D12.13 CORE Final report on phase one developments of the Kenya demonstrator - summary

Executive summary

This document serves as the month 24 deliverable (D12.13) of the CORE Final report on phase one developments of the Kenya demonstrator. It builds on the work reported earlier in deliverables D12.11 (m12) and D12.12 (m18) of this demonstrator.

The Kenya demonstrator focusses on import of flowers from Kenya to the Netherlands via air. It addresses the issues of Coordinated Border Management (CBM) involving Customs and Phytosanitary authorities, and the use of ePhyto Certificates. FloraHolland is the key actor driving this demonstrator (WP12). The air trade lane lacks a single orchestrating party, instead the supply chain consists of many actors working together. FloraHolland offers several services to its growers, but does not have a full control over the supply chain. This is *different* from the FloraHolland demonstrator in WP11, where the import of flowers is done via sea and FloraHolland acts as orchestrator over the supply chain.

As reported in M18 deliverable, the setup phase of this demonstrator was built around two problem scenarios and related high-level Use Cases:

- Problem scenario 1: Lack of supply chain visibility resulting in poor logistic reliability and efficiency
- High level Use Case: Event-based virtual tracking of shipment journey
- Problem scenario 2: Phytosanitary Certificate has crucial role in process continuity
- High level Use Case: Substituting paper Phytosanitary Certificate with an e-Certificate

Regarding the first problem area, in essence the strive is to first of all set-up a connectivity infrastructure and provide Dashboards for the Business and Government actors so that they can use it for better supply chain visibility, as well as system-based supervision. Regarding problem Scenario 2, initial piloting is with a pdf document and for Phase 2 the goal is to exchange the electronic ePhyto Certificate.

The progress from Month 18 to Month 24 regarding this problem scenario is that:

The connectivity infrastructure, the Business and the Customs Dashboard are ready; the business and government actors are trained how to use it. They were already in place for the Sea FloraHolland demonstrator (WP11); however, additional adjustments to the Business Dashboard needed to be made to reflect the data fields specific for air cargo. Testing with the technical infrastructure has taken place to ensure that the infrastructure is up and running. The piloting with real shipments is in its final preparation stage, where the commitment of the Freight Forwarder has been secured and there is a short list of growers who have daily shipments. We have planned to start pilots end of April 2016.

In Month 18-24 substantial work has been done in developing of Coordinated Border Management Redesign scenarios, which can be explored once the connectivity infrastructure, the business and the Customs Dashboards are in place. The ultimate scenario envisaged is “clearance in the air”, where the goods are cleared for onward transport at the moment the plane lands, which is a significant improvement compared to the current processes where delays are due to Customs and Phytosanitary clearance that takes place once the plane lands. The piloting with real shipments for Phase 1 starts shortly. Further development of the scenarios and a feasibility analysis for implementation will continue to take place in Phase 2 based on the outcomes. In addition to that, in order to support the

business case, as well as to engage the stakeholders for further discussion on adoption and scaling-up of the solutions, cost-benefit analysis is taking place. Initial estimates about the potential gains from the redesign scenarios are already reported in this deliverable. We will collect real-time data and further measurements when the pilot is running (foreseen April 2016), in order to make the costs and benefits explicit and to make a more clear business case and models for cost benefit sharing (this is also related to the work on cost-benefit sharing in T6.1 in WP6).

Scope of this deliverable in terms of the CORE Description of Work

The progress reported in this deliverable relates to Work Package 12 (Demonstrator Schiphol), Task 12.1: FloraHolland Kenya demonstrator as described in the CORE Description of Work (DoW, v. 2015-06-16).

The work in this demonstrator is structured around four sub-tasks (ST) as follows:

- ST12.1.1 Specify AS IS and TO BE situation (M 8);
- ST12.1.2 Specify use cases for evaluation (M 12);
- ST12.1.3 Develop demonstrator solution (M 18);
- ST12.1.4 Piloting (M 48)

Problem, ambition and goal of demonstrator

Problem context

In the air trade lane, the high volumes of flowers and the perishability of flowers require effective and quick handling at the transport nodes including correct documentation handling.

The air trade lane lacks an orchestrating party that controls the shipment of goods. Instead, a chain of supply chain actors works together on a one-to-one relationship without end-to-end visibility and integration. FloraHolland offers services only in some of the transport legs. The lack of visibility and ineffective information sharing often results in irregularities (reliability) and reactive handling (efficiency), leading to delays and added costs in the entire supply chain.

The lack of transparency furthermore hinders effective border protection by the Dutch Customs Administration. The challenge here is to improve transparency and control in a supply chain that lacks clear orchestration.

Ambition

The objective of this trade lane of flowers from Kenya to the Netherlands is to enhance reliability and to reduce the administrative burden and re-use solutions to these problems at the same time to enhance the effectiveness of supervising global trade and safeguarding supply chain security.

In order to achieve these goals, the aim is to

- Decrease dependencies on paper documentation
- Improve visibility to supervisory bodies.
- Increase responsiveness in the event of interruptions in the supply chain by improving visibility.
- Share Supply Chain status events proactive and throughout the entire chain
- Enable more focus on irregularities in the supply chain and its administrative process to increase reliability
- Re-use digital information in data entry-related tasks to improve data quality and increase efficiency

Implications for the Business Model

For FloraHolland it is crucial to preserve a strong marketplace. Easy access to the market places is therefore of high importance. An efficient administrative process and reliable supply to the market place at low costs can offer a competitive advantage for FloraHolland and the Netherlands as main flower hub, compared to other emerging flower trading services and hubs worldwide.

Short description of scope of the demonstrator

For the majority of flowers exported from Kenya to Europe, FloraHolland is the hub where the flowers are auctioned or delivered to the buyer (wholesalers or retailers, of which many are situated at the premises of FloraHolland).

The supply chain for flowers from Kenya to the Netherlands is operated by many LSP's. Growers or buyers can choose between several LSP's for the transport of flowers.

Within the airfreight supply chain, FloraHolland offers logistical services only in two transport legs. The focus for the Living Lab is primarily on the trade lane where growers make use of the services of FloraHolland. However, the potential benefits extend further as FloraHolland, as a cooperative, also represents growers that use other logistical services or ship to destinations other than the auction facilities.

Living lab methodology

To realize results with this demonstrator, a Living Lab methodology is applied, which follows a cyclical approach. Through this cyclical approach, several solutions can be tested and re-adjusted/improved to fit the needs of the real-life environment.

Review of the use cases

The setup phase of this demonstrator was built around two problem scenarios:

- Problem scenario 1: Lack of supply chain visibility resulting in poor logistic reliability and efficiency
  - High level Use Case: Event-based virtual tracking of shipment journey
- Problem scenario 2: Phytosanitary Certificate has crucial role in process continuity
  - High level Use Case: Substituting paper Phytosanitary Certificate with an e-Certificate

Use Case: Event-based virtual tracking of shipment journey

Being able to track the journey of a shipment increases responsiveness of actors; it enables them to better plan activities (transport, unloading, unpacking) and to prevent avoidable communication (email, phone calls).

For this, the concept of a Business Dashboard is introduced. The Dashboard tool will support visualization of:

- Shipment details like; contents of the shipment, consignor, consignee, freight forwarder
- Status information such as location, shipment progress, clearance status in order to prevent avoidable communication (email, phone calls, Excel sheets)

- Notifications on expected or actual changes due to SC events, in order to optimize planning (e.g. 'actual arrival time differs from planned arrival time').

Use Case: Substituting paper Phytosanitary Certificate with an e-Certificate

In the export process from Kenya the grower already requests from KEPHIS a Phytosanitary Certificate online. Based on this digital request, the Certificate is printed and endorsed. The NVWA and KEPHIS recently already initiated an 'e-Certificate' pilot where Phytosanitary Certificates ('e-phyto') are shared between both agencies electronically.

The use cases defined above aim to ensure that a connectivity infrastructure for information sharing, as well as Business and Customs Dashboards are in place. As reported later in this deliverable, these components are already developed and tests with pilot shipments are planned to start end of April 2016.

Once the connectivity infrastructure and the Dashboards are in place these form the basis on which further redesigns scenarios related to Coordinated Border Management can be developed. In the period M18-M24 three such scenarios were developed (see sections 4.5 and Annex 1 of this deliverable) and will be further explored in Phase 2.

Summary of Set-up phase

The progress from Month 18 to Month 24 regarding this problem scenario is that:

The connectivity infrastructure, the Business and the Customs Dashboard are ready; the business and government actors are trained how to use it. They were already in place for the Sea FloraHolland demonstrator (WP11); however, additional adjustments to the Business Dashboard needed to be made to reflect the data fields specific for air cargo. Testing with the technical infrastructure has taken place to ensure that the infrastructure is up and running. The piloting with real shipments is in its final preparation stage, where the commitment of the Freight Forwarder has been secured and there is a short list of growers who have daily shipments. We have planned to start pilots end of April 2016.

In Month 18-24 substantial work has been done in developing of Coordinated Border Management Redesign scenarios, which can be explored once the connectivity infrastructure, the business and the Customs Dashboards are in place. The ultimate scenario envisaged is "clearance in the air", where the goods are cleared for onward transport at the moment the plane lands, which is a significant improvement compared to the current processes where delays are due to Customs and Phytosanitary clearance that takes place once the plane lands. An evaluation workshop with the key stakeholders took place on 17 February 2016 to discuss the proposed scenarios and to set-up actions for the next period. Decisions and plans for the next steps are also reported in this document. The piloting with real shipments for phase 1 starts shortly. Further development of the scenarios and a feasibility analysis for implementation will continue to take place in phase 2 based on the outcomes. In addition to that, in order to support the business case, as well as to engage the stakeholders for further discussion on adoption and scaling-up of the solutions, cost-benefit analysis is taking place. Initial estimates about the potential gains from the redesign scenarios are already reported in this deliverable. We will collect real-time data and further measurements when the pilot is running (foreseen April 2016), in order, to make the costs and benefits explicit and to make a more clear business case and models for cost benefit sharing (this is also related to the work on cost-benefit sharing in T6.1 in WP6).

Current status of the demonstrator in the **Living Lab methodology**

This demonstrator is currently set in the "do" phase of the Living Lab methodology.

The technical environment (connectivity infrastructure) is operational; the Business Dashboard tool is adapted to support airfreight shipments (support for airfreight-specific data elements).

Preparations for the pilot on information sharing are taking place on an organizational level. A freight forwarder has agreed upon participation. Suitable growers for the pilot are approached.

Actions performed since last report

Organizational actions

- A pilot plan has been set-up, defining the pilot context, operational procedures and evaluation procedure.
- Employees at FloraHolland and Dutch Customs have been trained for working with the developed tools in a day–to-day process.
- FloraHolland presented their long-term vision on the development of trusted trade lanes by use of a chain risk management approach to establish assurance in (supply) Chains.
- Preparation of a workshop with supply chain actors to establish a chain risk management protocol will be held in April 2016.
- A Partner meeting was held on the FloraHolland demonstrators in February 2016 (see results of this meeting in section 3.4 'Partner engagement during process')
  A Workgroup meeting was held (FH, DCA, NVWA) to analyze redesign scenario's for phase 2

Technical actions (connectivity infrastructure)

The connectivity infrastructure is operational (Use Cases 1 ,2 ,3).

Integration of Phytosanitary Certificates is momentarily only supported by use of PDF-files (use case 5). Integration of Electronic e-phyto Certificates is preferred, as this will enable cross validation of data elements of various sources. Incorporation of the e-phyto will also be required for use case 4. The integration of the electronic Phytosanitary Certificate will be established in Phase 2. One of the reasons that we couldn't implement this yet is that upcoming changes in EU plant health regulations create uncertainty about the current systems used by the NVWA (i.e. Client import). New EU regulation prescribe the use of TRACES by all NPPO's. Thus far it is not sure whether CLIENT and TRACES will be compatible and thus whether incorporation of Client into the Connectivity Infrastructure is feasible for the long term.

Living Lab pilot

The pilot will be set-up in collaboration with one of the freight forwarders in Kenya (Panalpina Airflo). In this Living Lab, there are seven Kenyan growers who ship flowers on a daily basis with Panalpina Airflo to be auctioned at FloraHolland. Growers are to be approached to give permission to share their invoice information. The freight forwarder will be the party responsible for sharing the shipment information, in accordance with the growers involved.

The pilot will entail:

- Visualization of shipment information in the Business Dashboard
- The original documentation, which is linked to the shipment and other information (pro-forma invoice, Phytosanitary Certificate), will also be shared with Dutch Customs using the connectivity infrastructure.

- Visualization of shipment information by Dutch Customs using the Customs Dashboard (pro-forma invoice and Phytosanitary Certificate)
- Trial of a supply chain risk management approach contributing to development of a Trusted Tradelane. For the chain risk management approach a workshop is being prepared, in which all chain participants will work towards a chain risk management protocol; Instead of risk management approaches on company level, we aim to work toward a risk management approach that takes the whole chain into account. Currently now such technique or approach consists. This protocol amongst other formalizes the way information is shared and integrity of goods is handled throughout the entire chain.

Decisions made since last report

Freight Forwarder Panalpina Airflo has agreed to participate in the airfreight trade lane. We are in the selection process for the most suitable growers.

A Steering Committee meeting was introduced in order to realign ambitions, vision and progress in the FloraHolland demonstrators. The steering committee consists of project sponsors of FloraHolland, NVWA, DCA and TU Delft. Decisions were made on current developments (and improvement scenarios for the second improvement scenario. Steering committee meetings will be held every 2 months.

Dissemination activities performed during past months

The dissemination activities performed during the past months are listed below.

Table 1: Dissemination activities

'Sierteelt Digitaal' in Sassenheim, Netherlands (21-01 2016).	
Partner involved	FloraHolland
Description	Presentation given on Core project and FloraHolland demonstrators at congress 'Sierteelt Digitaal' in Sassenheim, Netherlands (21-01 2016). Sierteelt Digitaal (Floricultural digitisation) is a congress organized by Floricode. Floricode is a foundation that ensures the floriculture sector of having everything it needs to conduct its business efficiently in digital form, such as registration and coding of floriculture products and development of message standards to exchange commercial, logistical and financial information.
WCO TI forum: 28 October 2015, Rotterdam	
Partner involved	Descartes
Description	WCO TI forum: 28 October 2015, Rotterdam. Breakout session 1. Presentation on "Multi-party security filing" and the Dutch CORE pilot. The presentation highlighted how additional

	information can be shared with Dutch Customs on a voluntary basis. More information on https://www.eiseverywhere.com/ehome/ti2015/270696/

Qualitative description of the demonstrator results

Pilot results will be obtained from April onward.

In order to address the two problem scenarios and related use cases as discussed in Section 2.5, three key components of the solution configuration needed to be in place as follows:

- The data pipeline which serves as the connectivity infrastructure for sharing data among business and government actors (developed by Descartes)
- The Customs Dashboard which is the interface that Customs uses to view relevant information that is made available via the pipeline (Developed by Intrasoft)
- The Business Dashboard, which is the interface that businesses use to view relevant information that is made available via the pipeline (Developed by Descartes).

Phase one of the demonstrator focused on setting up and testing these critical infrastructures and preparing the grounds for the piloting with real shipments that will take place in phase 2.

At the moment the data pipeline is in place and the business and Customs Dashboards are ready and being tested.

The pilot shipments will take place from April 2016 onward. The Freight Forwarder has already been selected and a short list of growers who ship daily is available.

The availability of the data pipeline, as well as the business and Customs Dashboards make it possible to develop redesign scenarios and process simplification. Further conceptual work has been done to develop Coordinated Border Management Redesign Scenarios. These scenarios have been already discussed with key stakeholders and follow-up meetings are planned to explore legal feasibility, barrier and how these can be overcome. Initial cost-benefit and improvement estimates are reported in this deliverable (see Annex 1) and we will continue to collect cost-benefit measures. The further elaboration and piloting with the scenarios will be subject for further exploration in Phase 2.

Conclusions

The success and barrier of the Kenya demonstrator can be discussed with respect to the solutions developed and the process.

On the technical development side, the biggest achievement so far is that the technical platforms (i.e. the connectivity infrastructure, the business and the Customs Dashboards) are already in place and have been adapted for the Air freight context. Regarding the process redesign, the success is that a number of Coordinated Border Management redesign scenarios have been identified, the most visionary being “Clearance in the Air”. These scenarios show conceptually the potential for procedure simplification and related benefits that can be achieved (for both businesses and the authorities) once the technical infrastructure is in place. As such, this demonstrator can serve as a showcase for Coordinated Border Management for other countries which are working on or planning to implement, in future, a Coordinated Border Management concept.

On the process side, the success of this demonstrator is that the collaboration among the partners has intensified during the last period; there are very short communication lines and this helps to quickly

align activities and accordingly take follow-up actions. The newly introduced Steering Committee Meeting has turned out to be very valuable for creating a common vision for future developments and, at the same time, the high-level of involvement and support at the management level of the parties involved ensures a solid ground for the further adoption of the ideas developed.

Attracting external stakeholders has taken more time than expected. The CORE concepts remained conceptual for a long period. External stakeholders saw the benefits, but at the same time, they were not able to understand the real impact. Having the infrastructure and capabilities in place helps to explain the benefits of the solutions developed and draws enthusiasm from external stakeholders.

For the coming period, there are a number of barriers that need to be overcome. Because of the above-mentioned reasons, this demonstrator has experienced a slight delay with the pilot shipments. The project team has set-up a new plan for the next pilot shipments, a short-list for growers is already in place and the commitment of the Freight Forwarder is secured. As such, the key building blocks are in place and there are no major problems foreseen for starting the pilot shipments within the timeframe of the revised planning.

On the solution side, the delay with the pilot shipments means that there is also a delay in the data collection and analysis, as well as in the learning loops related to the use of the connectivity infrastructure and the Dashboards. At the same time, pilot shipments in sea freight using the infrastructure and Dashboards have already taken place and the technical partners can capitalize on these earlier experiences from sea freight to further improve the technical environment also for the air pilots. Similarly, the earlier experiences from the sea freight have helped to gain experience and refine the measurement methods. This learning curve is immediately of value for the Kenya demonstrator as well.

Regarding the redesign scenarios, a major barrier for the coming period is to establish what are the legal frameworks related to Customs and Phytosanitary inspections, what are the barriers for implementing the scenarios and how can these be overcome. Initial discussions on that topic are already taking place. There is already a dedicated team of experts working on this issue and a number of meetings will take place to further analyze the legal barriers and opportunities.

Next steps

- Building on the results so far, the next steps for the Kenya demonstrator are listed and discussed below: Phase 1 Pilots and Evaluation

The Phase 1 pilot shipments importing roses from Kenya to the Netherlands will start in April 2016. During the pilot the focus would be on testing the connectivity infrastructure, the business and the Customs Dashboards and collect further measurements. Evaluation and continuous improvement on the set-up will be performed during pilots. Each of the individual partners will perform evaluation on the parts that are in his area of control and results and experiences will be shared on continuous bases. Periodically evaluation meetings will be held to consolidate the findings and set-up steps for improvement in the next shipment cycle.

- Further development of the Trusted Trade Lane concept

A Workshop to establish a supply chain risk management approach will be held. The outcome of the workshop will enable us to explore the possibilities for the set-up of a trusted trade lane for the import of flowers. This work contributes to gaining further understanding of the Trusted Trade Lane concept and how it can be operationalized.

- Further exploring and demonstrating the Redesign scenario in Phase 2 of the demonstrator.

The scenarios discussed in section “4.5 Redesign Scenarios for the 2nd phase” will be further explored and demonstrated in Phase 2 of the FloraHolland demo. One of the major activities related to this step is to establish what the legal barriers for implementing these scenarios are and how these can be overcome.

1 Annex 1: Coordinated Border Management Redesign Scenarios

This Annex describes in more detail problems in the current situation due to the sequential dependencies among the Phytosanitary and Customs procedures and outlines 3 Coordinated Border Management Redesign scenarios.

1.1 Sequential dependencies among inspection agencies in the import of flowers

Only 5% of the flow of the goods imported by FloraHolland to the Netherlands are subject to inspection; the remaining 95 % do not undergo inspection. In the redesign scenarios discussed below we looked for redesign scenarios that can lead to process simplification for the 95% of the flow that does not undergo physical inspections.

In the current import procedure of flowers, there is a sequential dependency among the different authorities which lead to administrative burden, inefficiencies and time delays. On a high-level, the process looks as follows:

First, Customs of entry carries out risk analysis (focus on security) based on ENS data. Subsequently, the Freight Forwarder submits a Phytosanitary declaration to the Phytosanitary authorities. The Phytosanitary authorities indicate whether the goods have been selected for a random check or not. If not, the Freight Forwarder can proceed with the next step and file the import declaration to Customs. Only after that step can Customs start with its risk analysis. It can either give an ok and release the goods or it can decide to inspect the goods. In cases where Customs needs further information to make a decision they can ask for additional documents. The current procedures are characterized with sequential dependencies among the steps performed by Customs and the Phytosanitary authorities and this leads to inefficiencies and delays. Figure 6 below illustrates these dependencies and indicates problem areas that lead to delays and inefficiencies.

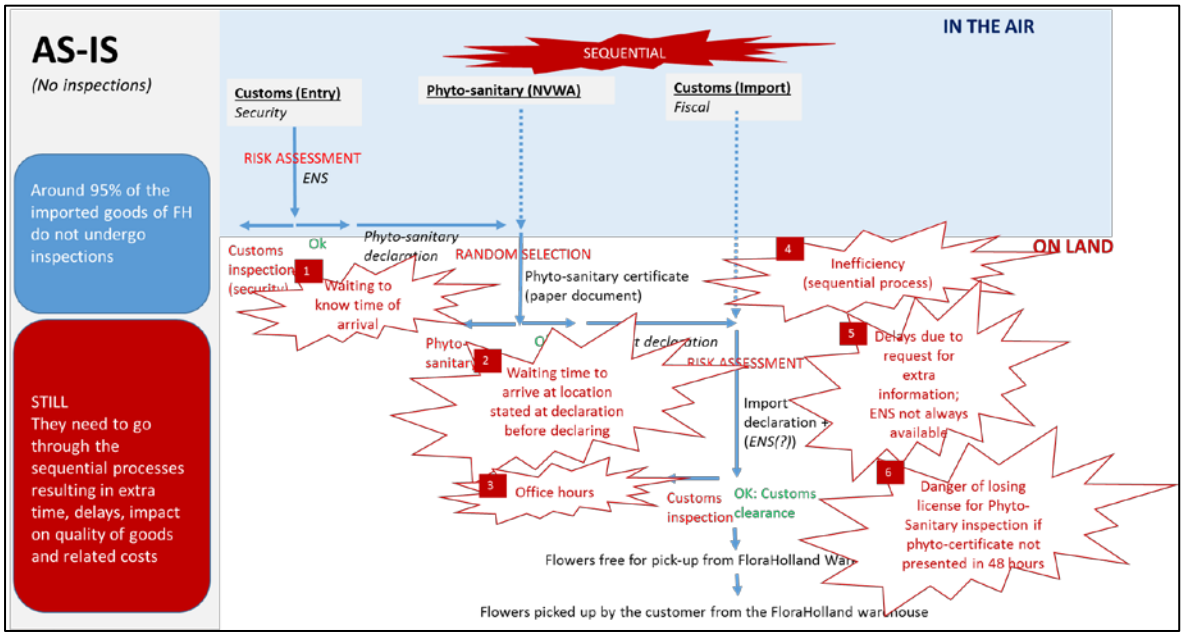


Figure 1: Problem areas in the AS-IS situation

1. Problem 1: The Freight Forwarder needs to wait for filing the Phytosanitary declaration until he knows the estimated time of arrival of the goods, so that the authorities know when to send the inspection team, in cased the goods need to undergo a Phytosanitary inspection. The

Phytosanitary declaration is currently usually done 30 minutes before the plane lands. This is a bottleneck in the process [problem 1 in Figure 6 above].

2. Problem 2: After receiving OK from the Phytosanitary authorities, the Freight Forwarder needs to know at which location the good are delivered. Once the goods arrive at that location, the Freight Forwarder can sumbit the import declaraton to Customs. This is a bottleneck in the process [problem 2 in the Figure 6 above].
3. Problem 3: The import declaration process can be delayed by the office hours and related delays [*problem 3 in the figure above*].
4. Problem 4: Currently the risk assessment done by the Phytosanitary authorities and the Customs authorities at import *[problem 4* in Figure 6 above*]* is a sequential process, meaning that Customs at import cannot begin their risk assessment before the Phytosanitary procedure is finished, and this has to be confirmed with a P2 message that is issued by the Phytosanitary authority, forwarded by the Freight Forwarder, and ultimately received by Customs. This sequential processing leads to time dependencies and inefficiencies in the process. The message sending typically also leads to delays in the process. [*Problem 4 in Figure 6 above*]
5. Problem 5: Customs at import needs to carry out risk assessment based on the import declaration data. It takes on average 30 minutes for Customs to respond to an import declaration. They can respond with a request for a physical inspection, with a response that the goods have been cleared or they can request additional information. In the last case, Customs would ask the company to provide additional information, so that they can carry out the risk assessment. This is because the import declaration often contains insufficient and/or inaccurate data. While in some cases Customs may have access to the ENS data, in cases that the office of entry in the EU is different than the process of import, Customs of import does not have access the ENS data either. In order to perform the risk assessment Customs may need to ask for additional information (such as the ENS, proforma invoice, Phytosanittary Certificate) to complete or cross-validate the import declaration data, which is typically done by a large number of phone calls and email messages, which leads to considerable extra delays in the Customs risk assessment process and additional costs. In case of parisheable goods Customs can use a conditional clearance procedure, where the goods are allowed to proceed but the company needs to still collect and provide all the necessary documents which can take hours or even days [*This links to problem 5 in Figure 6*].
6. Problem 6: The paper-based Phytosanitary Certificate is often missing at the time of risk assessment leading to conditional clearance (with the obligation to produce the paper-based document in 48 hours). If the document is not presented within the 48 hours and the goods have left the premises of FloraHolland warehouse, that can have severe consequences for FloraHolland (such as losing the Phytosanitary licence which allows the phsycial inspections to be done at FloraHolland warehouses) *[This links to problem 6 in Figure 6].* The frequencies of occurrence of this problem is very low but it poses strategic risks to FloraHolland, such as losing the license which may lead to losing business.

While 95% of the goods of FloraHolland are granted OK and are not subjected to physical inspections, they need to undergo the steps explained above. This causes delays, hampers predictablity, leads to extra costs, and the delays may impact the quality of the goods. In the next section we discuss scenarios which aim to remove inneficiencies, based on the data pipeline, Business and Governmant Dashboard innovations to exchange more data throughout the whole supply chain, and allow for faster clearance of the 95% flow of goods which do not need to undergo physical inspections.

1.2 TO-BE 1 Scenario: Customs of Import receives extra information

The first scenario discussed below (also called TO-BE 1, as we use is as a basis for the further redesign scenarios) aims to address *Problem 5* discussed in Figure 6 and the related explanation, namely providing in advance the necessary extra information to the Customs of Import, for completing or cross-validating delcaration data, so that they can more efficiently carry out their risk assessment.

If Customs at the Office of Import is given access to additional information from documents listed below, then they will have the information needed for a more effective risk assessment. This will eliminate the delays related to asking additional information and the time needed by the company to provide the requested documents:

- ENS (in case the Customs Office of Import is different than the Customs Office of Entry)- The ENS data is available at the Customs Office of Entry. The carrier provides this information to the Customs of Entry. Through the data pipeline such informaton may potentially be shared with the Customs of Import.
- The Phytosanitary Certificate- This certificate contains data about the actual exporter; i.e. the grower of the roses. It is owned by the grower. In case of consolidated shipments there is a consolidated Phytosanitary Certificate which is made by FloraHolland or the Freight Forwarder. Most of the shipments via sea are consolidated, and some via air. In the FloraHolland case, this document is issued by the Phytosanitary authorities in Kenya and is intended for the Phytosanitary authorities in the Netherlands. It is possible to issue an electronic version of this certificate, but there is still a legal requirement to have the paper-based document, as well. This certificate contains valuable information for Customs. If an electronic version of this certificate (e-phyto certificate) is shared in advance with Customs, customs can use it as an additional source of information for their risk assessment.
- Proforma invoice- this document contains very accurate information about the goods description. In the FloraHolland case, the proforma invoice contains also the packing list information. The information is owned by the grower in case of individual shipments; consolidated proforma invoice is made by FloraHolland or the Freight Forwarder. This document contains a detailed goods description data, which is also very valuable for Customs. If this information is available in advance, it will also facilitate the risk assessment.

Making this Phytosanitary Certificate and pro-forma invoice accesible for Customs solves their problem that often the import declaration does not mention the true buyer and true seller of the goods and that goods description are often not fully correct.

Figure 7 below illustrates TO-BE 1 scenario.

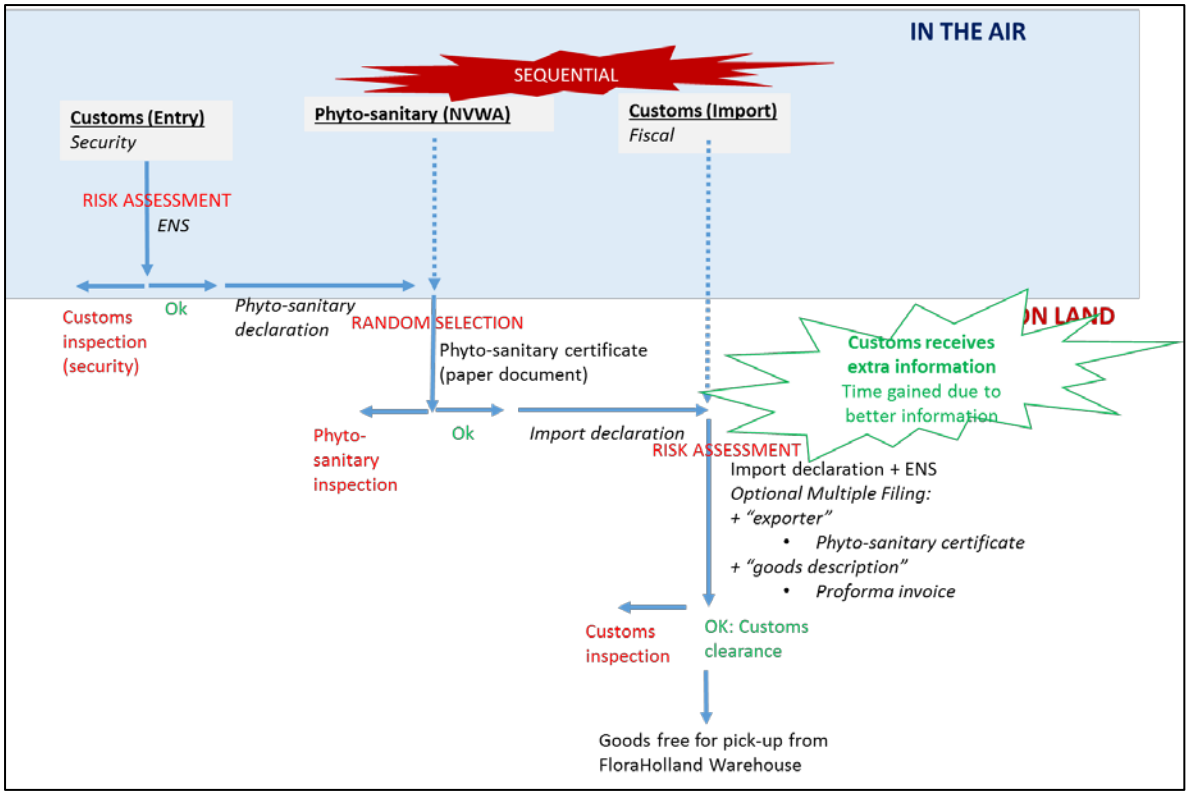


Figure 2: TO-BE 1 Scenario: Customs receives extra information in advance

If Customs can receive in advance additional information such as information about "the exporter" and information about "the goods description", which can be provided on voluntary basis by the company via the so-called Optional Multiple Filing, this provides possibilities for Customs to carry out a more efficient risk assessment. The time and costs saved are the time and costs saved from the extra time and efforts that businesses and Customs put in activities (such as as phone calls and e-mailing) in order to request and make available the additional information needed (this benefit is indicated with the green shape in the right-hand side of the figure above).

Furthermore, TO-BE 1 scenario contributes to reducing the risk associated with Problem 6 indicated in Figure 6, namely the danger of losing the Phytosanitary license in case the phytosanitary document is not available within 48 hours and in case the control over the goods is handed over to the next partner in the chain. Availability of electronic Phytosanitary Certificates in advance gives certainty that at least the document has been issued by the authority and it exists. While this does not solve the problem that the company needs to present the paper-based document within 48 hours (legal obligation) and the danger of losing license, having the electronic version of the Phytosanitary Certificate gives more certaintly in the process that the document was indeed issued. The possibility for further simplification related to e-phyto certificate, the legal barriers and how these could be overcome will be the subject of further research.

The potential benefits of TO-BE 1 Scenario consist of:

- Reduction of on average a couple of hours (but in exceptional a couple of days) lost by Customs and businesses to collect and process the additional information required by Customs (by phone calls and/or emails) for declarations marked with "red" (relates to KPI in M18 = Transport lead time variability).

The possibility for Customs to receive additional data for risk analysis in advance opens opportunities for further process simplifications as discussed in Scenarios 2 and 3 respectively.

1.3 TO-BE 2 Scenario: Parallel Phytosanitary and Customs (Import) procedure

A further improvement could be that Customs uses these additional data not only to complete or cross-validate declaration data, but also to start earlier with the risk assessment process (i.e. move from a sequential to a parallel process). In this scenario, Customs at Import does not need to wait until the Phytosanitary procedure is finished in order to start with the risk assessment. If customs receives information in advance (i.e. the ENS data, the import declaration data, as well as additional data from the Phytosanitary Certificate (electronic), proforma invoice and packing list) it can perform the risk analysis procedure in parallel with the Phytosanitary procedure. In the FloraHolland demo receiving this extra information in advance can be done via the Optional Multiple Filing, where companies are given the opportunity to provide additional information to Dutch customs on a voluntary basis via the Customs Dashboard. The reason why companies are willing to provide this information is that this will enable customs to carry out the risk assessment more efficiently and such companies would have benefits of faster clearance, compared to companies which do not provide such additional information in advance.

Based on this data, customs can do a risk assessment *in parallel* with the Phytosanitary authorities and time is gained from getting rid of the delays and inefficiencies in the *sequential* process. In particular, this solves the issue that the customs risk assesment process is often extra delayed, because of the delays in the exchange of the P2 clearance message from Phytosanitary inspection via the freight forwarder to customs. If both authorities give an OK, then goods can be cleared and proceed further down the chain.

The potential time gained is indicated with the green cross in Figure 8 below, as the activities can be performed earlier, i.e. customs risk analysis can be done in parallel with the Phytosanitary procedure.

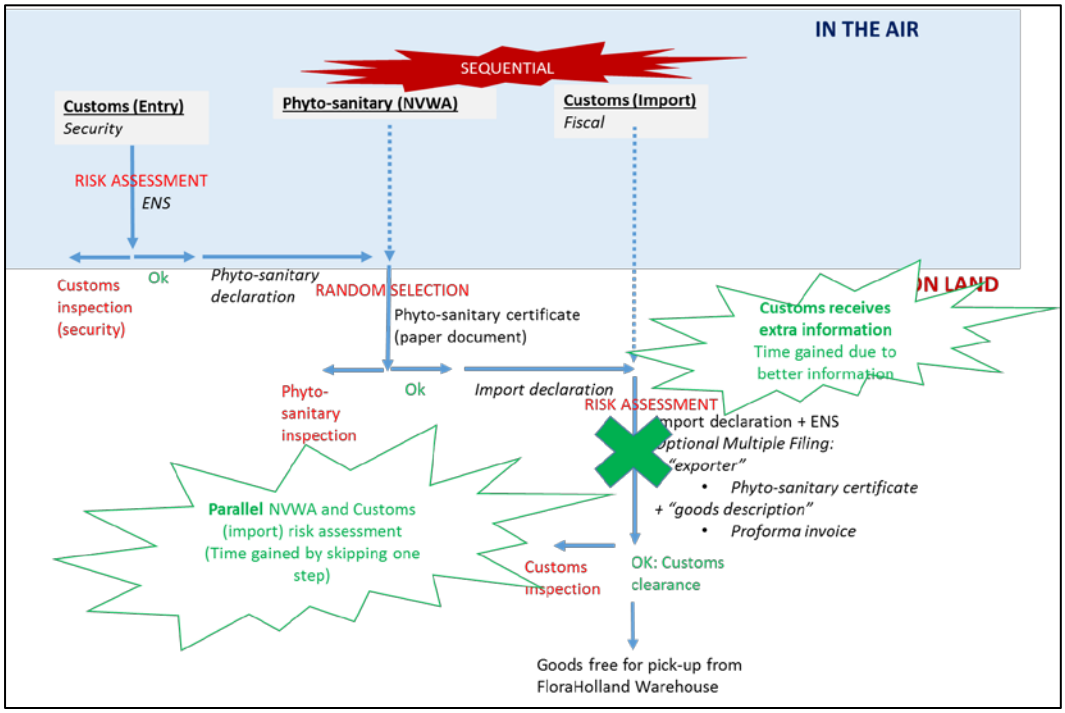


Figure 3: Moving from a sequential to a parallel process allows for time saving of skipping one step in the process

The resulting process based on the Parallel scenario is TO-BE 2 Scenario (which we call “Parallel”) and it is represented in Figure 9 below.

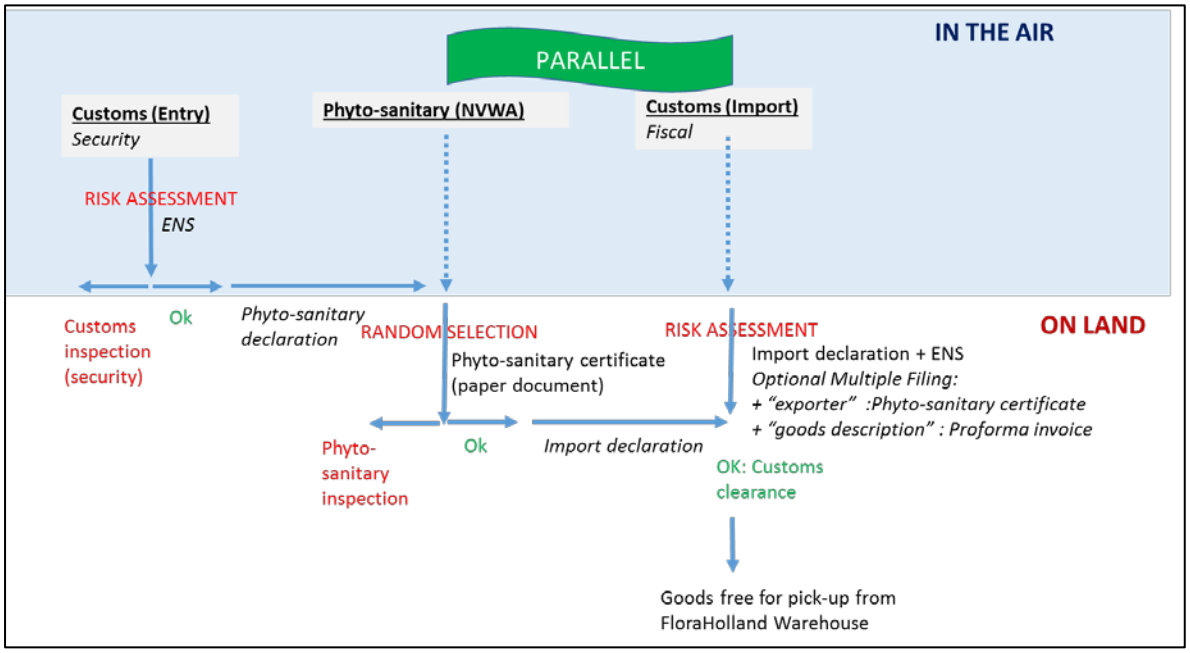


Figure 4: TO-BE 2 Scenario: Parellel Phytosanitary and Customs

Summary potential benefits TO-BE 2 Scenario: *Parallel*

- Benefits from Scenario TO-BE 1
- Reduction of time lost in exchanging the clearance message from the Phytosanitary inspection via the freight forwarder to the Customs and the time needed to file the import declaration.
- Reduction of the time for Customs risk assessment based on import declarations (the average time that Customs sends a response to a declaration, after the declaration is received; due to the parallel process, processing this activity can be done in parallel rather than sequential, resulting in time saving of skipping one step in the process).

It is also to be further investigated whether this process can also contribute to addressing Problem 2, namely, whether the goods need to reach the physical location stated on the import declaration before the Freight Forwarder is able to file the import declaration. As the risk assessment from Customs at import will be done in advance, the goods location information may not be needed in case the goods are not selected for physical inspection, which would also remove this bottleneck from the process.

1.4 TO-BE 3 Scenario: Parallel "In the Air"

The TO-BE 3 Scenario is further optimization of TO-BE Scenario 2 with the difference that the random selection by the Phytosanitary authorities and the risk assessment by the Customs at import is done *"In parallel"* and when the goods are *"In the air"* i.e. before the plane lands and the goods are unloaded at the airport of destination.

In this case 95% of the imported goods, which are not selected for physical inspections will be cleared in the air, which will save the time which would be required to carry out the parallel process once the goods arrive on the ground (as in Scenario TO-BE 2). This has tremendous implications in terms of time saved, predictability and logistics optimization, as it will enable planning of the on-ward transport of 95% of the goods that are already completely cleared, and these goods can be immediately picked-up and transported further in the chain as soon as the plane lands.

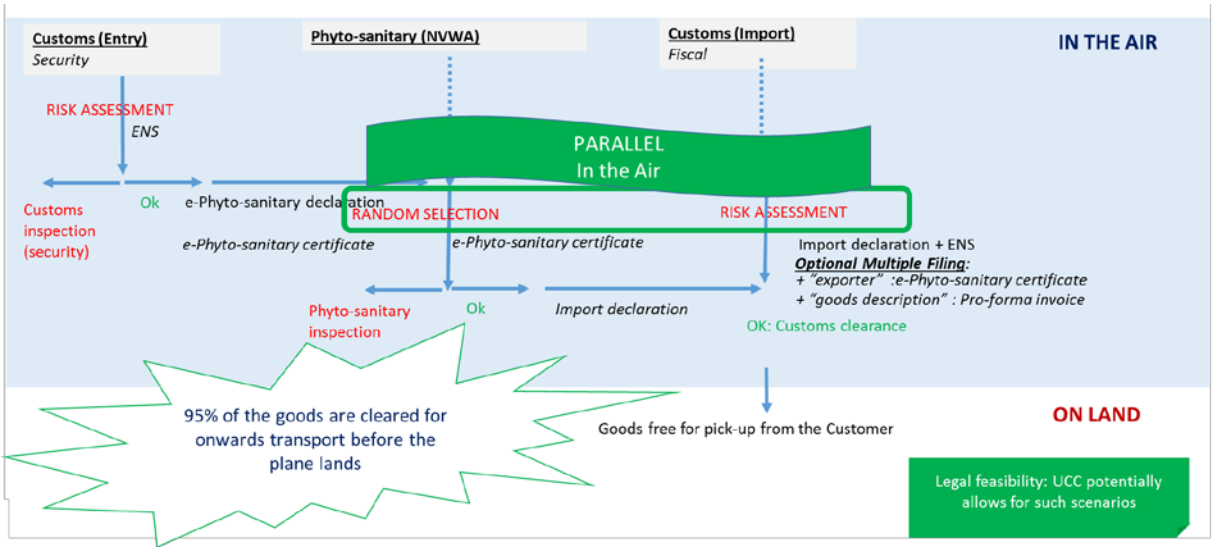


Figure 5: TO-BE 3 Scenario: Parallel "In the Air"

This scenario helps to address also problems 1, discussed earlier. In TO-BE 3 Scenario the Freight Forwarder could submit the Phytosanitary and customs declarations earlier rather than waiting until it has a better estimate of the arrival time for filing the Phytosanitary declaration (around 30 minutes before the arrival of the plane) and waiting for the goods to arrive at the location mentioned on the import declaration to file the import declaration. The Freight Forwarder can make all the information available early in the process, once the goods are "In the Air". The authorities can use the time when the goods are "In the Air" to do the risk assessment and, in case the goods are not selected for inspection, clear the goods for further circulation.

Summary potential benefits TO-BE 3 Scenario: *Parallel "In the Air"*

The potential benefits of TO-BE 3 Scenario consist of:

- Benefits from Scenario TO-BE 1
- Benefits from Scenario TO-BE 2
- Reduction of time lost in waiting time for organizing onward transport of cleared goods.
- Allowing to do declarations during office hours (for late flights)
- Allowing timely re-planning of processes in case inspections are requested.

These scenarios indicate clear benefits and cost reduction from Coordinated Border Management and Information sharing.

In next steps special attention will be paid on examining legal issues and barriers and what is needed to overcome these to make such scenarios feasible for implementation.

2 Annex 2. Review of KPIs and Measurement approaches

2.1 Background and methodology

In earlier deliverables of the Kenya demonstrators KPIs have been identified and initial baseline measurements have been performed. The following starting points/ methods have been developed and can be found in the M18 deliverable:

- In deliverable D12.12, a number of research questions and related measurements, metrics, method and baseline measurements are defined (these are partly repeated in Section 4.2 of this deliverable as well). In this process KPIs were derived from the KPI list defined in the CORE project on supply chain security KPIs. For the Kenya demonstrator, a selection of KPIs from the CORE KPI list was made. Next to that, additional KPIs were added to reflect the specific needs of this demonstrator and initial base-line measurements were provided.

The same steps were performed also in the Colombia/ Kenya demonstrator (the FloraHoland sea trade lane demo in WP11). When trying to use the measurement instruments to measure what we observed in the sea pilot shipments in the Colombia/Kenya Demonstrator is that our measurement approach had a number of limitations, namely:

- First of all, the CORE KPIs were derived based on the SCOR model (http://www.apics.org/sites/apics-supply-chain-council/frameworks/scor), which identifies 5 supply chain performance attributes (*Reliability* including metrics on time, quantity and quality; *Responsiveness*; *Agility*; *Costs* and *Asset Management*). While these categories are very useful, the SCOR model does not allow to capture in detail the process steps from Kenya to the Netherlands and capture observations that we made in a specific part of that process. At FloraHolland internally another measurement approach was recently introduced, based on the SIPOC model. This model takes the process perspective as a starting point and links measurements to steps in the process. It also defines categories like Process measures, Present data, Goal performance, Sources of variation and waste, Impact on performance, Result measures, Result concerns and Customer needs. As a result, we enhanced our measurement model to combine the attributes used by SCOR with the process approach of SIPOC. Some of the other categories from SIPOC overlap to some extent to those used in SCOR others differ. In order to not to over complicate the model and keep it manageable, we decided not to include all the elements from SIPOC but instead to use these as inspiration. Especially the indicators related to Sources of Variation and Waste can be useful as a check list to keep us alert on types of problems that may cause disturbances and this will allow us to easier identify them in pilot shipments.
- When analyzing the shipments we also needed a way to represent measurements on an individual incident basis, whereas some of the KPIs refer to aggregates. We therefore decided to make an explicit conceptual distinction between measurements per incident (these will be measurements based on following individual shipments) and aggregate measurements (these will be measurements which we will derive for a population of shipments).
- When reviewing the research questions and KPIs we also decided to make a clear distinction about measurements that concern the AS-IS situation and measurements which concern the TO-BE situation and make the benefits of the CORE solutions visible. We therefore make an explicit conceptual distinction between measurements of the AS-IS and the TO-BE situations. It is important to highlight that in the initial shipments for the sea trade lane (WP11) when using the visibility infrastructure, we were able to more clearly identify and make visible problems in the AS-IS situation. Therefore, despite the fact that we use the visibility infrastructure these measurements should not be mistaken of measurements of

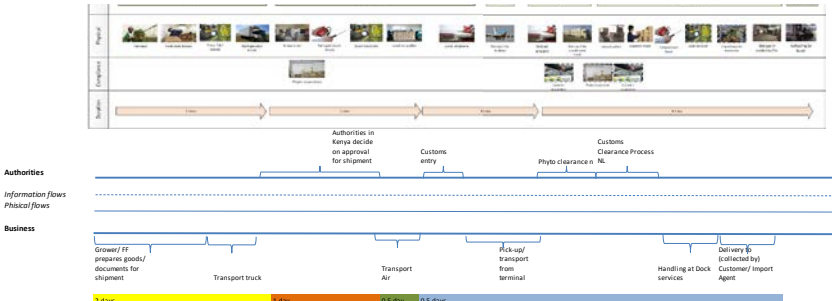
the TO-BE situation. Measurements of the TO-BE situation will relate to how the solutions of CORE bring improvements in the TO-BE situation.

In the Colombia Kenya demonstrator, we use this model to capture results from the pilot shipments that are running with importing flowers via sea. As soon as the air pilot shipments start we will use the same method to capture the results. The knowledge accumulated in working with this instrument in the sea trade lane can be applied to air as well. Furthermore, we will use this method to capture aggregate data to be able to evaluate effects that the redesign scenarios will have on the overall process improvement. We already collected initial estimates from experts but we will continue collecting information so that we get a better estimate related to the different indicators.

2.2 Measurement model and M18 measurements.

Figure 11 below demonstrates the revised measurement model. The model elaborates on the work previously done in D12.11 and 12.12, but now also enables us to capture the process, the measurements, impact and causes into one model. The measurement model will be used to capture and analyze results. As the models is quite detailed, simplified versions of the model will be used to share the findings. The model below enlists baseline measurements performed in D.12.12 (marked with red in the table below). The column with CORE/ FH KPIs reflects the KPIs from the list defined for the CORE project that were selected for the FloraHolland Demo.

CORE



SCOR	Grower	FF Export	Transport truck	Scans, checks and load on pallets	Kenyan auth.	Load Plane; Transp Air; unload	Cust. Entry	FF Import	Pick-up	Phyto	Customs Import	Doc Services	Deliv. To Customer	Effects		CORE/ FH KPIs	Additional baseline measurements M18
																KPI Name	
RELIABILITY																	
Physical flow																	
Time																	
3. Delivery performance to customer request date																3. Delivery Performance to Customer Request Date	
9. Supplier on-time delivery performance																9. Supplier On-Time Delivery Performance	
31. ETA accuracy (of total SC and specific transport leg)																31. ETA Accuracy	Not acquired at this point.
46. Transport lead time variability																46. Transport lead time variability	Not acquired at this point.
Quality																	
Quantity																	
Information flow																	
Time																	
Filling out doc	10 min (100% frequency)	10 min (100% frequency)						15 min									
Collecting endorsed doc	10 min (100% frequency)																
Communication (email, phone calls, excel sheets, fax, sending inform. Multiple times) (a4)								30 min				8 min (100% frequency)					
Checking data of Phyto certificate and packing list												5 min (5% of shipments)					
Correction procedure due to data discrepencies								??				10 min (90% frequency)					
Exception handling (e.g. flight delay, then min. outsourced HR)												3% of shipments					
Wrong planned phyto inspection (too early)								10 min (0,05%)				10 min (0,05%)					
Time spent for aquiring additional information about a shipment (a12)																	
SC replanning activities (a3)																	Not acquired at this point.
Average time spent for communicating with actors in the SC																	
The number of original paper documents required in int. trade which can delay a shipment (a6)																	Of all documents, 4 original paper trade documents are identified that can block shipments: • (Pro-forma) Export invoice; required with endorsement of phytosanitary certificate and export certificate. • Packing list • Phytosanitary certificate; required for export and to be submitted to Dutch NPPO. • Export certificate; required for export approval The certificate of origin needs to be present in original paper form. However, the lack of this document does not delay a shipment, but can have financial consequences.
The number of original paper documents required in int. trade (a9)																	In total 13 documents have been identified in the trade lane. Five of the border crossing related documents are required in paper form: • Packing list* • (Pro-forma) Export invoice • Phytosanitary certificate • Export certificate • Certificate of Origin (EUR1) * The packing list can be integrated with the pro-forma invoice.
Quality																	
18. Number of orders (shipments) with complete and accurate documentation (a8)																18. Number of Orders with Complete and Accurate Documentation	Not acquired at this point
Quantity																	
Authorities																	
Time																	
Time spent on risk assessment																	
Time spent on resulting delays																	
Quality																	
Quantity																	
Number of physical inspections																	
36. Inspection hit rate (a13, a14)																	
Hit rate physical inspections (a17)																	
Plant health inspection in Kenya during export																	100%
Customs inspection during entry in the EU at Schiphol Airport																	On average 4% on flowers from Kenya (2014)
Plant Health inspection during import, at the auction facilities (while goods are still in transit)																	Ranging 5% to 100%, depending on origin and species. Roses from Kenya (around 90% of goods) have inspection rate of 5%.
Customs inspection during import (release goods for free circulation)																	On average 0.9% (2014)
32. Hit rate																36. Inspection Hit Rate	
RESPONSIVENESS																	

Figure 6: Revised measurement model

2.3 Impact areas based on Scenario 1, 2 and 3

The impact areas of the redesign Scenarios 1, 2 and 3 discussed in the main text of the deliverable are marked with *orange* in Figure 12 below (for readability purposes only relevant parts of the table were copied). Specific measurements will be collected regarding these areas in order to more accurately estimate the impact of the three Coordinated Border Management redesign scenarios.

SCOR	Grower	FF Export	Transport truck	Scans, checks and load on pallets	Kenyan auth.	Load Plane; Transp Air; unload	Cust. Entry	FF Import	Pick-up	Phyto	Customs Import	Doc Services	Deliv. To Customer	Effects		CORE/ FH KPIs
																KPI Name
RELIABILITY																
Physical flow																
Time																
3. Delivery performance to customer request date																3. Delivery Performance to Customer Request Date
9. Supplier on-time delivery performance																9. Supplier On-Time Delivery Performance
31. ETA accuracy (of total SC and specific transport leg)																31. ETA Accuracy
46. Transport lead time variability																46. Transport lead time variability
								time lost in waiting time for organizing onward transport of cleared goods				time lost in waiting time for organizing onward transport of cleared goods				
								Allowing to do declarations during office hours (for late flights)								
Quality																
Quantity																
Information flow																
Time																
Filling out doc	30 min (100% frequency)	20 min (100% frequency)						15 min								
Collecting endorsed doc	10 min (100% frequency)															
Communication (email, phone calls, excel sheets, fax, sending inform. Multiple times) (a4)								30 min				8 min (100% frequency)				
								time lost in exchanging the clearance message from the phyto-sanitary inspection via the freight forwarder to the customs and the time needed to file the import declaration								
Checking data of Phyto certificate and packing list												5 min (5% of shipments)				
Correction procedure due to data discrepencies								??				10 min (90% frequency)				
Exception handling (e.g. flight delay, then min. outsourced HR)												3% of shipments				
Wrong planned phyto inspection (too early)								10 min (0,05%)				10 min (0,05%)				
Time spent for aquiring additional information about a shipment (a12)								on average a couple of hours (but in exceptional a couple of days) lost by Customs and businesses to collect and process the additional information required by customs (by phone calls and/or emails) for declarations marked with "red"								
SC replanning activities (a3)																
								time gained for re-planning of processes in case inspections are requested. (in case of parallel in the air)								

Quality																
18. Number of orders (shipments) with complete and accurate documentation (a8)																18. Number of Orders with Complete and Accurate Documentation
Illegitimate release of goods												Reduced chance of illegitimate release		Danger of losing customs license		

Figure 7: Impact areas phase 2 scenario