

ePhyto Technical Details

Presented by Peter Neimanis
IPPC ePhyto Steering Group

9 November 2015



International Plant Protection Convention
Protecting the world's plant resources from pests



Discussion Points

- 1) Electronic Phytosanitary Certification (ePhyto)
- 2) ePhyto Exchange
- 3) Global Hub
- 4) Generic National System
- 5) Harmonisation of Data Exchange
- 6) Legislative and Regulatory Needs
- 7) Analysis of ePhyto Benefits



1) Electronic Phytosanitary Certification

ePhyto - IPPC Initiative

- Appendix 1 to ISPM 12
- Global hub
- Generic national system
- Harmonised content
- Harmonised exchange

1) Electronic Phytosanitary Certification

What is Appendix 1 to ISPM 12?

- Critical to global harmonisation
- The full title is “Electronic certification information on standard XML schemes and exchange mechanisms”
- Describes the format and the contents of ePhytos and their exchange
- UN/CEFACT XML schema and data mapping (which indicates where the data should be placed in the XML schema)
- NPPOs should develop a system for the issuance, transmission and receipt of ePhytos that uses XML, standardised message structure and contents, and standardised exchange protocols



1) Electronic Phytosanitary Certification

Appendix 1 to ISPM 12 aims to deliver the following:

- 1) XML message structure
- 2) XML message contents
- 3) Country names
- 4) Scientific names of plants and pests
- 5) Description of consignment
- 6) Treatments
- 7) Additional declarations
- 8) Initial harmonisation of the exchange



1) Electronic Phytosanitary Certification

What is XML?

- Extensible Markup Language (XML) is an internationally recognised language used to produce documents in a format that is both human-readable and machine-readable
- XML is a textual data format that is standardised to allow communication between different computer systems and usability over the internet
- XML is widely used for the interchange of data over the internet
- Phytosanitary certificate data in XML format could be authorised and encrypted
- Phytosanitary data in hard copy need to be stamped and signed whereas ePhytos contain authorised phytosanitary data in XML format

Protecting the world's plant resources from pests

```
<?xml version="1.0" encoding="UTF-8" ?>
<certificates>
- <rsm:SPSCertificate xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:rsm="urn:un:unece:uncefact:data:standard:SPSCertificate:6"
  xmlns:ram="urn:un:unece:uncefact:data:standard:ReusableAggregateBusinessInformationEntity:10">
- <rsm:SPSExchangedDocument>
  <ram:Name languageID="en">PHYTOSANITARY CERTIFICATE</ram:Name>
  <ram:ID>2119540</ram:ID>
  <ram:TypeCode>851</ram:TypeCode>
  <ram:StatusCode>39</ram:StatusCode>
  <ram:IssueDateTime>2014-10-03T05:41:57</ram:IssueDateTime>
- <ram:IssuerSPSParty>
  <ram:Name>Department of Agriculture, Fisheries and Forestry</ram:Name>
</ram:IssuerSPSParty>
- <ram:ReferenceSPSReferencedDocument>
  <ram:IssueDateTime>2012-10-23T00:00:00</ram:IssueDateTime>
  <ram:RelationshipTypeCode>ANE</ram:RelationshipTypeCode>
  <ram:ID>P8-12-00026</ram:ID>
</ram:ReferenceSPSReferencedDocument>
- <ram:SignatorySPSAuthentication>
  <ram:ActualDateTime>2014-10-03T00:00:00</ram:ActualDateTime>
- <ram:IssueSPSLocation>
  <ram:Name>BRISBANE 4000</ram:Name>
</ram:IssueSPSLocation>
- <ram:ProviderSPSParty>
  <ram:Name>Authorised Officer</ram:Name>
  <ram:RoleCode>PQ</ram:RoleCode>
- <ram:SpecifiedSPSPerson>
  <ram:Name>Bev Beacham</ram:Name>
- <ram:AttainedSPSQualification>
  <ram:Name>AO OF DAFF</ram:Name>
</ram:AttainedSPSQualification>
</ram:SpecifiedSPSPerson>
</ram:ProviderSPSParty>
- <ram:IncludedSPSClause>
  <ram:Content languageID="en">This is to certify that the plants, plant products or other regulated articles described herein have been inspected and/or tested according to appropriate
    official procedures and are considered to be free from the quarantine pests specified by the importing contracting party and to conform with the current phytosanitary requirements of
    the importing contracting party, including those for regulated non-quarantine pests.</ram:Content>
</ram:IncludedSPSClause>
```



1) Electronic Phytosanitary Certification

What is XML Schema?

- XML schema is the standardised (harmonised) structure and format for the data elements of the electronic phytosanitary certificate
- The use of free (i.e. non-standardised) text should be limited when appropriate codes are available
- XML schema is used to standardise transmitted message data. There are numerous versions and it is important that both exchanging countries support the same version

1) Electronic Phytosanitary Certification

XML Schema Contents

- NPPOs are encouraged to use harmonised terms, codes and text for the data elements of the XML message to facilitate electronic communication and processing phytosanitary data
- For dates and country names, harmonised text is available and no free text is anticipated to be required
- For scientific names of plants and pests, consignment description, treatments, additional declarations and points of entry, extensive lists of harmonised terms, codes and text are being developed and will be available. Free text (not codes) may be inserted if the appropriate term, text or value does not appear in the lists



1) Electronic Phytosanitary Certification

What is WSDL?

- WSDLs are the way two systems talk with each other, e.g. computer of NPPO of exporting country with computer of NPPO of importing country.
- WSDLs are the Web Services Description Language
- There is no standard for eCert (ePhyto) WSDLs and, as such, there is a lot of communication between authorities to get WSDL working for both parties

1) Electronic Phytosanitary Certification

What is a Data Exchange Mechanism?

- Transmission of data over the Internet from the NPPO of the exporting country to the NPPO of the importing country using secure IT mechanisms (e.g. Simple Object Access Protocol (SOAP)) using systems that are mutually compatible
- Transfer of ePhytos between NPPOs can be done as
 - ✓ Direct exchange between systems of two NPPOs (point-to-point), or
 - ✓ Exchange via a central hub (hosted by UNICC)



1) Electronic Phytosanitary Certification

What is UN/CEFACT?

- The United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) is an organisation that makes international Electronic Data Interchange (EDI) standards for electronic trade documents in XML format
- There are over 90 forms developed by UN/CEFACT (version D15A) – of interest to us are
 - ✓ SPS Certificate
 - ✓ SPS Acknowledgement

1) Electronic Phytosanitary Certification

What is Authentication?

Authentication is the transmission mechanism agreed upon by the two countries involved to exchange ePhytos with an authentication key..

Single Point or Hub Option:

- The ePhyto certificate is delivered to the recipients' "mailbox" or hub where all NPPOs participating in the hub accept common rules for authentication.
- The hub notifies the recipient that a certificate has arrived.
- The importing NPPO national system accesses the system with its authentication key and "pulls down" or receives the ePhyto certificate from its private "mailbox".

Point to Point Option:

- The encrypted ePhyto certificate is sent directly to the importing NPPO's system using a transmission mechanism agreed upon by the two countries involved.



1) Electronic Phytosanitary Certification

Hub Standards

- UN/CEFACT schema v12B
- Sender identity through X.509 certificates
- Single Web Services Description Language (WSDL)
- Exchange protocol is Simple Object Access Protocol (SOAP) over HTTPS
- Exchange mechanism
 - ✓ Pushing of an ePhyto from the Exporter NPPO to the Hub
 - ✓ Retrieving messages from will be through a push or pull method.
- Authentication of systems that contact the hub through X.509 certificates



1) Electronic Phytosanitary Certification

Hub Standards

- Message signature may be considered for future inclusion
- Testing environment for countries connected to the hub
 - ✓ The UNICC will provide a standard test plan to new countries joining the Hub.
 - ✓ Countries already utilising the Hub will need to be involved in the testing process from a send and receive perspective.

1) Electronic Phytosanitary Certification

National System for Participating Countries

This system can be either

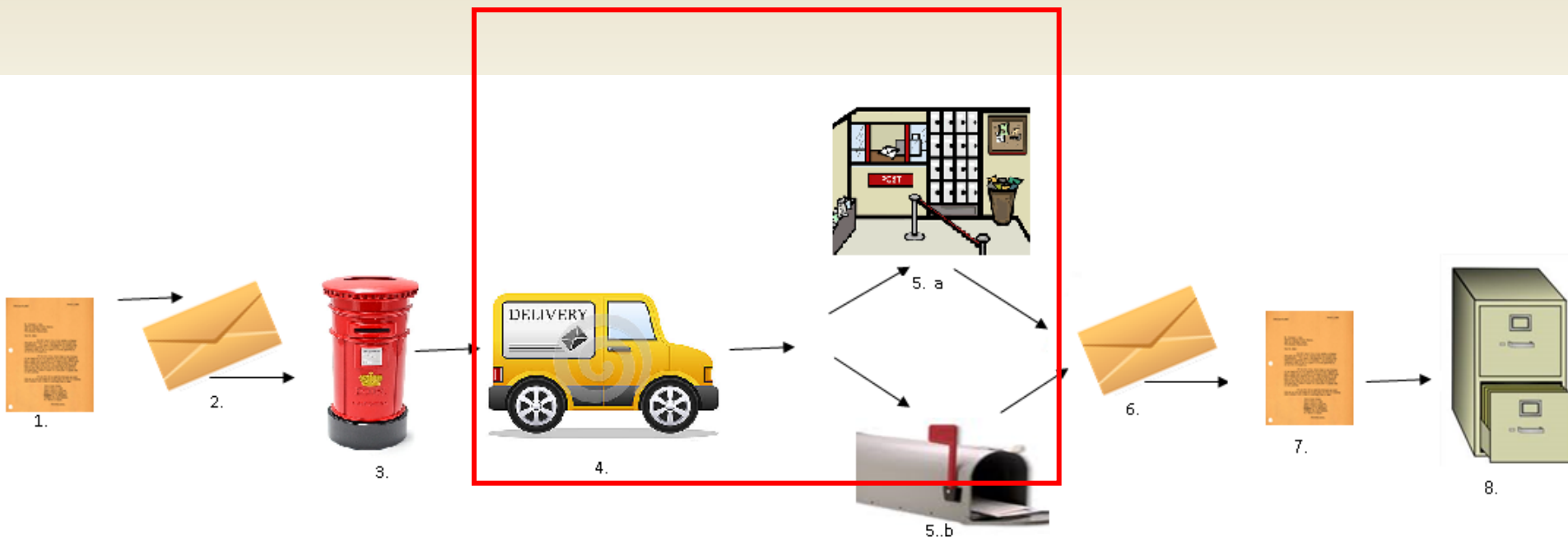
- A truly national system, being part of a larger national system, or
- A generic system, made available to those countries that do not have a national system (may be web-based)

Critical Technical Components

- Availability of 'national' system
- Harmonisation of exchange
- Efficient electronic exchange (hub)



2) ePhyto Exchange

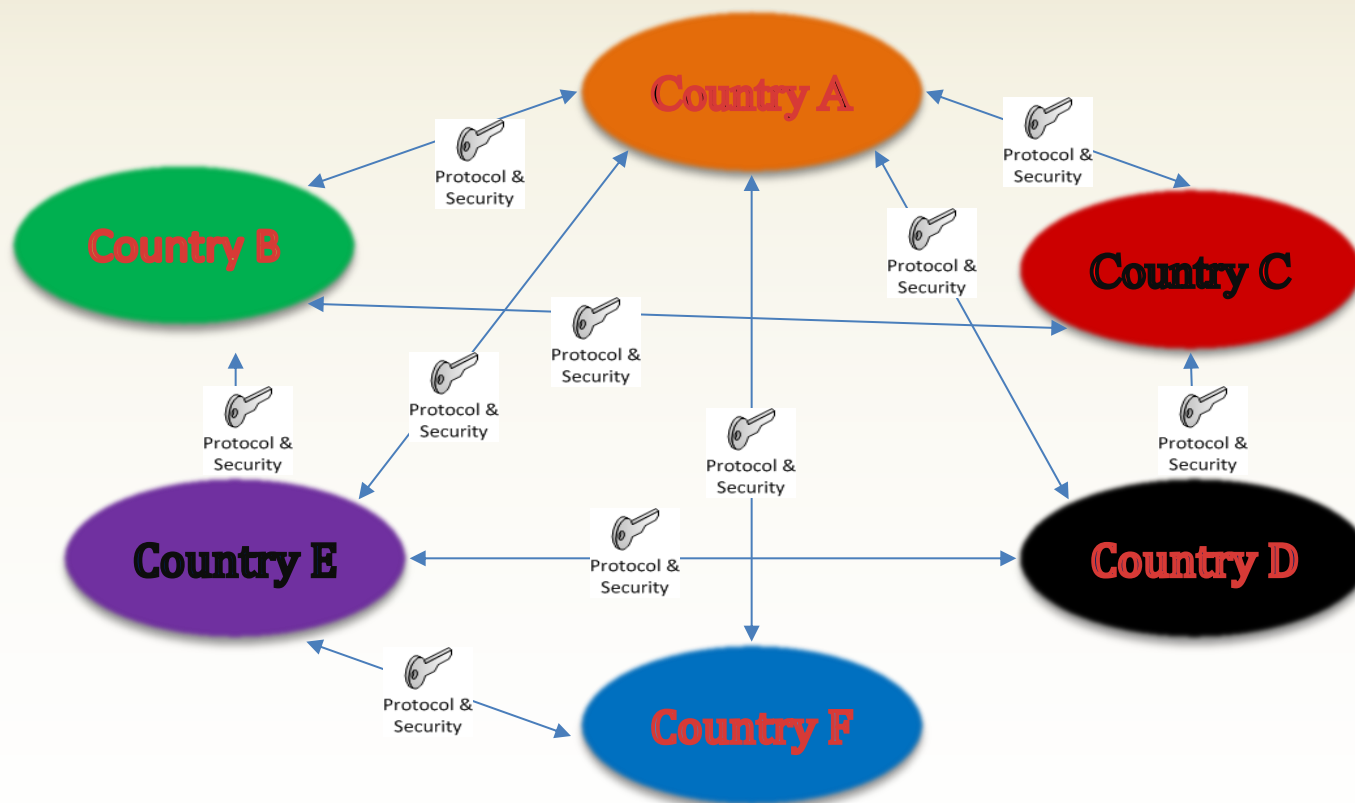


Exchange mechanism

Transmission of message

Either directly between NPPOs or via
a central Hub

Point to Point eCert Transmission



3) Global Hub

Business Rules

- Use of the Hub is voluntary
- The Hub is a single, multilateral system
- The Hub will be available 24/7
- No information (messages, transactions) should be lost
- There is a single exchange protocol
- The IPPC determines the version of UN/CEFACT schema
- Participating countries will require a National System to exchange ePhyto through the Hub or use the generic system
- An envelope is used to allow the hub sends the message to the correct destination

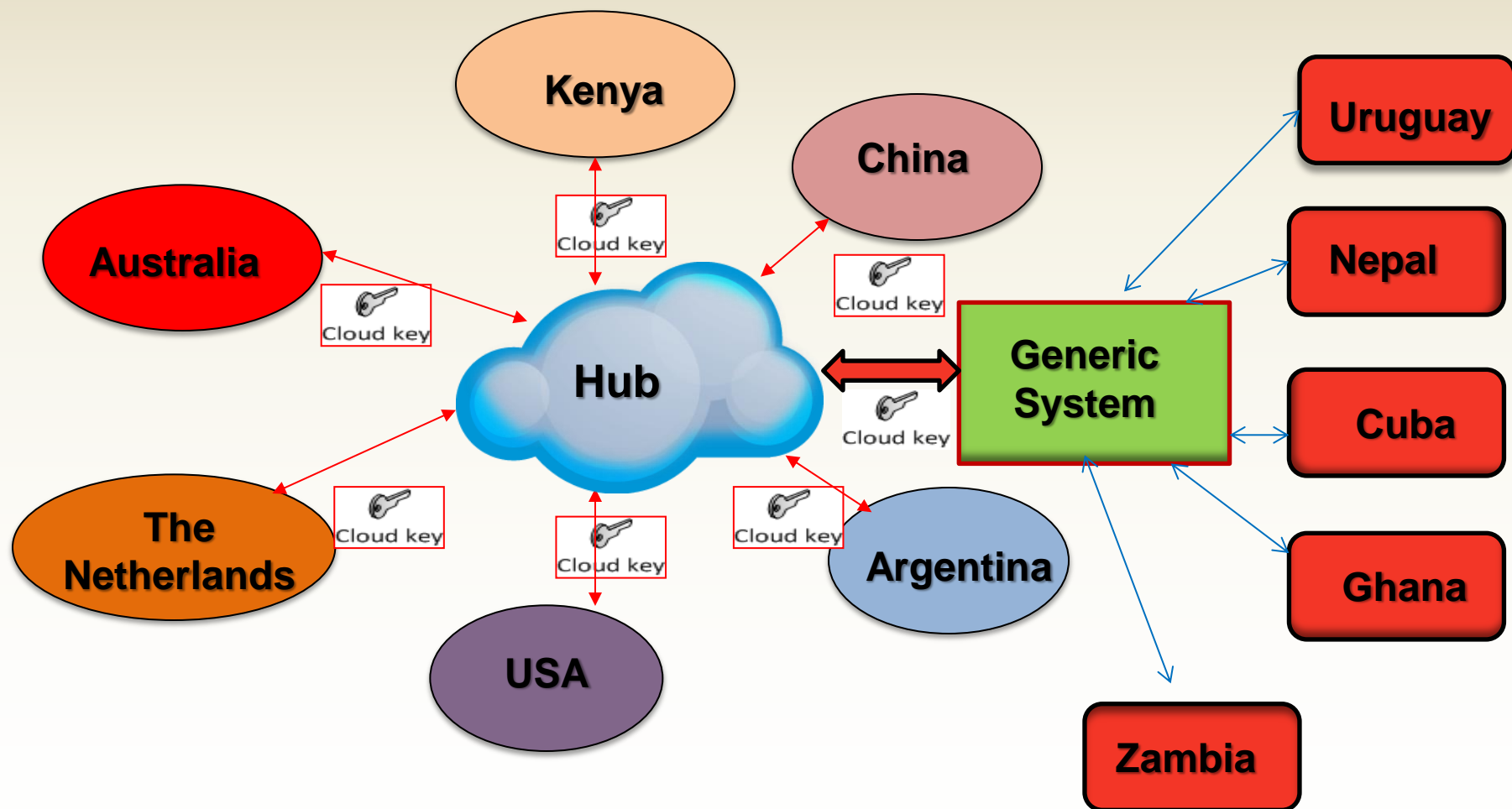


3) Global Hub

- Messages are in the hub temporary - until they are received by the importing NPPO
- The Hub will conduct verification on the envelope of the transmitted ePhytos
- The Hub doesn't validate the ePhyto (message) content. The privacy of the message content is maintained as only the destination NPPO is allowed to read the message
- The Hub facilitates encrypted transfer of ePhyto data between countries
- The Hub will authenticate to ensure the identity of both sending and receiving NPPOs
- Change in the schema and the exchange protocol will be properly planned and timed



ePhyto via the Hub and the Generic System



4) Generic National System

Components of the Generic National System

- Data entry for export certification
- Production of an ePhyto with data in the UN/CEFACT format as per ISPM12 Appendix 1
- Issuance/authorization of the ePhyto
- Sending of the ePhyto
- Printing of the sent certificate data on paper
- Receipt of the ePhyto
- Storage of issued ePhytos for an agreed time



4) Generic National System

Components of the Generic National System

- Checking the authenticity of the ePhyto received
- Extraction of the data from the ePhyto
- Printing of the received certificate data on paper
- Store the ePhytos for later reference
- Connected to the hub
- Reporting

4) Generic National System

Options for Future Modules

- Industry to enter export details
- Determination of export commodity records
- International cost recovery (charging) function
- Compilation of historical volume and cost data associated with ePhytos for statistical assessments
- Training modules



5) Harmonisation of Data Exchange

- ePhyto requires a harmonised exchange protocol (e.g. a software programme to encrypt and decrypt data for an exchange between national systems)
- ePhyto format, content and exchange should be harmonised as per Appendix 1 of ISPM12
- Further harmonisation of the format, contents and exchange are needed, later for ESG priority format, terms and codes



5) Harmonisation of Data Exchange

- ePhyto message format should be XML aligned with the UN/CEFACT SPS Schema with a separate Schema for the re-export certificate
- ePhyto scientific names (synonyms; common names etc.) should be guided by the EPPO database and align with the IPPC terminology
- ePhyto communication between different country platforms should be harmonised
- ePhyto should have provisions built into accommodate future adjustments of Appendix 1 of ISPM12



6) Legislative and Regulatory Needs

- Some countries do not have an ePhyto system and major changes will be required
- Legislative changes should be planned in advance for participating countries as this process may take time
- Range of regulations (e.g. compliance; fines etc.) may have to be amended for some countries
- Some countries will have to estimate the benefit of the ePhyto system before regulations are revised
- New regulations may have to be established for the use of ePhyto system for some countries



6) Legislative and Regulatory Needs

Exports: Australian Department of Agriculture is currently working to completely phase out the issuance of hard copy certificates (table below).

- Communications with industry
- Converting manually submitted documents into electronic

Export Commodity Groups	Year	Manually produced	Electronically produced hard copies	Total
Grain (inc grains, seeds, timber, woodchips, cotton and fodder)	2012/13	25%	75%	45,000
	2013/14	24%	76%	44,500
	2014/15	4%	96%	48,789
Horticulture (fresh fruit, fresh vegetables, nursery stock, cut flowers)	2012/13	8%	92%	26,000
	2013/14	11%	89%	20,000
	2014/15	2%	98%	25,313

7) Analysis of ePhyto Benefits

- A **benefit** is a measurable improvement resulting from the changes and outcomes introduced by a project or program. A benefit must be perceived as having an advantageous or positive effect by one or more stakeholders.
- Where a change or outcome is perceived as having a negative or disadvantageous effect by one or more stakeholders, this is referred to as a **disbenefit**.

7) Analysis of ePhyto Benefits

Benefits of ePhyto

- improve planning for the arrival and clearance of goods
- reduce delays on replacement certificates
- maximise the investment by building on existing initiatives
- potential to link into Customs 'single window' initiative
- reduce fraud
- reduce data entry and validation functions
- reduce costs -(printing, shipping, sorting, distribution, archiving)
- expedite communication between NPPOs
- improve security in transmission



7) Analysis of ePhyto Benefits

Additional Benefits of Global Hub

- reduce ongoing bilateral arrangements and associated costs
- accelerate the harmonisation in the use of ePhyto



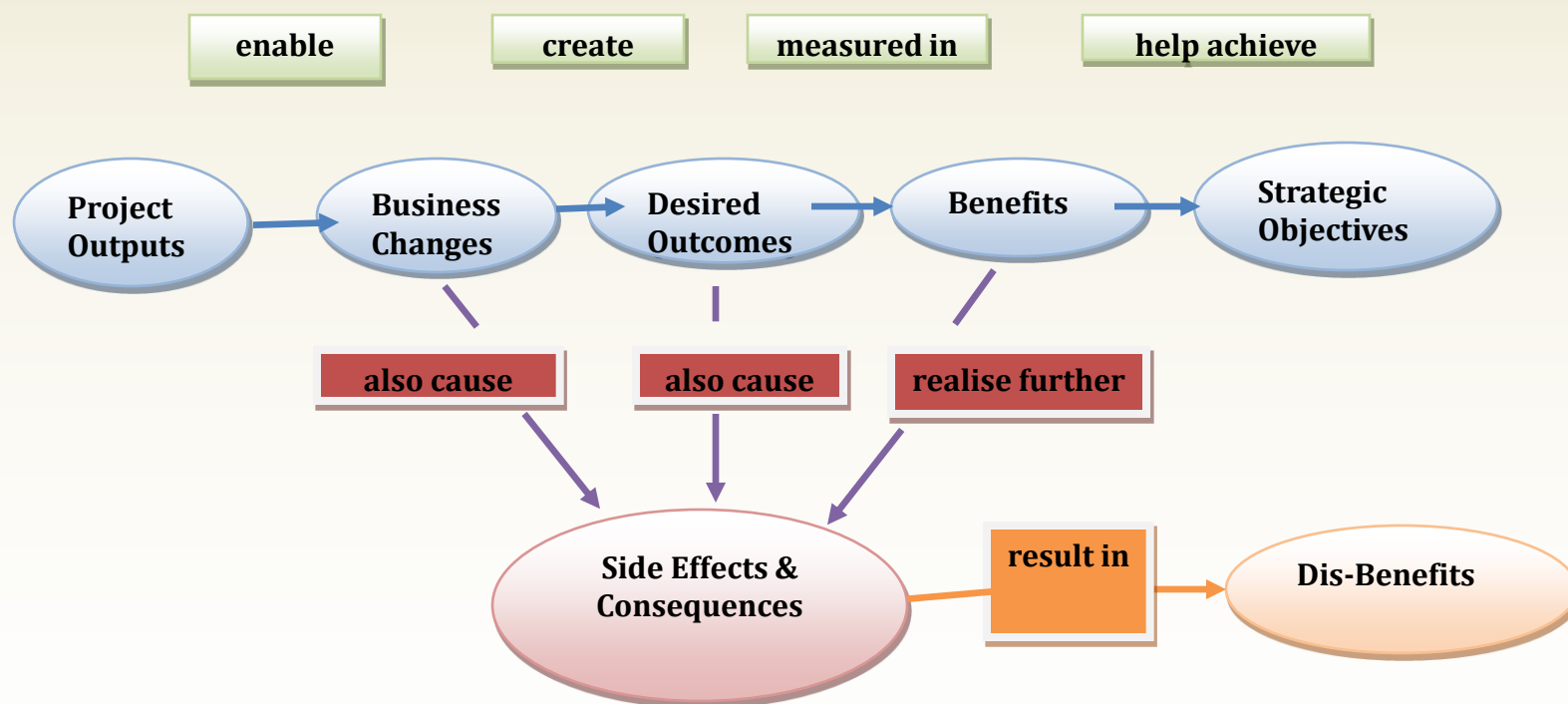
7) Analysis of ePhyto Benefits

Regardless of whether they are financial or non-financial, benefits should be

- Aligned to corporate objectives and strategy
- Mapped from the outputs and outcomes provided by the project
- Quantified (with tolerance)
- Measurable
- Assigned

7) Analysis of ePhyto Benefits

Relationship between outputs, outcomes and benefits



7). Analysis of ePhyto Benefits

Post Implementation Review for a Pilot Country

- Process continued after the pilot is finished
- compares realised benefits against baseline (status before the pilot is started)
- analyses any changes the Business has encountered because of the implementation of ePhyto
- determines impacts of benefits
- reviews unrealised benefits

The above process contributes to the continual improvement of project/program delivery.



7). Analysis of ePhyto Benefits

Post Implementation Review also captures

- Were there any unexpected benefits because of the ePhyto program or project?
- What plans are in place to ensure remaining benefits are successfully realised?
- Have all expected business benefits been fully realised? If not, is there still potential to realise them?
- Were benefits realised within expected timeframes? If not, what influences affected the timeframe?
- How has the business adopted the ePhyto program or project benefits?
- Have all realised benefits (including disbenefits) been accepted by the business?

RESOURCES

The IPPC ePhyto and technical documents pages

- 1) <https://www.ippc.int/en/ephyto/>
- 2) <http://ePhyto.ippc.int/>

Future IPPC publications by the IPPC ePhyto Steering Group

- 1) A Global ePhyto Solution
- 2) Global ePhyto Benefits Awareness Strategy (eBAS)
- 3) Global ePhyto Benefits Analytical Guide (eBAG)



Contact Details

International Plant Protection Convention Secretariat (IPPC)
AGPP - FAO, Viale delle Terme di Caracalla,
00153 Rome, Italy. Tel: +39-06-5705-4812
E-mail: IPPC@fao.org

For further information, please visit:

www.ippc.int

www.phytosanitary.info



