



Sustainable Horticulture
Kenya's Flower Power

Abstract

This advisory paper was written for the Dutch Embassy in Nairobi, Kenya, with the aim of providing recommendations to optimize the agriculture industry in the country. We are aware of the role the Dutch Embassy plays in promoting sustainable economic development in Kenya, and as such, we have carefully considered the local context and challenges facing the agriculture sector.

The article is structured in three parts, each focusing on a different phase of the agriculture value chain: Production, Transport, and Export. In the Production phase, we highlight the need to improve the horticultural sector by recognizing and incentivizing the participation of different demographic groups, foster sustainable pre-harvest practices, optimize post-harvest handling to reduce losses, and create better market accessibility for small and medium farmers. The Transport phase examines the challenges in getting agricultural products to markets, including inadequate infrastructure and logistics, and proposes solutions such as investments in

consolidation points and external parties such as gigmatchers. Lastly, the Export phase looks at ways to enhance the competitiveness of Kenyan agricultural products in international markets. Recommendations include facilitating public-private dialogue to ensure common interests, optimizing logistics to increase efficiency, utilizing digitalization and automation, and partnering with the Port of Rotterdam for knowledge exchange. Explanations on specific recommendations in this document can be found under the paragraphs listed with the corresponding solution group number and letter of specific recommendation.

Overall, we believe that implementing these recommendations will contribute to the growth and sustainability of the Kenyan agriculture industry and support the Dutch Embassy's efforts towards inclusive and sustainable economic development in the country.



Introduction

This policy advice is written by the Nairobi Track 2023 of The West Wing, at the behest of the Dutch Embassy in Kenya. It addresses the question how The Dutch Embassy could strengthen the new 'combi' strategy on sea-freight via the new 'combi-strategy' framework and the identification of Dutch trade-opportunities, while achieving impact on the SDGs. According to the Nairobi track, the combi-track should be operationalized as a method to achieve development goals by boosting the local economy and expanding trade prospects for Kenyan firms by utilizing the expertise and capabilities of Dutch enterprises. Our addition to the combi-track approach is that, if strengthening trade connections is not sufficient to achieve the desired developmental objectives alone, development aid may be used to bridge the gaps. This aid could be targeted at marginalized populations such as women and youth who may face additional barriers to accessing economic opportunities. By adopting our recommendations, the Dutch Embassy will be better equipped to support Kenya in meeting its external logistics goals, promote economic growth and development, and support its transition from air to sea freight. The recommendations in this document specifically focus on the horticultural sector in Dutch-Kenyan economic trade ties, but many of the guidelines also apply to other industries or can be altered to make them do so.

Kenya has a trade logistics system that has been historically geared towards imports, primarily due to its colonial history. Its infrastructure was inherited from colonial powers and led to economic growth between 1960-1970. This growth, however, stagnated in the mid-1990sⁱ. The rapid, constant, and ongoing increase in household demand for infrastructure resulting from Africa's high population growth and rapid increase of the urbanization rate contributed to fuelling demand regardless of all changes in the economy's production structureⁱⁱ. Therefore, it

became an import-oriented country. Resulting from these developments, a growing mismatch appeared between demand and supply for infrastructure in the country. This was fuelled by Kenya's advantageous location as an outlet for European goods.

Its import-oriented infrastructure currently falls short in assisting its export-oriented economic aspirationsⁱⁱⁱ. Despite the fact that researchers have consistently emphasized the importance of a robust trade infrastructure in promoting development, Kenya's logistical system remains inadequate^{iv}. As a result, the country has focused on developing its port and trade corridors to make these the most competitive route for transporting goods into inland West Africa. By adopting a more holistic approach to trade logistics, Kenya will be better equipped to meet external logistics goals and promote economic growth and development. This is particularly important given the country's aspirations to become more export-oriented, and the need for a robust trade infrastructure to support this transition. In contrast to the import-orientated logistical system in Kenya, western countries mainly have an export-orientated and organically developed trade network that starts at the farmer and ends at the port^v. To address the challenges facing the supply chain in Kenya, it is imperative to consider the process from the farmer to the port, rather than the other way around. This would enable the logistical system to meet external logistic goals, ultimately promoting economic growth and development. This policy advice derives from the notion of rethinking Kenyan logistics.

The first section addresses the production-phase issues and potential solutions, with an emphasis on everything that occurs at the farm. This is followed by the transportation stage, which involves pick-up at the farm and drop-off at the port. The final stage is the export phase, which includes all processes from entering the Kenyan port to entering its destination.



The West Wing: Nairobi Track 2023



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Published on the 2nd of May, 2023

Presented on the 12th of May, 2023

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Dutch Ministry of Foreign Affairs, Rijnstraat 8, The Hague



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Executive Summary

This section consists of an analysis of several issues in the early stages of the Kenyan horticultural supply chain of products, and recommendations aiming to improve upon existing practices to achieve trade and Sustainable Development Goals (SDGs). Recommendations made in this section are mainly relevant for rural areas with a high degree of division of land held by small and medium sized farmers, and are grouped in the following solution spaces:

1. Recognizing the impact which socioeconomic factors of demographic groups can have on the horticultural sector and incentivizing participation;
2. Fostering effective and sustainable pre-harvest practices;
3. Optimizing, and creating uniformity in, post-harvest handling of products to reduce losses;
4. Creating better opportunities of market accessibility for small and medium farmers.

Main issues that were encountered throughout research that these solutions aim to address are:

- Significant youth unemployment, with prospects in the agriculture value chain not valued or recognized by Kenyan youth. In addition, the number of senior farmers is increasing.
- Overuse of harmful agrochemicals in Kenya's thriving agricultural economy.
- Inefficient post-harvest handling practices leading to product losses.
- Packaging and storage practices which are not suited for streamlined supply chain.
- Limited access to market information for small and medium farmers.

Production



	<i>Solutions</i>	<i>Recommended Steps</i>	<i>Benefits</i>	<i>SDGs</i>
1	Recognizing the impact of socioeconomic factors and incentivizing participation	a. Establishing partnerships with local organizations and government agencies to support youth-led agribusiness initiatives.	Can help create an enabling environment for young people to start and grow their agribusinesses and contribute to the sector.	1,8
		b. Engaging projects with the private sector to create opportunities of participation in the sector.	Can help young people to secure employment in the value chain.	1, 8
		c. Promoting the participation of women through agricultural education programmes.	Promoting sector specific education programmes with interlocutors can improve the participation of women.	1, 5, 8, 10
2	Fostering sustainable pre-harvest practices	a. Promoting a ban on the import and sale of non-authorized agrochemicals (using the European Union register)	Reducing the presence, use and spread of hazardous agrochemicals and thereby limiting their damage	2, 3, 15
		b. Facilitating education and sharing of best-practices in agrochemical use, labelling, and safety.	Increasing regulation and monitoring of safe agrochemicals.	2, 3, 15
		c. Establishing platforms and channels to provide information and education on import monitoring and border surveillance	Reducing the import of fake, hazardous and counterfeit agrochemicals, thereby increasing the health of the Kenyan pesticide stock.	2, 3, 15
3	Optimization of post-harvest handling of products	a. Leading discussions on packaging relevant parties to achieve high standards and uniformity needed for a streamlined supply chain.	Uniform and purpose-fit packaging can reduce the need for rehandling, improve efficiency in transport and reduce waste.	12, 13
		b. Facilitating a platform for combined market research on cooling standards on the Kenyan and Dutch sides of the supply chain.	Accessible cold storage facilities can help in achieving the required shelf life for products transported via sea freight.	2, 12, 13
4	Improving market accessibility for small farmers	a. Supporting user-friendly digital information systems and applications.	With easy access to information, farmers can adjust their production strategies to market demand.	12
		b. Supporting farmers' cooperatives	Can increase market accessibility and improve the position of smaller farmers in the markets.	8



Solution Spaces

1. *Recognizing the impact of social circumstances and incentivizing participation*

The high percentage of youth unemployment in Kenya poses serious problems for the further social and economic progress of the nation. The unemployment rate for Kenyan youth aged 20 to 34 was 22.2% in 2020, according to the Kenya National Bureau of Statistics. This is substantially higher than the 10.4% national unemployment rate.^{vi} However, there are many opportunities in the agricultural industry for young people to create employment and earn money. The agriculture industry may maintain sustainable growth by providing young people jobs and entrepreneurial possibilities with the correct laws and initiatives. SDG 8: Decent Work and Economic Growth.

- a. Establishing partnerships with local organizations and government agencies to support youth-led agribusiness initiatives

The Embassy can establish partnerships with local organizations and government agencies to support youth-led agribusiness initiatives. This can include providing funding, technical assistance, and facilitating in creating mentorship programs to help young people start and grow their businesses. By working with local organizations such as Young Professionals in Agricultural Development (YPARD) Kenya and Agriculture Sector Network, the Dutch Embassy can leverage their expertise and networks to promote youth participation in the agriculture value-chain. Through partnerships and collaborations, the Embassy can help create an enabling environment for young people to start and grow their agribusinesses and contribute to the development of the agriculture

sector in Kenya. Examples of local organizations are Young Professionals in Agricultural Development Kenya and Agriculture Sector Network. SDG 1: Reduce Poverty and Improve Economic Opportunity for Young People in Kenya may be achieved through expanding youth engagement in agriculture value chains.

- b. Engaging projects with the private sector to create opportunities of participation in the sector.

The Embassy can help in developing connections between young people and well-established participants to the supply chain, such as larger-scale farmers, processors, and dealers. By doing this, it can offer young people a chance to learn from seasoned experts and secure employment in the value chain's latter phases. In addition, it is crucial to improve the image of agriculture by reframing it as agri-entrepreneurship. Agriculture sector has traditionally been viewed as a low-tech, low-value sector, which has led to a negative perception among youth. By rebranding agriculture as agri-entrepreneurship, it can be positioned as an innovative and high-value sector that offers opportunities for entrepreneurship and innovation.^{vii} SDG 8: Decent Work and Economic Growth may be benefited by this recommendation.

Consequently, the Embassy needs to look into barriers regarding the process of obtaining (work) visas. During an interview with an agriculture export specialist, it was revealed that in order to promote knowledge transfer between the Netherlands and Kenya, Kenyans in the agribusiness must have the ability to acquire visas. Currently, obtaining work visas can be challenging and time-consuming, involving extensive paperwork and documentation, as well as high application fees. This may prevent Dutch firms from investing in Kenyan employees and business, particularly in young people, and hamper their capacity to attract new talent. In addition to this, there may be a lack of digital and technical skills among Kenyan youth, which can affect their ability to effectively work in a modern agricultural enterprise.



To overcome these barriers, the Dutch Embassy can work with Dutch enterprises to provide training and capacity building programs to Kenyan youth, enhancing their digital and technical skills. The Embassy can also provide support in navigating the (work) visa application process and reducing the visa application fees for young people who want to work in the agricultural sector. By doing so, the Dutch enterprises can benefit from the talent and energy of Kenyan youth, while providing opportunities for young people to advance their careers and contribute to the growth of the Kenyan and Dutch economies.

c. Promoting the participation of women through agricultural education programmes

The Embassy has a unique opportunity in supporting and empowering women in rural communities through their involvement in farmers' cooperatives, which directly aligns with the United Nations' Sustainable Development Goal (SDG) 5: Achieve gender equality and empower all women and girls. To further the position of women, the Embassy should encourage these cooperatives to establish a fund for women's education. This fund would specifically be used to help women attend agricultural education programs in Nairobi, where they can acquire new technical skills and knowledge.

These educational programs can provide women with the tools they need to succeed in the agricultural sector, often dominated by men. This will increase their resilience in the face of increasing climate change, which disproportionately falls on the shoulders of women.^{viii} By attending these programs, women will be better equipped to take on larger roles within the cooperatives and rural leadership. This not only benefits the women themselves but also has a broader positive impact on their communities, as it can lead to more sustainable and diverse agricultural practices which benefits every member of the cooperatives.

Moreover, by investing in women's education, the Embassy can help to foster a culture of inclusivity and equal opportunity within the cooperatives. This will encourage more women to join the cooperatives

and actively participate in decision-making processes, leading to a more balanced and representative leadership.^{ix}

2. Sustainable pre-harvest practices

The worldwide use of hazardous agrochemicals poses a threat to food security, workers safety and environmental health. As such, they obstruct multiple Sustainable Development Goals, such as SDG 2 'Zero Hunger', and 3 'Good Health and Well-Being'.^x These concerns are also prevalent in the agricultural sector of Kenya. Its export and economy are heavily reliant on agriculture, and agriculture practices have intensified.^{xi} Since Kenya lacks the natural resources and infrastructure to produce pesticides, it relies heavily on the import of said substances from China, the European Union and neighbouring countries in the Horn of Africa.^{xii} Despite recent regulation successes, Kenya's monitoring of hazardous pesticide use lags behind the country's agricultural expansion. Challenges include the significant import of counterfeit pesticides, unsafe storage of redundant chemicals (causing contamination of soil and water), wrongful labelling of unauthorized products, improper handling of chemicals by uninformed workers, and a general lack of safety education within the whole agricultural sector. The disproportionate usage of said harmful pesticides poses limitations on Kenya's potential export volume to markets such as the European Union. More importantly, pesticide poisoning cases in Kenya amount to up to 350,000 cases yearly.^{xiii} As such, the reinforcement of agrochemical regulation should be a priority in the combination-approach as proposed by the Dutch Embassy.

a. Promoting a ban on the import and sale of non-authorized agrochemicals (using the European Union register, Rotterdam Convention)

The Embassy can play a role in lobbying for a Kenyan ban on the import and sale of non-authorized agrochemicals- for instance by adopting the



European Union agrochemical register, as already proposed by Kenyan county authorities.^{xiv} The Dutch Embassy can expand on its current relations with the Kenyan national government, counties, and the Kenyan Pest Control Products Board by information exchange on the benefits of such a ban, and by promoting its necessity. However, as per the Rotterdam Convention, of which both Kenya and The Netherlands are member states, this should not be a one-sided responsibility.^{xv} Aside from the suggested Kenyan ban on the import of non-EU-registered agrochemicals, the European Union bears the responsibility of not exporting the agrochemicals they have banned for European use. Per the embassy's ties with the Dutch Ministry of Foreign Affairs, European attention should be urged towards this discrepancy in policy.^{xvi}

- b. Facilitating education and best-practices sharing on agrochemical use, labelling and safety

The Dutch Embassy has recently announced a partnership in agricultural best practices and the sharing of technologies on a county level (Bomet, Meru counties). While this partnership has already led to increased production value, it could be expanded upon to include cooperation on the proper import and the safe use of authorized agrochemicals. The sharing of agricultural technology and knowledge is to be further supported on a larger scale. On a national level, the embassy should aim to facilitate platforms to share best practices between The Netherlands' and Kenya's agricultural experts. For instance, training and knowledge sharing could be attained through The Rotterdam Convention. Additionally, The European Union Policy for External Relations has recently recommended supporting LIC's in the re-registration and labeling of agrochemicals as per a shared responsibility. Support by the Dutch Embassy on this matter could be realized financially, or in a facilitating capacity, for instance by hosting or further connecting Kenyan and Dutch ministries, universities, European Union Boards, The Rotterdam Convention, and the PCPB.

- c. Establishing platforms and channels to provide information and education on import monitoring and border surveillance

The previous two recommendations have focused on official regulations on trade, labelling and the use of agrochemicals. However, to guarantee practical adherence to the suggested regulations, import monitoring and border surveillance are of significant importance. The Dutch Embassy can facilitate the sharing of training programs for government officials on the aforementioned subjects. This can be done by benefiting from the available training programmes offered by The Port of Rotterdam.^{xvii} This recommendation will be further elaborated on in the export section Further partnership on the training and best practices can be sought from the Dutch Marechaussee (through the Dutch Ministry of Defence), Schiphol airport, and the World Customs Organization.^{xviii} Additionally, The Rotterdam Convention offers an existing platform meant for knowledge sharing on the import of agrochemicals.

3. Optimization of post-harvest handling of products.

- a. Leading discussions on standardization and uniformity of packaging.

The Embassy could adopt a function as intermediary to facilitate discussions including private parties and local authorities to discover requirements of packaging along the supply chain and standardize packaging practices. A better understanding of packaging requirements in different stages of the supply chain could reduce post-harvest losses and prevent avoidable repackaging, reducing waste. Most current packaging used is reported to be of insufficient quality and often not optimally compatible with reefers or even airfreight.^{xix} ^{xx} A common understanding on optimal packaging could prevent the need for repackaging if uniform packaging can be employed efficiently in all



transport and storage facilities, such as cooling facilities, consolidation points and reefers.^{xxi} Equally, a reduced need for rehandling could decrease the risk of losses during repackaging. Local authorities could draft guidelines for standardization and private parties may encourage the use of standardized packaging during negotiations or by entering discussions with farmers' cooperatives. Improvements under this step could benefit SDG's 12 and 13 by reducing waste and greenhouse emissions by optimizing transport.

- b. Facilitating a platform for combined market research on cooling standards.

The Embassy could create a platform for parties with the relevant technical know-how on both ends of the supply chain to share information on cooling standards, therefore assisting in the understanding and planning of adequate cooling facilities when applicable. Proper cooling of horticultural products is considered to be critical for obtaining the requisite shelf life and making sea freight economically viable for this industry.^{xxii} Especially in stages subsequent to the harvest, many small farmers lack the facilities for cold storage or immediate transportation to locations with such facilities. A better application of cold storage practices may provide opportunities in reaching the required shelf life of products exported via sea freight. Better cold storage practices can benefit SDG 12 by reducing post-harvest losses and preventing waste. SDG 13 and SDG 2 are also relevant as less post-harvest losses can reduce greenhouse gas emissions associated with the industry and spill over of these practices to food products can improve accessibility to food.

4. Improving market accessibility for small farmers.

Market access is one of the main issues faced by Kenyan farmers. Due to their inability to individually access international markets, the majority of medium and small-scale farmers are compelled to sell their

goods at cheap rates to intermediaries who profit from their lack of access to information. In turn, this limits their capacity to generate a respectable income, making it challenging for them to invest in their farms or raise production.^{xxiii} In addition to this, farmers typically rely on merchants for transportation and sale of their goods. Farmers have less negotiating leverage than merchants because farmers have limited access to price information. As a result each farmer negotiates the price with the trader and other purchasers on an individual basis, where prices are frequently far below those paid on the international marketplace.^{xxiv}

- a. Supporting user-friendly digital information systems and applications.

By improving small and medium farmers' access to market information, the Dutch Embassy in Nairobi can significantly improve their competitiveness and sustainability in Kenya's agricultural sector.^{xxv} SDG 12 which promotes sustainable production and consumption patterns is supported by this initiative. The Embassy can help farmers access user-friendly digital information systems and software, such as phone applications like WeFarm, Farm.ink, M-farm, Kilimo Salama, and Esoko. However, some farmers could find it difficult to afford smartphones and data subscriptions, which emphasizes the need for creative methods to deal with this issue. Some farmers' lack of digital literacy may also make it difficult for them to use these systems efficiently.^{xxvi}

The Embassy can address these issues by providing training and capacity building to enhance the digital skills of farmers and other stakeholders in the agricultural sector. By improving small and medium farmers' access to market information, they can make educated decisions regarding production, marketing, and sales. For instance, M-Farm provides farmers with real-time market and pricing information on their crops, a virtual marketplace where they may sell their items, as well as a messaging platform for corresponding with customers. Ultimately, increasing small- and medium-scale farmers' access to market



information will raise their income and level of life while also advancing the agricultural industry as a whole.^{xxvii}

b. Supporting farmers' cooperatives

Several programs providing education and information on seeding and equipment, available for the use of cooperatives, is already being facilitated by the Kenyan Government.^{xxviii} Small and medium scale farmers are increasingly successful in working with government support through cooperatives, through which the government initiates these programs. However, the capacity to meet all the definitions of a farmer's cooperative is hindered by limited budgets and lack of organization. Without cooperation within cooperatives, farmers rely on middlemen and short-term financing to access markets and conduct business.^{xxix} These costs cut into the profit margins of smallholder farmers, which limits their ability to reinvest in their businesses. This would support the United Nations' Sustainable Development Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

The Embassy should create and fund an organization that will help farmers organize cooperatives, oversee the application and regulation of the system, help these cooperatives with accessing government programs and access foreign financing. The Embassy could reach out to an organization such as Farmlink, which oversees cooperatives in the country for better outreach. Cooperatives can help farmers get access to equipment, better information about markets. With more information and access to technology like phone apps, as a group, farmers will be better able to negotiate the domestic and international market and rely less on middlemen. When enough foreign and governmental financing has been provided, cooperatives can turn sufficient profits that can in turn be reinvested in these cooperatives which will limit the need for future foreign assistance and dependence.



Executive Summary

The context for the solutions discussed here pertains to transport, which concerns the process of the goods leaving the farm until they have arrived in a container at the (air)port. This section offers an insight into the everyday inefficiencies of the sector and aims to offer solutions to streamline and optimize this process. This section has been divided into four solution spaces:

1. Consolidation points
2. Gig matchers
3. Driver shortage

Main issues that were encountered throughout research that these solutions aim to address were:

- Difficulties in 'the first mile', getting the products from the farm to a mean of transportation;
- Lack of available 'consolidation points';
- Complication due to maintaining the products at the required temperature;
- Lack of awareness on the availability of 'Gig matchers';
- Insufficient use of poorly available 'track and trace' options;
- Insufficient number of drivers in Kenya.

Transport



	<i>Solutions</i>	<i>Recommended Steps</i>	<i>Benefits</i>	<i>SDGs</i>
1	Optimizing opportunities for consolidation	a. Brokers role for a enabling environment to establish consolidation points closer to farms	Winning transportation days in sea freight, making it a more viable alternative	8, 9
		b. Improvement of cool storage at consolidation facilities	Increasing accessibility to sea freight for smallholder farmers	8, 9
		c. Increase the applicability of Dutch technology in agro-logistics for the Kenyan market	Trade opportunities for Dutch companies with expertise in cool storage and logistics.	8, 9, 17
2	Gig matchers	a. Train and inform farmers on the use of gig matchers	Improve efficiency of first mile transport and decrease post-harvest losses	1, 2, 8, 9, 12
		b. Cooperate with gig matchers to invest in suitable modes of transport.	Enable farmers to upscale their production	8, 9, 17
		c. Invest in tracing products for better transparency	Improve the transparency of the transportation process	8, 9, 12
3	Creating a safe, inclusive environment that empowers youth	a. Create a safe, inclusive environment that empowers youth b. Connect Dutch and Kenyan entrepreneurs c. Create awareness around road safety	Decrease aging problem in agriculture Improve knowledge and opportunities abroad Increase female participation in the transport sector	5, 8, 9, 10, 16



Solution Spaces

1. Optimizing opportunities for consolidation

- a. Broker's role for an enabling environment to establish consolidation points closer to farms

A main bottleneck in keeping horticultural products in Kenya at an optimal level is suboptimal storage of these products in uncooled and uncontrolled atmospheres after harvesting^{xxx}. This is mainly a pressing issue in smallholder farms. Moreover, smallholder farmers have less-than-container (LCL) loads, and thus need to group their products destined for sea transportation. Therefore, the fresh products are transported to consolidation points where a cooled facility may be available. Kenya has a relatively higher amount of cold storage units compared to other African countries in the region, but these are mostly present at larger flower farms that harvest and export relatively high volumes to Western Europe^{xxxi}.

Establishing consolidation points with cold storage facilities closer to the location of the smallholder farms reduces the number of horticultural products that are stored at suboptimal temperatures. This leads to improved product shelf life. In earlier studies, the proposed location for consolidation centres were Naivasha, Nakuru, and Mt. Kenya, as these are close to horticultural production regions. Moreover, Muranga county (north of Thika) has good facilities: e.g. Vegpro, Keitt, Kakuzi, GMS facility^{xxxi}.

The Embassy should play a 'brokers role' in creating an enabling environment to establish such consolidation points. On an intergovernmental level, the Embassy can connect and involve county governments of the listed counties for the establishment of these consolidation points. Emphasizing the added value of bringing the consolidation points closer to the farmers, such as an improved economic position of the smallholder farmers in the county, is a leverage

point for these discussions. Moreover, involving local farmers as part of creating this enabling environment is integral to the approach. Solution 2 of this chapter further highlights the importance of engaging with the smallholder farmers, improving their information position and connecting them to a network of transporters.

Lastly, the Embassy can explore the added value of Dutch companies in building, equipping and managing a consolidation point and see where these fit local demands. Consolidation and grouping of logistics is also extensively done in the Netherlands throughout different sectors. Logistics companies with a footprint in Africa include the following (non-exhaustive): Bolloré Logistics, Cornelder Holding BV, Greenshields and Partners BV, Hapag Lloyd, Jacob Lawren Europe BV, Koninklijke de Gruijter & Co., Portside / Ports Marine Ltd, Red Transport & Logistics BV, SMT Shipping (Netherlands) BV, Steder Group BV and Supermaritime International BV^{xxxiii}.

Much expertise is available already in the field of cold storage and logistics, as recommended by the next step. To make a consolidation point a reality, the Embassy can explore opportunities of financially contributing to the implementation of the consolidation point, for example, through financial instruments of Invest International, such as DRIVE, focussed on the establishment of infrastructure relevant for development. Exploring the appetite of Dutch investors to invest in the establishment of the points(s) is also a possibility.

- b. Improvement of cold storage at consolidation facilities

Moreover, an important step in achieving increased feasibility of sea freight for Kenyan fresh products, is not only to bring the consolidation points closer to the farmers, but also improving cold storage facilities at the consolidation points. The consolidation points currently in place are equipped with cooling facilities for air freight achieving typically a minimum of 5-12°C. This is not cold enough for products traveling by sea, resulting in rapid warming during the journey. The consolidation points



for smallholder farmers require the following infrastructure adjustments^{xxxiv}:

- Large cold storage rooms at low temperatures <2°C for maintaining temperature prior to loading the container;
- Facilities to cool any warm deliveries prior to loading by blast air or vacuum cooling;
- Suitable loading facilities for filling containers directly from the fridge in place of use of forklifts in a yard.

In contexts such as Colombia and Ecuador, facilities equipped for cold transport of flowers over sea have already been established, e.g. by Capiro farms in Medellin Colombia. Lessons learned from these projects in Latin America can be of added value to the Kenyan context. Thus, it is recommended that the Embassy establishes contact with these projects to obtain information.

There is significant Dutch expertise available in the field of cold storage and logistics for fresh products. This is exemplified by the agreement to support the Flying Swans Consortium which was signed between the Dutch Ministry of Foreign Affairs and the Government of Kenya in 2022. Flying Swans is a consortium consisting of Havenbedrijf Rotterdam, Boskalis, Mercator Novus and GroentenFruit Huis^{xxxv}. The Embassy should remain in close contact with this consortium to help position the group of companies in the Kenyan market and continuously update them on developments on policy levels. The Embassy can assist the consortium in signing an MoU with Kenyan parties, and help to establish a strong local network with relations that last through changes of public governance. Moreover, companies such as Celtic Cooling, GEA Refrigeration Netherlands, Kuehne+Nagel, Interko and Weber Cooling have expertise in the field of cold supply chains, and the former three are already working in the Kenyan context. Strengthening the position of Dutch companies through trade missions or a Partnership for International Business (PIB), can increase business opportunities while providing Kenya with solution needed for establishing a cold chain. The

Embassy can learn from foreign examples of cooperation at sub-sectoral level, such as the Cold Chain Federation in the United Kingdom, and the Global Cold Chain Alliance in the USA, where American government organizations provide considerable funding.

- c. Increase the applicability of Dutch technology in agro logistics for the Kenyan market

Although the Netherlands has expertise in agro logistics, international competition in this field is stiff. Strengthening the position of Dutch solutions can benefit from increasing their application in Kenyan context. Dutch technology, focussing on improving the agro logistics sector, does not always fit the context of low- and middle-income countries (LMIC). Most Dutch companies internationally active in agro logistics do not develop specific products for certain countries. Products are initially developed for the Dutch market. When successful, these are sold to foreign markets as well.

Dutch institutions are in place which could help in innovating solutions for a more suitable application of Dutch agro logistic technologies in Kenya. For example, Wageningen University & Research, Aeres, HAS, and Van Hall Larenstein. The Embassy should work from this 'triple helix' approach combining industry, knowledge institutions and government and explore opportunities to facilitate collaboration between the private sector and knowledge institutions. A platform on which industry can present their challenges in adapting their solutions to a LMIC-context, to which Dutch knowledge institutions, such as the aforementioned, can respond, can be a solution for increasing the unique selling points of Dutch agro logistic technologies. In the longer term, Kenyan knowledge partners can be introduced to the platform as well.

It is important to recognize the entire value chain while Dutch technological solutions are introduced to the Kenyan agro logistic market. These links should match each other, include hardware, software and orgware, adapted to each other and adapted to the appropriate level of development of the country. In the solution space of establishing



consolidation points closer to Kenyan smallholder farmers, it is important to recognize that with consolidation, complications with invoicing, booking and logistics can arise as logistic providers have different requirements for charging methods (e.g. per kg per container, per pallet, or one farm books the entire container and splits afterwards)^{xxxvi}. Standardization of these agreements on booking and charging makes access for smaller farmers easier and more predictable. The Embassy can play a role in standardizing the administrations around consolidation by connecting the managing organizations of the consolidation points to Dutch organizations with best practices in administrative standardization around logistic processes.

2. Gig matchers

a. Informing farmers on the use of gig matchers

Many smallholder farmers do not have efficient means of transport to transport their products. Because of this, the 'first mile' transportation process is sub-optimal, inefficient, and unreliable. This leads to losses in shelf life of horticultural products due to delays in transportation times^{xxxvii}. This poses a challenge because it results in lower income for the farmers and prevents them from upscaling their production. Therefore, investing in the first mile transportation to the consolidation points or bigger farms can lead to a better socio-economic position of Kenyan farmers and an increased competitiveness of Kenyan export^{xxxviii}.

One opportunity to tackle these difficulties in transportation is to optimize opportunities for consolidation by bringing these points closer to smallholder farmers. Another important step is to assist farmers in finding efficient means of transport for the first mile. Gig matchers can offer a potential solution for this first mile transportation challenge. Gig matchers are platforms that connect independent drivers with producers whom need transport services. Therefore, these platforms can help the farmers to transport their produce in a cost-effective and efficient way,

and also eliminate the need for third-party transporters. Moreover, gig matchers can help in making the transportation process more transparent. Therefore, we have several recommendations concerning first mile transportation and gig matchers.

As mentioned above, increasing the usage of gig matchers can improve the efficiency of first mile transportation. However, until now, gig matcher firms have been mostly active in other parts of the supply chain and have limited presence in the first mile. In order to successfully implement the usage of gig matchers in the first mile, the Embassy can enter into conversations with both gig matcher firms and farmers. To map out the opportunities, the Embassy can initiate and finance a study conducted by local parties to analyse the added value and potential of gig matchers. Consequently, the Embassy can help in lowering barriers that farmers encounter in using gig matcher platforms. The Embassy can assist in informing farmers, for instance, through distributing information booklets, organizing small information events, or by using social media to share best practices. Moreover, we advise to focus on cooperating with a diverse pool of gig matcher firms. Examples of these gig matcher firms are Amitruck, GetBoda and Kobo 360.

b. Cooperate with gig matchers to invest in suitable modes of transports

One of the main obstacles in working with gig matchers is the lack of suitable vehicles for first mile transportation. According to a study on rural road transport infrastructure, it is important to improve the vehicle supply in rural areas to enhance smallholder farmers' agricultural productivity.

Gig matchers mostly invest in trucks and vans due to their limited presence on the first mile. However, investing in vehicles like motorbikes is essential for efficient first mile transportation. To address this challenge, the Embassy can collaborate with gig matcher firms to identify opportunities for first mile transportation and the necessary investments.



By initiating talks with gig matcher firms, the Embassy can work towards improving the availability of appropriate vehicles for first mile transportation. These firms have a vested interest in investing in first mile transport as it can increase their clientele. Therefore, the Embassy should take advantage of these opportunities to collaborate with gig matcher firms to improve first mile transportation in rural areas.

c. Invest in tracing products for better transparency

Finally, we see an opportunity for the Embassy to explore the potential of product tracing to enhance the reliability and transparency of transportation. By working with gig-matchers on first mile transportation, the transportation process can be formalized and an opportunity can be provided to trace products during transportation. This can benefit both the consumers and producers by ensuring the safety and quality of products.

To accelerate the process of increasing transparency, the embassy can connect Dutch firms with knowledge on product tracing to the gig matcher firms. This collaboration will not only help in improving the quality of transportation services but also enhance the competitiveness of the local products in the global market. Moreover, it can create opportunities for Dutch firms to showcase their expertise and expand their business in Kenya. Control Union and ChainPoint are examples of Dutch companies that could collaborate with gig matcher firms in Kenya to improve product tracing and transportation transparency. Control Union provides a product tracing service that can help businesses track their products from farm to shelf, ensuring safety and quality. Meanwhile, ChainPoint offers software solutions for sustainable supply chain management, including a product tracing tool that enables businesses to monitor their products throughout the entire supply chain.

3. Create a safe, inclusive environment that empowers youth

The aforementioned combination approach also includes the value of "equal partnership." It is therefore important that the focus is not only on men, but also on involving youth and women within the transportation sector. This focus on youth and women should be further encouraged by the Dutch embassy. It can be difficult to reach these groups. We see an opportunity for the Dutch embassy in Kenya to set up a "youth consultation". Local youth can share their concerns and come up with out-of-the box solutions. It is important to reach out to the Ambassador of Youth, Education and Employment for help. He stimulates cooperation between governments, partners, stakeholders and young people. In addition, we see a role for the Dutch Embassy in Kenya, connecting Dutch entrepreneurs and Kenyan youth. The exchange of information and training could take place in the Netherlands. However, there are often many problems with applying for a (temporary) visa. The Embassy could help to streamline this process, as well as petition the Ministry of Foreign Affairs to improve this process from the Netherlands.

In addition, traveling and using transportation options are at risk. Especially for young people and women, Nairobi's roads are not safe. It is the result of inadequate public transportation or road safety measures. A role for the Dutch Embassy could be creating awareness around this lack of safety which creates issues that go beyond road safety. Also, the "race to be the Central African gateway" plays a big role. Crimes on the Northern Corridor are a threat to regional trade. This could potentially worsen the international competitive position, as companies choose the Central Corridor through Tanzania rather than Kenya.



Executive Summary

The context for the solutions discussed here pertains to export, which encompasses all processes that occur starting from when cargo has entered the Port of Mombasa (PoM) until the cargo has departed. All identified issues and recommendations are discussed at length in following sections. A table is included showcasing problems, solutions, and benefits for ease of reference. This section offers a multitude of 'action points' recommended steps that can be taken. These are grouped in four solution spaces, namely:

1. Facilitation of public-private dialogue to ensure optimization of common interests;
2. Logistics optimization to increase efficiency and procedural ease;
3. Digitalization and automation increase international competitiveness;
4. Port of Rotterdam as a partner in fostering knowledge exchange.

Main issues that were encountered throughout research that these solutions aim to address were:

- Communication difficulties resulting in differing expectations among stakeholders;
- Bottlenecks in processes that rely on a multitude of public stakeholders; especially the customs process;
- Unexpected delays leading to loss of perishable goods and reluctance to use maritime shipping;
- A need for higher cargo volumes to realize direct connections to sales markets;
- High degree of human error in the workplace with no standard procedures in place to remedy error-prone areas;
- A need for better trained personnel in the port.

Export



	<i>Solutions</i>	<i>Recommended Steps</i>	<i>Benefits</i>	<i>SDGs</i>
1	Facilitation of public-private dialogue	a. Inter-organizational messaging application between KPA, PoM, KRA, and KEPHIS.	Improves communication, time efficiency, collaboration	8, 9
		b. Common goal setting through quarterly round-table discussions	Foundation for sector-wide collaboration in reaching desired export volumes	8, 13
2	Logistics optimization	a. Priority Lane for perishables	Reduces degradation of goods	8, 12
		b. Decreasing time needed for gating, scanning, and customs	Addresses key bottleneck and prevents delays	8
3	Digitalization and automation	a. Remote reefer monitoring	Enables fast responses to human errors; provides increased quality assurances of cargo	9, 12
		b. Establishment of a Port Community System in the Port of Mombasa	Long-term goal; crucial to ensuring long-term competitiveness in international shipping	8, 9
4	Port of Rotterdam as a partner	a. Training courses organized by the Port of Rotterdam in Mombasa or Rotterdam for port personnel	Ensures process optimization and improved personnel education in the Port of Mombasa	8, 9, 17
		b. Hiring consultancy services of the Port of Rotterdam	Provides trade opportunities for Dutch firms	17



Solution Spaces

1. Facilitation of public-private dialogue

The Dutch Embassy should facilitate public-private dialogue in the PoM in order to improve communication between stakeholders. This increases trust in the sea freight process, can lead to the elimination of future, newly identified bottlenecks, and engenders common goal-setting^{xxxix}. Ultimately, this will lead to increases in export volumes through sea freight relative to air freight, which in general affects SDGs 8 and 13. Public-private dialogue is particularly effective in the PoM as the KPA is highly receptive to feedback by stakeholders^{xl}. The Dutch Embassy can facilitate public-private dialogue by organizing meetings between the KPA, Dutch trading companies and interest groups, and horticultural transporters and producers in varying constitutions depending on the particular issue.

a. Common goal setting through quarterly round-table discussions

We recommend that the Embassy facilitate quarterly round-table discussions with important Kenyan stakeholders to see what their goals are and where the Embassy can be of use. In this sense, discussions can be very specific, concerning desired export volumes for instance, but also broader in terms of brainstorming and networking. The Dutch Embassy will gain legitimacy if it ensures a solid, honest dialogue with its Kenyan stakeholders. This legitimacy is of vital importance if the Embassy is to foster Dutch interests in Kenya.

One focus point of public-private dialogue should be to work towards common export volume goals in certain sectors. Currently, communication between the public sector and private companies operative in the Kenyan horticulture sector generally occurs bilaterally. As a result, communication is ineffective, as the interests of only a single

group are represented. This results, in turn, in suboptimal outcomes that do not take into account the broader playing field involved in the export of perishable goods. This lack of coordination and multilateral communication can be addressed through quarterly round-table discussions with a focus on common goal setting. Common goal setting encourages all actors to act effectively towards and in correspondence with a specific goal.^{xli} In this context, the focus should be to find a common goal with regard to desired export volumes in a certain year. The Dutch Embassy can promote this effort by initiating and facilitating the quarterly round-table sessions between the various stakeholders involved in the horticultural supply chain via sea freight. If proven successful, multiple, smaller round-table sessions could be hosted for each sector (f.e. flowers, avocado's, mango's).

b. Inter-organizational messaging application between KPA, Port of Mombasa, Kenya Revenue Authority, and Kenya Plant Health Inspectorate Service

A Microsoft Teams platform between the Port of Mombasa (PoM), the Kenya Ports Authority (KPA), the Kenya Revenue Authority, and the Kenya Plant Health Inspectorate Service (KEPHIS) should be established. This would allow for instant messaging between groups active in the port, something sorely needed. Currently, time-sensitive communication takes place physically with individuals having to locate each other. An interview conducted with the KPA offered the following example: after a reefer has been scanned by the KRA, it needs to be plugged into a power outlet by the scan operator so that the cargo is cooled. This is sometimes forgotten, and when a PoM employee notices this, they must find a scan operator in order to rectify this mistake. Time is of the essence, with cargo deteriorating until the reefer receives electricity. An instant messaging platform like Teams would save time, and allow for these different agencies to better collaborate with each other. Although there are different applications available, Microsoft Teams is recommended because it is proven in a public context, and



Microsoft has already successfully collaborated with various public Kenyan agencies.^{xliii}

2. Logistics optimization

Large steps have been made in recent years to improve the logistic efficiency in the Port of Mombasa, which enabled an increase in the volume of agricultural exports. Still, there is sufficient room for improvement, primarily through the further stabilization of the Mombasa-Rotterdam connection. This recommendation is in line with the Dutch combi-approach, as it increases confidence of the Dutch business life in the sea freight supply chain, on one hand, and it ensures greater export volumes through sea freight relative to air freight, on the other. Increases in export volumes through sea freight relative to air freight affects SDGs that promote sustainability.

a. Press for a direct line connecting Mombasa to Rotterdam

Currently, the line that ships horticulture products from Mombasa to Rotterdam includes a transit in Doha or Salalah.^{xliiii} The schedule is tight, however, risking that a small delay results in missing the transfer and essentially nullifying the value of the horticultural cargo. This is a major risk for horticultural producers, who often only receive income after the approval of their products in the Netherlands. A major improvement in this light would be the establishment of a direct line connecting Mombasa to Rotterdam. Establishing a direct line would not only increase the confidence in the sea freight supply chain and horticultural export volumes, but also greatly advance trade connections between Kenya and the Netherlands. One challenge in this regard, however, is that a direct line would require larger trade volumes. Therefore, action should be taken on the medium or long-term, accompanied by other actions that promote trade between The Netherlands and Kenya. In the initial phase, the Dutch Embassy can press for high-level communication between the Dutch Ministry of Foreign Affairs and Maersk to further this goal.

Essential in this effort is to communicate to the ministry the economic benefits that a direct line would bring. The benefits for the Netherlands are multifaceted: It would a) increase trade volumes for the Netherlands, both in relation to export and import, b) increase the competitiveness of Dutch businesses relying on Kenyan imports, and c) eventually strengthen the economic and political ties between the Dutch and Kenyan government. For Maersk, a direct line could streamline their operations and reduce costs and time associated with transshipment. Further information, however, should be acquired through stakeholders, such as Maersk, horticultural trading companies and interest groups, but also Dutch policy officers specialized in trade relations. The effort to press for ministerial action with regard to the direct line connecting Mombasa to Rotterdam should be accompanied by calls by Dutch stakeholders, who should be made aware of their role.

b. Priority lane for perishables

Currently, horticultural goods have to arrive in the port of Mombasa two days prior to departure. It would benefit the export of perishable goods through sea freight if these products can arrive closer to the departure time, as product degradation diminishes. One possible way to achieve this, would be through the establishment of a so-called 'priority lane' in the PoM. A recent pilot with a priority lane for perishable goods during the avocado season has proven successful.^{xliiv} However, when the avocado season ended, enforcement of correct procedures in the priority lane faded and it essentially dissolved. The (re-)establishment of a permanent priority lane ensures reduced product degradation and would, therefore, benefit the export through sea freight. The Dutch Embassy should aim to promote the establishment of a permanent priority lane by lobbying to the KPA, forming an advocacy coalition with shipping companies, producers, transporters and trading companies. In this regard, Maersk has indicated to be a keen partner.^{xliiv}

c. Decreasing time needed for gating, scanning, and customs



Stakeholders indicate that the time needed for gating, scanning, and customs is a persisting bottleneck within PoM logistics. This process is necessary as reefers cannot be opened and, as such, need to be scanned by the KPA. Delays with regard to this process are common, which leads to more delays further down the supply chain. The lengthy process and the related delays decrease product quality. Further investments are needed to streamline this process. This does not only benefit the exporters and producers of perishable goods, but also the PoM, as investments in non-intrusive technology are associated with an increased custom performance at the PoM. Therefore, the Embassy should address this bottleneck with stakeholders, such as the KPA, Dutch trading groups and shipping companies, in order to contribute to improvements.

3. Digitalization and automation

a. Remote reefer monitoring

Shipping lines currently have access to real-time mobile data services pertaining to temperature and gas levels in reefers, measured by sensors inside. When containers are in the terminal, it would be of great value if the Port of Mombasa invested in a remote reefer monitoring system. Manual checking, as currently occurring, introduces greater human error, reduces cold chain integrity, and is time-intensive.^{xlvi} In light of labour issues at the PoM, an investment in these data services would reduce workload and increase efficiency. Cold chain integrity could be better ensured as temperatures can be continuously tracked, and data-based interventions can be planned. The dashboard is recommended because these are especially useful in monitoring, measuring, and analysing key data from different areas. In addition, a dashboard can be accessed by a variety of employees to whom this data is relevant. It is also an important step in a long-term plan to fully digitalize the Port, in line with Kenya's Digital Economy blueprint.

b. Establishment of a Port Community System

A Port Community System (PCS) is an electronic platform that connects all stakeholders in port operations. One operational aspect that distinguishes the largest, most efficient ports in the world from the rest is that they have a highly advanced PCS that enables them to streamline processes, have real-time tracking of all port aspects, and make processes paperless.^{xlvii} Hence, a PCS can be considered instrumental in becoming an internationally competitive port^{xlviii} - although a long-term goal in practice. Portbase is the company behind the PCS used by *all* Dutch ports. Note that this is unique in the world that all ports in a country use the same PCS. The embassy could put Portbase forward as a partner for the Port of Mombasa to begin establishing modules of a PCS. Stakeholder interviews confirmed the desire of the KPA to begin work on such a system, and is in line with Kenya's Digital Economy blueprint^{xlix}. Portbase would also be a suitable partner because the majority of Kenya's exports go to Rotterdam, and would represent an opportunity for them to offer their expertise abroad. Portbase was the first company to develop a PCS twenty years ago for the Port of Rotterdam, and does not operate for profit. Hence, a partnership between the PoM and Portbase could prove a materialization of the combi-approach.

4. Port of Rotterdam as partner

a. Training courses organized by PoR in Mombasa or Rotterdam for port personnel

The Port of Rotterdam (PoR) has valuable expertise concerning sustainability, logistics and handling, and knowledge transfer. To this end, the port has training programmes that can be tailored to the exact needs of the KPA and Mombasa port. PoR offers training courses in port management, digitalisation, and energy transition. These programmes, if



desired by KPA, can take place in Rotterdam, where personnel will be educated. They can also take place in the PoM.

b. Hiring of consultancy services of the Port of Rotterdam

PoR also offers advisory services that see a consultant arriving on location to assist with the themes mentioned above. For achieving the combined goal of aid and trade, we advise the embassy to offer the services of the PoR to its Kenyan contacts. By taking part in a training

programme, KPA personnel will be educated in such a way that they can pass this knowledge on within the organization. In our opinion, hiring a PoR consultant would not result in the same skill appropriation as the options outlined under 4.a. We see mutual benefits to be gained: KPA would be taught valuable skills, whereas the PoR would gain a business opportunity. In this way, the combination of aid and trade is reflected to the fullest. The embassy should therefore try to bring the KPA in contact with PoR.



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