avocado	2.8%	0.9%	Physical damage
Sweet potatoes	6%	0.2%	Physical damage
Garden eggs	7.6%	0.5%	Physical damage, overripening and fruit fly
Apple banana	6.6%	0.2%	Bruised fingers
Sugarcane	0.1%	0%	Cracking virus
Hot pepper	12.1%	0.3%	
Chili	9.7%	0.1%	Physical damage & small fruits
Bananas	3.8%	0.2%	Bruised fingers, physical damage
Matooke	4.2%	0%	Bruised fingers
Bird eye chillis	9.3%	0.2%	
Pineapple	7.0%	0.2%	Overripening
Passion fruit	4.4%	0.5%	Physical damage

Product name	Average %age wasted	Average %age rejected	Key reasons for rejection/wastage
Curry leaves	21.7%	0%	
Ginger	4.5%	0.3%	Bruised, broken rhizomes, small size
Tomatoes	42.2%	0%	
Coco yam	4.3%	0.3%	
Peanut	3.5%	0.4%	Immature pods
Aubergine	20.2%	0%	
Irish potatoes	13.6%	0%	
Green chillis	5.8%	0.4%	
Okra	9.7%	0%	
Green pepper	9.7%	0%	
Mangoes	1.7%	0.1%	
Groundnuts	6.5%	0.1%	Immature pods, cracked shells
Plantain	3.2%	0.2%	
Chinese Cabbage	37.1%	0%	
Gunda	8.2%	0%	
Cucumber	22.8%	0%	
Red chillis	3.7%	0%	
Cauliflower	2.9%	0%	
Yams	0.8%	0.1%	Excessively soiled fruit and
Zucchini	12.2%	0%	
Turkey berries	15%	0%	
Kalera	4.8	0%	
Beans	0.9%	1.2%	
Turmeric	1.9%	0%	
Bitter gourd	0.3%	0.2%	
Jackfruit	0.0%	0%	
Soursop leaves	0.0%	0%	
Lemon grass	0.0%	0%	
Peanut pods	0.0%	0%	
Dried Beans	0.0%	0%	
Ash plantain	0.0%	0%	
Banana leaves	0.0%	0%	
Cassava	0.0%	0%	
Sweet melon	0.0%	0%	
Watermelon	0.0%	0%	
Leek	0.0%	0%	
Radish	0.0%	0%	
Turnip	0.0%	0%	

Table 3: Risk matrix based on wastage and rejection data at packhouses during the intervention period.:

5. Deep Dive: Loss Analysis

To conduct a potential loss analysis, the team aggregated export data, product wastage and rejection figures for selected products based on figures provided by exporters for payment to farm suppliers and final prices received from importers. This allowed the team to calculate an expectation of the estimated losses to farmers and exporters based on different variables, factoring in different scenarios of the inspection and export process.

5.1 Assessment of losses to farmers due to product wastage and rejection for selected products

Product	Wastage in kgs	Rejection in kgs	Average Farm price in US$[20]	Losses at wastage in US$	Losses at rejection in US$
(Derived from data analysis)					
Avocado	14,159	4,674	0.36	5,097	1,683
Sweet potatoes	12,368	374	0.5	6,184	187
Garden eggs	7,735	483	0.81	6,265	391
Apple bananas	6,345	163	0.5	3,173	82
Sugar cane	101	138	0.55	56	76
Passion fruit	2,132	241	0.6	1,279	145
Banana	3,687	191	0.4	1,475	76
				$ 23,529	**$ 2,639**

Table 4: Estimated losses to farmers during the assessment period due to wastage and rejection at packing facilities

As Table 4 illustrates, based on these products, fruit and vegetable sector farmers lost an estimated US$ 26,168 due to wastage and rejection of fresh produce at the packhouse over the six-month period. Farmers incurred these losses due to non-export. When extrapolated over a year the loss amounts to an estimated US$ 69,803.

5.2 Assessment of losses to exporters due to wastage and rejections at packhouses

We replicated this methodology to assess the potential losses to exporters for unsold produce, factoring in the price that exporters would have received from the market. For the period under review, this amounted to US$ 55,962 as illustrated in Table 5. When extrapolated over a year, the loss is estimated at US$ 134,310.

Product	Wastage in kgs	Rejection in kgs	Average export price in US$[21]	Losses at wastage in US$	Losses at rejection in US$
(Derived from data analysis)					
Avocado	14,159	4,674	0.99	14,017.41	4,627.26
Sweet potatoes	12,368	374	1.21	14,965.28	452.54
Garden eggs	7,735	483	1.34	10,364.9	647.22
Apple bananas	6,345	163	0.77	4,885.65	125.51
Sugar cane	5,881	138	1.11	112.11	153.18
Passion fruit	2,132	241	1.09	2,323.88	262.69
Banana	3,687	191	0.78	2,875.86	148.99
				$ 49,425	$ 6,417

Table 5:Estimated losses to exporters due to unsold produce during the assessment period

[20] Price obtained from survey of exporters for price paid to farmers to buy export produce per kilogram
[21] Price obtained from survey of exporters for price received from export market.

Assuming 30 active exporters use the airport as the primary departure port for their produce, this amounts to an estimated annual loss of US$ 4,477 per exporter per year.

5.3 Assessment of losses due to chemical testing at the export market

Exporters indicated that the chemical residue test in the EU market costs an average of US$ 280[22] per consignment with 39%, or around 250 consignments a year affected. This translates to annual losses of US$ 70,000 due to chemical testing requirements.

Aside from the payment required to conduct the test, exporters reported wait times of up to a week for results and feedback. This increases the risk of products held in storage over-ripening, or even spoiling. It is critical that exporters do not consider such expenditure and potential losses are not normalized as a cost of doing business.

These losses are avoidable. The adoption of smarter inspection and sorting techniques, not only at the packhouse but also at the production area (on the farm) would significantly reduce product wastage.

It is also important to note that, during the assessment period – only 4% of consignments reported conducting chemical testing before export in Uganda. This was for exports to the United Kingdom, The Netherlands, France, Germany, and Belgium. Currently, there is no specific mandate from the NPPO outlining chemical testing requirements pre-export.

These findings indicate that more efficient processes would achieve significant cost savings. Incremental process gaps can result in significant losses. Table 7 summarizes potential losses.

Stakeholder	Cost driver / loss driver	Total estimated annual losses
Exporters	Wastage and rejections at the packhouse	US$ 134,310
Exporters	Chemical testing	US$ 70,000
Farmers	Wastage and rejections at the packhouse	US$ 72,054
NPPO	Incremental labor cost to meet capacity challenges	US$ 23,305.6
Total sector losses due to SPS compliance inefficiencies		**U$ 297,418.6**
In Uganda shillings		**1,085,577,890**

Table 6: Estimated annual losses to the fruit and vegetable export sector due to SPS inspection inefficiencies.

Our estimates indicate that the fruit and vegetable export industry loses nearly US$ 300,000 annually in SPS compliance inefficiencies. Assuming 30 active exporters, this amounts to nearly US$ 10,000 per exporter, per year. These inefficiencies are primarily driven by:

- Resource limitations at the NPPO to ensure compliance of a maximum number of consignments and farm inspections.
- Inadequate planning data and processes to ensure quality inspection.
- Continued focus on 100% inspection of all consignments and no application of data-driven risk-based inspection.
- Manual processes that often lead to delays.

[22] This is the cost of conducting the tests in designated labs in the destination country. It does not include destruction costs should the result lead to an interception.

6. Progress on SPS Complimentary Workstreams

As stated earlier, besides SPS process improvements, the project is supporting other workstreams to streamline the fruit and vegetable export process. These interventions include:

- **Working with the Ministry of Trade to enhance export information provision for the sector**. The project has supported the updating of the National Trade Facilitation portal with modules relevant to fruit and vegetables, adding nine new detailed modules covering several products. The Trade Ministry has been supported to build a trade facilitation simplification plan which, if fully implemented by the various participating trade facilitation institutions and given access to good information on different trade procedures, will furnish exporters with greater knowledge and enable them to spend less time complying with export processes. This will reduce export time and costs.
- **Training of trainers to build capacity to sustainably design and deliver training programs** for the sector, with a focus on SPS knowledge needs and requirements and how to meet them. At the time of publication, 11 experts have been trained both in-country and externally in Turkey. The Turkish Airlines Aviation Academy collaborated with the project to offer Uganda's Ministry of Agriculture and the private sector an opportunity to learn international best practice. It is expected that the Ministry and trained experts from the private sector will conduct training in Uganda to impart these practices.
- **PPD engagements (especially with the sector's main representative association, Hortifresh).** The project supported the association to grow, and worked with it and peer organizations to formalize common actions on issues affecting the sector, such as MRLs.

Coupled with planned digitalization measures, the sector should experience improvements on the export front, especially in time and cost reduction.

7. Conclusions and recommendations

1. Farmers bear disproportionate losses arising from wastage during sorting. Hence, they should play a central role in any intervention strategy. Future projects should also address constraints on production as these have a knock-on effect on some of the challenges at other stages of the trade process.
2. Most of the trade export process is manual and so fails to take advantage of technological process efficiencies. It is possible to digitalize significant aspects of the process beyond the electronic phytosanitary (e-Phyto) certificate to enable further efficiencies, bringing time and cost savings as well as greater transparency. It will also enable data analytics that will improve sector performance and decision-making.
3. Appropriate use of data will enable the NPPO to optimize deployment of inspectors. The private sector can also use this data to meet SPS compliance requirements cost effectively, reducing export costs.
4. Based on the current data, it is possible to realize time and cost savings. These will not be transformational because of the limited price value of commodity exports and low labor rates for sector workers - the majority of whom are low-paid wage workers at the packhouses. The project team will conduct a controlled study to ascertain how much of these savings can be attributed to project interventions versus many other factors, working with a sample of companies to agree the key control factors within the remaining project duration.

Impact is key. Based on the data, the team would propose the following recommendations to the NPPO in streamlining export trade in fruit and vegetables.

7.1 Technical recommendations

A Data-Driven Approach: The study was driven by a strong focus on data collection, using the outcomes to build, design and develop improved processes and identify inefficiencies. The NPPO should adopt a data-driven approach towards the inspection process. We reported a 90% adoption rate of the new, improved checklists. We recommend that the NPPO uses these checklists to collect relevant export, SPS compliance, and inspection data. A data-driven approach will also build confidence in Uganda's SPS inspection regime, potentially leading to less testing in export markets, reducing the cost of testing and losses for exporters, and enhancing the reputation of the sector and the country, further driving sectoral export growth.

Risk-based inspection: The study recommends strong consideration of risk-based inspection. Data shows that certain commodities and exporters are more susceptible to SPS non-compliance. The team recommends the NPPO installs a robust, data-driven, risk-based mechanism that ensures inspectors are assigned to provide the most effective service for the regulator and exporters. We also recommend a substantial reduction in airport inspections.

Review the relevance of several inspection levels at the packhouses: An assessment of the requirement for inspections 1, 2 and 3 at this level of the value chain is necessary to further reduce time.

Labor optimization: The study has shown that there are opportunities for the NPPO to prioritize and focus inspectors' time and efforts on exporters and commodities that present the highest risk of SPS non-compliance. As well as improving inspection outcomes, this will ensure that the regulator does not have to incur more financial resources than necessary to recruit additional inspectors.

Technology and digitalization: The study recommends the adoption of a digitalized process encompassing documentation or inspection and greater use of technology to improve inspection processes. We recommend development of a robust inspection system that harnesses documentation, eases communication and interaction between inspectors and exporters, and generates key data and metrics to support data-driven approaches.

7.2 Learning and development

Regular training: The project recommends that the NPPO works closely with the private sector fruit and vegetable export associations to provide regular and continuous training on improved handling of fresh produce, inspection readiness, and improvement of processes at packhouses. The project conducted focused training for quality controllers that generated improvements in packhouse management processes and a reduction in interceptions.

Collaboration and exchanges: The project team recommends that the NPPO pursues more collaboration and exchanges, especially with Uganda's main export markets. These exchanges should be focused on identifying key areas for improvement and collaborating to improve fresh produce handling and phytosanitary compliance. Private sector collaboration should be central to this. Stakeholders such as KLM Royal Dutch Airlines, for example, provide awareness-training and capacity-building for clearing agents and handling companies to increase export process efficiency.

7.3 Regulatory

Production/farm level: The project team recommends that additional efforts (alongside inspector labor optimization) be extended towards continued capacity building of farmers and production-level inspection. As noted, improvements at farms are pivotal to reducing wastage and rejection, incurring potential revenue losses for farmers and exporters.

Chemical testing: The project team recommends that the NPPO works with the private sector to streamline chemical testing, adopting a risk-based approach. The study shows that exporters are ready to pay for chemical testing if the cost per sample is reduced and it leads to fewer tests at EU destination markets.

Technical dialogues: The project is introducing focused dialogues for key technical players (at packhouses and the airport) to ensure that technical stakeholders such as inspectors and clearing agents or agronomists and inspectors collaborate regularly to discuss and solve emerging challenges. We recommend that the NPPO continues to lead and support these important dialogues.

Commitment to sustainability: The project recommends that the NPPO commits to ensuring the future sustainability of the new inspection checklists, as well as the adoption of technology. We have noted a commitment from the Regulator to work continuously with exporters and inspectors to monitor data outcomes and ongoing compliance. We also believe that once the process is fully digitalized and data entry in the system becomes obligatory, the checklists will be fully adopted.

7.4 Additional recommendations by stakeholders

At a workshop in April 2023 to review this paper, stakeholders made the following key additional recommendations. Some may not necessarily be directly linked to the SPS process but are vital for overall efficiency.

- Supporting improvements in packaging and cargo handling – Can the airport installs the required technology to scan palleted cargo
- Improve inspection infrastructure at the airport – Can the airport provide a less-congested inspection area and shelter for both cargo and staff? There appears inadequate provision for such at the new cargo terminal which was completed in 2022 to provide more space for handling exports and manage higher traveler volumes.

- Training for other value chain actors beyond quality controllers and Inspectors – Can this extend to clearing agents, cargo transporters of fruits and vegetables from packhouses to the airport, cargo handlers at the airport etc.
- Embrace a systems approach to risk management across the entire value chain. This is the main demand from key regulatory agencies in end-markets.
- Adoption of Global GAP by farmers.

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Appendices

Appendix A: Data collection and exporter survey participating companies & Inspectors

S/N	Company Name	Contact email address
1.	Tropical Dynasty Limited	tropical.dynasty058@gmail.com
2.	KK Foods Limited	james@kkfoods.co
3.	Agricado Farms	supplychain@agricadofarms.com
4.	Shaga Greens	info@shagagreens.com/ shagagreensltd@gmail.com
5.	United Pearl Exporters	agronomist@unitedpearlexporters.com/ deus@unitedpearlexporters.com
6.	Thomas & Company	bijuthomas@ymail.com/ tandcklaquality@gmail.com/ operationstandckampala@gmail.com
7.	Go green Exim Uganda Limited	gogreenexim@yahoo.com
8.	FFP Uganda Ltd	betty@icemark-africa.com/ benonb@ffpmashamba.com
9.	Zahra Food Industries	quresh.fidahusein@zahrafi.com
10.	Mwuvaneza Food Industries	mwumvanezaoperations@gmail.com
11.	Roki Food Industries	rokifruits@gmail.com
12.	FPG Ug Limited	fpgugltd@gmail.com
13.	Aseel Impex Limited	aseelagronomist@gmail.com/ aseelfruits@gmail.com
14.	Afrimex Foods Uganda Limited	ivanmartin.nsubuga@yahoo.com/ maysum2006@yahoo.com
15.	Al Nabawi Agro Products Limited	alnabawiagroproducts@gmail.com
16.	YTBM Afrofruits	ytbmqc@gmail.com/ ytbmafrofruits2@yahoo.co.uk
17.	Reyez Uganda Limited	reyezoperations@gmail.com
18.	Freshmax(U) Limited	freshmax.u.ltd@gmail.com
19.	Al Gazal SMC Ug limited	algazalug@gmail.com
20.	BBarkingInvestments Company Limited	barukanginvestments@gmail.com
21.	B&S Group of Companies	info@bsgcompanies.com
22.	Destiny Agrosolutions Limited	kanyesigyepatricia@gmail.com
23.	Tropi Exports Limited	walseenterprises@gmail.com
24.	Allies Agric Uganda Limited	naizymcraze@icloud.com
25.	Biofresh Limited	soniam@biofreshltd.com/ miltono@biofreshltd.com
26.	Interfruit Dealers Limited	kisuulebashir95@gmail.com/ interfruits717@gmail.com
27.	Agriverde Uganda Limited	agriverdeugandaltd@gmail.com/ agik.harriet@gmail.com/ mugabiashirafu@gmail.com
28.	Asasira traders	asasiratradersltd@gmail.com
29.	40 Miles farm Business SMC Limited	40milesfarmbusiness@gmail.com
30.	SM impex	cturyamureeba790@gmail.com/ smimpexint@gmail.com

Agricultural Inspectors who participated in data gathering

S/No	Name	Inspection Area
1	Kirongo Patrick	Packhouse
2	Sebutare Gilbert	Packhouse
3	Ssamula Alexander	Packhouse
4	Okwir R Bruno	Airport
5	Aceng Mildren	Packhouse
6	Ekaru Samuel	Packhouse
7	Ongom Lawrence	Packhouse
8	Mukwaba Erisa	Packhouse
9	Chemonges Martin	Packhouse
10	Chemonges Martin	Packhouse
11	Wasongola Albert	Packhouse
12	Asega Husseini	Packhouse
13	Agaba Burnet	Airport
14	Kainomugisha JB	Packhouse
15	Owiny Raphael	Airport

Appendix B: Inspection checklists

Pre-inspection planning schedule

MAAIF – NPPO
WEEKLY PRE-INSPECTION SCHEDULING AND PLANNING FORM
VOLUME 2.0
To be completed by packhouse quality controllers and shared with assigned agricultural inspectors

Week:
XXXX

Company details:

Export Company name	Export registration #	Consignment location Packhouse facility/ Name	Quality controller name

Export schedule and planning details:

Commodity for export	Product HS code	Estimated flight time and date	Airline	Name of Exit Handler (ENAS/ DAS)	Total estimated product weight (net weight) (Kgs)	Expected inspection date	Requested inspection time

Guidance:

1. Quality controllers/agronomists at packhouses should endeavor to **complete this form weekly** once export orders have been confirmed.
2. The form should be **sent to assigned agricultural inspectors at the beginning of every week**, to enable adequate planning and timing for inspection.
3. Agricultural inspectors should endeavor to confirm the inspection in advance to quality controllers.

XXXXXX – insert quality controller / agronomist name

Date:

XXXXXX - insert Export company name

Airport inspection checklist

HORTICULTURE EXPORT INSPECTION RECORDS
AIRPORT INSPECTION CHECKLIST

GENERAL INFORMATION			
Inspector Name			
Exporter *(Token Number)*		E-phyto certificate No:	
Inspection date		Inspection start time	

INSPECTION INFORMATION							
No	**Parameter**				**Response**		
1	Inspection No						
2	**HS CODE**	**Commodity (s) for Export**	**Risk level *(High/low)***	**No of packages**	**Gross weight *(In Kgs/Mts)***	**Net weight (*unit in Kgs/mts*)**	
3	Inspected?				Yes	No	
4	MRL testing certificate *(Where required - (Critical for High-risk Crops)*				Present	Absent	Not applicable
10	Packaging review (Tick accordingly)				Leveled	Not leveled/deformed	
11	Country of Export						
12	Clearance Outcome (Tick accordingly)				Accepted	Rejected	
13	Commodity Interception	**Commodity**	**Amount intercepted**		**Reason/cause of wastage**		
14	Key compliance comments						
15	Recommendations						
16	Airport clearance end date				Airport Clearance end time		

Airport Inspector name:

Signature ..... Date .....

Destination checklist

HORTICULTURE EXPORT INSPECTION RECORDS

FINAL DESTINATION CHECKLIST

GENERAL INFORMATION			
Inspector Name		Quality controller	
Inspector No		Contact	
Exporter/Packhouse		Airway bill No:	
Date		E-phyto certificate No.	

INSPECTION INFORMATION							
No	Parameter				Response		
1	Consignment arrived at final destination				Yes	No	
2	Date of Arrival						
3	Commodities tested on arrival				Yes	No	
4	**HS CODE**	**Exported Commodity**	**No. of Packages**	**# Accepted packages**	**# Rejected packages**	**Reason for rejection**	**Payment cleared / received (Yes / No)**
5	Country of Export						
6	Comment/Review						

Completed by .....

Title.....

Signature.....

Date.....

Exporter questionnaire

RE-ENGINEERING UGANDA'S SANITARY AND PHYTOSANITARY INSPECTION PROCESS OF HORTICULTURE EXPORTS

EXPORTER QUESTIONAIRE

Hello. My name is _____. Thank you for the opportunity to speak with you. We are a team from Swisscontact. We are conducting a survey to learn about and try to improve horticulture export in terms of time, cost, and wastage in Uganda. Your company has been selected to participate in an interview that includes questions on topics such as your company information, general company characteristics, training history, time and cost assessment, infrastructural setup, and chemical testing among others. The questions about the company and its characteristics will take about 30-45 minutes to complete. Your participation is entirely voluntary. If you agree to participate, you can choose to stop at any time or skip any questions you do not want to answer.

Your privacy is important to us. Private information like your name will not be shared with anyone. Information like your plot location may be shared with researchers who will use it to better understand Horticultural exports as a whole in Uganda; these researchers are legally required to protect your information. Some survey responses will also be shared with the public, but no information will be shared that can link you to the study. After entering the questionnaire into a database, we will remove all information such as your name that could link these responses to you before sharing it with others for research purposes.

Do you have any questions about the survey or what I have said? If in the future you have any questions regarding the survey or the interview, or concerns or complaints, we welcome you to contact Swisscontact, by calling Viola Nampeera (Senior MRM Officer)- at 0772205665 or Benjamin Mugema (Project Manager) – at 07788876634

COMPANY INFORMATION

Interview respondent name	
Contact	
Role/ position of Interviewee	
Exporter Name (Company)	
Name of packhouse (If different)	
Packhouse Location	
Date of establishment	

Company staffing details

Parameter		**Male**	**Female**
Age	Below 20		
	20-25		
	26-30		
	31-35		
	36+		
	60+		
People With Disabilities			
Education	Tertiary		
	Secondary		
	Primary		
	None		

SN	QUESTION	RESPONSE	SKIP
A: GENERAL COMPANY INFORMATION			
A1	Commodities for export (List)		
A2	Countries mainly exported to (List)		
A3	What is your average quantity exported per shipment? (In kgs or tonnes)		
A4	How often do you export?	Daily .....1 Weekly .....2 Monthly.....3 Quarterly 4	
A5	How many consignments do you export per week?		
A6	Does your company belong to any fruit and vegetable exporter Association?	Yes .....1 No 2	If no, go to A11
A7	If yes, which Association?		
A8	How long have you been a member of this association?		
A9	Have you had any engagements with your association?	Yes.....1 No 2	
A10	What engagements? (Multiple responses)	Awareness dialogues.....1 Annual general meetings .....2 Sensitization workshop ....3 Others (Mention).....4	
A11	In which category of Enterprise is your company?	Micro .....1 Small.....2 Medium.....3 Large 4	
A12	Company ownership	Woman-Owned Business.....1 Male owned Business.....2	
A13	What is the origin of your exporter products?	Own a farm .....1 Outsource from other farmers .....2 Both.....3	
A14	What is the distance average distance from the farm to the packhouse? (In Kms)		
A15	What is your average distance from the packhouse to the airport? (In Km)		
IB: INTERCEPTION AND WASTAGE			
B1	Have you experienced any interceptions in the past 3 years? (At packhouse, airport, or final destination)	Yes.....1 No .....2 Don't know.....3	If no or don't know, go to B4
B2	If yes, how many interceptions has the company experienced in the past 3 years?	Year / 2019 / 2020 / 2021 / 2022 No. of interceptions	
B3	Reason for an interception over the past 3 years	**Year** / **Interception reason** / **Product** / Country / Place of interception 2019 2020 2021 2022	
B4	Diversity of Infrastructure set up of the pack-house in terms of sophistication and technology	High-tech .....1 Moderate .....2 None at all.....3	

C: TRAINING			
C1	Has any of the packhouse staff received any training relevant to SPS in the past 2 years?	Yes.....1 No 2	
C2	Do you conduct any kind of training for the packhouse staff?	Yes.....1 No 2	If no, go to C6
C3	If yes, which kinds of training? (Please list)		
C4	How often are trainings held?	Weekly.....1 Monthly .....2 Quarterly.....3 Annually.....4	
C5	Training modalities	Classroom-based.....1 On-site mentorship 2	
C6	Do you have a full-time agronomist/Quality Controller?	Yes .....1 No 2	If no, go to D1
C7	If yes, how many agronomists/Quality Controllers?		
C8	Does the agronomist (s) usually receive any SPS-related training?	Yes .....1 No 2	
C9	If yes, when was their relevant training last conducted?		
D: CHEMICAL TESTING			
D1	Are you aware of the new regulation on mandatory chemical testing for capsicums required by the EU?	Yes .....1 No 2	If no, go to D3
D2	If yes, how did you get to know of it?		
D3	Have you done chemical testing for your products before? (At a local laboratory or destination market)	Yes .....1 No 2	If no, go to D8
D4	If yes, with which company?		
D5	What was the cost of chemical testing (record as cost/weight)?		
D6	Have you seen changes in the costs of chemical/microbial tests over time?	Yes .....1 No 2	
D7	What's the minimum time spent waiting for a sample from the chemical testing company		
D8	Do you anticipate the benefits of mandatory testing?	Yes .....1 No 2	If no, go to D10
D9	If yes, what benefits?		
D10	If not, what do you anticipate from this mandatory chemical testing for capsicums?		
E: CONSIGNMENT TIME ASSESSMENT			
E1	On average, how long does it to move products from the farm to the packhouse for a single consignment? (In hours)		
E2	What is your assessment of this time spent? (Tick)	Short | Adequate/enough	Too long
E3	Comments / explanation		
E4	On average, how long does it take you to move your consignment from the packhouse to the airport? (In hours)		
E5	What is your assessment of this time spent? (Tick)	Short | Adequate/enough	Too long
E6	Comments / explanation		
E7	On average, how long does it take you to finalize (the entire process) a consignment to make it ready for export? (In hours)		
E8	What is your assessment of this time spent? (Tick)	Short | Adequate /Enough	Too Long
E9	Comments / explanation		
E10	On average, how long does it take you to clear a consignment at the airport? (In hours)		

E11	What is your assessment of this time spent? (Tick)	Short	Adequate/Enough	Too Long
E12	Comments / explanation			
E13	Have you experienced a situation of a missed flight due to delayed inspection?	Yes .....1 No 2		If no, go to E15
E14	If yes, how many times in the past year? (May 2021-May 2022)			
E15	As an Exporter, do you experience any form of delays during exportation?	Yes.....1 No 2		If no, go to E17
E16	What do you think could be the possible solution to this?			
E17	How much "additional time" do you plan for at the airport to reduce the risk of missing a flight?			
E18	Would you attribute additional costs to these delays?	Storage	Loss of goods (spoilage)	
		Demurrage	Loss of a sales contract	
		Missed flight (Additional logistics cost)		
E19	Recommendation for time improvement/reduction			
F: CONSIGNMENT COST ASSESSMENT				
F1	On average, what is the cost of transporting your products from the farm to the packhouse? (In UGX)			
F2	What is your assessment of this cost?	Very low.....1 Low .....2 Moderate/sufficient .....3 High .....4 Very High 5		
F3	Comments / explanation			
F4	On average, what is the total cost involved in preparing a consignment for export? (In UGX)			
F5	What is your assessment of this cost?	Very low.....1 Low .....2 Moderate/sufficient .....3 High .....4 Very High 5		
F6	Comments / explanation			
F10	Overall, what do you think about the cost of transactions during exportation?	Very low.....1 Low .....2 Moderate/sufficient .....3 High .....4 Very High 5		If no, go to G1
F11	What is involved in these transactions?			
F12	How can such extra costs be avoided?			
G: KNOWLEDGE EXCHANGE				
G1	Do you usually consult or hold peer-to-peer knowledge exchanges and share with other exporters?	Yes .....1 No 2		
G2	Have you had other exporters coming to you for consultation on best practices?	Yes .....1 No 2		
H: FARMER INFORMATION				
H1	Are the farmers you work with knowledge of and implementing good agricultural practices?	Yes .....1 No 2		
H2	Are the farmers you work with supported by any partner?	Yes .....1 No 2		
H3	If yes which partners? (Names of the organization from which support is received)			
H4	What support are you providing to your farmers?			

I: DOCUMENTATION				
I1	Have you experienced scenarios where your documents don't conform to requirements?	Yes.....1 No 2		
I2	What happens in the event that the documents are non-compliant both at the packhouse and airport?	Packhouse		
		Airport		
J: CHALLENGES				
J1	Does the current SPS process cause any challenges?	Yes.....1 No 2		If no, End interview
J2	What are these challenges?			
J3	What are your suggestions on how these can be solved?			

Interviewer Name/Signature: _____ Date: _____

Check for form completeness and any easily identifiable errors

Supervisor Name _____Supervisor Signature_____ Date_____

END OF QUESTIONNAIRE.