GLOBAL ALLIANCE FOR TRADE FACILITATION

Accelerating eCertification Adoption

LESSONS LEARNED FROM THE GLOBAL ALLIANCE FOR TRADE FACILITATION

ELECTRONIC PHYTOSANITARY CERTIFICATION (ePHYTO) PROJECTS

LESSONS LEARNED SERIES LL-05

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THE GLOBAL ALLIANCE FOR TRADE FACILITATION

The Global Alliance for Trade Facilitation (the Alliance) supports governments in developing and least developed countries in implementing the World Trade Organization's Trade Facilitation Agreement. Alliance projects cut through red tape and end costly delays at borders by bringing together governments and businesses of all sizes as equal partners to deliver targeted trade reforms.

By emphasising digitalisation and delivering other best practices, Alliance projects enable businesses to trade more easily thanks to streamlined and more predictable processes. Governments save time and resources by modernising trade procedures while safeguarding their borders. Ultimately, Alliance projects boost trade competitiveness and business conditions, which are key drivers of inclusive economic growth and poverty reduction.

The Alliance is led by the Center for International Private Enterprise, the International Chamber of Commerce, and the World Economic Forum, in cooperation with Gesellschaft für Internationale Zusammenarbeit (GIZ). It is funded by the governments of the United States, Canada and Germany.

LESSONS LEARNED SERIES

The Global Alliance for Trade Facilitation Lessons Learned Series is a collection of papers documenting the technical and operational insights gained from the Alliance's experience in the implementation of trade facilitation reforms. Its goal is to share lessons and emerging best practices as a resource to governments, businesses and other organisations and initiatives in the trade facilitation and related fields.

HOST ORGANISATIONS

IN COOPERATION WITH

OUR DONORS

ACRONYMS

ASEAN ..... Association of Southeast Asian Nations

CODEX ..... Codex Alimentarius

ePhyto..... Electronic phytosanitary

eVet ..... electronic Veterinary certificate

FAO ..... Food and Agriculture Organization

GeNS ..... Generic ePhyto National System

GIZ ..... Deutsche Gesellschaft für Internationale Zusammenarbeit

IPPC..... International Plant Protection Convention

ISPM-12 ..... International Standards for Phytosanitary Measures

LDCs ..... Least Developed Countries

NPPO..... National Plant Protection Organization

SPS..... Sanitary and phytosanitary

TFA..... Trade Facilitation Agreement

UN/CEFACT.... United Nations Centre for Trade Facilitation and Electronic Business

UNICC ..... United Nations International Computing Centre

WOAH..... World Organisation for Animal Health

WTO..... World Trade Organization

EXECUTIVE SUMMARY

In supporting developing countries and least developed countries (LDCs) to fulfil their obligations under the World Trade Organization Trade Facilitation Agreement (TFA), the Global Alliance for Trade Facilitation deploys digitalisation as a core component of change management.

The Alliance has accumulated deep knowledge through successfully implementing the International Plant Protection Convention (IPPC) ePhyto Solution in 12 countries across Africa, Asia, the Asia-Pacific region, Latin America, and the Middle East, replacing manual, paper-based transmission of mandatory phytosanitary certificates with seamless, electronic exchange.

Phytosanitary certificates are issued to traders by National Plant Protection Organisations (NPPOs) to demonstrate to an importing country that shipments of plants and plant products are free of pests and disease. Prior to the introduction of the IPPC ePhyto Solution, traders had to apply for paper phytosanitary certificates in person before transferring them with the relevant consignment or couriering them to the destination port for inspection.

The manual process was slow, and it also left documents prone to error, loss, or fraud. In case of rejection at a destination port, the original certificate would have to be returned to its country of origin to be rectified, incurring additional storage charges, possible spoilage, and frustrated customers.

Digitalising the phytosanitary certification process has been a game-changer for adopting countries. Seamless, end-to-end transfer between relevant authorities in exchanging countries largely eliminates the shortcomings associated with paper-based transactions.

Electronic transfer reduces the time and cost of trade particularly for micro, small and medium-sized enterprises (MSMEs) that form the economic backbone of most countries but lack the resources or the appetite for international trade.

Like all forms of eCertification, ePhyto saves traders the time and cost of travelling and waiting at official centres to complete paperwork for shipments, while governments also benefit through increased competitiveness, reputational advantage, and the ability to deploy scarce administrative resources more efficiently, enhancing consumer safety.

Alliance measurement of six projects estimates annual private sector savings of US $ 51.3 million—a figure likely to grow exponentially as more countries adopt the IPPC ePhyto Solution.

During every project, the Alliance takes every opportunity to gather knowledge to inform best practice, not only for application in similar projects elsewhere but also to extend targeted digitalisation efforts into other areas. In this regard, this paper seeks to impart the potential for extending the ePhyto experience to other eCertification initiatives, such as Certificates of Origin and animal health certificates (eVet).

While recognising that every certificate has different characteristics requiring bespoke approaches, this paper asserts a strategic commonality applies to extending digitalisation efforts, including knowledge readiness and technological expertise among implementing teams and key project stakeholders; ensuring the availability of sufficient digital infrastructure, and thorough training for public and private sector users.

The Alliance's public private partnership approach suffuses every project from inception to successful conclusion. Buy-in from both government and business is essential in reaching successful, sustainable change as borders are a shared responsibility. eCertification initiatives would certainly benefit from emulating this approach.

INTRODUCTION

About this report

The entry into force of the WTO's Trade Facilitation Agreement (TFA) in 2017 and technological advances have encouraged the transition to paperless trade. The lockdowns associated with the Covid-19 pandemic accelerated this transition, providing further impetus for the digitalisation of trade documentation exchange, including of electronic sanitary and phytosanitary (eSPS) certificates (OECD, 2021).

Among the various trade and sanitary and phytosanitary (SPS) documents being digitised, the phytosanitary certificate (Box 1) is the most advanced, having progressed to a globally recognised electronic phytosanitary certificate (ePhyto) with a technical system of exchange. A phytosanitary certificate is a legal document issued by a country's National Plant Protection Organisation (NPPO) for exports of plants and plant-based goods certifying that they are free of specific pests and diseases. Since its introduction in December 2017, the International Plant Protection Convention's (IPPC) ePhyto Solution has seen promising results (UNICC, IPPC ePhyto Solution, Four Years In, 2022).

The Alliance has been supporting governments in developing and least developed countries to implement the TFA, including supporting 12 countries to transition to ePhyto (Box 2). In partnership with the IPPC Secretariat and the United Nations International Computing Centre (UNICC), the Alliance provides support to developing countries and LDCs at various stages of the digital transformation process, including developing local public private partnerships, guiding countries through process improvement, delivering trainings to public and private sector representatives, and deploying information technology solutions. Based on the needs and the local context, the Alliance designs tailored assistance to each country, working with the public and private sectors as equal partners in delivering trade reform.

In this context, this report presents the insights and lessons learned collected from the ePhyto implementation projects led by the Alliance. It will contribute to the knowledge base by sharing lessons obtained throughout the process of supporting national public and private sector stakeholders to take up the transition to paperless operations. Analysis of these learnings allows the Alliance to present a list of key factors for a successful transition to ePhyto. The IPPC ePhyto Solution has enabled ePhyto to be the first SPS certificate to achieve a common standard with a multilateral electronic system of exchange. Thus, in sharing this knowledge, the Alliance aims to contribute to the conceptualisation and development of other digitised trade certificates, while recognising the associated complexity.

BOX 1: What is a Phytosanitary Certificate?

As per the FAO's Guidelines for Phytosanitary Certificates, "phytosanitary certificates are issued to indicate that consignments of plants, plant products or other regulated articles meet specified phytosanitary import requirements" (FAO, 2001). Phytosanitary certificates have a standard wording and format for both physical and electronic versions as set forth in the FAO Guidelines and the International Standard for Phytosanitary Measures (ISPM) 12 (FAO, 2022).

BOX 2: The Alliance's ePhyto projects

The Alliance has supported 12 ePhyto projects around the world. Each project is designed and implemented according to the requirements of the country. As shown in the table, countries can decide whether to use a national system or the Generic ePhyto National System (GeNS) to connect to the ePhyto Hub.

Some countries also receive support to implement technologies such as ePayment or eSignature, which enable ePhyto exchanges with the countries or regions that have such requirements.

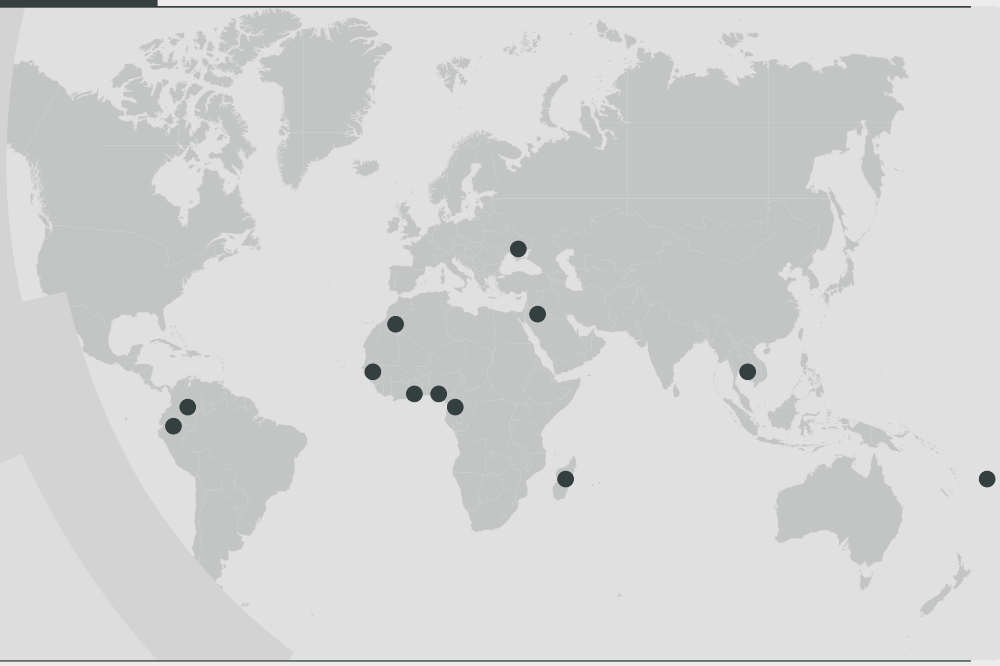


TABLE: Status and assistance provided to the Alliance's ePhyto project countries (as of July 2023).

Country	Status	ePhyto Assistance Provided		ePhyto Assistance Provided Additional Technology Incorporated
		GeNS + Hub	National System + Hub	
Cameroon	Achieved		X	eSignature
Colombia	Ongoing		X	
Ecuador	Achieved		X	
Fiji	Achieved	X		eSignature
Jordan	Achieved	X		ePayment
Madagascar	Achieved	X		eSignature
Morocco	Achieved		X	eSignature
Nigeria	Ongoing	X		eSignature + ePayment
Senegal	Achieved	X		eSignature + ePayment
Thailand	Achieved		X	eSignature
Togo	Ongoing	X		eSignature + ePayment
Ukraine	Ongoing		X	eSignature + ePayment

Source: Website of the Global Alliance for Trade Facilitation (Global Alliance for Trade Facilitation ePhyto Projects, 2023)

Methodology

Data for this paper was collected through qualitative methods. A literature review of ePhyto, eSPS, and digitalisation was conducted, with key references shared in the bibliography. The Alliance Knowledge team also conducted 10 interviews with different stakeholders including project managers, ePhyto domain experts, local government partners and private sector partners to receive their insights about the ePhyto transition. The paper was further informed by qualitative and quantitative project-level impact reporting conducted by the Alliance.

THE CURRENT STATE OF eSPS CERTIFICATES

Background

For more than a decade, efforts have been made to promote the digitalisation of sanitary and phytosanitary (SPS) certificates. Appendix 1 presents the main stakeholders managing SPS certification and their existing programmes or policies to facilitate electronic exchange of SPS certificates. The three standard-setting bodies[1] in the field of SPS (IPPC, WOAH, CODEX) have initiatives to provide support and guidance for their members to use electronic certificates, but are at varying stages.

Digitalising Phytosanitary Certificates

Among the SPS certificates, the phytosanitary certificate is the most advanced in electronic transition, with an approved universal standard for the electronic certificate (ISPM-12) and a solution that allows efficient exchanges at a global scale.

Great progress in digitising the phytosanitary certificate has been made thanks to the ePhyto Solution launched by the IPPC in 2017 and developed with the financial support of the Standards and Trade Development Facility (STDF). The ePhyto Solution includes the Hub for ePhyto exchange and the Generic ePhyto National System (GeNS) which allows countries to produce ePhytos and connect to the Hub (Box 3).

1 The three standard setting bodies are: the Codex Alimentarius Commission, the World Organization for Animal Health (founded as OIE), and the International Plant Protection Convention, known as the "Three Sisters"

BOX 3: The IPPC ePhyto Solution

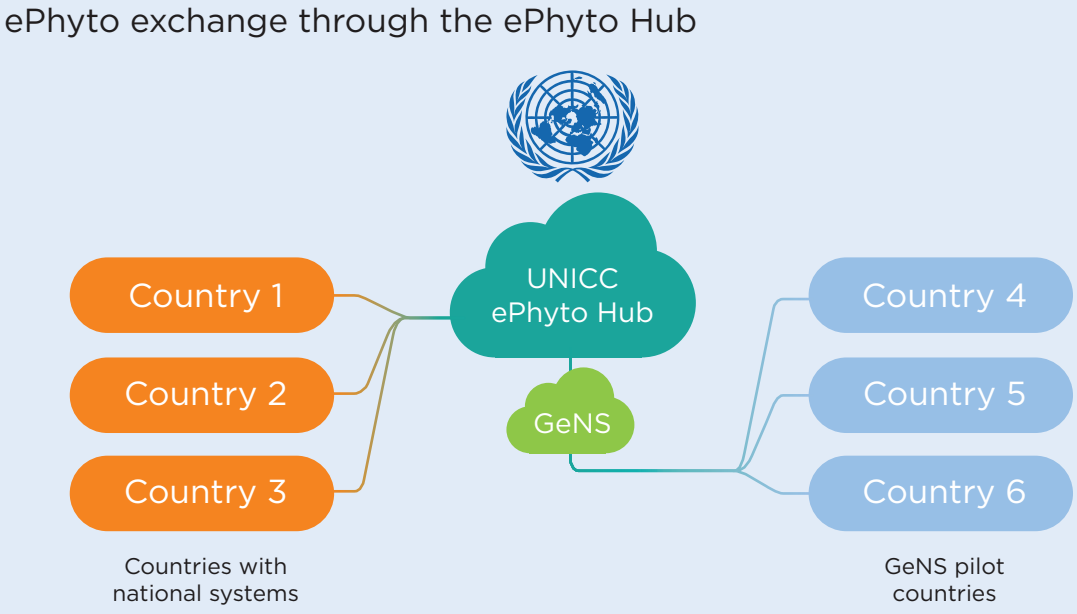
The ePhyto Solution is composed of a central server (the Hub) and the Generic ePhyto National System (GeNS), which allow for the exchange of ePhytos in a standardised format. It provides a solution to developing countries to issue and exchange ePhytos with other countries, while being compatible with existing national ePhyto systems.

The National systems are IT systems developed by countries to manage the phytosanitary quarantine and certification process. Such systems can be connected directly to the ePhyto Hub to exchange ePhytos internationally, provided that they fulfil the standards requirements.

The GeNS is an IPPC web-based system that supports the issuance of ePhytos at a national level and the exchange of ePhytos through the Hub, with assured authenticity. It is an alternative for countries that do not have a national system able to connect directly to the Hub. The GeNS offers the possibility to many developing countries to join the Hub and exchange ePhytos internationally, no matter the existence, or the level of maturity of their IT systems.

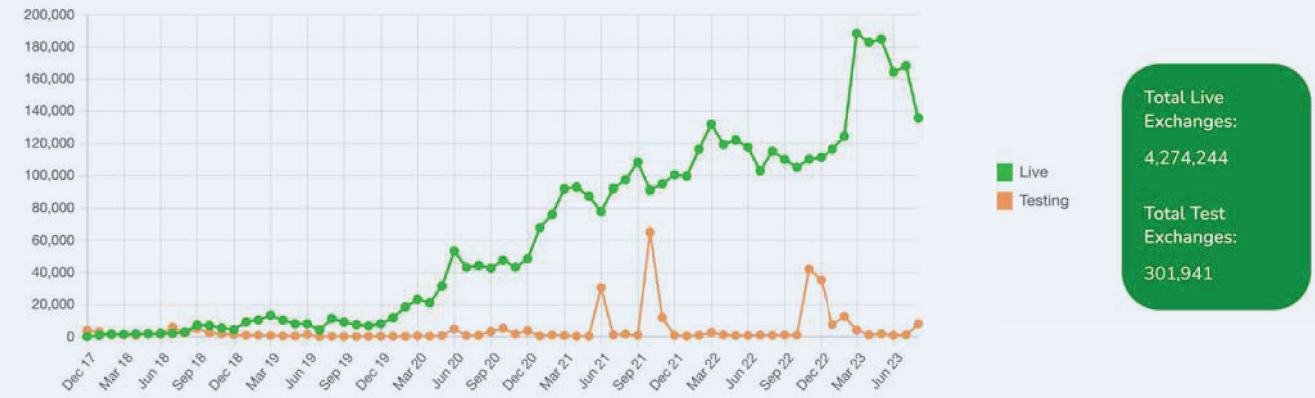
The Hub works as a central exchange system to transfer ePhyto certificates between the NPPO of the countries. The Hub can be connected with the GeNS or with another national electronic system (IPPC, 2019). The Hub and the GeNS are operationalised by the United Nations International Computing Center (UNICC, IPPC ePhyto Solution, Four Years In, 2022).

As of July 2023, the IPPC ePhyto Hub connected 127 countries, among which 80 were actively exchanging ePhytos with one other and 38 were under testing. (IPPC ePhyto Solutions, 2023).



Data from the IPPC shows that the total monthly number of ePhytos successfully exchanged through the ePhyto Hub has increased rapidly in recent years, from 7,983 in December 2019 to 21,051 in April 2020, as shown in Figure 1 (Infographics of ePhyto Hub, 2022). From May 2020 onwards there was an increasing trend with exchanges reaching 168,169 in July 2023. This is partly due to the connection of the EU TRACES system to the ePhyto Hub in May 2020.[2]

Summary of the certificates successfully exchanged through the HUB



2 TRACES is the European Commission's online platform for sanitary and phytosanitary certification required for the importation of animals, animal products, food and feed of non-animal origin and plants into the European Union, and the intra-EU trade and EU exports of animals and certain animal products. It facilitates the exchange of data, information and documents between all involved trading parties and control authorities and therefore simplifies and speeds up the administrative procedures. See more: https://food.ec.europa.eu/animals/traces_en

FAO data indicates that the value of plant exports from ePhyto participants increased sharply in the early months of the Covid-19 pandemic when social distancing measures and lockdowns were imposed, despite the overall value of agri-food trade declining (FAO M. a., 2022). The acceleration of plant exports from ePhyto users continued over the pandemic years, growing from US $1 billion in January 2020 to US $7.8 billion in December 2021. This exponential increase of 682% stands in contrast to the 29% growth for the total value of plant exports requiring a phyto (FAO M. a., 2022), thus suggesting that an increasing number of countries see the potential of ePhyto and are committed to the transition. Furthermore, donors, private sector associations, regional organisations and partnerships including the Standards and Trade Development Facility (STDF) continue to raise awareness of ePhyto, while international organisations such as the Alliance and the World Bank conduct in-country projects to support developing countries to achieve the transition to ePhyto. These efforts will continue: at end-2021, only 10.6 percent of the value of plant exports requiring phytosanitary certifications were covered by the ePhyto Solution (FAO M. a., 2022).

Digitalising Other Certificates

Inspired by the success of ePhyto, relevant standard-setting bodies and international organisations are exploring the possibility of digital exchange of other SPS certificates. For example, the World Organization for Animal Health (WOAH) and the STDF implemented a project in 2018 to understand the potential of using electronic Veterinary certificates (eVet) by conducting surveys and research in developed and developing countries (Facilitating e-veterinary certification based on Single Window system, 2018). As of 2022, the Alliance, via its implementing partner GIZ, is also exploring an opportunity to pilot issuance and exchange of eVet in a specific veterinary sector, between two or more select countries willing to set a precedent in the digital exchange of veterinary certificates. Other similar initiatives can be found in the domain of CITES[3] certification and the transfer of Certificates of Origin[4].

In addition to these global steps, efforts are being taken to accelerate electronic SPS certificate exchange at the regional level. For example, the ASEAN Single Window has been operating since 2005 and the exchange of eSPS certificates is among its main initiatives (Suvannaphakdy, 2020). The measures being implemented under the ASEAN Single Window include carrying out readiness assessments, developing a Message Implementation Guide and Process Specification for ePhyto and aligning to the IPPC's ePhyto guidelines. As of 2021, this eSPS initiative was entering the phase of end-to-end testing (Chan, 2021).

Despite the achievements obtained with ePhyto, many challenges exist for the use and exchange of digital SPS certificates at the global level. According to the 2021 United Nations Global Survey on Digital and Sustainable Trade Facilitation, the implementation of electronic exchange of SPS certificates is still low. Less than 5 percent of the 144 survey countries have fully implemented the electronic exchange of SPS certificates, and only 40 percent have partially implemented or are at pilot stage (United Nations, 2021).

While the transition to ePhyto is underway, the development of other universally accepted electronic SPS certificates are still in their infancy for four main reasons. First, countries lack a harmonised standard for digital certificates relating to human and animal health and products. The globally recognised business and IT standards for the certificate is the first step that made universal multilateral exchange of ePhyto possible**.** Only when countries agree on the common standards used for the certificate, can the eCertificate become valid and acknowledged by governments. Since the IPPC is the only standard setting organisation for plant health, this made it easier to achieve agreement on a common standard for ePhyto. Taking the veterinary certificate as an example, the sanitary certification for animals and animal products is not as straightforward, given the complex risks to public health. Also, the standard of certification for animal health is set by the WOAH, while that for food safety is set by CODEX. This makes it more challenging for sanitary certification to achieve a compatible standard. It requires more coordination, especially between the two standard-setting bodies, and stronger shared incentives to drive forward a solution.

Second, a technological solution is needed and must be agreed upon between users to facilitate the digital global exchange of certificates. The ePhyto Hub could be used as a foundation. The ePhyto Hub and the GeNS are excellent examples of how a relatively straightforward, yet robust and reliable system is all that is needed to build a workable solution that generates a high level of confidence for users. Furthermore, UN/CEFACT XML standards and the standardised IT language for trade can facilitate the design of the IT protocols for new eSPS certificates. The existing ePhyto Solution reinforces that the technology behind electronic certificate exchange does not have to be extraordinarily complex or cutting edge in order to meet users' needs.

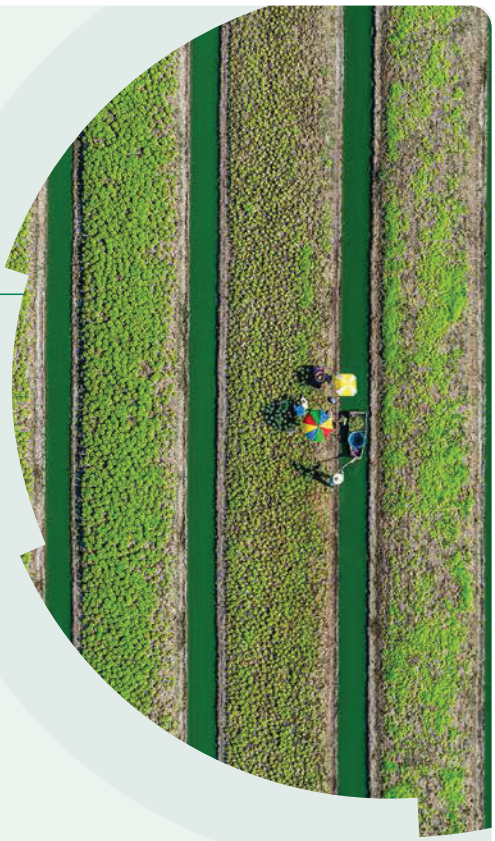
Third, once a standard and a technology are adopted, there is a strong need for cooperation among international organisations, governments and industry to facilitate the transition. In the pursuit of ePhyto, the key actors gathered private sector representatives into the ePhyto Industry Advisory Group, which holds regular meetings and provides advice to governments and companies on the transition to ePhyto. This international collaboration has continued to exist after the introduction of the ePhyto Solution, and is especially useful in addressing the evolution, maintenance and sustainability of the system.

Finally, most developing countries lack expertise in electronic SPS certification and the technical capacity for issuance and exchange, which makes it challenging to achieve a global digital transition. This is not specific to eSPS but is applicable to a variety of digital trade facilitation solutions. Without change management, process improvements, training and knowledge sharing, an IT solution is not guaranteed to generate benefits. Organisations like the Alliance are dedicated to helping developing countries and LDCs onboard new technologies, ensuring that no country is left behind.

3 CITES—the Convention on International Trade in Endangered Species of Wild Fauna and Flora—is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten the survival of the species. https://cites.org/eng/disc/what.php

4 See examples here: https://cites.org/eng/prog/eCITES; https://www.tradefacilitation.org/project/streamlining-export-procedures/

ADVANTAGES OF ePHYTO IMPLEMENTATION



Background

Digitalisation brings increased adaptability, resilience and flexibility for traders and government agencies. While the use of the ePhyto Solution shares these advantages, it also presents unique benefits.

There are five main categories of benefits tied to ePhyto implementation:

- Reduction in time and cost
- Efficient border clearance leading to less food spoilage
- Decreased fraud
- Dynamic cooperation of stakeholders
- Economic growth

Reduction in time and cost

Replacing a series of manual, paper-based procedures with seamless eCertification reduces the time and cost associated with requesting, processing, obtaining and exchanging documents. It enhances transparency and ensures any errors are relatively easy to rectify.

These efficiency benefits extend to all stakeholders involved in the ePhyto process. This includes traders and the NPPOs, the public institutions responsible for issuing phytosanitary certificates, safeguarding a country's agricultural resources and preventing the introduction and spread of pests and disease.

For the private sector, ePhyto reduces the cost associated with preparing, transmitting, and archiving certificates due to ePhytos' ease of use and the fact that they can be prepared without requiring travel to another location. (Stokes, 2017) (STDF, 2017). The time saved from avoiding travel to the NPPO to submit paper materials can especially benefit companies located in remote areas and MSMEs, who tend to be more resource-strapped. Companies can also save on courier costs associated with transporting physical documents to the destination market border, including the additional costs and delays incurred by having to rectify errors on original documents. Data collected from six Alliance projects predict total annual cost savings accumulate to US $51.3M for the private sector.

Ecuador

In Ecuador, the Alliance conducted a baseline study to assess the potential benefits from digitalising phytosanitary certificates.

Following 25 interviews with private sector stakeholders (mainly from the banana and cut flower sectors, which account for around 85% of exports), we concluded that traders spent approximately 8 working hours (over 5 working days) on documentary compliance processes for requesting the phytosanitary certificate, obtaining the physical document and bringing it to the point of exit or a courier service to be dispatched to the destination country. A fully digital ePhyto Solution is expected to cut traders' time to only 2 hours and 30 minutes on this particular compliance process.

PROJECTED TIME AND COST REDUCTIONS

For the public sector, the digitalisation brought by the ePhyto process frees personnel from collecting and validating paper materials and from putting all the elements on the paper certificate by hand. For example, in Madagascar the Alliance project shifted the responsibility of completing an ePhyto certificate from a paper-based document filled by the public sector to an online system filled by the private sector. Seamless, end-to-end transmissions means fewer errors occur and also enhance transparency, reducing the inspections required of hand-written documents.

"This ePhyto project is revolutionary—thanks to it, sanitary and phytosanitary inspectors are seeing a seismic change in how they do their jobs. [...] it also reduces the fraud that creates problems.

The ePhyto Solution will certainly have positive impacts on the exports and imports of plants and plant products, which account for over 43% of Madagascar's exports."

Saholy Nomenjanahary Ramiliarijaona, Head of the Plant Protection Directorate

More efficient clearance, less spoilage, and risk of loss

In addition to time and cost savings, ePhyto adoption also contributes to faster border clearance with benefits for both the public and private sectors by potentially increasing trade while reducing food spoilage and waste. An ePhyto enables quicker analysis and faster exchange between border agencies and traders. For example, one global company partnering with the Alliance observed that the application of ePhyto could save 2 to 3 days at the importing border when compared to its paper equivalent.

The benefits of ePhyto for border clearance become most evident when there is a problem of noncompliance with the phytosanitary certificate, such as a clerical error. With a paper document it can take a long time to exchange a new or revised certificate between the importing and the exporting countries. In this case, the consignment would have to be stored at the port before the arrival of a new certificate, during which time product spoilage may occur and demurrage charges will accrue. Furthermore, if dealing with a paper certificate, it may become lost or damaged during the trip. With an ePhyto, a new certificate can be submitted and transferred in minutes, rather than waiting hours or days for a physical courier. The ability to resolve non-compliance issues in minutes contributes to less spoilage at the port, which is crucial for perishable products, and helps enhance reliability and predictability of global food systems.

Such delays can have clear business ramifications. An Alliance business partner shared that seeds being imported for a field trial missed the sowing season due to the lengthy amount of time spent on resolving a non-accepted phytosanitary certificate with a non-harmonised template. This delay resulted in potential lost sales for a period of up to one year.

In particular, the reduction of spoilage and loss of goods benefits small traders. In case of any certificate errors or delays in cross-border trade, the loss could be disproportionately catastrophic for MSMEs since they tend to have limited financial resources to recover from the loss of products or the additional storage fees at the port.

Less fraud, more integrity

Digital certification and relevant authentication tools used for exchange, such as eSeal and eSignature, enhance the credibility of certificates and products, while reducing the opportunities for fraud.

Additionally, the enhanced data integrity could even prevent fraud of other sanitary or trade certificates for the same product since some data elements collected for ePhyto could be used for other trade certificates. For example, the information collected about the exporting country of the products could be applied when reviewing the Certificate of Origin of the same product, thus potentially also helping reduce fraudulent Certificates of Origin. In this way, the reduction in fraud and higher integrity of ePhyto and other sanitary certificates helps achieve goals to protect animal and plant health by efficiently supporting the inspection of plant or animal disease. (Gain & Sela, 2019)

Dynamic cooperation among stakeholders

The transition to ePhyto also reflects reform of the operational processes around ePhyto certification, which requires cooperation among public agencies as well as between the public and private sectors. A public private partnership approach to ePhyto implementation is necessary to ensure that the system matches the reality on the ground and that it is actually used by the private sector. If not, a government could implement a system that never goes live. According to the project managers interviewed, Alliance ePhyto projects provide opportunities for stakeholders to participate in dialogue and work together. The public private cooperative relationship that is set up for the transition enhances understanding between the sectors and increases trust. An improved public private working relationship could present benefits that carry over to other digitalisation and/or trade reform projects.

Economic growth

By connecting the vast majority of countries for efficient exchange, the multilateral ePhyto Solution produces a market creation effect. Although it is only facilitating exchange of one certificate, a study from the OECD notes that since the introduction of the IPPC ePhyto Solution, the trade volumes of plant and plant products have grown more rapidly than previously. It further states that the application of eSPS certificates has a strong positive impact on trade volumes, in particular for plants, vegetables and processed food products. The positive effect on trade volumes is generally realised shortly after implementation and could last for at least two years. (OECD, 2021)

The ePhyto Solution will principally impact export growth for developing countries that otherwise may not have the resources to create a system to produce and exchange electronic certificates. As agriculture is an important sector contributing to exports and national income in many developing and LDCs, the ePhyto Solution provides an opportunity for agricultural products to reach international markets, with important implications for job creation and poverty reduction.

Finally, the transition to ePhyto could help highlight a country's level of digitalisation, making it the regional leader on the transformation. As the first country in Asia to "go live" with the ePhyto Solution, Sri Lanka has become a leader of eCertification in the region. The Alliance has also observed that countries are encouraged to connect to the ePhyto Hub after their neighbours and/or main trading partners do so.

The greater number of users on the Hub will have a network effect, contributing to the expansion of cross-border trade on a global scale. With additional large trading economies such as India, Japan and Thailand coming onboard in 2022 and 2023, large growth is expected for ePhyto usage and trade in plant products (FAO M. a., 2022).

LESSONS LEARNED FROM ePHYTO IMPLEMENTATION

The transition to ePhyto, like any major change in government procedures, requires coordination and cooperation among national public agencies, traders, countries and international actors like the IPPC and UNICC. This presents a set of unique challenges to the various stakeholders involved. With seven years of experience implementing digitalisation projects around the world through a public private approach, the Alliance has gained strategic knowledge about best practices. This section will introduce the challenges confronted by the project teams, businesses and government stakeholders during the transition, accompanied by the lessons learned. Sharing these insights will provide guidance for future digitalisation projects.

Knowledge readiness

At the beginning of every ePhyto project led by the Alliance, a team of experts and project managers carry out research, build relationships with local stakeholders and identify the main challenges. This work is conducted during a 'scoping phase', which, if conducted successfully, can directly impact the effectiveness of the project. At this stage, having local partners with strong knowledge of the agri-food sector and local trade processes is extremely useful. For example, in the scoping phase the local Ecuador project team identified two focus sectors for the project that make up 85% of the certificates issued, and which showed the most complex processes for requesting phytosanitary certificates. The digital transition of these two sectors supports trade growth for a large majority of agricultural products in the country, but also helps ease the transition for other products by tackling the most complex products first. Thus having the right knowledge at the scoping stage ensures that the project delivers a stronger impact.

Moreover, the Alliance's ePhyto teams and experts have emphasised the importance of having project teams throughout project scoping and implementation with strong ePhyto knowledge and who understand the local context. In these situations, the scoping process can enable an efficient implementation by adequately identifying knowledge gaps and challenges and making strong plans to address them in the project. For example, in Fiji, the expertise of the local team enabled the Alliance to implement the project shortly after timely scoping.

The Fiji team had strong experience scoping and implementing previous ePhyto projects and could effectively and efficiently identify the challenges of the local actors in the ePhyto transition.

Country readiness

Assessing a country's readiness for ePhyto implementation is vital to ensure a successful transition. Several key factors need consideration, including evaluating stakeholders' technical IT skills, assessing infrastructure readiness and addressing potential language and legislative hurdles.

Transitioning to ePhyto demands strong technical IT skills within the NPPO. Insufficient IT knowledge can pose significant challenges for both the project team and the local NPPO. Seeking external support becomes crucial in such cases, as exemplified by the project team in Thailand, who turned to the IPPC and UNICC for assistance during technical difficulties. Expert advice not only enabled the team to familiarise themselves with the IT system but also bolstered their credibility, building trust with the government.

Differing levels of digital literacy among system users can impede the ePhyto transition. Some traders or government workers may exhibit resistance due to limited familiarity with basic technological infrastructure. Project teams must provide opportunities or upskilling and secure NPPO leadership support to effectively manage potential difficulties during the technological shift.

Furthermore, developing countries and LDCs often face challenges related to inadequate digital infrastructure, including limited access to laptops and the internet. These constraints significantly impact the implementation of the ePhyto Solution, which relies on technology availability for the issuance and exchange of ePhytos. Procuring or building the necessary infrastructure requires additional budget and resources, while developing a sustainable funding model for long-term maintenance can present another obstacle. Madagascar serves as an example, where the project team and the local NPPO had to allocate funds for IT equipment and internet connectivity over several years. To sustain the system beyond this period, the Malagasy NPPO must explore alternative funding models.

Unreliable internet adds to the infrastructure challenge, hindering th e efficient functioning of the entire ePhyto system. Language barriers also play a significant role in ePhyto implementation. Initially available only in English, the GeNS system posed challenges for non-English-speaking countries in setting up the system and fully understanding its functions. However, efforts have been made to overcome this barrier.
The ePhyto Solution is now available in French and, while introducing the system in Jordan, the Alliance supported its translation into Arabic, thus facilitating wider adoption among Arabic-speaking countries and further promoting accessibility.

Lastly, while ePhyto adoption typically does not require legislative changes, incorporating technologies such as eSignature may necessitate legal reform. Digitalising the entire certificate process is ideal for maximising benefits. For example, if ePhyto is implemented but wet signatures are still required, traders' advantages are limited as they must print, sign, and physically deliver documents. To fully advance trade facilitation, countries should plan for necessary digitalisation and associated legislative changes. This proactive approach ensures unhindered implementation and reaps the full benefits of ePhyto.

Public sector engagement

An ePhyto project cannot progress efficiently without the support and engagement of the local public sector, which is one of the main stakeholders involved in the digital transition. In every country, the NPPO, usually associated with the Ministry of Agriculture, is responsible for implementing rules and regulations in support of plant health and safety. However, the NPPO is rarely the only agency interacting with phytosanitary documentation at the border. To achieve the project objectives as planned, the project team needs to maintain a cooperative relationship with the NPPO, Customs and relevant ministries, and to encourage these actors to actively participate in the project.

Achieving consistent buy-in from government can be challenging. Regimes can change during the course of any project or reshuffles may mean having to deal with different ministers and high-level officials. As such, this may result in project delays. In Ecuador, the team managed government transitions by actively communicating with the NPPO and consistently conveying the benefits of the ePhyto Solution. Despite the change in key government counterparts, the project team managed to keep the new government committed to the project. In addition, the project team worked with local consultants who had a strong understanding of the project and could assist new government officials with the transition, thereby ensuring continuity. Keeping consistent interest in the solution among government stakeholders can also be achieved by organising study tours to review best practices in other jurisdictions.

The Alliance has found that at first it can be a challenge for governments to trust the multilateral ePhyto Solution because it is a completely different way of working than a paper-based system. However, the trust of governments grows in tandem with usage. As more countries connect to the Hub the trade potential for each count ry grows, and the more trusted trading partners connect to the Hub, the more the implementing government is likely to trust in the data security and other elements of the Solution. The successful example of a country connecting to ePhyto could also raise interest among trading partners or neighbouring countries. For example, the successful implementation of ePhyto in Senegal has increased interest among neighbouring countries in the region, such as Burkina Faso and Togo, resulting in the Alliance supporting ePhyto adoption in Togo.

Private sector engagement

The local private sector is the end-user and a main beneficiary of the ePhyto Solution. It is necessary to understand the needs and challenges of businesses, as their engagement and contributions are vital to implementing the ePhyto Solution. Strong private sector engagement is also essential for building strong public private dialogue and partnership, which is a fundamental pillar of Alliance projects. Project teams reported that a private engagement strategy and an active comm unication plan were helpful in achieving a positive relationship with the local private sector.

For example, the ePhyto project team in Thailand created a private sector engagement strategy to ensure that the private sector is included in all stages of the project. A Private Sector Advisory Group and a Pilot Group were set up to facilitate companies' input into the project. In this case, the group consisted of relevant traders, service providers and business associations, allowing practical experience and information to be collected through roundtable meetings at various stages of the project. Moreover, the project identified a Pilot Group consisting of exporters and relevant service providers from key export sectors who would champion the new ePhyto process. From experience, this group is essential for measuring the impact that ePhytos have on time and cost for business.

Having a communications strategy that conveys the right message to the target audience is another key factor to maintain the engagement and trust of the private sector. In Madagascar, the companies and traders were worried about data security and hesitant to take up the transition at the beginning. Through strong communication on the benefits of the system and providing opportunities for system piloting, the Malagasy NPPO was able to alleviate these concerns. The project team created videos to share information on the ePhyto transition, and organised meetings with exporters across all major cities to advance dialogue and address concerns. Strong relationships with the local associations, chambers of commerce and personal networks were essential for successfully engaging the private sector. Local traders are now fully confident, show more interest in ePhyto. and are actively engaging in the transition.

Similarly, the ePhyto project team in Ecuador executed a communications strategy to maintain a close relationship with the private sector. The project team kept business updated on the process and achievements of the project mainly via public-private meetings, events and interviews. The team also launched a campaign on social media to increase the visibility of the project. With these strategies, the team managed to maintain a close relationship with the private sector.

Change management

The transition from paper to digital certificates creates unavoidable changes in the operational process and the responsibilities of the public and private sectors. To ensure that every stakeholder can adjust to the new certification process, change management measures, such as trainings and communications, need to be carried out as part of the project. Through these activities the Alliance plays an essential role in enabling successful ePhyto adoption as well as contributing to a foundational environment for adaptability and reform, thereby providing more than just a technological solution.

For the ePhyto system to work properly, the private sector needs to trust in the Solution and the new way of working. Some projects encounter hesitancy from traders to move to a fully paperless system since the documents downloaded from GeNS do not have the signature and stamps typical of the old paper document (however in recent months eSignature and eSeal have subsequently been included as enhancements to the Solution). A trader may also need to convince another trading partner in the destination market that the new document is compliant. Furthermore, traders may be worried about data security. To enable a successful transition, projects need to have strong communications and trainings that allay the concerns of traders, clearly explain the system benefits, and ease the transition.

In Senegal, the ePhyto project team adopted a seasonal training strategy to support both the companies and the NPPO to become familiar with the new system. The project team organised companies according to the products they traded and conducted timely training sessions before the trading season. Companies would receive two training streams: a theoretical session where the IPPC ePhyto Solution and its components were introduced, and a practical session where companies were provided with the chance to practice under different simulated scenarios. Notably, government and inspectors (who were trained prior to the companies) also took part in the trainings organised for the private sector, so that the questions and comments from companies could be addressed in real-time. Organising trainings in this way also provides a more sustainable platform for long term problem-solving once the project is completed.

In addition, close and interactive communication can be another means to support the users to manage the transition smoothly. In Senegal mobile phone discussion groups were created and served as the platforms where questions and feedback from traders were rapidly addressed by both the Alliance project team and the NPPO. In this way, the project also created additional opportunities for public private dialogue and relationship-building.

Change management is equally essential for the public sector. There may be inclination from officials to maintain the status quo due to misunderstanding, general hesitation to change, or in some cases, conflict of interest. If officials are still requesting paper documents, it can defeat the purpose of the ePhyto system. There is a clear role that the project stakeholders play in sensitising the solution, raising awareness of the benefits that it creates and training stakeholders to use it. The Alliance has seen that when a country allows for both the paper and electronic systems to operate at the same time, there is less uptake of the electronic system.

In some situations, the NPPO may also need to conduct change management with their counterparts in trading partner countries. If the destination market NPPO is not aware of ePhyto there is a risk that shipments could be rejected. To mitigate this for Senegal, the NPPO wrote an email explaining that the country would be using only the electronic system going forward. Information on ePhyto needs to be communicated at all levels of the NPPO in the origin and destination markets to ensure a seamless transition.

Long-term sustainability

The greatest long-term challenge to ePhyto project success is obtaining financial resources to maintain ePhyto system access at a country level. This primarily pertains to the financial sustainability of infrastructure in some developing countries. For example, some developing countries undergoing the transition to ePhyto did not have the required infrastructure such as laptops and internet connection. Although the Alliance can sometimes help fill those gaps in the short term, a long-term financing model needs to be developed to sustain the infrastructure. Especially in LDCs, it is difficult to find government budget to cover these costs, so there is a need to explore alternatives, such as levying a fee on users of the system.

For example, to mitigate this challenge in Senegal, the Alliance provided support to the NPPO to build a fee-based payment strategy for inspection and certification services, as well as update the organisational design and tools to enable the NPPO to collect the resources. These resources will fund the maintenance and regular expenses for internet connection and infrastructure necessary to run the system after the Alliance project is completed. Despite this resulting in a cost for businesses who use these services, the strategy was generally well received by the private sector who saw it as beneficial to ensure the reliability of the ePhyto system in the long term.

The continuity of national public private partnerships in the long run is also a challenge noted by various project managers. Companies may be less engaged in the topic once the project is finished, which is not beneficial to improving the ePhyto system or transitioning to other eCertification. To engage the private sector in the paperless transition and to encourage its continuing contribution requires incentives. In essence, it is important that Alliance projects set a baseline of trust and cooperation between the local public and private sectors which is institutionalised to continue beyond the lifetime of the project. The value of this partnership could lead to other successful reforms.

Finally, it may be challenging for the local government to lead trainings and the development of the system once the project is finished. Therefore, beyond the typical training for the government, the ePhyto project team needs to employ a strategy to train-the-trainers, which enables the NPPO and inspectors to provide effective trainings to new users in the future. Facilitating connections with a network of experts in relevant international organisations could also be helpful for governments when seeking guidance. For example, the project team in Morocco made efforts to build the relations between the local NPPO and UNICC. This connection should work as a channel for professional advice in the future in case of any technical challenges, even after the Alliance's ePhyto project completion.

In addition, the financial sustainability of the ePhyto Hub and the GeNS needs to be addressed. The maintenance and the operation of the system is currently funded by donor countries for the first five years. The IPPC has established a working group of members to review options for a sustainable business model, which were presented in a paper at the annual IPPC Commission on Phytosanitary Measures (CPM) meeting in 2023. Some user countries of the ePhyto Solution are exploring domestic options to raise funds in case they become financially responsible for the maintenance and functioning of the system. This would represent a greater challenge for developing and least developed countries.

Key Success Factors

The lessons learned and the best practices from the Alliance's ePhyto projects enable us to share a list of key success factors for implementing a transition to electronic certification in developing countries. This list is presented in Table 1. Notably, this is a general list and some key success factors may have differing levels of relevancy depending on the unique context of the project country.

Furthermore, each factor does not impact the transition to ePhyto in isolation. Instead, they interact with one another, generating synergies and driving successful uptake. For example, the engagement of both the public sector and private sector could be strengthened partly through an effective communications strategy. And a public-private cooperative framework could further facilitate the engagement of both sectors, enhancing trust, and benefiting the long-term implementation of ePhyto and other digitalisation projects.

TABLE 1: Key success factors for each stage of an ePhyto project

Project stage	Topic	Key success factors
Scoping	Knowledge readiness	Relevant knowledge of ePhyto by the project team
		Experience of local context by the project team
Scoping and project implementation	Infrastructure readiness	Accessible internet connection
		Basic infrastructure such as laptops
Scoping and project management	Project management	Local contact person who is familiar with the local environment
		Clear and proper objectives established at the outset of the project
		Technical and IT skills and capacities of the public agency (NPPO)
Scoping and project management	Public sector engagement	Clear indications of support from the public agency (NPPO)
		Political will and supporting legislative framework
		Advanced awareness of required legislative changes for full implementation of ePhyto, including eSignature
		Continuous contribution and collaboration on the project activities
Scoping, project management and long-term sustainability	Private sector engagement	The existence of a channel or strategy to include the perspectives and to listen to the demands and questions of the private sector
		Continuous contribution to the project activities, such as through a pilot group
Scoping and project implementation	Communication	Communication strategy targeting different public and private stakeholders to continuously raise awareness of activities and maintain interest and momentum
Project implementation and long-term sustainability	Change management	Complete and step-by-step trainings for public and private sector stakeholders
		Strategy that helps every stakeholder adapt to the transition
		Training-of-Trainers to ensure long term training needs are met
		Awareness-raising of changes in destination markets and for trading partners
	Financial resources	Adequate funding or sustainable budget plan to cover future infrastructure and maintenance costs
	Public private cooperation	Local platform for public-private cooperation that allows for exchange and improvement of ePhyto in the long term (e.g., Working group, NTFC)
	Knowledge	Knowledge or skills to update and maintain the ePhyto system
		Connecting with experts in international organisations such as UNICC and IPPC

THE NEXT FRONTIER: ENABLING WIDE-SCALE eCERTIFICATION

The successful introduction of the IPPC ePhyto Solution rests upon global acceptance of a common standard for phytosanitary certification and a common recognition of an electronic equivalent. Currently over 100 countries are connected to the IPPC ePhyto Hub in some capacity, which reflects the clear demand for a multilateral digitalised solution that facilitates trade. However, ePhyto is only one compulsory document among many in international trade. The success of ePhyto provides learnings for the digitalisation of other SPS or trade certificates, which is an essential step towards fulfilling trade facilitation goals. While recognising the complexity associated with creating one standard internationally-recognised document for other SPS certificates, governments, business, and consumers all stand to gain from digital transformation. This paper aims to provide practical insights designed to inform the acceleration of eCertification efforts.

While the standard-setting organisations work towards a multilateral standard, other actors are beginning to pilot bilateral or regional solutions. For instance, the Alliance via GIZ is reviewing an opportunity to pilot bilateral exchange of electronic veterinary certificates, potentially using the ePhyto Hub technology. A pilot implementation between two selected countries could help test the scalability and effectiveness of the system and the universal data/ information framework beyond ePhyto but would require technical expertise and capacity building for the developing countries involved. Such assistance would be provided by the Alliance but would also require cooperation among the mandated organisations and willing partners. The successful piloting could put in place a proof of concept for the technology exchange but it would need to have multiple options built in so it could be customised for individual countries and products.

Pursuing bilateral eVet exchange presents both an opportunity and a risk. The alignment between two countries on one electronic format helps to expedite the creation of a standard that other countries can adopt. However, this assumes that countries will be willing to follow, instead of being part of a global process where all countries have input into the new standard through the WOAH and CODEX. It also creates a risk that different document standards may arise between different trading partners, creating overlapping requirements instead of pursuing the harmonisation sought through trade facilitation. There is an essential role of international organisations to work on this harmonisation, and of partnerships like the STDF, to continue facilitating dialogue and information sharing between stakeholders and countries who wish to lead the digital transition.

Such actors will also need to determine a sustainable financing model for an exchange system to ensure its long-term application. The system sustainability is one of the major challenges for universal digital certification, since it is difficult to find a solution that is both resilient and compatible with the financial capacity of all the users. By gathering the private sector and government in partnership, international organisations such as the IPPC are working on possible solutions. As a public private partnership, the Alliance brings together business and government in its projects and global events and can thereby contribute to the collaboration necessary to finding a sustainable model.

Beyond eSPS, the learnings shared in this paper should also be useful for other digitalisation projects, such as the Certificate of Origin. Here too, a multilateral solution would require alignment among countries on a single standard, but the potential exchange through the ePhyto Hub or similar technology would require technological implementation in countries as in the Alliance's ePhyto projects. Hence, the key success factors can be taken as guidance for other digitalisation projects led by the Alliance and other international development organisations.

The Alliance has at its core the pursuit of trade facilitation; through its projects it creates a world where trade is easier, faster and more cost-effective for business. Digitalisation of trade documentation will ensure that trade becomes more accessible for small and large companies alike, creating economic growth and improving livelihoods. With that in mind, the Alliance will continue its work to upscale the ePhyto Solution and stands ready to implement additional eCertification initiatives for developing countries and LDCs.

APPENDIX 1: Main stakeholders and initiatives on electronic SPS certificates

Name of the organisation	Roles in the domain	Relevant initiatives on electronic SPS certification
FAO/WHO Codex Alimentarius Commission (CODEX)	Standard-setting body for certificate on food safety	**Guidance on paperless use of electronic certificates:** In 2021, the Codex Alimentarius Commission adopted a draft guidance on paperless use of electronic certificates, which includes an electronic version of a generic Model Official Certificate. (CODEX Alimentarius, 2021), (World Health Organization, 2021)
World Organization for Animal Health (WOAH)	Standard-setting body for certification on animal health and zoonoses	**STDF Electronic Certification Project:** In the WOAH General Session in 2016 and 2017, a need was expressed to look at the state of play of eVet across WOAH members. This resulted in the approval of the project "Development of a framework to facilitate e-veterinary certification for international trade on the basis of Single Window system" led by the Standards and Trade Development Facility (STDF). The project was managed by the WOAH in five applicant countries, providing findings on drivers and challenges of eCertificates. (World Organization for Animal Health, 2020)
International Plant Protection Convention (IPPC)	Standard-setting body for certification on plant products and plant health; within the Food and Agriculture Organization of the United Nations (FAO)	**Appendix 1 Electronic Phytosanitary Certificates:** The Commission on Phytosanitary Measures, the governing body of the IPPC, approved the Appendix 1 'Model Phytosanitary Certificate' in 2004, which sets the standard format for ePhyto exchange. The appendix falls under the 'International Standards for Phytosanitary Measures (ISPM) 12' guidance document. **The IPPC e-Phyto Solution:** The Hub and GeNS systems provide a multilateral solution for countries to exchange e-Phyto and facilitate safe and efficient cross-border trade on plant and plant products. (IPPC ePhyto Solutions, 2023)
Standards and Trade Development Facility (STDF)	A joint initiative to enhance developing countries' capacities on SPS standards	The STDF facilitates dialogue through events, seminars and sessions, providing the latest updates and knowledge on electronic SPS certification. The STDF participates in and funds projects around the world in cooperation with FAO/IPPC and WOAH on the implementation of ePhyto and eVet certificates. For example, the STDF provided seed funding for the creation of the IPPC ePhyto Solution. (Electonic SPS Certification, n.d.)

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