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The applicability of traceability systems for CITES medicinal plants with a focus on the Greater Mekong subregion

A Preliminary Assessment

Dr Heiner Lehr
UNCTAD Consultant
heiner@syntesa.eu

CITES CoP17

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BIOTRADE III FACILITATION PROGRAMME

Content

1. Methodology and timeline of the study
2. The market chain
3. The UN/CEFACT Traceability Framework
4. Certification schemes for medicinal and aromatic plants (MAP)
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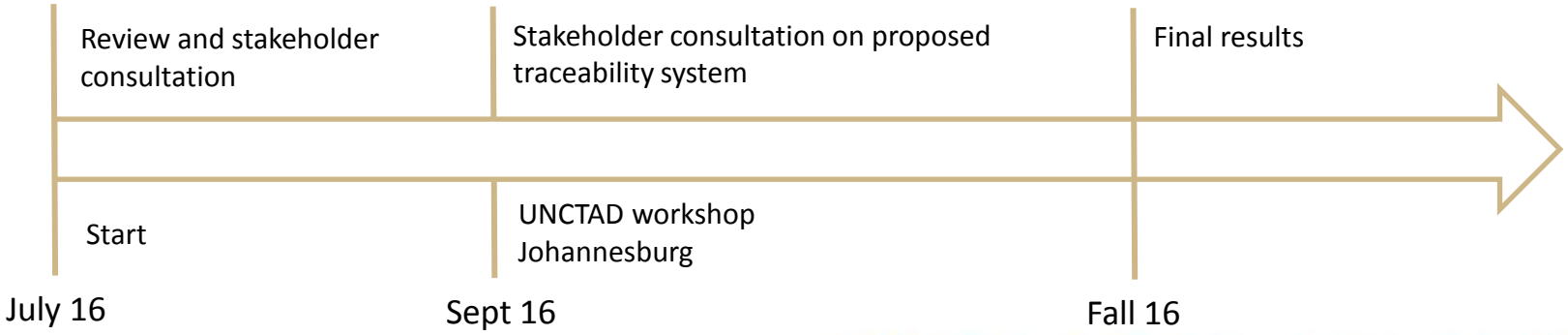
METHODOLOGY AND TIMELINE

Analysis of the use of traceability to strengthen the CITES processes for medicinal plants under Appendices II and III

- The varying technical capabilities of supply chain partners, in particular small-scale growers
- The varying availability of technologies used in traceability, in particular related to automated identification and data capture (AIDC) technologies and data exchange technologies
- The wild or artificially propagated origin of the materials as well as its applicability to derivatives
- The robustness of the system with respect to fraudulent activities involving CITES-listed species of medicinal plants
- The impact on supply chain players, in order to mitigate the risk of undue barriers to trade.

Country	
Cambodia	KH
China	CN
Lao PDR	LA
Myanmar	MM
Thailand	TH
Vietnam	VN



THE MARKET CHAIN

- 1244 CITES-listed plant species (PLANTAE) from the Mekong subregion
- This list was compared with the sub-set of the Global Checklist of Medicinal Plants (GCL-MP) of the priority 5000 medicinal plants species
- Resulting overlap of 33 CITES-listed species

Species name	App	Species name	App	Species name	App
Aquilaria baillonii	II	Dendrobium crumenatum	II	Malaxis acuminata	II
Aquilaria crassna	II	Dendrobium fimbriatum	II	Nardostachys grandiflora	II
Aquilaria grandiflora	II	Dendrobium nobile	II	Panax quinquefolius	II
Aquilaria malaccensis	II	Dendrobium officinale	II	Pleione bulbocodioides	II
Aquilaria sinensis	II	Dioscorea deltoidea	II	Pleione yunnanensis	II
Aquilaria subintegra	II	Euphorbia antiquorum	II	Podophyllum hexandrum	II
Aquilaria yunnanensis	II	Euphorbia atoto	II	Rauvolfia serpentina	II
Bletilla striata	II	Euphorbia barnhartii	II	Taxus cuspidata	II
Cibotium barometz	II	Euphorbia prostrata	II	Taxus fuana	II
Cistanche deserticola	II	Flickingeria fimbriata	II	Taxus sumatrana	II
Dendrobium candidum	II	Gastrodia elata	II	Taxus wallichiana	II

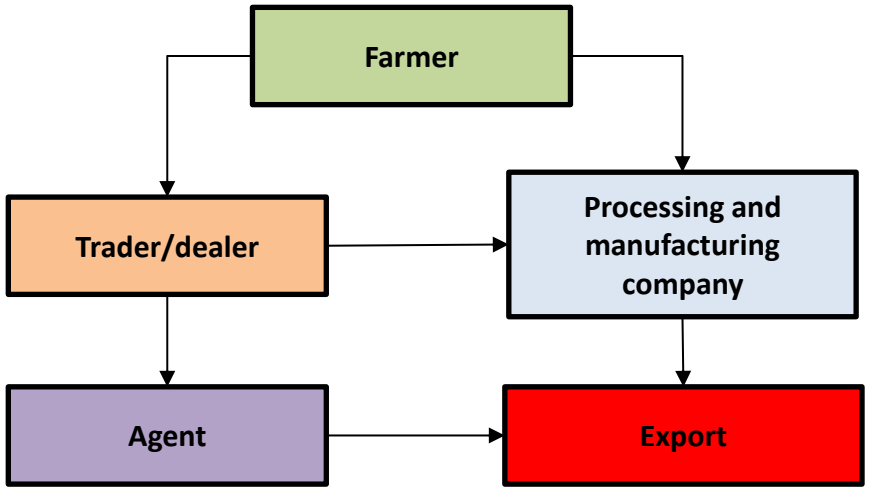
- Of the 33 CITES-listed medicinal plant species, 24 had trade reported in the period 2005-2014
- No trade in selected species was reported by exporters between 2005 and 2014 (although there are some cases where imports were reported).
- Nearly all trade was reported for commercial purposes
- Based on the initial analysis and agreement with UNCTAD BioTrade and the CITES Secretariat, the species prioritised were:
  - *Aquilaria crassna*
  - *Gastrodia elata*
  - *Dendrobium nobile* (desk-top study to link the ornamental study for traceability to this study)

Gastrodia elata

- ~90% exports of this species are from the Mekong Subregion, with >99% of exports coming from China
- 100% trade was for commercial purposes
- 100% exports and >99% re-exports were reported as derived from artificially propagated specimens
- Roots, medicine, derivatives and extract make up 90% of all trade by weight (~1,070 tonnes)
- Republic of Korea was the main destination (82%) followed by Japan (9%)
- Data suggest a shift in either trading commodity or reporting practices over the period
  - Roots and derivatives principal commodities in trade in 2005-2010
  - Extract and medicine taking their place in 2011-2014
- Importers, predominantly the USA and New Zealand, reported >90 seizures; most were extract (13 tonnes from the Republic of Korea) and derivatives and medicine (~23,500 specimens coming from China)

Use and supply chain

- For medicinal uses
  - Rhizome (tubers)
  - Aerial parts
  - Powdered dried tuber
- For cosmetic uses
  - Extract of the roots
  - Fermented root extract



- For herbal medicinal products
  - Gastrodin purified from extracts rhizomes
- The selected finished products containing *Gastrodia elata* in the European market include cosmetic and medicinal products

Aquilaria crassna

- 100% exports of this species are from the Mekong Subregion
- >95% trade was for commercial purposes
- >99% exports and 75% re-exports were reportedly derived from artificially propagated specimens
- >3 million live specimens were exported from Thailand and Vietnam, destined mainly for Indonesia, China, Lao PDR and Myanmar
- Powder (926 tonnes), sawn wood (308 tonnes), chips (254 tonnes) and logs (46 tonnes) were the main commodities in trade by weight
- For powder and chips, Thailand and Vietnam were the principal exporters, and Taiwan, Province of China, Saudi Arabia, Malaysia, China and United Arab Emirates (UAE) the principal importers
- For sawn wood/logs, Thailand was the principal exporter, and Taiwan, Province of China, mainland China and Saudi Arabia the principal importers
- There were no reported exports of *Aquilaria crassna* from Lao PDR but it was reported as source country in several import and re-export records

Use and supply chain

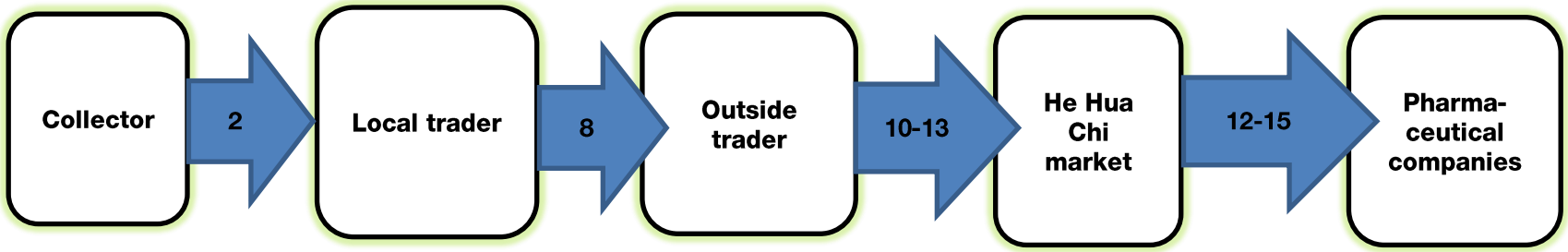
- Agarwood (eaglewood, oudh and gaharu) is used in perfumes, traditional medicines, incense, and as an essential oil, distilled from the wood
- Four principal ways that pure agarwood is traded
  - Resinous timber and wood chips,
  - Distilled oil for perfume
  - Exhausted powder for incense.
  - Raw agarwood can be an end use product or used for carvings, e.g. prayer beads.

Dendrobium nobile

- ~26% exports of this species are from the Mekong Subregion, of those over 88% of the exports coming from China
- 99.78% of trade was for commercial purposes
- Live, roots and dried plants make up 97% of all trade by weight (~26.54 tonnes)
- Singapore was the main destination (97%) followed by Republic of Korea (2.33%). Both these destinations were the recipients of 2 large orders in 2009 and 2013
- Data suggests that reporting practices are inconsistent though live plants and stems have been the predominant items recorded and exported with ad hoc sales of derivatives, dried plants and roots recorded up until 2008.

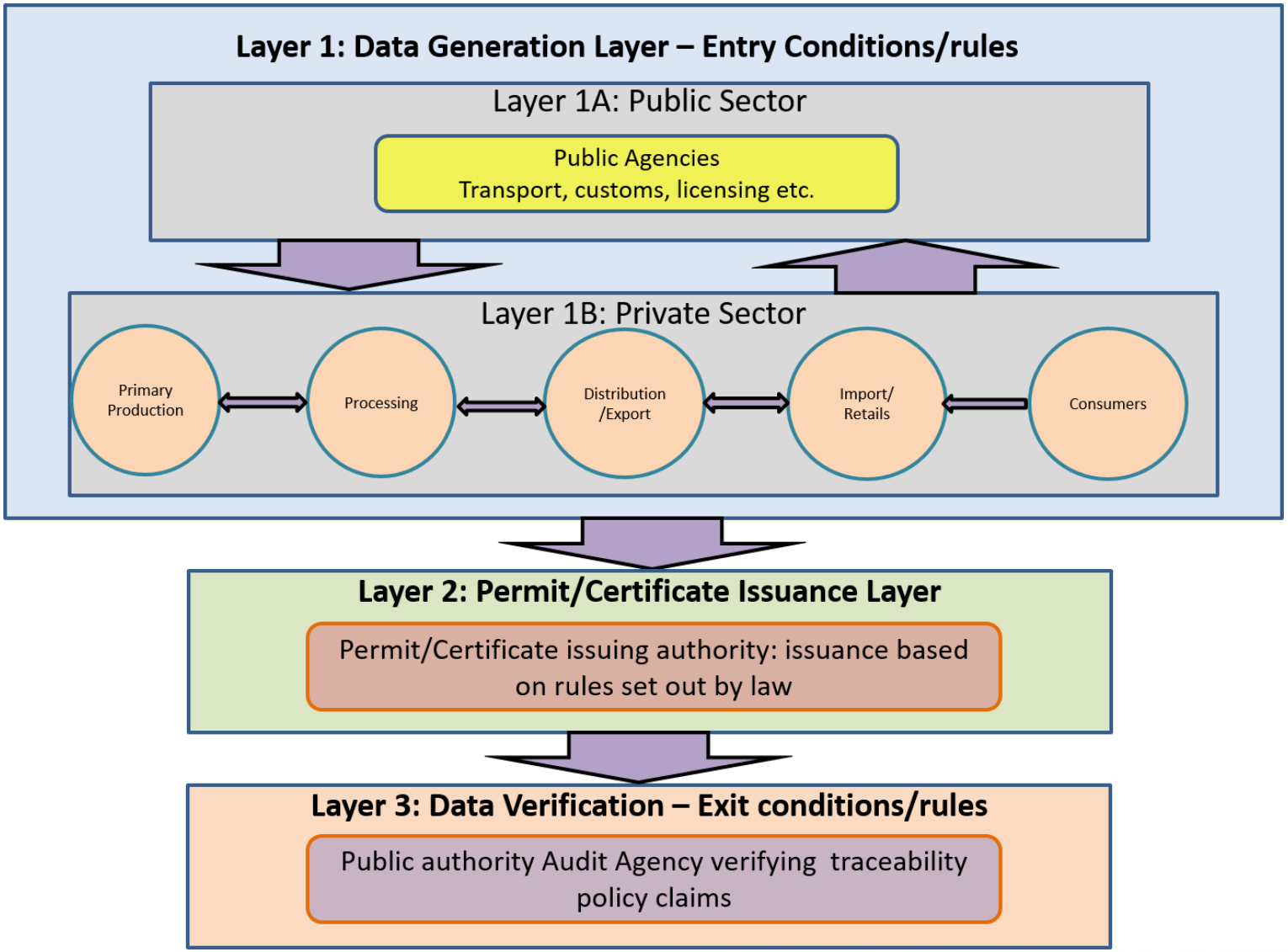
Use and supply chain

- Used both ornamentally and medicinally
- Has been used in Chinese medicine for many centuries to treat illnesses such as fever, diabetes, infection and cancer.
- *Dendrobium nobile* is used in medicinal products, cosmetic products and food and dietary supplements for improving athletic performance



Simplified trade chain for Schisandra sphenanthera in Pingwu County and Chengdu, Sichuan, China (Numbers indicate purchase/sale price in CNY/kg in 2009. He Hua Chi market is in Chengdu)

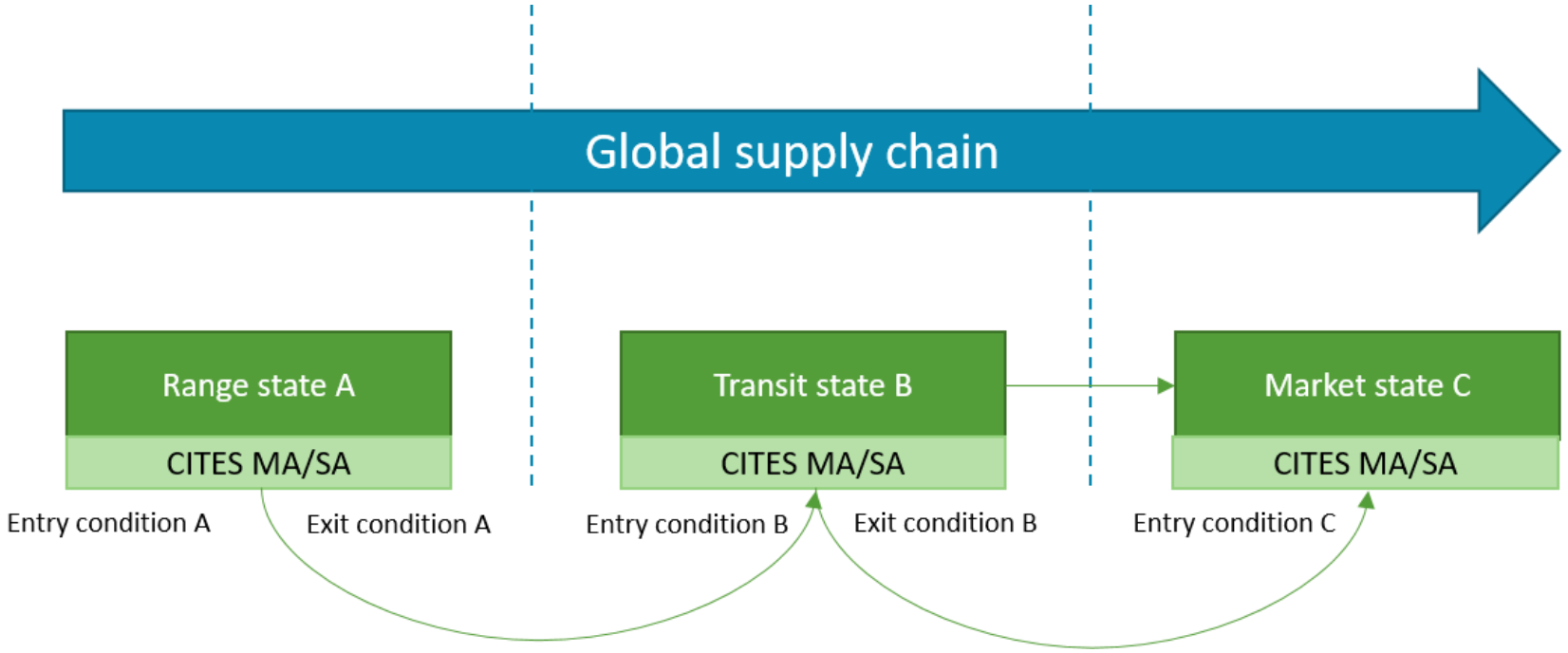
THE UN/CEFACT TRACEABILITY FRAMEWORK


Layer 1: Data Generation Layer – Entry Conditions/rules
Layer 1A: Public Sector
Public Agencies
Transport, customs, licensing etc.
Layer 1B: Private Sector
Primary Production
Processing
Distribution /Export
Import/ Retails
Consumers
Layer 2: Permit/Certificate Issuance Layer
Permit/Certificate issuing authority: issuance based on rules set out by law
Layer 3: Data Verification – Exit conditions/rules
Public authority Audit Agency verifying traceability policy claims

What is public sector traceability?

- The statement to be supported by traceability system is called a **Policy Claim:**
  - *"A policy claim is a high level statement, usually about an intangible feature or a process that is associated with a traceable asset that requires tracing of a supply chain and is supported by data collection"*
- Traceable Asset = "that which is under consideration" in other traceability definitions
- **Traceability** is then defined as:
  - *"The ability of substantiating a Policy Claim that implicates a Public Authority via the collection of relevant data-sets along supply chains for cross border trade."*

Full chain traceability

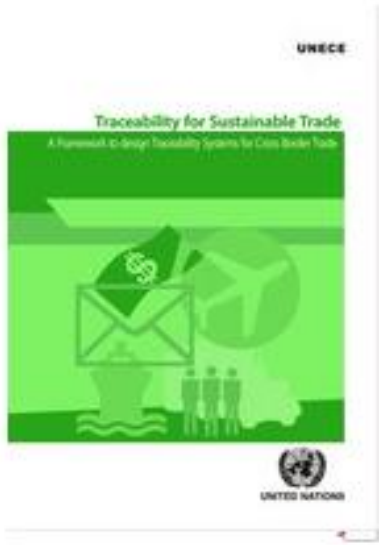


http://www.unece.org/index.php?id=43763

- Entry point: origination process with respect to the Policy Claim
- Exit point: a Traceable Asset leaves the realm of the Policy Claim
- Each entry/exit point has an entry/exit condition
- Between entry and exit points there are **transformation rules**

Implementation of public sector traceability systems

- Feasibility Study
- Business Process Analysis (Baseline)
- Master Plan
  - Vision Statement
  - Define Scope
  - Define Objectives
  - Define Benefits
  - Steering Committee (Governance)
- Data Management
- Traceability Management



Traceability for Sustainable Trade: A Framework to design Traceability Systems for Cross Border Trade (ECE/TRADE/429)
Published: September 2016

http://www.unece.org/index.php?id=43763

CERTIFICATION SCHEMES FOR MEDICINAL AND AROMATIC PLANTS

- The FairWild Standard
  - ensure the continued use and long-term survival of wild species and populations in their habitats
  - respecting traditions and cultures
  - supporting the livelihoods of all stakeholders by benefit-sharing throughout the value chain.
- Full traceability of goods and finances are the basic principles of the standard (Principle 10)
  - *Applying Responsible Business Practices: Collection of wild resources shall be undertaken to support quality, financial and traceability requirements of the market without sacrificing sustainability of the resource*
- Key systems and documents to demonstrate the implementation of traceability requirements include:
  - Traceability system (labels; harvest, processing and sales records).
  - Storage labelling.

Key traceability requirements

- Market needs identified (e.g. buyer orders, specification sheets etc.)
- Buying records are reliable and adequate, with details of collectors' name, quantities and collection area. Collectors are issued receipts.
- Documentation of central processing/packing activities to allow traceability of batches is adequate.
- An effective system that ensures traceability to collection area is established.
- Labelling procedures, well documented purchase and sale of products under the certification scope (as relevant) are established.
- If certified, the status of the products is indicated on the invoices and shipping documents.

Implementation of the standard

- The FairWild Standard has been implemented in a variety of countries globally, among them India, China, Vietnam, Lesotho, Namibia, Cambodia, Brazil, Bosnia and Herzegovina and Nepal
- In addition to its uptake by industry, the Standard is implemented in other scenarios, including through TCM supply chains in China and for harvesting of traditional Vietnamese medicine ingredients
- At the moment FairWild certification is not applied to CITES-listed species in spite of interest

Latest list of FairWild-certified operators available:
http://www.fairwild.org/publication-downloads/other-documents/FairWild_species_products.pdf

Union for Ethical BioTrade (UEBT)

- Aims to contribute to a process of market transformation in the cosmetics, food and natural pharmaceutical sectors
- Provides a model and platform for businesses to contribute to local development and biodiversity conservation
- Promotes private sector engagement in the sourcing of natural ingredients
- Guides company practices and drives sustainable business growth, local development and biodiversity conservation
- Brings together companies and non-private sector organisations committed to Ethical BioTrade
- Has over 40 member companies in approximately 15 countries with:
  - Over 80 suppliers certified against the Ethical BioTrade standard around the world
  - 260 natural ingredients from agroforestry, wild collection and agriculture.
- Member companies may:
  - Collect or grow plant material (for example, through wild collection, agroforestry or agriculture)
  - Produce plant-based ingredients such as extracts, vegetable and essential oils, tinctures, and active ingredients, or conduct research and development on new ingredients and products

The UEBT Standard defines:

- Practices that promote biodiversity conservation by maintaining and restoring ecosystems and by using biological resources sustainably
- Practices that aim to contribute to local development by equitably sharing the benefits generated through the use of biodiversity.
- Practices that seek to respect human rights, the rights of workers and local and indigenous communities, and other rights linked to natural resources
- Practices that address sourcing risks and improve the economic viability of companies and their products, so that Ethical BioTrade companies and their supply chains are sustainable in socio-economic terms

Implementation – UEBT/UTZ Herbal Tea Program:

- UEBT certifies the herbs used for tea, and UTZ traces them from producer to the shelf.
- Core component of this program is the traceability requirements
- These requirements must be adhered to for supporting an audit process to verify claims and confirm certification
- Must ensure that a traceability system is in place and functioning at all levels in the Supply Chains
- Critical control points in the supply chains must be identified and monitored
- Ensure Ingredient(s) subject to certification can be traced from source of origin via the UEBT Member to its client

Ethical Biotrade Principles

- Biodiversity conservation
- Sustainable use
- Fair and equitable benefit sharing
- Socio-economic sustainability
- Legal compliance
- Respect for the right of actors
- Clarity about land tenure

Key traceability requirements

Applied to UEBT members and certified suppliers which are externally audited stipulating that:

- The organisation knows & documents the flow of natural ingredients used within its own operations
- The organisation sets critical control points to monitor traceability within its organisation & supply chains

TRACING MEDICINAL PLANTS

Why traceability?

Benefits

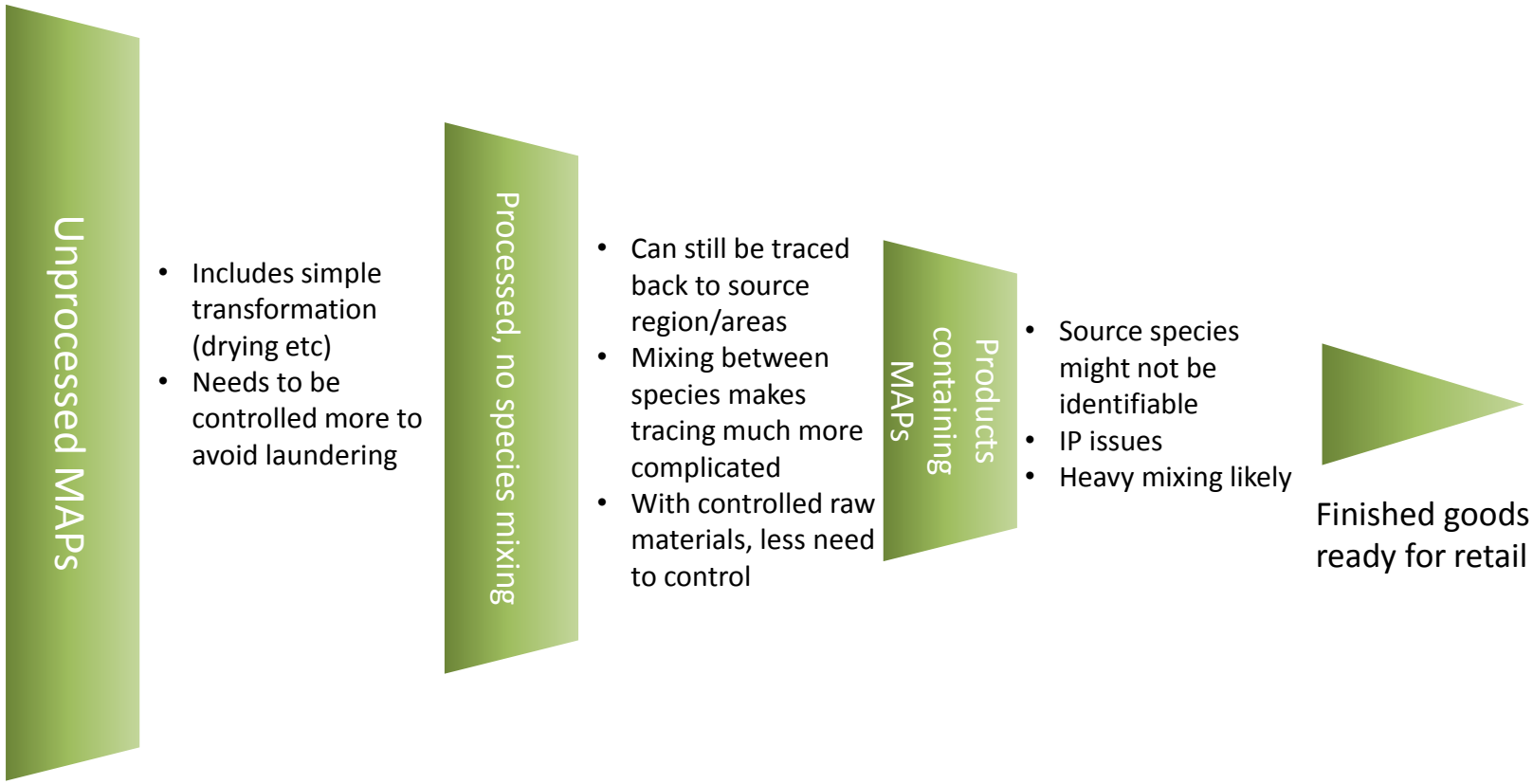
- Improved compliance, especially on legal acquisition and non-detrimental trade
- Proof of legal origin of a specimen
- Data for use in non-detriment findings and key indicators
- Prevention of laundering
- Ability to track and trace a specimen throughout the entire supply chain
- Increased confidence in the supply chain
- Improvements to CITES processes and procedures

Challenges

- A portion of the medicinal plant trade is illegal, unregulated and/or unreported
- There is also evidence of informal trade
- Medicinal plant supply chains are quite complex
- Medicinal plants are often a minor ingredient if measured by weight
- Making laundering more difficult can drive informal chains into illegality

Framework element	Definition	Process	Description
Policy Claim	The statement that the traceability system supports	Internal, but ideally coordinated with other Parties	Policy Claim example: "Medicinal and Aromatic Plants (MAPs) are harvested and traded in accordance with applicable national and international rules and regulations. In particular, CITES-listed MAPs and products thereof [destined for export] can be traded only if legally acquired and where such trade will not be detrimental to the survival of contained species. Records must be kept by all operators to demonstrate legal acquisition, whereas non-detrimental levels of trade will be determined by the corresponding Competent Authority." The Policy Claim therefore falls within the authority of one Party, i.e. "a State for which the Convention has entered into force"
Traceable Asset	Any item (object, product or service) that needs to be tracked along a supply chain at any given state or moment	Import, (re-)export and internal	i. Unprocessed MAPs ii. Processed MAPs without mixing species iii. Products containing MAPs iv. Finished products packaged and ready for retail

Level of control



Entry point conditions

Unprocessed MAPs

- Operators require a uniquely identified operating permit
- For wild harvested specimens, records must be kept on collection date, species and quantities
- For artificial propagated specimens, a registry of parent plants must be kept and all propagated plants linked to their parent plant
- An annual summary record needs to be filed with total quantity harvested or sold per species
- Small-scale collectors are excluded from [a collection permit and] harvest records

Processed MAPs without mixing species

Products containing MAPs

- See transformation rules
- Clients of small-scale operators selling Traceable Assets have to record sales date, species, weight and price. An annual report must be filed with total purchased quantity per species from small-scale collectors.

Finished products packaged and ready for retail

- Potentially excluded from CITES control; see discussions at CoP17

Transformation rules

Unprocessed MAPs

- Purchase records detailing supplier, species, quantity and date of purchase must be kept. An annual report has to be filed detailing total quantity of purchased material per species.
- Small-scale traders are exempt from [an operating permit and] keeping purchase records, but their sales must be recorded by their immediate clients with sales date, species, weight and price. An annual report must be filed with total purchased quantity per species from small-scale traders.

Processed MAPs without mixing species

- An annual report must be filed detailing total purchased volumes per species and total volume of products produced containing CITES-listed MAP.

Products containing MAPs

Finished products packaged and ready for retail

- A list of suppliers identified unequivocally e.g. through their respective permit numbers, must be supplied annually.
- Voluntary declaration of purchased quantities from those suppliers.

Exit: an acquisition is legal if

Unprocessed MAPs

- The trader holds a valid operating permit
- Has filed the annual report the year before
- Can demonstrate upon request purchase records
- Small-scale traders are not eligible for export permits.

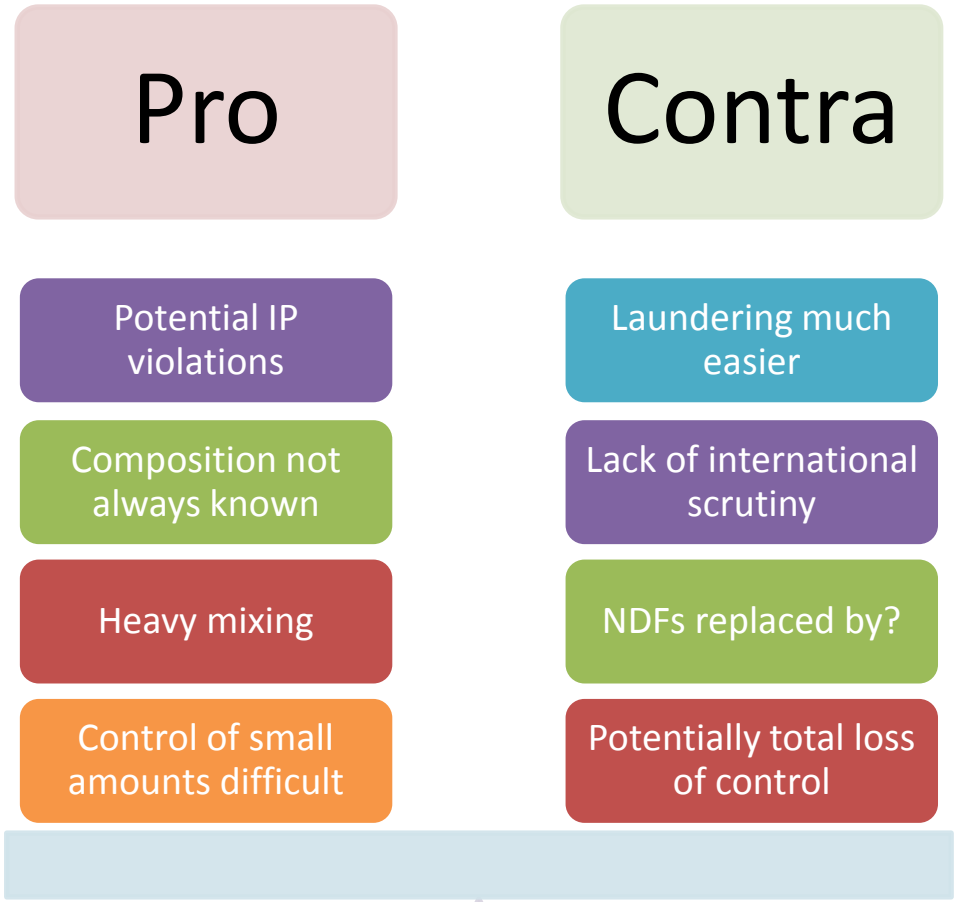
Processed MAPs without mixing species

Products containing MAPs

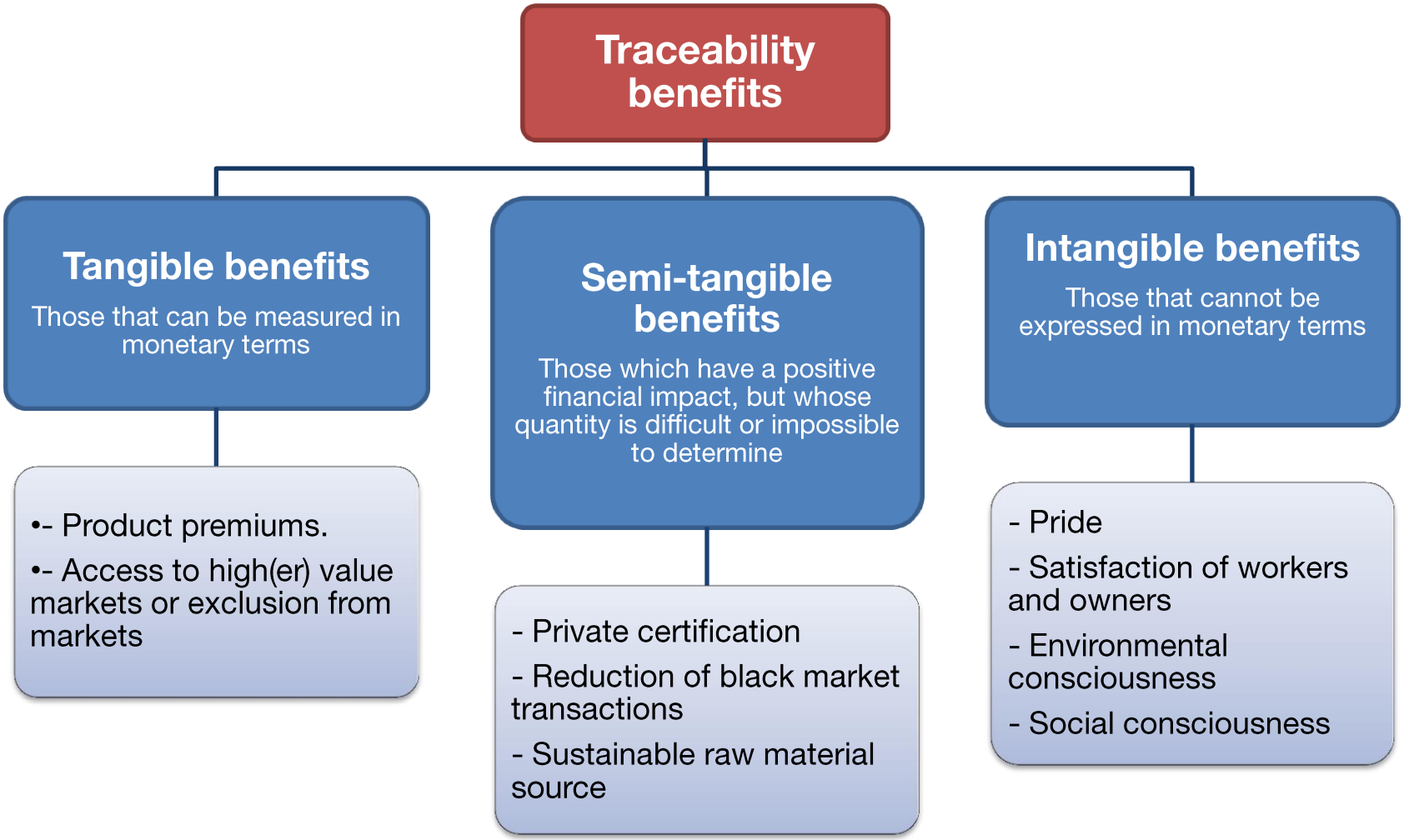
Finished products packaged and ready for retail

- The trader holds a valid operating permit
- Has filed the annual report the year before
- The exported quantities can reasonably be substantiated

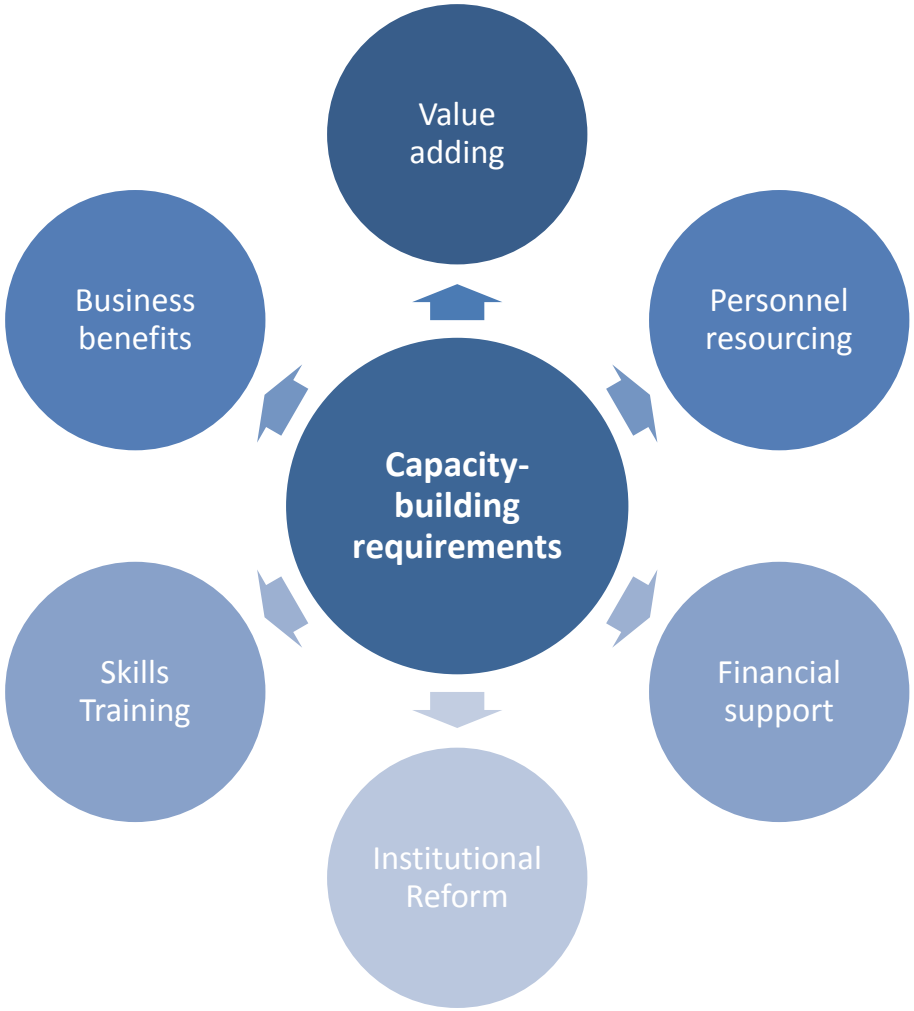
Should finished goods be exempted from CITES control?



Benefits for private sector stakeholders



Capacity-building requirements



SUMMARY AND RECOMMENDATIONS

- The implementation of traceability is a very detailed and often difficult process
  - Private sector has to have the right motivation and benefits.
- The medicinal supply chain is complex by nature due to
  - the (number of) stakeholders involved,
  - the high degree of processing
  - Illegal or poorly controlled wild harvesting and informal trade
- A robust traceability system can be implemented, e.g. based on the UNECE traceability architecture
  - Balance between the need to control and the practicalities of business
- Benefits – especially to small-scale operators – are not immediately clear
- Therefore implementation has to be approached with some care
  - Should be embedded in a more general framework of activities, such as improving trade data collection, capacity-building and awareness creation of stakeholders and information distribution on market prices and other relevant data.
- Formation of partnerships with certification schemes can be helpful
- It is essential to test the traceability system before attempting further implementation

Comparison traceability for ornamental and medicinal plants

- The traceability system designed for ornamental plants is a special case of the more generic traceability system for medicinal plants
- Both control the original source of plant material quite closely (ideally with the help of electronic systems)
- Medicinal and aromatic plant products have a much more complex supply chain
- The generic traceability system can be a model for any species and its products

Towards generic traceability principles

1	• Controls are managed within one Authority; (e-)certificates are the means of control between Authorities
2	• Each Authority shall make a Policy Claim and establish entry and exit points, as well as transformation rules
3	• Close control of natural resource, mass balance type control of derivatives is recommended. Final products may be excluded from control if provisions exist
4	• Legal origination processes need to be established via operating permits, natural resource registries and appropriate controls of wild collection, ideally in electronic format
5	• Risk management principles should be used in controlling the traceability system for effectiveness and resource efficiency

Criteria for a pilot for traceability of non-timber forest plant species

- Large and long enough to have a measurable impact
- Parties participating should be willing to collaborate and already have a control system in place;
  - ideally 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
  - Should include a country/supply chain with low technological capacity
- A socio-economic impact assessment should be made
- 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 provide better motivation to business operators

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