UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

UNCTAD

APPLICABILITY OF TRACEABILITY SYSTEMS FOR CITES-LISTED MEDICINAL AND ORNAMENTAL PLANTS (APPENDICES II AND III)

PRELIMINARY ASSESSMENT: KEY FINDINGS

UNITED NATIONS

Note

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This publication has been edited externally.

For further information on UNCTAD's BioTrade Initiative please consult the following website: http://www.unctad.org/biotrade, or contact: biotrade@unctad.org

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This document presents the main findings and recommendations from two UNCTAD studies on assessing the traceability systems of non-timber plant species (ornamental and medicinal plants) under CITES Appendices II and III. These studies were developed in consultation with CITES Secretariat, CITES Management and/or Scientific Authorities and BioTrade partners. The complete studies are available at: http://unctad.org/biotrade and www.biotrade.org.

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Acronyms

ASYCUDA	Automated System for Customs Data (UNCTAD Programme)
BT (P&C)	BioTrade Principles and Criteria
CART	capacity-building requirements table
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COP/CoP	Conference of the Parties
CTEs	critical tracking events
KDEs	key data elements
LAFs	legal acquisition findings
MAPs	medicinal and aromatic plants
MoU	memorandum of understanding
NDFs	non-detriment findings
NTF	non-timber forest
SWOT	strengths, weaknesses, opportunities and threats
ToR	terms of reference
UN/CEFACT	United Nations Centre for Trade Facilitation and Electronic Business
UNCTAD	United Nations Conference on Trade and Development
UNECE	United Nations Economic Commission for Europe
UNEP-WCMC	United Nations Environment Programme - World Conservation Monitoring
SC66	66th Standing Committee (CITES)

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1. BACKGROUND

1.1 What is BioTrade and its relation to CITES and traceability?

BioTrade refers to those activities of production, transformation and commercialization of products and services derived from native biodiversity (species and ecosystems) under social, economic and environmental sustainability criteria.

The United Nations Conference on Trade and Development (UNCTAD) is the United Nations (UN) focal point for trade and development, and for interrelated issues in the areas of finance, technology, investment and sustainable development. Its objective is to assist developing countries to integrate beneficially into the global economy. The BioTrade Initiative of UNCTAD is a practical programme that aims to promote the conservation of biodiversity to further sustainable development through its sustainable commercial use in a variety of sectors (Table 1.1). UNCTAD, in close cooperation and collaboration with partners, is implementing BioTrade[1] in Africa, Asia and Latin America.

1.2 UNCTAD and CITES collaboration

UNCTAD[2] and the CITES Secretariat have enjoyed a long-standing partnership since early 2000 (Box 1), which was defined by a memorandum of understanding (MoU), signed in 2010. Under this MoU, both organizations are committed to ensuring the conservation of species, enhancing the livelihoods of the poor in remote and marginal areas, and promoting business opportunities for entrepreneurs that comply with CITES requirements and national legislation. Particular attention is paid to the role of economic incentives for sustainable management of CITES Appendices II- and III-listed species and benefit sharing with resource owners. UNCTAD channels its contribution through its BioTrade Initiative. The BioTrade Initiative is concerned with activities of production, transformation and commercialization of products and services derived from native biodiversity (species and ecosystems) under social, economic and environmental sustainability criteria.[3]

In addition, UNCTAD and the CITES Secretariat agreed to collaborate in developing an off-the-shelf solution for the automation of CITES permit procedures and exchange of electronic permits known as ASYCUDA eCITES. This software solution is available for Parties to consider for CITES permit management, including electronic permit application and electronic fee payments, information exchange with customs, CITES annual reporting, among others.

This note presents the main findings and recommendations from two UNCTAD studies on assessing the traceability systems of non-timber plant species (ornamental and medicinal plants) under CITES Appendices II and III. The complete studies are available at: http://unctad.org/biotrade and www.biotrade.org.

Furthermore, this complements the information provided in CoP17 Doc. 45 on traceability, particularly paragraph 12 and its annex 1 with the draft key findings of the ornamental plants study:

"12. Notable progress has also been made by UNCTAD, which in cooperation with CITES has launched a project in 2015 to assess the traceability systems for non-timber plant species listed in CITES Appendices II and III. The first assessment study

Table 1.1 BioTrade sectors prioritized by countries and partners in Africa, Asia and Latin America

Sector	Type of product
Personal care	Essential oils, natural dyes, soaps, creams and butters, cosmetics, etc.
Pharmaceutical (phyto-pharma)	Extracts, capsules and infusions from medicinal plants, etc.
Food	Fruits pulps, juices, jams, cookies, sauces, spices, nuts, tubers, snacks, food supplements, meat from caiman and fish, etc.
Fashion	Skins, belts, bags from Caiman yacare, etc.
Ornamental flora and fauna	Heliconias, orchids, butterflies, etc.
Handicrafts	Jewellery, decorative items based on native species, garments, etc.
Textiles and natural fibres	Furniture and decorative items based on natural fibres, bags, shoes, etc.
Sustainable tourism	Ecotourism, nature-based tourism, community-based tourism, etc.

Box 1. BioTrade and CITES cooperation

Since 2001, under the BioTrade Initiative, UNCTAD and the CITES Secretariat have had a long-standing partnership to enhance the conservation of CITES-listed species, in order to improve the livelihoods of poor people in remote and marginal areas who harvest and trade in these species, and to promote opportunities for businesses that comply with CITES requirements and national legislation. The cooperation also encourages consultations between BioTrade partners and CITES authorities when including species listed in the CITES Appendices in BioTrade programmes and value chains; and facilitates capacity-building in developing countries on issues relating to the organization of value chains for species listed under CITES.

BioTrade Principles and Criteria (BT P&C) guide the intervention of activities to be implemented on the ground, for instance in the development of businesses, value chains and sectors. These principles include, inter alia, the conservation and sustainable use of biodiversity, legal compliance with national and international regulations, respect for the rights of actors – all of which are in line with CITES goals.

UNCTAD's BioTrade and the CITES Secretariat, as well as selected Parties, have implemented concrete actions to support the sustainable management of species in a variety of sectors such as the personal care, pharmaceuticals, food, ornamentals with both flora and fauna, and fashion where CITES-listed species are being supported. CITES-listed species within these sectors, include, for example, Caiman yacare and vicuña for the fashion industry, paiche (Arapaima gigas) for the food sector, orchids and amphibians for the ornamental flora and fauna sectors, among others. In recent years, UNCTAD has also worked with CITES on traceability issues, such as for python skins in South-East Asia and non-timber plant species.

focused on ornamental plants in the Andean sub-region, and included an extensive consultation with representatives from government, industry and civil society. The report of the preliminary findings was submitted at SC66 as an information document[4] *and also discussed at a side event at SC66. Another study on medicinal plants for the Mekong subregion. Both studies were submitted for peer review, a workshop organized to discuss the main findings with various stakeholder representatives from the two subregions….. The final report was submitted to CoP17 as an information document."*

2. TRACEABILITY-RELATED ACTIVITIES

At the 15th and 16th meetings of the Conference of the Parties (CoP) to CITES in 20101 and 2013, it was decided to consider the possible development of traceability systems to assist in ensuring the sustainable use of CITES-listed species. In response, UNCTAD and the CITES Secretariat have collaborated in drafting technical documents and organizing workshops on traceability issues to better understand the requirements in developing such systems for species through the supply chain, from sourcing all the way to the market and final consumption by consumers. In 2014, UNCTAD and CITES jointly conducted a study to assess the traceability systems for the sustainable international trade in South-East Asian python skins (Ashley, 2014) in response to CITES Decisions 16.102, 16.103 and 16.105 (CITES, 2013).

Complementing this work, UNCTAD, in consultation with the CITES Secretariat, selected CITES Management and Scientific Authorities, and BioTrade partners, started to work on traceability issues for CITES-listed (Appendices II and III) non-timber plant species in 2015. In particular, two comprehensive studies were developed to facilitate work related to the tracing of CITES-listed non-timber forest (NTF) plant species, focusing on ornamental and medicinal plants.

The first study **assessed the applicability of traceability systems for ornamental plants in Latin America with an emphasis on the Andean subregion**. Preliminary findings and recommendations were submitted to the CITES Secretariat (document SC66.Inf.16 (Lehr, 2016a) at the 66th Standing Committee meeting (SC66) in January 2016, and discussed at a side event. Additionally, the draft study was further discussed with experts and CITES Parties through bilateral consultations, and a peer review process that took place in the summer of 2016.

The second study **assessed the applicability of traceability systems for medicinal plants in the Asian region, particularly the Greater Mekong subregion**. It was also developed in consultation with CITES Secretariat, selected Parties, BioTrade partners and industry. Its findings were also discussed with selected Parties and stakeholders.

Both studies analyse the use of traceability systems as a tool to strengthen existing CITES processes, in particular, legal acquisition findings (LAFs) and non-detriment findings (NDFs), for ornamental and medicinal plants, listed under CITES Appendices II and III.

Additionally, through this work UNCTAD aims to contribute to the ongoing traceability discussions to provide an umbrella traceability mechanism for CITES-listed species as noted in Standing Committee document SC66 Doc. 34.1 (Rev.1)[5] considered at CITES CoP17. This complements the Secretariat's discussions with the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) regarding the possible development of a business requirement specification for international trade in wildlife (AC28 Doc. 14.2.1,[6] SC66 Doc. 34.1 (Rev.1)). The terms of reference (TOR) of the studies are outlined in Box 2.

The findings and recommendations of both studies were discussed and validated during the workshop on traceability systems for CITES-listed non-timber forest plant species (ornamental and medicinal plants) on 22 September 2016 in Johannesburg, South Africa. The event was organized on the margins of the 17th meeting of the CITES CoP17 held in Johannesburg from 24 September to 5 October 2016. Further information on the workshop is available at: http://unctad.org/en/Pages/MeetingDetails.aspx?meetingid=1182.

The results of the studies will also be disseminated at the IV BioTrade Congress on 3 December 2016, in Cancun, Mexico, organized in the context of COP 13 of the Convention on Biological Diversity (CBD) and its Biodiversity and Business Forum.

Box 2. Summary of the TORs and outcomes from the studies on the applicability of traceability systems for CITES-listed non-timber forest plant species listed in Appendices II and III, focusing on ornamental and medicinal plants

- Develop an outline and methodology to carry out the study, which will be discussed and validated with UNCTAD and the CITES Secretariat.
- Discuss with the United Nations and other organizations working on traceability systems, possible standards for use in the development of a CITES traceability system for medicinal and ornamental plants in the Asian region, with an emphasis on the Mekong subregion.
- Carry out an in-depth review of existing information on the value chains for medicinal and aromatic plants (MAPs) in the selected regions, focusing on CITES-listed species and those being supported by BioTrade partners.
- Identify and review existing traceability systems for medicinal and ornamental plants, and determine those to be further analysed in the framework of the study.
- Map the value chains for medicinal and ornamental plants in the selected regions. This would include identifying key stakeholders and their role in defining and implementing traceability systems, as well as identifying livelihood benefits obtained by upstream and downstream stakeholders.
- Analyse and assess how the selected systems are being implemented, including their internal control systems (documentation and methodology used, as well as key intervention points and actors throughout the value chain to ensure the system's effectiveness to limit illegal harvesting and trade in the species, etc.) and categorize them according to criteria defined jointly with UNCTAD and the CITES Secretariat.
- Assess the socioeconomic implications and benefits of the selected systems, particularly considering the needs of small farmers and landowners, governments and industries, to define their capacity-building needs and a fair distribution of benefits being generated throughout the value chain.
- Provide practical recommendations on how a traceability system should be defined and implemented for non-timber flora species within the CITES framework, taking into account previous technical studies developed by UNCTAD and others.
- Prepare a first draft on the initial findings and recommendations of the study to be peer reviewed and/or discussed with relevant stakeholders, as well as UNCTAD and the CITES Secretariat.
- Present the studies and validate findings and recommendations with relevant stakeholders involved in traceability systems for CITES-listed species at a regional workshop organized by UNCTAD in consultation with the CITES Secretariat and other stakeholders on 22 September 2016.
- Prepare a short note to be submitted to CITES CoP17 as an information document, summarizing the findings and key recommendations on the work undertaken.
- Participate and present the study at UNCTAD dissemination events as required.

The outcome of the studies, which are based on international standards and norms, include, inter alia:

◊ A technical summary of traceability systems available for medicinal and ornamental plants.
◊ Recommendations on how a traceability system should be defined and implemented and on how to address the capacity-building requirements for the associated small farmers and landowners, CITES Management and Scientific Authorities.
◊ Recommendations for advancing with the studies' outputs and recommendations within CITES (and other relevant intergovernmental bodies).

3. MAIN FINDINGS OF THE TWO UNCTAD STUDIES TO ASSESS THE APPLICABILITY OF TRACEABILITY SYSTEMS FOR CITES-LISTED ORNAMENTAL AND MEDICINAL PLANTS UNDER APPENDICES II AND III

3.1 Traceability considerations for non-timber forest plant species

Traceability can be defined as "the ability to access any or all the information relating to that which is under consideration, throughout its entire life cycle, by means of recorded identification."[7] In other words, traceability enables one to recover the history of an asset by linking together records taken on its way through the supply chain.

Traceability systems are usually constructed using three different elements:

- **Unique identification:** Used to identify the assets (usually both the product unit and the business operator).
- **Critical tracking events (CTEs):** Critical points in time when not recording data about the asset will break traceability. Typically, there are three categories of CTE per entity: reception, processing and dispatch.
- **Key data elements (KDEs):** Information elements that must be stored at each CTE. In general, KDEs might include basic descriptive elements, origin and destination, processes applied to the product or legal status. A traceability system must define specific KDEs for each CTE.

Within CITES processes, a traceability system can make concrete contributions to:

- **Legal acquisition findings (LAFs):** Traceability can provide a link to the production source. This would then allow CITES Management Authorities to make a stronger legal acquisition finding.
- **Non-detriment findings (NDFs):** The use of a traceability system could be beneficial for providing improved trade statistics. In this regard, such a system could also contribute to achieving consistent global trade volumes.

3.2 UNCTAD studies on the applicability of traceability systems for medicinal and ornamental plants

The UNCTAD studies provide an analysis on the use of traceability systems as a tool to strengthen existing CITES processes (LAFs and NDFs) for non-timber plant species, particularly medicinal and ornamental plants, listed under CITES Appendices II and III. Both studies analysed trade from the following countries and species:

- Ornamental plants (*Cycadaceae, Orchidaceae, Bromeliaceae and Euphorbiacecae*) from Andean countries (Plurinational State of Bolivia, Colombia, Ecuador and Peru) and selected Latin American countries (Argentina, Brazil, Chile, Costa Rica, Guatemala, Mexico, Panama and the Bolivarian Republic of Venezuela); and
- Medicinal plants (*Aquilaria crassna – agarwood, Gastrodia elata and Dendrobium nobile*) from the Asian region with an emphasis on the Greater Mekong subregion countries: Cambodia, China, Lao People's Democratic Republic, Myanmar, Thailand and Viet Nam.

Through these studies, an analysis of the market chain for ornamental and medicinal plants is presented for the selected species and regions. This is followed by examples of existing traceability and control systems applicable for the CITES-listed non-timber forest plant species. A proposed traceability system for each of the cases is recommended, as well as assessments of the capacity-building needs of involved stakeholders. It is important to note that the studies consider other potential internationally accepted and used traceability methodologies and strategies, which could be adapted to the species and countries studied.

Key common findings regarding the applicability of traceability systems for both ornamental and medicinal plants:

1. Traceability can clearly contribute to the robustness of LAFs, and may also generate useful trade data to improve NDFs with strong collaborative partnerships between the private and public sectors.
2. Taking into account internationally recognized frameworks and best practice, the study on medicinal plants proposes a traceability system based on the United Nations Economic Commission for Europe (UNECE) traceability framework. The framework is built on definitions of (a) a policy claim as the overall mandate of the

Figure 3.1 Generic principles for traceability of CITES-listed species

traceability system, (b) the specification of entry/exit points defining the part of the supply chain to which the policy claim applies; and (c) an audit process. The framework is used to support CITES data requirements for the issuance of export permits and certificates.

3. Recording of reception of plant material at nurseries or plantations, creation of a database of properly identified parental plants and linking export permits to identified parental plants, can significantly strengthen the CITES Management Authorities' permit process, especially if coupled with risk management systems in the controls for an operating licence and in the issuance of CITES import and export permits and certificates.
4. A traceability architecture is proposed that

Figure 3.2 SWOT analysis for proposed traceability system

Strengths
- Generic, standards-based model for traceability of CITES-listed species.
- Several levels of complexity available, depending on technical capacity.
- Step-wise improvement possible.
- Strengthens CITES management decisions, in particular the LAF.

Weaknesses
- Replacement of species still possible.
- Like other documentation systems, addresses only white and grey market.
- Works best when supported by an electronic system.
- Involves effort and cost for private and public stakeholders.

Traceability as a tool for strengthening CITES management decisions

Opportunities
- Helps avoid laundering.
- Provides better trade data.
- Allows more efficient and more effective control.
- Allows for integration with approved trader and similar schemes.
- Partnerships with certification schemes.

Threats
- Needs identification of clear benefits for private operators.
- Lack of capacity, especially in developing nations.
- Does not address illegal trade.

renders stricter control on the early stages of the value chain where risk for introduction of illegally harvested material is greatest. For later stages in the value chain, controls may be less tight and adapted to the realities of the mixing of medicinal plant species in final products. The ornamental study, for example, proposes a risk management methodology.

5. The role that the private and public sectors play in developing a traceability framework is crucial, and the management of this relationship is one of the keys to successful implementation. This is also a key principle of the UNECE traceability framework.
6. The possible socioeconomic impacts arising from the use of any traceability framework must be properly understood. A practical project to implement the traceability framework may be the most appropriate way to further define the socioeconomic implications, particularly the costs and benefits for all value chain actors.
7. Building on existing structures such as certification schemes could be an alternative to advancing this process. For instance, establishing a partnership with a wild-collected plant species standard and certification scheme (FairWild, Union for Ethical BioTrade, etc.) or similar, might help in facilitating the implementation of a traceability system by introducing financial benefits to local stakeholders, particularly small farm holders or local wild collectors. For further information, see sections 4.6., 4.7 and 5.5 from the UNCTAD medicinal plants study (Lehr, 2016c).
8. Recommendations for the development of a traceability framework project are made to deepen the understanding of the best approach for implementing traceability in non-timber plant species, as well as the right mix of positive and negative incentives.

In addition, the studies and the traceability workshop on 22 September 2016 provided valuable information to define generic principles for traceability systems for non-timber plant species listed in CITES Appendices II and III (Figure 3.1), but which may be applicable to other species.

A strengths, weaknesses, opportunities and threats (SWOT) analysis of the proposed solutions is presented in Figure 3.2.

3.3 Main findings of the ornamental plants' study in Andean and other Latin American countries

1. The floricultural trade has experienced strong worldwide growth of 12 per cent per annum between 2010–2014. Total trade in 2014 was US$21.5 billion.
2. Of the CITES-listed ornamental plants and plant products exported from the considered countries between 2010–2014: Cycadaceae represented 63.5 per cent with nearly 28.7 million exported products (only considering leaves, live plants, roots and stems); Cactaceae 22.5 per cent with over 10 million plant products (including seeds, live plants and stems); Orchidaceae 8.7 per cent with 4 million plant products (live plants, leaves, roots and stems); Bromeliaceae represented 3.5 per cent with just over 1.5 million live plants; and Euphorbiaceae together with Zamiaceae represented the remaining 1.8 per cent with just under 1 million products (live plants, roots, wax).
3. Orchid exports from the chosen countries seem to have grown strongly until 2012, but experienced a slowdown in 2013; however, this might be due to an exceptional spike in trade from Brazil in 2012. Costa Rica is the largest exporter in the 2010–2014 period. The main markets are the United States of America, Japan and the European Union.
4. Trade of CITES-listed Cycadaceae seems to be declining. Costa Rica is by far the most important exporter; trade from the only other trader, Guatemala, seems to have come to a standstill in 2013. The main markets are the European Union and the United States of America.
5. However, market assessment is made difficult by the inconsistent reporting between exporters and importers. Within the studied period of 2010–2014, exporters reported 20 per cent more trade than importers in Orchidaceae and 33 per cent more trade in Cycadaceae.
6. In the studied countries, Orchidaceae represent an important family within the trade in ornamental plants; the traded plants are nearly all artificially propagated.
7. Regarding existing control systems, the interviewed CITES Management Authorities operate a comprehensive control system based on issuance and control of operating licences[8] and control of exported quantities/specimens via CITES import and export permits and certificates. However, determining the species of exported plants is very

difficult. This affects both the controls for operating licences as well as export control. Some private operators have internal traceability systems.

3.4 Main findings of the medicinal plants' study in the Greater Mekong subregion

1. Globally, there are over 60 000 species of mainly wild collected plants used for their medicinal properties.
2. 33 CITES-listed medicinal plants were identified originating in the Greater Mekong region countries. CITES trade data analysis was conducted for these. Two species: *Aquilaria crassna and Gastrodia elata* were selected for in-depth study, while *Dendrobium nobile* was selected for a desktop review.
3. Medicinal plants are a source of many traditional and modern medicines, and make an important contribution to rural livelihoods, as well as having cultural value. Harvesters are often among the poorest and most vulnerable members of society. Wild plants can be the source of supplementary income for households, providing seasonal work for villagers in rural areas.
4. The wild harvesting that occurs for medicinal plants is difficult to track back to its source and estimate its value due to long trade chains. Trade can be illegal, unregulated and/or unreported and is sometimes known as the "hidden harvest". Tracking is made more complex by the different forms that species are traded in and their aggregation in export codes.
5. Of the selected CITES-listed medicinal plants (*Aquilaria crassna*, *Gastrodia elata* and *Dendrobium nobile)*, and their derived plant products, exported (mainly for commercial use) from the study countries in the Greater Mekong subregion between 2005–2014, *Aquilaria crassna* represented 99 per cent of global trade in this species with 3 547 666 specimens; *Gastrodia elata* 91 per cent of global trade with 80 140 specimens; and *Dendrobium nobile* 26 per cent of global trade with 215 626 specimens registered.
6. Trade of CITES-listed *Aquilaria crassna* has been consistent since 2011 with varying fluctuations in quantities traded. Thailand and Viet Nam have been the major exporters with produce destined mainly for China, Indonesia, Lao People's Democratic Republic and Myanmar. The question and complexity of the legality of wild-harvested agarwood suggests that, under current definitions, some trade may be deemed illegal. Seizure data show an increase in the illegal trade of agarwood products for wild-harvested *Aquilaria crassna*. Difficulties in distinguishing between wild and propagated harvesting makes enforcing legal compliancy difficult.
7. Trade of CITES-listed *Gastrodia elata* shows export fluctuations: the data suggest a shift in either trading of the commodity or reporting practices over the period. 90 per cent of exports of this species are from the Greater Mekong subregion with more than 99 per cent originating from China; mainly for commercial purposes. In China, declarations of suspicion of illegal harvesting lead to additional authorization processes. The Republic of Korea was the main destination (82 per cent) followed by Japan (9 per cent). Mismatches in trade data are reported which complicates the assumptions made about the trade analysis of *Gastrodia elata*.
8. Trade of CITES-listed *Dendrobium nobile* has increased slightly each year in the countries studied, though again with varying fluctuations reported. Most exports originate from China, Thailand and Viet Nam for propagated live plants. Noteworthy were 2009 and 2013 when extraordinary export records were registered, showing a sharp spike in trade. The major importers were the Republic of Korea and Singapore.
9. Market assessment is complex due to the inconsistent reporting between exporters and importers. For example, within the period studies (2005–2014), only 13 per cent of *Dendrobium nobile* imports were recorded from exports shipped.
10. In the studied countries, *Dendrobium nobile* represents an important family within the trade of medicinal plants; the traded plants are nearly all artificially propagated, with 88 perc cent reported as live exports.
11. Regarding existing control systems, the CITES Management Authorities in Thailand have just implemented a control system based on the issuance and control of operating licences.
12. Importing nations have a significant role to play in refusing the purchase of illegal and unsustainable agarwood and other medicinal plants by encouraging the sourcing of sustainable and legal products/ingredients.

4. CAPACITY-BUILDING REQUIREMENTS

Capacity-building is an important cog in a supply chain towards supporting the development of a traceability system. Key stakeholders (including small farmers and landowners, CITES Management and Scientific Authorities) along the supply chain need to have their capacity-building gaps identified so that plans can be made to improve or fix them. This is also true for developing nations who lack the basic infrastructure to support the implementation of a traceability system. Various capacity-building gaps have been identified during the research for this document, particularly during the interviews conducted with stakeholders. The gaps identified were:

- Awareness of CITES-listing, requirements and documentation, between and among government agencies, companies and other relevant stakeholders (producers, collectors, etc.) in the trade supply chains;
- Available tools and identification materials;
- Skills to support primary producing communities and develop sustainable value chains;
- Available financing for capacity-building activities for wild collectors, collection operations and farmers (access to development services and processing equipment);
- Value addition (processing equipment), control and systems improvement;
- Awareness in industry associations of their role in supporting members to carry out their business legally, in particular, sourcing raw materials from legal sources;
- The systematic application of standards in the production of medicinal and ornamental plants;
- Awareness in importing nations of their significant role in refusing the purchase of illegal and unsustainable non-timber forest plant species such as agarwood;
- Training of customs officers to identify species and legally and illegally sourced goods; and
- Training of law enforcement officials in countries involved in the trade of medicinal and ornamental goods.

Other capacity-building gaps directly related to the functioning of a traceability system:

- Developing project management communication skills to identify and communicate stakeholder benefits and reach private sector buy-in in traceability;
- Training in how traceability functions along a supply chain;
- Training in appropriate record keeping and product tagging (as required);
- Understanding upstream and downstream supply chain actors (e.g. knowing the sources of the particular ingredient batches and destination of product batches, also known as the “one step up, one step down” system);
- Clarification of legal/illegal sourcing of plants, particularly medicinal plants; and
- Education on supporting the implementation of sustainable development practices, for both environmental and business needs.

At project level, capacity-building requirements can be identified via an adapted capacity-building requirements table (CART) (see Table 4.1). For a given project, the CART is used to show requirements under

Table 4.1 Capacity-building requirements table (CART)

	Capacity-building dimensions					
Objective: Developing a traceability architecture	Financial support	Institutional reform	Skills training	Business benefits	Personnel resourcing	Value addition
Wild collector	X		X			X
Nursery			X	X		X
Customs		X	X		X	
Transportation			X	X		
Supply chain		X				
Public authority		X	X		X	
Private business	X			X		X
Project management			X		X	
Law enforcement		X	X		X	

critical dimensions. Each row focuses on a primary objective (for stakeholders) which can be tracked across various capacity-building dimensions. This helps to ensure that all possibilities are considered. Each stakeholder in the supply chain is identified and assessed against each dimension, to identify the gaps.

A project coordinator or manager can review the capacity-building needs using a CART and make appropriate plans to ensure that the key dimensions are addressed and the traceability project will be implemented successfully. As has been mentioned in previous sections, traceability projects frequently fail. This is partly due to the stakeholders involved not having the skills or resources to enable them to succeed, understand or clearly identify the benefits to supporting implementation of a traceability project. The ultimate aim should be to ensure that all identified stakeholders' capacity-building needs are addressed, reducing their risk to potentially undermine the success of the traceability project.

5. KEY ISSUES FOR TRACEABILITY FRAMEWORKS FOR CITES-LISTED NON-TIMBER PLANT SPECIES

This section details the main issues discussed at the workshop on 22 September 2016, and at bilateral meetings organized with selected CITES Parties and BioTrade partners, as well as regional organizations and civil society.

5.1 Role of traceability within CITES

The objective of traceability within CITES is to support management decisions such as LAFs. Traceability is not a means in itself, and it should not be used to "fix" the implementation of CITES processes within a country. It should not be considered as a panacea either. Traceability is a supporting tool that has the capacity to strengthen managerial decisions, but also to discover areas needing improvement in the implementation of CITES processes at the national level.

5.2 Need for and feasibility of traceability for selected species

The need for traceability is increasing for a variety of reasons. Supply chains of some CITES-listed species have begun implementing traceability systems (e.g. reptiles, sharks, timber, etc.), including those led by private stakeholders. This is done to ensure the sustainable supply of raw materials and respond to the increasing number of environmentally and socially conscious consumers. Global traceability systems have been implemented for a variety of commodities, such as tea, coffee, palm oil, cotton, soya and fish. Major importing regions, such as the European Union and the United States of America, require exporting nations to have traceability (at least for some products). Therefore, traceability might be in the pipeline for species listed under CITES; thus expanding work on this issue is crucial. Another topic highlighted the interest in implementing a Single Window[9] for sustainable trade in wildlife.

5.3 CITES, traceability and sample experiences with CITES-listed plants

Currently, there is an opportunity to guide the discussions on traceability before definitions, and uncoordinated, unaligned and even incompatible implementation systems proliferate. Laying out common traceability principles with the CITES Parties may ensure that traceability frameworks employ a common language and are or can be made compatible. The use of international standards is very important in this context. For example, UN/CEFACT provides standards that may be useful for traceability of CITES-listed species.

For ornamental and medicinal plants, there are two interesting cases of traceability systems being implemented, in Peru and Thailand, illustrating not only the feasibility aspects but also the benefits that can be generated. Peru has implemented a limited traceability system for orchids under its National BioTade Programme, and the experience has helped nurseries improve their organization, increase control over parental stock and identify good business practices. Peru hopes to extend these practices to other operators that currently do not reach international markets. The benefits for operators are increased efficiency and access to higher value markets. Thailand reported on its successful experience with a recently implemented fully electronic system that issues operating permits, registers parental stock and links export permits. Thailand has also started to geo-reference plantations to comply with its forest law that prohibits trade in specimens extracted from the wild, such as orchids and agarwood.

5.4 Traceability – international and domestic trade

CITES is primarily a trade convention but aims also to ensure that sustainable trade is not disrupted. Strong CITES processes contribute significantly to ensuring the sustainability of trade in CITES-listed species. However, successful implementation of traceability-based control systems, as in Costa Rica, Thailand and Peru, have shown that systems are most effective when they are not limited to specimens destined for international trade only.

Based on these experiences and associated discussions, a successful implementation of traceability-based control systems may require national legislation applicable to all trade whether cross-border or internal/domestic, which goes beyond the CITES mandate. However, suggestions have been made that CITES provides Parties with a framework, implementation guidelines and processes

and standards for consideration in implementing or improving internal and cross-border processes related to the Convention. This also provides the opportunity to adopt traceability as a supporting technology.

5.5 Level of control over products of CITES-listed species

In order not to disrupt sustainable trade, controls cannot place an undue burden on those operators trading legally in CITES-listed species and products. Naturally, finding the right balance is difficult, in particular as it also depends on the concrete benefits that can be obtained for private operators. Premiums have been identified as the clearest foundation for a business case, and these can potentially be achieved when partnering with certification schemes (where traceability is then shared).

In general, raw materials need to be controlled more closely. Whereas for derivatives, simpler control mechanisms have been well accepted; mass balance or even chain-of-custody-like systems are more appropriate in this case than full batch traceability. Figure 5.1 shows how the control of traceability can be done in products containing CITES-listed non-timber plant species – this is simpler with unprocessed MAPs than when they are processed and mixed.

5.6 Cost of traceability

In the early stages of production, especially for small-scale operators, the cost of implementing traceability is of concern. Clearly, costs increase with the precision of the traceability system[10] and the level of control, as shown in Figure 5.2. Consequently, costs can become significant if too close a control is attempted and if the precision of the system is not adjusted correctly. A comprehensive cost and benefit analysis should be done to find the right balance.

For example, the United Nations Environment Programme/World Conservation Monitoring Centre (UNEP-WCMC) reported Ecuadorian experiences on traceability with a variety of flora and fauna species listed under CITES. They highlighted difficulties regarding tagging of plants and plant parts, as well as concern about costs from private stakeholders in the country. This is consistent with the general experience in implementing traceability globally.

Traceability in its simplest form is based on simple record keeping. It requires supply chain partners to consistently record information on paper, at practically no cost. Implementation of computerized systems can be costlier, but generally available mobile technology together with professional databases free to use for non-commercial purposes drive down the costs of such projects.

Providing too many options in information technology (IT) systems related to CITES may lead to confusion; the associated complex decision-making resulting in low adoption rates. Key to controlling both costs and driving adoption is to keep the system simple and

Figure 5.1 Recommended levels of control in traceability of products containing MAPs listed under CITES

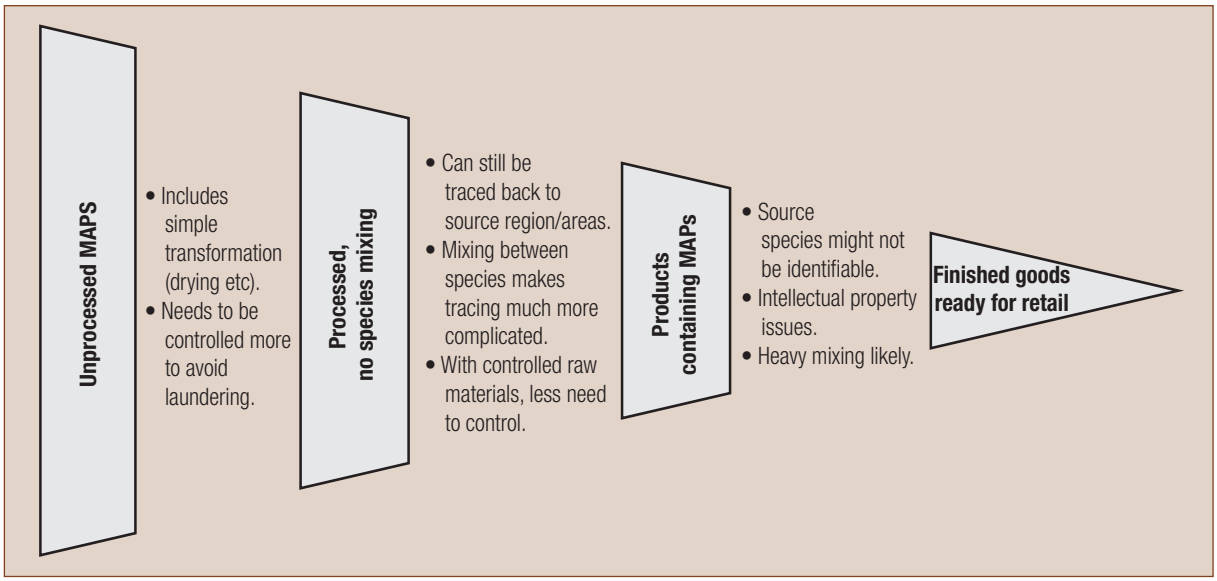
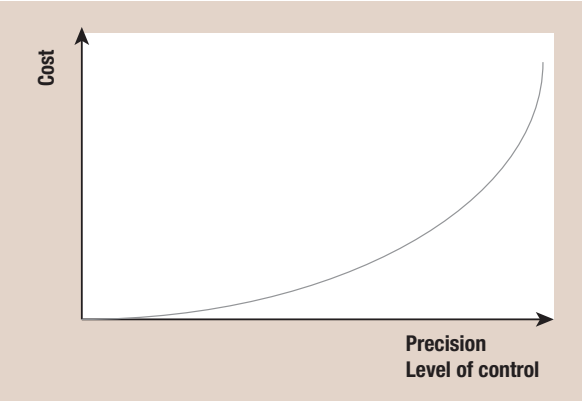


Figure 5.2 Relationship of cost to precision of the traceability system and level of control



balanced between costs and benefits. The high cost of some IT systems is often a result of attempting to do too much with a single tool.

It should also be mentioned that UNCTAD ASYCUDA has elaborated a draft CITES management module which is available free of charge to Parties; this module could cover raw material traceability (i.e. registration of receptions, mother plants and link to CITES permits) quite easily, provided the availability of funds.

5.7 Traceability and tagging

Traceability systems and tagging (i.e. physical identification) systems are part of the traceability framework. A tagging system does *not,* however, establish traceability. Traceability is achieved under two conditions:[11]

- Unique identification of (a collection of) traceable assets, such as bark, flowers, agarwood seeds; and
- Recording of key information elements[12] at critical points[13] in the (supply) chain (e.g. by recording the supplier, supply date, product and quantity at raw material reception).

Tagging satisfies – if properly done – the first condition, but not the second.

Furthermore, investment in a specific tagging solution is not generally recommended, unless embedded in a traceability framework and balanced with the benefits for private operators. It is highly unlikely that a specific tagging solution can be found that is generic enough to cover a large variety of products made from CITES-listed species.

Moving the discussion on from specific tagging solutions to a generic traceability framework is favoured. In particular, the following aspects need outlining: a common definition; elaboration of recommendable governance models; a common description of a traceability architecture; guidelines on the process of implementing traceability; and clear indications of the benefits for the private sector, potentially in collaboration with other schemes, such as certifications or benefit sharing schemes. For instance, the UN/CEFACT framework could be an interesting methodology to consider, as shown with the medicinal plants example.

Overall, for any traceability framework, it is essential to demonstrate its feasibility and assess the costs and benefits for the private sector.

6. CONCLUSIONS

The implementation of traceability is a very detailed and often complex process, but it can be straightforward and successful when private sector and government join forces and establish win-win frameworks that benefit all the stakeholders involved. In other cases, implementation has proven to be lengthy and complicated, with, at best, mixed results.

CITES supply chains, particularly when the final products includes a mixture of several species, are complex due to: the number and type of stakeholders involved; the degree of processing of CITES-listed species; and the fact that there is still illegal or poorly controlled wild harvesting of Appendix II plant species for medicinal and ornamental purposes due to constrained capacity.

The traceability framework proposed in the studies aims to balance the need to control the legality of the raw material source and the practicalities of businesses. It recommends stricter control of raw materials using operating permits, registries of natural resources, records of collection and inputs for artificial propagation, and annual reports about raw material receptions and products dispatched. For later stages in the supply chain, it suggests less strict controls, in the form of mass balance systems, using operating permits and annual reports about materials received and dispatched. For heavily processed goods, one recommendation is to consider a chain-of-custody type system where only the supply chain partners are reported, and not necessarily quantities of materials. The system may include the possibility of excluding finished products ready for retail from CITES controls, if former stages are adequately controlled and documented.

7. RECOMMENDATIONS

A combination of public and private sector support is essential for success, and an open and collaborative discussion between them is highly recommended, e.g. in the form of national traceability round tables.

A robust, generic traceability system could be implemented to support CITES policy claims, trade data collection and better documented NDFs. The use of international standards is highly recommended; particularly for the assessment of traceability systems for medicinal plants it was found useful to employ the UNECE traceability architecture.

Given the complexity of the system for fully processed goods containing CITES-listed species, its implementation must be approached carefully and be embedded in a more general framework of activities, such as improving trade data collection, capacity building and awareness creation of stakeholders, and information dissemination, especially to smaller players, on market prices and other relevant data.

To ensure that all stakeholders in the supply chain see direct benefit and advantage of participation, consideration should be given to working with existing structures or establishing partnerships with sustainability certification and benefit-sharing schemes.

Additionally, the following elements are considered essential to successfully implement traceability systems:

- Demand-driven process, starting from the Parties interest and request to strengthen CITES processes through traceability systems.
- Carry out a local assessment of the recommended traceability framework with respect to technical, economic and conservation aspects, for instance by conducting a socioeconomic impact analysis.
- Validate if the proposed traceability architecture is generic enough to be adapted to different types of supply chains in different countries and regions, i.e. not only to non-timber forest plant species.
- Develop a traceability toolkit (or integration into the CITES e-permitting toolkit), so that traceability is easier to implement, yet meaningful to CITES Management and Scientific Authorities.
- Provide capacity-building initiatives and dedicate funds to implement the traceability framework, particularly for countries lacking adequate infrastructure to implement and use it.
- Within each country, identify a strong project management team that can work collaboratively with the public and private sectors to ensure that both of their standards and requirements are considered.
- Design the right mix of positive and negative incentives for the private industry to participate in traceability.
- Improve the cross-border reporting of exports and imports to ensure a better understanding of the traded volumes of medicinal species for effectively managing the reporting of endangered medicinal plant resources.
- Improve identification procedures for plant species sourced, either wild collected or artificially propagated.
- Adhere to international standards and norms when available, including joint work with traceability frameworks (e.g. UNECE) and standard-setting organizations. Furthermore, analyse the benefits and costs to partners with certification and good practice schemes to ensure benefits for the small stakeholders in the supply chain.

The work undertaken by UNCTAD is a starting point to identify the right approach to developing a uniform, umbrella, traceability framework for CITES-listed species. Further development is needed through practical implementation on the ground, e.g. through a traceability framework project to confirm the approach, identify costs and benefits, test the implementation methodology and seek partnerships with other stakeholders that can generate further benefits to the private sector operators and sourcing communities.

Ideally such a project could be built considering existing structures and projects that are already promoting the sustainable trade of biodiversity-derived products, such as within BioTrade programmes and partners.

This project should have, *inter alia,* the following criteria:

- Large and long enough to have a measurable impact.
- Parties participating should be willing to collaborate and share information, and ideally already have a control system in place, i.e. they would also support electronic recording of traceability records and the use of risk-based methodologies in control systems.
- It should involve at least one developing country, with a further enriching exercise if it is a country and/

or supply chain with low technological capacity, in order to be replicated further.
- Carry out an in-depth socioeconomic impact assessment, and define how stakeholders' needs be addressed and opportunities seized.
- It should attempt to quantify the amount of illegal and unreported trade using local expert knowledge.
- It should involve a trading partner with a history of strong interest in sustainable use of biological resources to better motivate business operators.

References

Ashley D (2014). Traceability systems for a sustainable international trade in South-East Asian python skins. Geneva: United Nations Conference on Trade and Development. Available at: http://unctad.org/en/PublicationsLibrary/ditcted2013d6_en.pdf.

CITES Secretariat (2013). CoP16 Decisions. Available at: https://cites.org/sites/default/files/eng/dec/valid16/E16-Dec.pdf.

CITES Secretariat (2015a). AC28 Doc. 14.2.1. Available at: https://cites.org/sites/default/files/eng/com/ac/28/E-AC28-14-02-01%28Rev1%29.pdf.

CITES Secretariat (2015b). SC66 Doc. 34.1 (Rev. 1). Available at: https://cites.org/sites/default/files/eng/com/sc/66/E-SC66-34-01-Rev1x.pdf.

CITES Secretariat (2016). CoP17 Doc. 45. Available at: https://cites.org/sites/default/files/eng/cop/17/WorkingDocs/E-CoP17-45.pdf.

Lehr H (2013). Communicating food safety, authenticity and consumer choice: Field experiences. *Recent Patents on Food, Nutrition, and Agriculture.* 5 (1):19–34.

Lehr H (2016a). The applicability of traceability systems for CITES ornamental plants with a focus on the Andean and other Latin American countries - A preliminary assessment. New York and Geneva: United Nations Conference on Trade and Development. Available at: https://cites.org/sites/default/files/eng/com/sc/66/Inf/E-SC66-Inf-16.pdf. (document SC66 Inf.16).

Lehr H (2016b). The applicability of traceability systems for CITES ornamental plants with a focus on the Andean and other Latin American countries - A preliminary assessment. New York and Geneva: United Nations Conference on Trade and Development. Advance copy: http://unctad.org/meetings/en/Contribution/ditc-ted-22092016-johannesberg-UNCTAD-traceability-1.pdf.

Lehr H (2016c). The applicability of traceability systems for CITES medicinal plants with a focus on the Greater Mekong countries - A preliminary assessment. New York and Geneva: United Nations Conference on Trade and Development. Advance copy: http://unctad.org/meetings/en/Contribution/ditc-ted-22092016-johannesberg-UNCTAD-traceability-2.pdf.

Olsen P, Borit M (2013). How to define traceability. *Trends in Food Science and Technology*. 29(2):142–150. http://doi.org/10.1016/j.tifs.2012.10.003.

UNCTAD (2006). Trade Facilitation Handbook Part II - Technical Notes on Essential Trade Facilitation Measures. New York and Geneva: United Nations Conference on Trade and Development. (UNCTAD/SDTE/TLB/2005/2). Available at: http://unctad.org/en/Docs/sdtetlb20052_en.pdf.

UNCTAD (2016). Meeting report of UNCTAD side event – Traceability systems for ornamental plants. Geneva: United Nations Conference on Trade and Development.

UNECE (2016). Traceability for sustainable trade: A framework to design traceability systems for cross border trade (ECE/TRADE/429). Available at: www.unece.org/index.php?id=43763.

ANNEX 1: PERSONS AND INSTITUTIONS CONSULTED

Organization	Country	Individual
CITES		
CITES Secretariat	Switzerland	Tom de Meulenaer Haruko Okusu Milena Sosa Schmidt Markus Pikart Daniel Kachelriess Dave Henson Mrigesh Kshatriya Karen Gaynor
CITES Management Authorities		
Division of Flora Affairs	China	Yue Zhang
Ministerio de Ambiente y Desarrollo Sostenible	Colombia	Diego Higuera Antonio José Gómez
Ministerio del Ambiente y Energía	Costa Rica	José Joaquín Calvo
Ministerio del Ambiente	Ecuador	David Veintemilla
Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO)	Mexico	Maria Isabel Camarena Osorno
Ministerio del Ambiente	Peru	Mirbel Epiquién Rivera Isela del Carmen Arce Castañeda Harol Gutiérrez Peralta Vanessa Ingar Elliott
National Institute of Biological Resources	Republic of Korea	Byoung Yoon Lee Tae-Kwon Noh
Federal Food Safety and Veterinarian Office	Switzerland	Ursula Moser Mathias Lörtscher
Department of Agriculture	Thailand	Duangduen Sripotar Paweena Taraksa Sumalee Thongdonae
Other international organizations		
Florida International University	United States of America	Hong Liu
International Trade Centre	Switzerland	Joe Wozniak
UNCTAD	Switzerland	Bonapas Onguglo Lorena Jaramillo Lalen Lleander Mariona Cusi Neiva Rosa David Vivas Jina Choi
UNDP	Thailand	Lisa Farroway
UNEP-WCMC	United Kingdom	Pablo Sinovas Kelly Malsch
UNECE (UN/CEFACT)	Switzerland	Markus Pikart
Private sector stakeholders		
Orquivalle	Colombia	Andrea Niessen Juan Carlos Uribe
Centro De Rescate De La Flora Amazónica	Ecuador	Omar Tello
Klaus Duerbeck Consulting	Germany	Klaus Duerbeck
Agro Oriente Viveros S.A.C	Peru	Karol Villena

Migros	Switzerland	Franziska Staubli
NuHerbs Ltd	United States of America	Wilson Lau
Traditional Medicinals Ltd	United States of America	Josef Brinckmann
BioTrade Implementation Group (BIG)	Viet Nam	Son Ta Minh
Center for Plant Conservation (CPC)	Viet Nam	Nguyen Tien Hiep
NGOs/INGOs		
FairWild Foundation	United Kingdom	Bryony Morgan
GS1 Global	Belgium	Jim Bracken
GS1 Switzerland	Switzerland	Anders Grangard
IUCN (Global Species Programme)	United Kingdom	Daniel Challender Richard Jenkins
TRAFFIC	United Kingdom	Anastasiya Timoshyna Thomasina Oldfield James Compton Chen Hin Keong
TRAFFIC	China	Zhou Fei Zeng Zhi
TRAFFIC	Viet Nam	Thuy Nguyen
Union for Ethical BioTrade	Netherlands	Rik Kutsh Lojenga
Winrock International	United States of America	Joel Jurgens
Experts		
Marcos Regis da Silva (ACTO, former-CITES staff)	Brazil	
Plant experts		
Kadoorie Farm and Botanic Garden	Hong Kong SAR, China	Stephan Gale
Xishuangbanna Tropical Botanic Garden, Chinese Academy of China	China	Gao Jiangyun
University of Florida	United States of America	Lorena Endara
Tradmed	United States of America	Josef Brinckmann
Royal Botanic Garden Sydney	Australia	Nathalie Nagalingum
Royal Botanic Gardens Kew	United Kingdom	Noeleen Smyth
Lancaster University	United Kingdom	Jacob Phelps
University of Kent	United Kingdom	Amy Hinsley

ANNEX 2: TRACEABILITY RECOMMENDATIONS FROM THE ORNAMENTAL PLANTS' STUDY (Lehr, 2016a)

It is recommended that parental stock at each nursery should be registered. Ideally parental plants are identified uniquely; alternatively, batches of parental plants can be grouped together. All additions to parental stock must be recorded together with the source of the material. Ideally, this register should be available online.

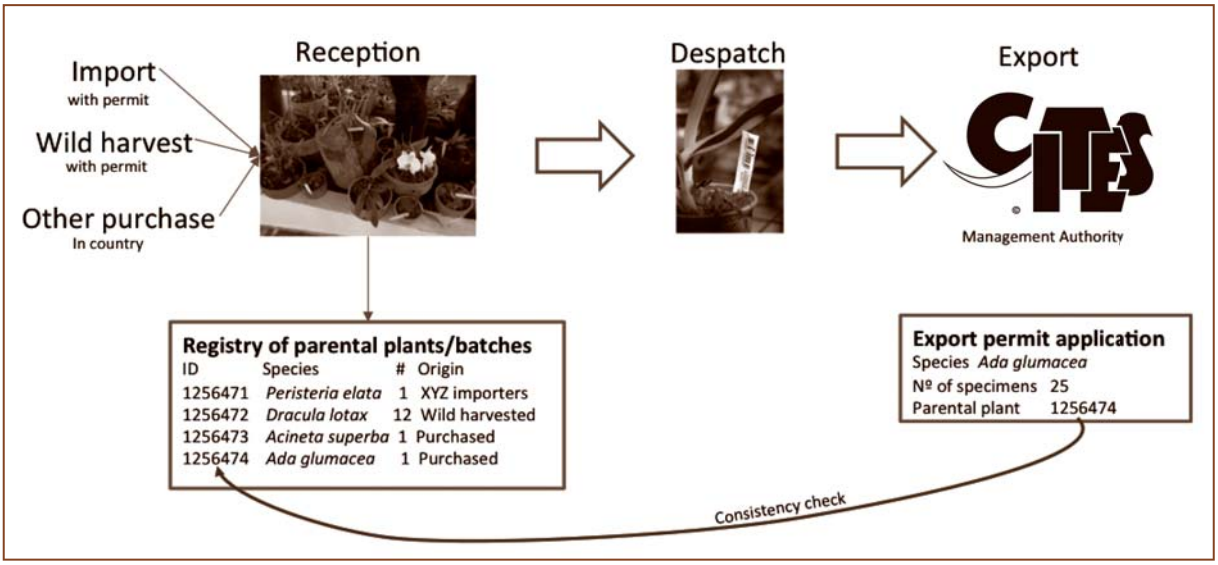
In a CITES permit application for the export process, a link must be established between the exported specimen(s) and the parental plants stock. For whole plants, it would be expected at an individual level. Alternatively, batches of plants from the same parental plant can be grouped together. For other products, such as plants parts, multiple source parental plants are possible. The corresponding CITES Management Authority can then run consistency checks to support the LAF. Since species identification is difficult, adding pictures to the registry would further help ensure that the material going through the export process is indeed the species for which the permit is valid.

A legal origination process for ornamental plants consists of the following steps (see Figure A2.1):

1. All receptions of CITES-listed ornamental plants, plant parts and seeds recorded with:
   - ◊ Date;
   - ◊ Supplier (name, business registration number or similar);
   - ◊ CITES permit information (if applicable);
   - ◊ Species;
   - ◊ Number of specimens; and
   - ◊ Identification codes (see point 2).
2. Registration of parental plants, i.e. specimens collected from the wild and plants purchased for propagation:
   - ◊ Plants of the same species can be registered as a batch if their origin is the same (i.e. they come from the same supplier under the same CITES permit);
   - ◊ This also applies to seeds and plants parts;
   - ◊ Preferentially, however, whole plants should be individually identified; and
   - ◊ All identifiers should be globally unique and must be unique within the context of the operator.
3. Inventory of parental plants, seeds and plant parts registered, ideally in an electronic system. It should be technically possible to identify these plants by using a plastic tag or printable label on the plant pot. This tag or label contains all relevant information either explicitly or through an identification code that links to an entry in the online registry.

See Lehr (2016a) for further details.

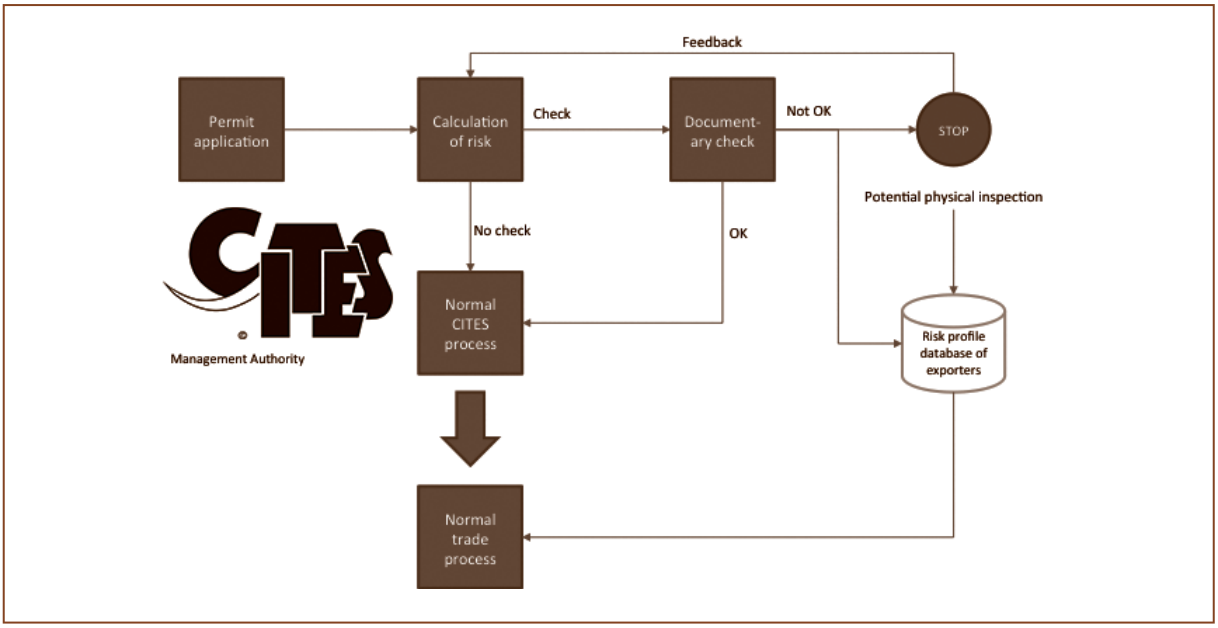
Figure A2.1 Recommendations for a traceability system for ornamental plants under CITES Appendices II and III



Source: Lehr, 2016a.

Moreover, to further strengthen the CITES process, the traceability system could be combined with a risk management methodology to define whether to check a particular shipment or exporter (see Figure A2.2). This means that authorities would need to calculate the risk for the export processes considering different factors, as for example the exporting history of that specific exporter (see Table A2.1). This could encourage exporters to be legal and, at the same time, use control resources efficiently. This could also contribute to creating a risk profile database for exporters that can be shared with border control for their own risk management and control processes.

Figure A2.2 Risk management-based process to decide verification level



Source: Lehr, 2016a.

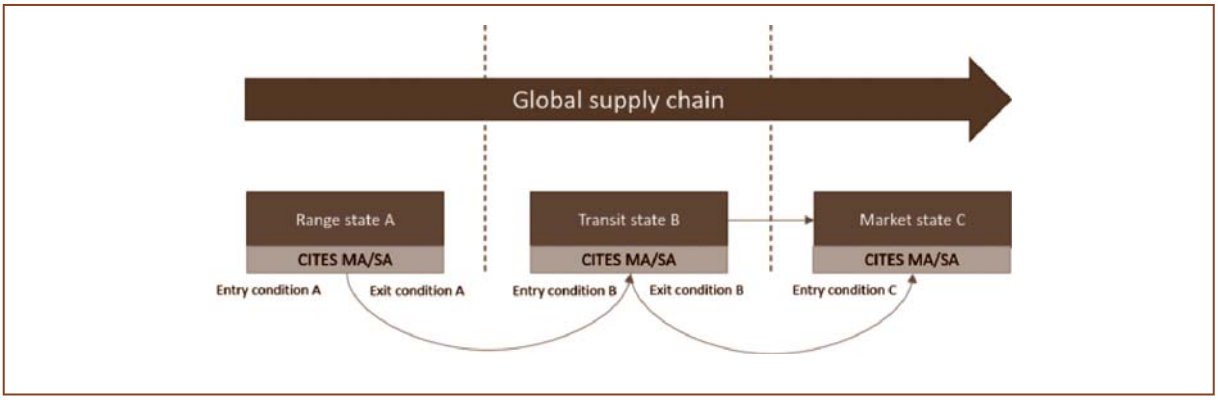
Table A2.1 Example of quality assurance using a risk-based control methodology

Factor	Inspection	Documentary check	Control frequency	
			Higher	Lower
Total number of exported plants higher than expected	Yes	Yes		
Number of plants inconsistent with inventory	Yes	Yes	X	
High number of imported plants	No	Yes		
Main exported species of exporter	No	No	X	
Any certificate issues in last 12 months	No	No	X	
Last control favourable	No	No		X
Parent plants identified individually	No	No		X
…				

ANNEX 3: TRACEABILITY RECOMMENDATIONS FROM THE MEDICINAL PLANTS' STUDY (Lehr 2016c)

The recommended traceability system for medicinal and aromatic plants confirms the view expressed in the study of ornamental plants that the supply chain should be broken down into management units pertaining to a CITES Management Authority, as shown in Figure A3.1.

Figure A3.1 Breakdown of the supply chain into units managed by one CITES Management or Scientific Authority



Source: Adapted from UNECE, 2016.

This means that traceability information is collected only within the realm of a CITES Management Authority and not exchanged or made available with other authorities. The aim of the traceability system is to support CITES managerial decisions and to strengthen CITES permits and certificates.

The recommended traceability system differentiates between four different traceable assets:

- Unprocessed MAPs;
- Processed MAPs without mixing species;
- Products containing MAPs; and
- Finished products packaged and ready for retail.

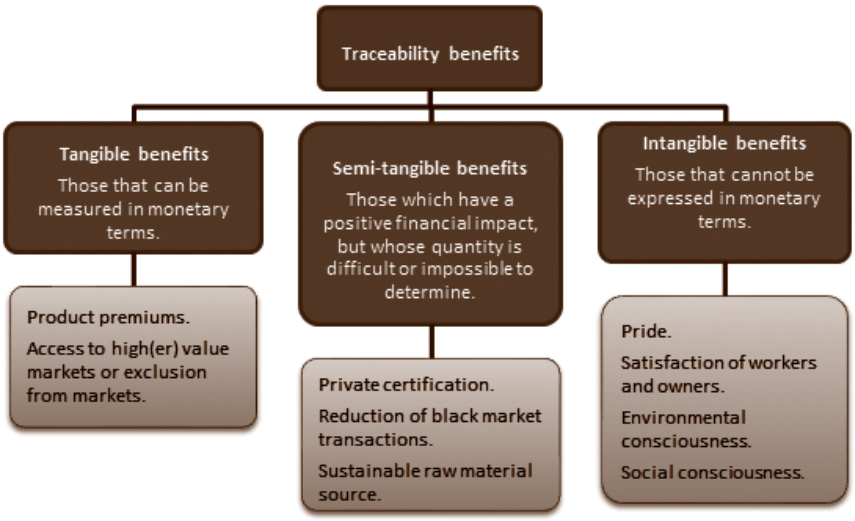
It proposes to exercise different levels of control over the four different types of assets. Raw materials, i.e. unprocessed MAPs are to be closely controlled in the same fashion as specified for ornamental plants. All operators will have to obtain an operating permit. Wild collectors must record collection dates, areas and amounts. Nurseries must document receptions (from collectors or other nurseries), keep a record of parent plants and link any exports to the corresponding parental plants.

First-level processed MAPs (i.e. where species are not mixed) are recommended to be controlled via a mass balance system, i.e. operators will need an operating permit and file an annual report detailing amounts of unprocessed MAPs purchased (per species) and amounts of processed products produced. Issuance of a renewed operating licence will depend on reasonable values of that ratio.[14]

Further processed MAPs, e.g. in the form of recipes, i.e. where mixing occurs naturally and different species of MAPs, including several CITES-listed species, might occur, are to be controlled via a chain-of-custody type of system. Operators will need an operating licence and need to file an annual report detailing their suppliers. All suppliers need to have a valid operating licence. Voluntarily, operators may specify volumes purchased from their suppliers.

Finally, products ready for retail might receive a different treatment. Discussion during CITES CoP17 considered whether to change the annotation for orchids and exempt finished goods ready for retail; this is a very difficult and complex issue. For some CITES-listed species this annotation already exists. The traceability system allows for

Figure A3.2 Potential benefits of private operators participating in the traceability system



the possibility to exempt consumer goods manufacturers from control; for species to which such an annotation does not exist, rules for products containing MAPs apply, i.e. operators would need an operating permit and file an annual report about their suppliers.

Special arrangements are considered for small-scale collectors or nurseries. Small-scale primary producers will not have to keep records; instead their purchasers need to document individual receptions from them (date of collection, area of collection, amount). It is recommended that such small-scale collectors and nurseries are excluded from international trade, since they will not be able to document legal origin of their materials. If such small-scale operators wish to export, they will have to subject themselves to the dispositions laid out above.

The system is summarized in Table A3.1.

The proposed system attempts to find a good balance between control and burden to the supply chain. Sustainable trade in MAPs should not be disrupted by too much control; on the other hand, illegal and informal trade in MAPs diminishes the livelihoods of local communities. The potential benefits of a traceability system for private operators can be seen in Figure A3.2.

In order to implement such a relatively complex system successfully, the motivation of the private sector is essential. For this it is of paramount importance that the system provides clear benefits to the operators. In general, benefits can be differentiated into tangible (i.e. monetary benefits), semi-tangible benefits (i.e. those where measuring the exact monetized impact is difficult) and finally intangible benefits which appeal to other than economic sentiments. Ideally, a system would have all three such benefits.

To understand the full socioeconomic impacts arising from the use of a traceability system, a practical pilot project is necessary, since costs and benefits are not easily estimated based on theoretical deliberations. Forming partnerships with a wild-collected plant species standard (FairWild, Union for Ethical BioTrade or similar) and certification or similar scheme might also help to facilitate the implementation of such a traceability system by introducing financial benefits to local stakeholders, particularly small farm holders or local wild collectors.

See Lehr (2016c) for further details.

Table A3.1 Summary of the proposed traceability system

	Asset type	Type of traceability	Entry condition	Transformation rule	Exit condition (LAF)
i	Unprocessed MAPS	Batch	Operating permit. All receptions recorded: • **From wild:** Collection date, species and quantities recorded. • **From other entities:** Date, species and quantity.	**Artificially propagated:** Registry of parent plants. Propagated plants linked to parent. Annual report with total quantity harvested or sold.	Trader holds a valid operating permit. Has filed the annual report the year before. Can demonstrate upon request purchase records.
i	Unprocessed MAPS (small-scale operators)	Batch	No operating permit. No record-keeping requirements.		Small-scale traders are not eligible for export permits.
ii	Processed MAPs without mixing species	Mass balance	Operating permit.	Annual report of total purchased quantity per species and total quantity of products produced.	Trader holds a valid operating permit. Has filed the annual report the year before. The exported quantities can reasonably be substantiated.
ii	Processed MAPs (from small-scale operators)	Reception control Mass balance	Record sales date, species, weight and price.	Annual report of total quantity per species from small-scale collectors.	
iii	Products containing MAPs	Chain of custody	Annual list of suppliers fulfilling dispositions above.	Voluntary: annual report of purchased and produced quantities.	
iv	Finished products packaged and ready for retail	Potentially excluded from control; otherwise chain of custody			

Notes

1 For further information, see www.biotrade.org.

2 UNCTAD is the agency within the United Nations system dedicated to the interface between trade and development, thus to promoting the development-friendly integration of developing countries into the world economy. In other words, UNCTAD is the focal point within the UN on trade and development. In 1996, UNCTAD launched the BioTrade Initiative with the aim of promoting trade and investment in biodiversity as a means of furthering sustainable development. Through this initiative, UNCTAD is supporting developing countries to enhance their biodiversity sectors and create businesses that trade in sustainably produced value added goods and services to national and international markets.

3 For further information on UNCTAD's BioTrade Initiative, see www.biotrade.org.

4 SC66 Inf.66 (https://cites.org/sites/default/files/eng/com/sc/66/Inf/E-SC66-Inf-16.pdf).

5 https://cites.org/sites/default/files/eng/com/sc/66/E-SC66-34-01-Rev1x.pdf.

6 https://cites.org/sites/default/files/eng/com/ac/28/E-AC28-14-02-01%28Rev1%29.pdf.

7 Olsen P, Borit M (2013). How to define traceability. *Trends in Food Science & Technology.* 29(2):142–150. http://doi.org/10.1016/j.tifs.2012.10.003.

8 A licence that allows a company to legally operate; often renewed on an annual basis.

9 A Single Window facility, as stated by UN/CEFACT, "enables parties involved in trade and transport to lodge standardized information and documents with a single entry point to fulfil all import, export, and transit-related regulatory requirements. If information is electronic, then individual data elements should only be submitted once. This may also provide a platform for coordinating controls among the agencies involved and payment of relevant duties, taxes and fees." (UNCTAD, 2006).

10 Precision here refers to the specificity of the identification system: a system where specimens are uniquely identified is considered more precise than a system with batch identification.

11 Also called the two principles of traceability (Lehr, 2013).

12 Also called key data elements (KDEs).

13 Also called critical tracking events (CTEs).

14 Sometimes called “transformation factors”.