GUIDANCE ON TERMS RELATED TO THE ARTIFICIAL PROPAGATION OF CITES REGULATED PLANTS

Convention on International Trade in Endangered Species of Wild Fauna and Flora

Published: 2024

Prepared under contract from the CITES Secretariat by UNEP-WCMC.

Citation
CITES Secretariat (2024). *Guidance on terms related to the artificial propagation of CITES regulated plants*

Acknowledgements
The CITES Secretariat and UNEP-WCMC are grateful to Noel McGough and Uwe Schippmann for their helpful input, suggestions and guidance on the content of this document, which was finalised following review by the Secretariat and the PC25 Working Group on *Guidance on the term "artificially propagated"*. Thanks are also extended to the CITES Parties that provided information for the collation of case studies on source code Y, namely China, India, Mexico and Peru.

Cover Adobe Stock: ChiccoDodiFC #79734814

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Introduction

The Conference of the Parties (CoP) have adopted a number of Decisions on issues relating to artificial propagation of CITES regulated plants. At its 18th meeting (CoP18, Geneva, 2019) the Conference of the Parties adopted Decision 18.178 on *Guidance on the term 'artificially propagated'* as follows:

> ***18.178 Directed to the Secretariat***
>
> *The Secretariat shall, subject to external funding:*
>
> *a) commission the preparation of guidance materials for the Parties on aspects of artificial propagation including the terms 'under controlled conditions', 'cultivated parental stock' and the new source code or such terms as may be adopted at CoP18, to supplement the publication* A Guide to the application of CITES source codes*;*
>
> *b) report to the Plants Committee at its 26th meeting on progress on paragraph a); and*
>
> *c) after review and revision by the Plants Committee, if directed by the Plants Committee, publish the final guidance on the CITES website.*

This guidance, which addresses paragraph a) of Decision 18.178, aims to explain the terminology used[1] in the Resolutions relevant to source codes A, D and Y and to help CITES Authorities understand how these Resolutions are applied to plants.

At CoP19, the Conference adopted the Decision 19.182 as follows

> ***19.182 Directed to the Secretariat***
>
> *The Secretariat shall, subject to external funding:*
>
> *a) revise, also considering recommendations made at the 25th meeting of the Plants Committee, the Preliminary guidance on terms related to the artificial propagation of CITES regulated plants to cover plant specimens derived from artificial propagation (source code 'A') or assisted production (source code 'Y');*
>
> *b) review the existing guidance materials, specifically A guide to the application of CITES source codes to ensure alignment with a finalized version of the Preliminary guidance on terms related to the artificial propagation of CITES regulated plants and report its findings to the Plants Committee for consideration;*
>
> *c) submit the draft revised guidance to the Plants Committee; and d) subject to approval by the Plants Committee, make it available to Parties in all working languages of the Convention.*

The guidance, which was updated in 2024 in line with this is complementary to the *Guide to the application of CITES source codes*[2].

Current Resolutions that are core to issues relating to artificial propagations are Resolution Conf. 11.11 (Rev. CoP18) on *Regulation of trade in plants*, Resolution Conf. 10.13 (Rev. CoP18) on *Implementation of the Convention for tree species,* Resolution Conf. 16.10 on *Implementation of the Convention for agarwood-producing taxa* and Resolution Conf. 9.19 (Rev. CoP15) on *Registration of nurseries that artificially propagate*

[1] Terminology provided is for guidance only and does not represent a legal interpretation of these terms.
[2] https://cites.org/sites/default/files/eng/prog/captive_breeding/E-Souce%20codes%20booklet%20-%20April%2017.pdf

specimens of Appendix-I plant species for export purposes. The range of source codes and purpose of transaction codes are outlined in Resolution Conf. 12.3 (Rev. CoP19) on *Permits and Certificates*.

Since the first formal definition of artificial propagation was adopted in Resolution Conf. 2.12 in 1979, the CoP amended and expanded the definition to adapt to new technologies and methodologies in propagation of CITES-listed plants, and it dealt with specific challenges by adopting new Resolutions. At its 24th meeting, the Plants Committee was invited to discuss options for a new source code and consolidate some definitions into Resolution Conf. 11.11 (Rev. CoP17) (PC 24 Doc. 16.1). An informative overview of the evolution of Resolution Conf. 11.11 (Rev. CoP18) on the *Regulation of trade in plants* is given in information document PC24 Inf.1 and on the discussions on plant productions systems in information document PC24 Inf.8. CoP18 Doc. 59.2 looked at *Source Codes for Plant Specimens in Trade* recommending a new intermediary source code between A and W to be termed Y to cover "assisted production"; the new source code was adopted in Resolution Conf. 11.11 (Rev. CoP18). CoP18 Doc. 59.1 on *Guidance on the Term "Artificially Propagated"* explored a range of issues including the need for guidance to help Parties clearly understand and apply some of the requirements around the definition of artificial propagation, in particular in relation to the terms "cultivated parental stock" and "under controlled conditions" and also guidance on the new source code Y for assisted production.

Terminology

The following terms and excerpts from key CITES Resolutions form the framework for understanding how CITES interprets artificial propagation. Text in *italics* indicates a direct excerpt from the relevant CITES Resolution. A visual guide to terms and definitions is included in Annex I.

'Artificially propagated'

Resolution Conf. 11.11 (Rev. CoP18), paragraph 2, *determines that the term 'artificially propagated' shall be interpreted to refer to plants specimens*[3] *that are:*

> *"a) grown under controlled conditions; and*
>
> *b) grown from seeds, cuttings, divisions, callus tissues or other plant tissues, spores or other propagules that are either exempt from the provisions of the Convention or have been derived from cultivated parental stock;"*

'Under controlled conditions'

Paragraph 1 a) of Resolution Conf. 11.11 (Rev. CoP18) adopts the following definition for the terms 'under controlled conditions':

> *a) 'under controlled conditions' means in a non-natural environment that is intensively manipulated by human intervention for the purpose of plant production. General characteristics of controlled conditions may include but are not limited to tillage, fertilization, weed and pest control, irrigation, or nursery operations such as potting, bedding or protection from weather*.

The term '*under controlled conditions'* refers to plants that are propagated and grown in a *non-natural environment* that is manipulated to promote optimal growing conditions and exclude predators and pests (see Annex I: Figures A and B). A nursery, glasshouse or monospecific *tree plantation* (see 'Trees and artificial propagation' section) are examples of *controlled conditions*. Temporary annexation or appropriation of a piece of natural or semi-natural vegetation where wild plants occur is not *controlled conditions.* Such annexation might occur when a field boundary is moved to incorporate adjacent wild habitat in which the targeted species occurs; this area then receives little or no management until harvest occurs, after which the original field boundary is restored.

The key element of the term '*under controlled conditions'* is that there is a management system in place for the cultivation of the plants in an environment which is clearly distinct from their natural habitat. Such a system may or may not involve the establishment of clear boundaries from the natural environment, but should have procedures to enhance growth and prevent loss of plants to pests and diseases. The types of interventions may differ due to the characteristics of the taxa concerned, their cultivation and their propagation systems. In cases such as desertification control and afforestation, interventions occur within natural habitats and therefore clear boundaries cannot be easily determined. A clear definition of how the term 'boundaries' applies to plants has not yet been considered by the Plants Committee; however, use of this terminology as it relates to captive breeding in accordance with Resolution Conf. 10.16 (Rev) paragraph 1 (d), provides some guidance as follows: *'a controlled environment…that has boundaries designed to prevent animals, eggs or gametes of the species from entering or leaving the controlled environment…'.* It could be assumed that a similar interpretation could apply to a limited number of highly controlled and contained plant production systems, and that such conditions would create a relatively high maintenance environment where the controls to enhance production are evident throughout the life cycle of the plants involved. In all cases, the management of such production systems would

[3] Note that this is slightly different for timber-producing trees and for specimens of agarwood, see below. Also note that for populations of Appendix-I listed species, an exception may be granted in accordance with paragraph 4 of Res. Conf. 11.11 (Rev. CoP18), see below.

be expected to have some level of record keeping in place, ensuring that the management system is maintained to an adequate level and that the plants produced are of high quality.

! Wild-collected plants are considered wild even if they are or have been maintained in *controlled conditions.* Furthermore, legally sourced wild-collected plants can be used to produce plant specimens in an *environment with some level of human intervention* (see sections on 'Source codes applicable to artificially propagated plants: A and D' and on 'Plant obtained through assisted production' pertaining to source code Y, for details).

'Cultivated parental stock'

Resolution Conf. 11.11 (Rev. CoP18), paragraph 1 b), contains the following definition for the terms 'cultivated parental stock':

> *b) 'cultivated parental stock' means the ensemble of plants grown under controlled conditions that are used for reproduction, and which must have been, to the satisfaction of the designated CITES authorities of the exporting country:*
>
> *i) established in accordance with the provisions of CITES and relevant national laws and in a manner not detrimental to the survival of the species in the wild; and*
> *ii) maintained in sufficient quantities for propagation so as to minimize or eliminate the need for augmentation from the wild, with such augmentation occurring only as an exception and limited to the amount necessary to maintain the vigour and productivity of the cultivated parental stock;*

The term '*cultivated parental stock'* refers to the ensemble of wild-sourced plants brought into cultivation and grown under controlled conditions that are used for reproduction.

The *cultivated parental stock*, which originated from wild collected material, must have been *established in accordance with the provisions of CITES and relevant national laws and in a manner not detrimental to the survival of the species in the wild*[4]. Simply stated, this stock must have been obtained legally in CITES terms (i.e. must have met the legal acquisition requirements according to CITES Resolution Conf. 18.7 on *Legal acquisition findings)* and in terms of any national laws in the country of origin (see Annex I: Figures A and B). There must be evidence that the plants have been acquired legally, for example, copies of permits, phytosanitary certificates, invoices, or authorization for collection by relevant authorities. In addition, the term *established … in a manner not detrimental to the survival of the species in the wild* indicates that a non-detriment finding is required for the parental stock that is being set up (see Annex I: Figure A).

The term '*cultivated parental stock'* is used in order to indicate that some addition of fresh wild collected plants is permissible following the establishment of the original parental stock. This should occur only *as "an exception and be limited to the amount necessary to maintain the [genetic] vigour and productivity* of the *cultivated parental stock".* Clearly, such addition of wild plants needs to be managed, limited, legally acquired and not detrimental to the survival of the species in the wild if the plants are to be considered *cultivated parental stock*.

Resolution Conf. 11.11 (Rev. CoP18) does not indicate what frequency of addition of fresh stock is appropriate, nor what level of addition is appropriate. Requirements can differ between the wide range of plant groups included in the CITES Appendices, and it is left to the relevant Scientific Authority to give appropriate advice. In practical terms, the Scientific Authority can base their advice on information supplied by experts (such as horticulturalists from a botanic garden) on the plant group concerned and, for example, by liaising with other Parties that have addressed the same issues. Such addition of fresh stock should be *an exception and limited.*

[4] Paragraph 1, b i) of Resolution Conf. 11.11 (Rev. CoP18).

Source codes applicable to artificially propagated plants: A and D

Codes 'A' and 'D' are used on permits and certificates to indicate the source of artificially propagated plant species. In both cases, plants are artificially propagated in accordance with the definitions contained in Resolution Conf. 11.11 (Rev. CoP18), paragraph 1 a) and b); however, the decision on applicability of the two source codes relies on an assessment of the purpose of the propagation (commercial or non-commercial), consideration of Articles VII, paragraphs 4 and 5[5] and is dependent on the CITES Appendix, noting that artificially propagated hybrids of unannotated Appendix I plant species are to be treated as Appendix II plant species.

Resolution Conf. 12.3 (Rev. CoP19), paragraph 3, j) recommends that source codes A and D be used to indicate the following source of the plant specimens:

> **A** '*plants that are artificially propagated in accordance with Resolution Conf. 11.11 (Rev. CoP18), as well as parts and derivatives thereof, exported under the provision of* ***Article VII, paragraph 5*** (*specimens of species included in Appendix I that have been propagated artificially for 'non-commercial purposes', and specimens of species included in Appendix II and III)*';
>
> **D** *'Appendix-I plants artificially propagated 'for commercial purposes', as well as part and derivatives thereof, exported under the provisions of* ***Article VII, paragraph 4****, of the Convention'*.

Concerning Article VII paragraphs 4 and 5 of the Convention:

- **Article VII, paragraph 4** states: '*specimens of a plant species included in Appendix-I artificially propagated for commercial purposes, shall be deemed to be specimens of species included in Appendix II.'* This means that those specimens can be traded under Article IV and r purpose code T (commercial purpose), while still being subject to a non-detriment finding (see Table 1).
- **Article VII, paragraph 5** states: '*Where a Management Authority of the State of export is satisfied that any specimens of ... a plant species was artificially propagated…a certificate by that Management Authority shall be accepted in lieu of any of the permits or certificates required under the provision of Articles III, IV and V*'. This means that certificates of artificial propagation can be used instead of permits; a non-detriment finding is not required prior to export of specimens but is still needed for the acquisition of the founder stock (see Table 1 for details).

Application of source code 'D' – a comparison between animals and plants

As it relates to animal specimens, Resolution Conf. 12.3 (Rev. CoP19) recommends that source code D should be used by Parties when trading '*Appendix-I animals bred in captivity for commercial purposes in operations included in the Secretariat's Register in accordance with Resolution Conf. 12.10 (Rev. CoP15)* on *Registration of operation that breed Appendix-I animal species in captivity for commercial purposes*. Parties that wish to export captive-bred animals of Appendix I species for commercial purposes should therefore register the relevant operations with the CITES Secretariat in order to qualify for the use of source code D.

Resolution Conf. 12.3 (Rev. CoP19) indicates that source code D should be used for Appendix I plants artificially propagated for commercial purposes, it does not specifically refer to Resolution Conf. 9.19 (Rev. CoP15) on the *Registration of nurseries that artificially propagate specimens of Appendix-I plant species for export purposes,* meaning that the approaches are different for plant and animal taxa. This distinction is reflected in the preamble of Resolution Conf. 9.19 (Rev. CoP15), which recognizes that '*the artificial propagation of plants is essentially different from captive breeding of animals, in particular with regard to the number of specimens produced, as well, in most cases, with regard to the time span between generations'.*

Resolution Conf. 9.19 (Rev. CoP15) outlines the procedure for the registration of nurseries that artificially propagated specimens of Appendix-I plant species for commercial purposes. Registration is the responsibility of the Management Authority, in consultation with the Scientific Authority within the Party where the nursery

[5] Document AC31 Doc. 19.3/PC25 Doc. 21 outlined the need for further guidance on whether Article VII, paragraphs 4 and 5 could be applied sequentially.

operation is located; a Register of nurseries is maintained by the Secretariat on the CITES website. The registration process is intended to facilitate the trade by making the use of the simplified procedure for the issuance of export permits to each registered nursery[6]. Appendix I artificially propagated plants from registered nurseries need to be packed and labelled in such a way that specimens are clearly separated from wild-collected or Appendix II artificially propagated plants within the same consignment.

Furthermore, as recognized in the preamble of Resolution Conf. 9.19 (Rev. CoP15), nurseries that are not included within the CITES Register *may still continue exporting Appendix I artificially propagated specimens by using standard procedures for obtaining export permits*, thus Appendix I plants that were artificially propagated for commercial purposes in nurseries not included in the CITES Register for can still be exported under Article VII, paragraph 4, using source code D.

If a nursery artificially propagates Appendix-I plants **from wild seeds or spores** for export, the nursery concerned should be registered as an operation with the CITES Secretariat in accordance with Resolution Conf. 9.19 (Rev. CoP15). The registration process is required to allow a Party to benefit from the exception outlined in paragraph 4 of Resolution Conf. 11.11 (Rev. CoP18) on *Regulation of trade in plants* [7].

In summary:

- **Source code D** should be used for:
    - plant specimens of Appendix I species that have been artificially propagated for commercial purposes, including their parts and derivatives, ; and
    - Appendix I artificially propagated specimens grown from wild seeds or spores, in registered nurseries, for commercial purposes, within a range State (according to paragraph 4 of Resolution Conf. 11.11 (Rev. CoP18).

- **Source code A** should be used for all remaining artificially propagated plant specimens, including their parts and derivatives, in the context of the application of Article VII, paragraph 5, of:
    - Appendix I species propagated for non-commercial purposes, including hybrids derived from one or more unannotated Appendix I species[8], and
    - Appendix II and III species, irrespective of the purpose of propagation and trade.

[6] In accordance with Article VII, paragraph 4, of the Convention, and with Resolution Conf. 12.3 (Rev. CoP19), section XIII. See also the *Guidance on the use of simplified procedures, section IV*.
[7] To fulfil the exception, the Appendix I taxa must be difficult to establish as a parental stock because specimens take a long time to reach maturity, and the propagation must take place in controlled conditions in a range State, and in a nursery registered with the CITES Secretariat.
[8] Resolution Conf. 11.11 (Rev. CoP18) paragraph 6, b) iii) states that "*artificially propagated hybrids derived from one or more unannotated Appendix-I species or other taxa shall be regarded as being included in Appendix II and entitled to all exemptions applicable to artificially propagated specimens of species included in Appendix II*".

Trees and artificial propagation

As the criteria for artificial propagation laid down in Resolution Conf. 11.11 (Rev. CoP18) were originally designed with horticultural plants in mind, issues with determining source codes arose when the first commercially traded timber trees were listed. Applying these "horticultural" criteria to trees and plantations posed challenges for CITES Authorities.

The Conference of the Parties took a pragmatic approach to defining "artificially propagated" in Resolution Conf. 10.13 (Rev. CoP18) on *Implementation of the Convention for tree species* (see Annex I: Figure C) stating that [paragraph 1.f)]:

Timber or other parts or derivatives of trees grown in monospecific plantations be considered as being artificially propagated in accordance with the definition contained in Resolution Conf. 11.11 (Rev. CoP18).

! Simply stated, timber or other parts or derivatives obtained from trees planted and grown in a monospecific (single species) plantation are considered artificially propagated if the seeds or other propagules from which the trees are grown were legally acquired and obtained in a non-detrimental manner as outlined in Resolution Conf. 11.11 (Rev. CoP18). This definition of artificial propagation applies only to tree species (source codes A or D apply as described above).

Species derived from mixed tree species plantations are not discussed in Resolution Conf. 10.13 (Rev, CoP18). However, mixed tree species plantations can qualify as artificially propagated if the trees grown meet the criteria of Resolution Conf. 11.11 (Rev. CoP18), paragraph 2. If the trees do not meet the criteria for artificially propagated, they may meet the criteria for 'assisted production' (source code Y; see section on 'Plant obtained through assisted production').

Special cases and exceptions:

Araucaria araucana: The Monkey Puzzle or Puhúen tree is the national tree of Chile; it is an iconic and highly valued species for Chile's indigenous people. This tree produces large seeds – *piñones* – which are edible and an important food source. The trees are grown from wild-collected seeds in nurseries, and the resultant plants have been exported internationally since 2004. As they were grown directly from wild seeds, the Appendix I seedlings could not be legally exported for trade because they did not fulfil the then definition of artificially propagated. The Parties therefore sought a solution to support sustainable harvest and trade of the species.

! The original version of current paragraph 4 of Resolution Conf. 11.11 (Rev. CoP18) was adopted at CoP13 in 2004 based on document CoP13 Doc. 51 and related to the example of *A. araucana*. Today, paragraph 4 recommends that a limited exception may be granted for some Appendix I specimens of some long-lived, late-maturing Appendix-I species (where *for the taxon involved, the establishment of a cultivated parental stock presents significant difficulties in practice because specimens take a long time to reach reproductive age, as for many tree species*), allowing qualifying specimens to be deemed to be artificially propagated if specific criteria are met. The criteria include that the Appendix-I material is grown under controlled conditions in a range State, from propagules collected from the wild within that same range State (the country of origin of the propagules), determined by the Management Authority to be legally acquired and by the Scientific Authority to be both non-detrimental and beneficial to the conservation of wild populations. Additional specifications are found in paragraph 4 a), b) and c) of Resolution Conf. 11.11 (Rev. CoP18). Any range State using this exception is required to register the nurseries concerned with the CITES Secretariat and fulfil the criteria outlined in paragraph 4. Of Resolution Conf. 11.11 (Rev. CoP18). Nurseries using the paragraph 4 exception will be indicated as such in the CITES Register maintained on the CITES website.

***Aquilaria* spp. and *Gyrinops* spp. (Agarwood):** Agarwood specimens are highly traded CITES non-timber forest products derived from the resinous heartwood of *Aquilaria* or *Gyrinops* trees. Renowned for its aromatic and medicinal properties, trade in agarwood specimens includes extract, oils, perfumes, chips, beads and powder. The production of resinous wood can be induced through natural or artificial stress factors (e.g., bacteria/fungi-infected tree attacks, inoculation or mechanical wood injuries) (see the information box below for details on agarwood cultivation methods).

Range States of agarwood-producing tree species proposed that cultivation of the trees is very different from that of conventional forestry, and the CITES definitions of artificial propagation were inadequate. As a result, at its sixteenth meeting (CoP16, Bangkok, 2013), the Conference of the Parties adopted Resolution Conf. 16.10 on *Implementation of the Convention for agarwood-producing taxa*, including a definition of "artificially propagated specimens" specifically for agarwood-producing taxa as follows:

Regarding artificially propagated specimens

Agrees that:

a) *the current definition of 'artificially propagated' in Resolution Conf. 11.11 (Rev. CoP18) does not meet the circumstances of agarwood-producing taxa, due to the definition of the term 'under controlled conditions', and the source of parental stock is not suitable and fully complied with the plantation activities of agarwood-producing taxa; and*
b) *the source of seeds or propagules for cultivation of agarwood-producing species may be obtained from the wild according to the definition of 'cultivated parental stock' in Resolution Conf. 11.11 (Rev. CoP18);*

Adopts the following definition for terms used in this Resolution:

> *For agarwood-producing taxa, 'under controlled conditions' means in a tree plantation, including other non-natural environment, that is manipulated by human intervention for the purpose of producing plants of plant parts and derivatives;*

Determines that the term' artificially propagated' shall be interpreted to refer to plant specimens of agarwood as follow:

a) *grown under controlled conditions; and*
b) *grown from seeds, seedlings, saplings, cuttings, grafting, marcotting/air-layering, divisions, plant tissues or other propagules that have been derived from wild or cultivated parental stocks, according to the definition of cultivated parental stock in Resolution Conf. 11.11 (Rev. CoP18).*

Agrees that trees of agarwood-producing taxa grown in cultivation such as:

a) *gardens (home and/or community garden); and*
b) *state, private or community production plantation, monospecific or mixed species, shall be considered to be artificially propagated in accordance with the definition above.*

This significantly extended the definition of artificial propagation for agarwood-producing taxa; for example, agarwood derived from trees grown in gardens and mixed species plantations grown from wild-collected seeds, plants parts and sapling can be considered artificially propagated.

Resolution Conf. 16.10 should be referred to when considering the issue of artificial propagation of agarwood-producing taxa, which is currently listed in CITES Appendix II as *Aquilaria* spp. and *Gyrinops* spp. (see Annex I: Figure D).

Examples of agarwood cultivation methods

Agarwood is a long-term plantation crop; to optimize and promote the growth of heathy trees and resin production, trees are widely cultivated in plantations and agroforestry systems, were environment factors (i.e., temperature, humidity, soil condition, inoculation techniques) can be kept under control. Trees are typically propagated by seeds or coppicing, with young seedlings planted in mono-specific or mixed-tree plantations; trees are also reported to be grown in home, village or community gardens. As example, *Aquilaria malaccensis* in Indonesia is found being cultivated in palm oil, rubber, pepper and other tree species in production areas, home gardens and on private land; in Malaysia, the species is reported to be cultivated in monoculture or crop rotation systems. Often, the origin of the seedlings is reported to be mother trees located in the nearby forests.

Tree spacing in production plantation and home gardens varies (2.75 m x 2.75m in plantation, and 1m x 1m to 1.5 x 1.5 m spacing in home gardens). Wider spacing is needed when trees are planted along with suitable crop; in these cases, the harvest of agarwood takes place at the end of the crop cycle. In cases where agarwood is planted in restricted spacing, the harvest take place between 2 to 3 times in 8 to 10-year period, with the purpose to thin out the plantation and allow the remaining trees to develop. After having been planted, seedlings are assisted with staking (to keep the young plant in upright position) followed by watering, and in some instances, by fertilization. A typical plantation harvesting cycle might take ~15 years, with shorter cycles being reported producing low-quality agarwood.

Since the natural process of agarwood formation is very slow and infrequent in old trees, to meet the market demand and to preserve natural agarwood populations, different agarwood cultivation methods have been developed. These span from the more conventional, laborious but less expensive methods to the more advanced and efficient methods that use chemicals and bioinoculants to produce resin. A non-exhaustive list of agarwood cultivation methods is presented below:

Wounding-nailing: tree trunks are subject to axe wounds, the bark is removed, and by hammering, hundreds of nails are applied to the trunks;

Fungi-inoculation: drills are used to make holes of at least 8 cm deep in the trunk (horizontal line); holes are then filled with fungi cultures (i.e. fungal strains of the genera *Aspergillus* spp. and *Fusarium* spp.), and holes are then wrapped by fabrics/ rubberized textile;

Burning-chisel-drilling: burning/ red-hot iron drill of 1.2 cm are used to drill holes in the tree trunk, roots, brunches; the wounds are kept open by small plastic pipes. Wounds are then inoculated with different chemical substances and then drilled again every 2 to three months.

Whole-tree agarwood inducing technique: agarwood inducers are injected into the xylem (through a transfusion set), and then these are transported to the whole tree body forming overall internal wounds;

Partly-trunk pruning: cuts of 2-4 cm wide/ 3-5 cm deep are sawn along one side of the trunk (50 cm above the ground, with spaces of 20 cm between two cuts);

Cultivated agarwood kits: microbes are inserted in the trunk via tubes in the trunk, delivering microbes that stimulate the defence mechanisms of the trees, and therefore agarwood production;

Aeration: Similar to the drilling method, trunk wounds are kept open by aeration devices of at least 2 cm in diameter (made of bamboo, wood or other materials), with the scope to maintain the wound open to prevent healing;

Bottle dipping methods: bottles filled with inducers, are placed upside down into the holes for inoculating the tree. Bottles are connected to the wounds via the hose, and parafilm is used to prevent the spilling of inoculants.

Further information on the cultivation methods cited above can be found in: Herath & Jinendra, 2023; Talucder, Haque & Saha (2016); Liu *et al*., 2013.

Other plant tissues and propagules

Paragraph 2 b) of Resolution Conf. 11.11 (Rev. CoP18) states that artificially propagated shall refer to plant specimens that are, *inter alia*, *grown from seeds, cuttings, divisions, callus tissues or other plant tissues, spores or other propagules that are either exempt from the provisions of the Convention or have been derived from cultivated parental stock*[9]. Paragraph 3 specifies that *plants grown from cuttings or divisions are considered to be artificially propagated only if the traded specimens do not contain any material collected from the wild.*

This list of terms has been interpreted by the Parties to embrace the range of plant parts used in propagation and the range of propagation techniques. The terms *other plant tissues* and *other propagules* are not formally defined. The term *other propagules* originated from Resolution Conf 2.12 on *Regulating trade in artificially propagated specimens under the Convention*, adopted in San Jose, Costa Rica, in 1979. The means by which plants can be propagated and the range of potential source material from which plants can be reproduced has expanded dramatically since that time. The terms *other plant tissues* and *other propagules*, in effect, have been interpreted by Parties to reflect such changes. This seems practical given the expanding range of source material and procedures for artificial propagation.

In the case of CITES Appendix-I listed plants, the individual plant, "*alive or dead*" and "*any readily recognizable part or derivative*" are covered under CITES[10]. In effect, everything is covered, as long as the specimens are readily recognisable in the sense of Resolution Conf. 9.6 (Rev. CoP19) on *Trade in readily recognizable parts and derivatives*. In the case of Appendix II and III-listed plant species, specimens covered under CITES include plants "*alive or dead*" and "*any readily recognizable part or derivative thereof specified in Appendices II and III in relation to the species*". The parts and derivatives covered or exempted are specified by an annotation to the relevant listing in the Appendices. For example, in the case of the Appendix II medicinal plant *Hydrastis canadensis* (Goldenseal or Yellow root), only trade in the underground parts of the plant, as specified in the Annotation #8[11], are covered under CITES. In the example of *Hydrastis canadensis,* all other parts and derivatives are not specified and are thus not covered by the Convention.

In accordance with paragraph 2 b) of Resolution Conf. 11.11 (Rev. CoP18), source material for artificial propagation should be either exempt from CITES or *derived from cultivated parental stock.* The preamble of Resolution Conf. 11.11 (Rev. CoP18) also states that *plant specimens may legally enter international trade under exemptions from the provisions of CITES, provided by an annotation, and that the qualification for such an exemption may cease outside the country of origin.* Propagules are, in fact, often exempted by annotations; for example, plants annotated with Annotation #4 exempts *seedling or tissue cultures obtained in vitro, transported in sterile containers* [paragraph b)]. In such cases where plants are grown from legally imported exempt seedlings or propagules, it would be the responsibility of the country of export to determine whether the plant specimens intended for export meet the definition of artificially propagated plants. Therefore, this stock should be managed under the terms of Resolution Conf. 11.11 (Rev. CoP18).

'Plant obtained through assisted production' – Source Code Y

'*Plant obtained through assisted production'* refers to a plant or parts or derivatives thereof that does not meet the definition of artificial propagation and therefore does not qualify for source code A. However, it is not a wild plant because it was propagated or planted in an environment with some human intervention in its cultivation or production; therefore, it does not qualify for source code W either.

An example of 'assisted production' could be bulbs grown in a hillside field in the Caucasus as a second crop under maize. In this situation, the parent stock has been originally sourced from the wild (exact timing unclear); there is some management by local people; and harvest of the bulbs takes place after the maize has been cleared. There is limited record keeping, and the boundaries with nearby wild populations may not be fully clear. The bulbs reproduce very well in these partially managed cultivation fields and are harvested and sold to middlemen acting for bulb exporters. A similar situation may occur, for example, for orchids grown within a

[9] Paragraph 2, b of Resolution Conf. 11.11 (Rev. CoP18).
[10] Article 1 (b) (iii) of the text of the CITES Convention.
[11] Annotation #8: Underground parts (i.e. roots, rhizomes): whole, parts and powdered.

village garden in South-East Asia – where epiphytic orchid stock is collected from natural habitat and is cultivated on trees and rocks adjacent to a village.

In both examples outlined above, the criterion of "controlled conditions" is not met. However, .

The Conference of the Parties at its 18th meeting (CoP18, Geneva 2019) amended Resolution Conf. 11.11 (Rev. CoP18)[12] to address the plant production system that is described as '*plants obtained through assisted production'.* These are defined in paragraph 9 of the Resolution as plants or specimens thereof that:

i) do not fulfil the definition of "artificially propagated", and
ii) are considered not to be 'wild' because they are propagated or planted in an environment with some level of human intervention for the purpose of plant production.

Propagation material can come from a range of sources, including from the wild, as long as that collection is legally acquired and non-detrimental to the survival of the species in the wild.

The exact amount of human intervention to qualify as assisted production (source code Y) is not defined in Resolution Conf. 11.11 (Rev. CoP18) and is determined by the national Scientific Authority. The key element for plants obtained through 'assisted production' is that such specimens can be propagated from plant material that is collected from the wild in a manner that is non-detrimental to wild populations, and grown in an environment with some level of human intervention in accordance with the provisions of CITES and relevant national laws. Four case studies of 'assisted production' systems for which source code Y is used by Parties are presented in Annex II as further guidance.

The example given earlier of the temporary annexation of a portion of wild habitat to provide material for harvest at the end of one season (see 'under controlled conditions'), would qualify for source code W (Wild) as there is no real management of this plant material until harvest occurs. However, if boundaries were added and the plants were grown with some level of human assistance for the purpose of plant production, and if plants are propagated from or derived from plant material that is exempt, or artificially propagated, or plant propagation material that is collected sustainably from the wild population, it might be considered appropriate for 'assisted production' and source code Y.

In effect, the situation in relation to the application of source codes W and Y is a gradient or cline, and it is more challenging to define the boundaries between these two codes compared with source codes A and W. In effect, the source code Y was adopted by Parties to allow them to assess situations that fall within this cline and apply the new source code as they determine to be appropriate.

Export permits can be granted for specimens produced by 'assisted production' methods if[13]:

a) *A Management Authority of the State of export is satisfied that the specimen to be exported was* obtained legally; and
b) A Scientific Authority of the State of export has advised that the export will not be detrimental to the survival of the species.

! This allows Parties to permit trade in specimen that do not qualify as artificially propagated and that are not wild (see Annex I: Figure E). Since source code Y specimens do not meet the definition of 'artificially propagated', they therefore do not qualify for the exemptions and other special provisions under Article VII, paragraphs 4 and 5. In practical terms, commercial trade in specimens of Appendix I species derived from assisted production would be prohibited under Article III paragraph 3 c).

Interpretation and application of source codes for plants

Source codes on CITES permits and certificates are reported as a one-letter code (see column 'Codes' in Table 1). According to Resolution Conf. 12.3 (Rev. CoP19) on *Permits and certificates*, there are seven options

[12] And, accordingly, Resolution Conf. 12.3 (Rev. CoP19) on *Permits and Certificates.*
[13] Paragraph 10 a) and b) of Resolution Conf. 11.11 (Rev. CoP18).

to indicate the original source in permits and certificates of the specimen of a plant species being traded (W, Y, D, A, U, I and O); all of these are reflected in the '*Guide to the application of CITES source codes*'.

When determining a source code, careful consideration should be given to the origin of the species and to the CITES Appendix in which the taxon concerned is listed.

Descriptions of the range of sources of plant specimens and guidance on the use of source codes are provided in Table 1 (and Figure A). If a non-detriment finding (NDF) and/or a legal acquisition finding (LAF) is required, this is also indicated in Table 1 (and Annex I -Figure A).

Table 1. List of source codes for plants and parts and derivative thereof, their definition and application, and interpretation of the NDF requirements under the provisions of Articles III and IV of the Convention and LAF requirements under the provisions of Articles III, IV and V of the Convention. Underlined text refers to the purpose of the propagation; **bold** text indicates the CITES Appendix (App). Unless otherwise indicated by a footnote, all definitions are sourced from Resolution Conf. 12.3 (Rev. CoP19) on *Permits and certificates*. The requirements for making NDFs under each source code in the table below align with the information contained in Module 2 (V1.0) of the CITES NDF guidance: Practical Considerations for Making Non-Detriment Findings.

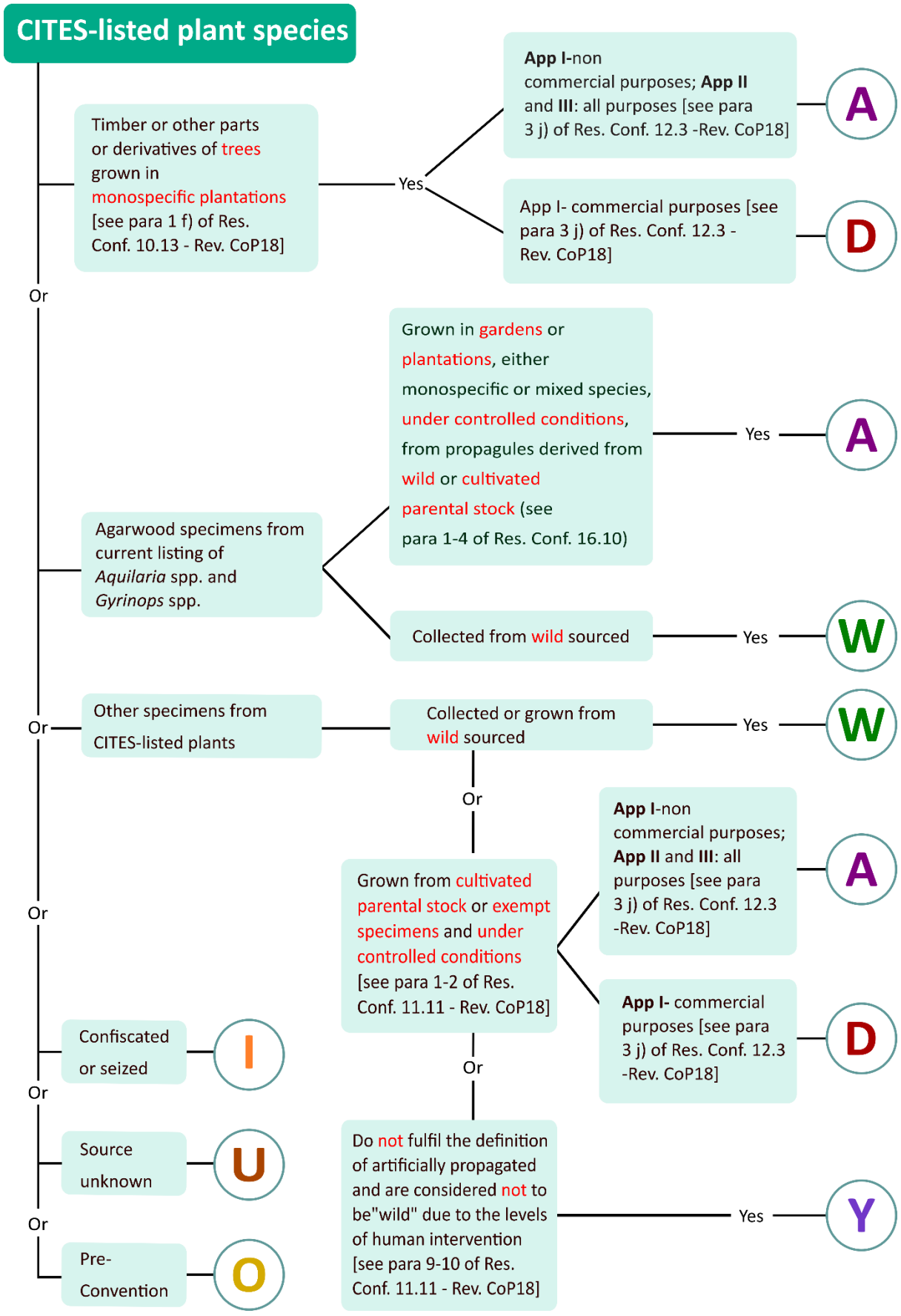
Source codes	Description	Definition	Application	Requirement for a non-detriment finding (NDF)	Requirement for a legal acquisition finding (LAF) or other legal finding[14]
A	Artificially propagated plant	Plants that are artificially propagated in accordance with Resolution Conf. 11.11 (Rev. CoP18), as well as parts and derivatives thereof, exported under the provisions of Article VII, paragraph 5 (specimens of species included in **App I** that have been propagated artificially for non-commercial purposes and specimens of species included in **App II and III**)[15]. Artificially propagated hybrids of unannotated **App I** plant species are treated as App II for purposes of Article VII, paragraph 5[16].	To be used for: **App I** – propagated for non-commercial purposes **App II** and **III**: all purposes.	Yes: only for founder stock removed from the wild of **App I and II** listed plants used to establish the cultivated parental stock in the propagation system involved[17] and for any harvest of additional wild specimens for augmentation.	Yes: for founder stock of **App I, II and III** listed plants used to establish the cultivated parental stock in the propagation system involved[18] and for re-export to ensure prior trade was in compliance with CITES.
D	Artificially propagated plant	**Appendix-I** plants artificially propagated for commercial purposes, as well as parts and derivatives thereof, exported under the provisions of Article VII, paragraph 4, of the Convention.	To be used for: **App I** – propagated for commercial purposes;	Yes: for founder stock removed from the wild of **App I** listed plants used to establish the cultivated parental stock in the propagation system involved[17] and any harvest of additional wild specimens for augmentation.	Yes: for founder stock of **App I** listed plants used to establish the cultivated parental stock in the propagation system involved[19]; Yes: for export permit of **App I** listed plants[20], and for re-export to ensure prior trade was in compliance with CITES.
I	Confiscated or seized	Specimens that were acquired illegally; imported or (re-)exported in violation of the Convention[21].	**All Appendices.**	Yes (in exceptional circumstances). An NDF is required by the Party that confiscated the specimen if it allows the specimen to enter back into trade (see Resolution Conf. 17.8 (Rev. CoP19), paragraph 8 c)).	Not applicable, except for export or re-export of confiscated specimens, under limited circumstances in accordance with Resolution Conf. 17.8 (Rev. CoP19).

[14] Resolution Conf. 18.7 (Rev. CoP19) on Legal acquisition findings.
[15] In addition to Resolution Conf 12.3 (Rev. CoP19), for the definition of artificial propagated specimen for agarwood-producing taxa the reader must refer to Resolution Conf. 16.10, and for tree species shall refer to Resolution Conf. 11.11 (Rev. CoP18) or Resolution Conf. 10.13 (Rev. CoP18).
[16] Paragraph 5 of the Interpretation section of the CITES Appendices.
[17] Resolution Conf. 11.11 (Rev. CoP18).
[18] Resolution Conf. 11.11 (Rev. CoP18).
[19] Resolution Conf. 11.11 (Rev. CoP18).
[20] Article III 2 (b) of the CITES Convention.
[21] Resolution Conf. 17.8 (Rev. CoP19) on Disposal of illegally traded and confiscated specimens of CITES-listed species.

Source codes	Description	Definition	Application	Requirement for a non-detriment finding (NDF)	Requirement for a legal acquisition finding (LAF) or other legal finding[14]
O	Pre-Convention	Specimens that were acquired before the provisions of the Convention applied to that specimen[22].	**All Appendices.** Source code O may be used with other source codes. To be used only in pre-Convention certificates. Date of acquisition is defined in Resolution Conf. 13.6 (Rev.CoP18)**.**	Not required.	Verification of date of acquisition, as defined in Resolution Conf. 13.6 (Rev. CoP18)**.**
U	Unknown	The source is unknown (source code U must be justified).	**All Appendices.** Specimens to be traded as source code 'U' are treated the same as source code 'W'**.**	Yes: see W below.	Yes: see W below.
W	Wild	Specimens taken from the wild, as well as parts and derivatives thereof.	**All Appendices.**	Yes: for exports of **App I** and **II** listed plants[23]; Yes: for imports of **App I** listed plants[24].	Yes: for exports of plants in **all Appendices**[25]; Yes: for imports of **App I** listed plants[26]. Yes: for re-export of **App I** and **II** listed plants[27].
Y	Assisted production	Specimens of plants that fulfil the definition for 'assisted production' in Resolution Conf. 11.11 (Rev. CoP18) as well as parts and derivatives thereof.	**All Appendices.**	Yes: for exports of **App I and II** listed plants. Yes: for imports of **App I** listed plants.	Yes: for exports of plants in **all Appendices**[28]. Yes: for imports of **App I** listed plants[29]. Yes: for re-exports of **App I** and **II** listed plants[30].

[22] Article VII, paragraph 2 of the CITES Convention; Resolution Conf. 13.6 (Rev. CoP18).
[23] Article III 2 (a) and Article IV 2 (a) of the CITES Convention.
[24] Article III 3 (a) of the CITES Convention.
[25] Article III 2 (b), Article IV 2 (b) and Article V 2 (a) of the CITES Convention.
[26] Article III 3 (c) of the CITES Convention.
[27] Article III 4 (a) and Article IV 5 (a) of the CITES Convention.
[28] Article III 2 (b), Article IV 2 (b) and Article V 2 (a) of the CITES Convention.
[29] Article III 3 (c) of the CITES Convention.
[30] Article III 4 (a) and Article IV 5 (a) of the CITES Convention.

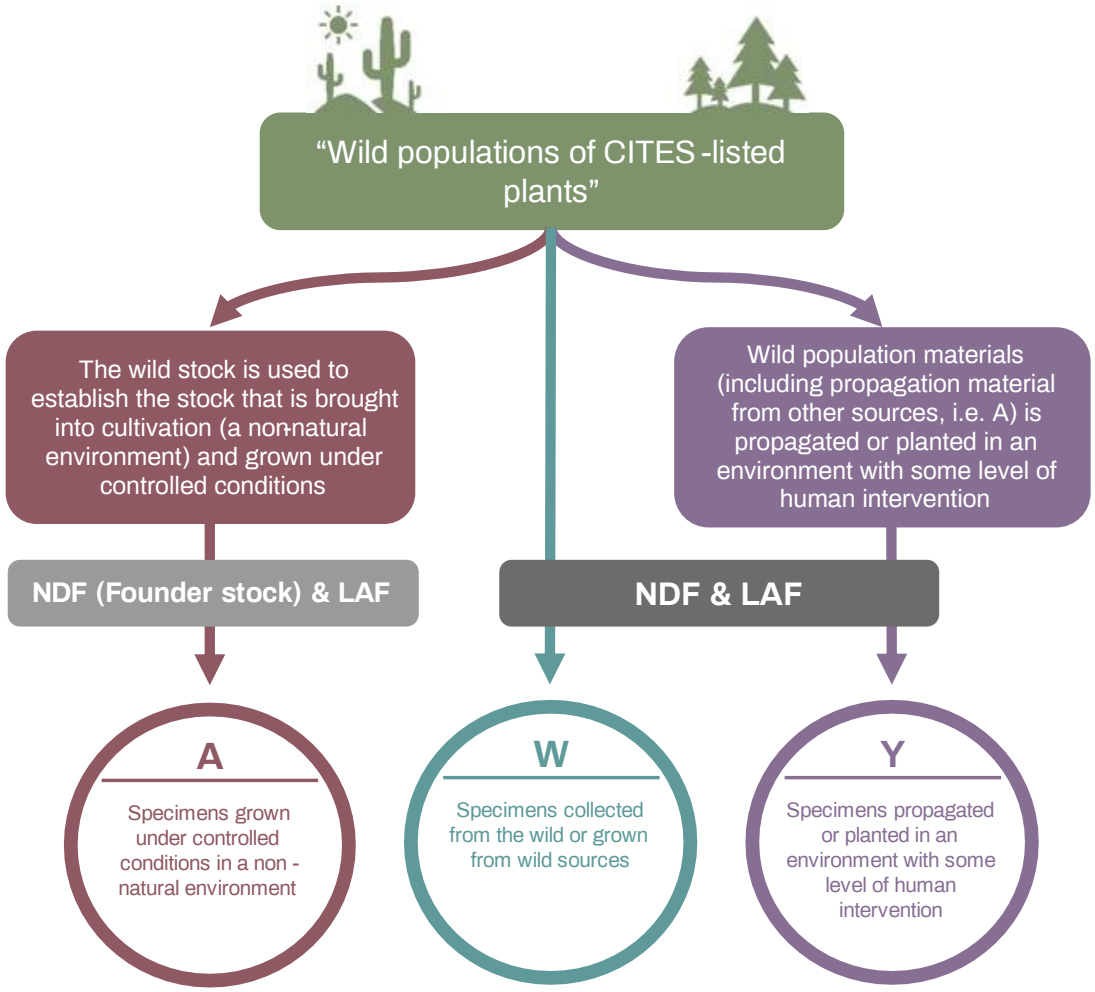
Figure 1. Flow chart differentiating the source codes that can be used for CITES-listed plants.



Annex I: A visual guide to NDF-LAF requirements, terms and definitions

This Annex provides a series of figures that help readers to visualise the legal and scientific requirements for trade in CITES-listed plants under three source codes – **Figure A**, as well as the main terms and definitions used in CITES Resolutions concerning artificially propagated plants: 'under controlled conditions' and 'cultivated parental stock' – **Figure B**; timber producing trees – **Figure C**; agarwood producing taxa – **Figure D**; and assisted production – **Figure E**.

Figure A: Overview of the differences between the source codes ('A', 'W' and 'Y'), as well as the stage at which a legal acquisition finding (LAF) is required by a Management Authority and a non-detriment finding (NDF) is required by a Scientific Authority for trade in CITES-listed plants.



Note: The requirement for both an NDF and an LAF for the founder stock removed from the wild and any harvest of additional specimens for augmentation for source code A is equally applicable to source code D specimens intended for international trade that are treated as Appendix II under Article VII, paragraph 4 and traded under Article IV. LAF are required for all original collections of parental stock, as well as acquisition of cultivated parental stock from suppliers that produce specimens that are propagated in accordance with Resolution Conf. 11.11 (Rev. CoP18).

Figure B: The main terms concerning source code 'A' for "artificially propagated" plants are: 'under controlled conditions' and 'cultivated parental stock' [Resolution Conf. 11.11 (Rev. CoP18)].

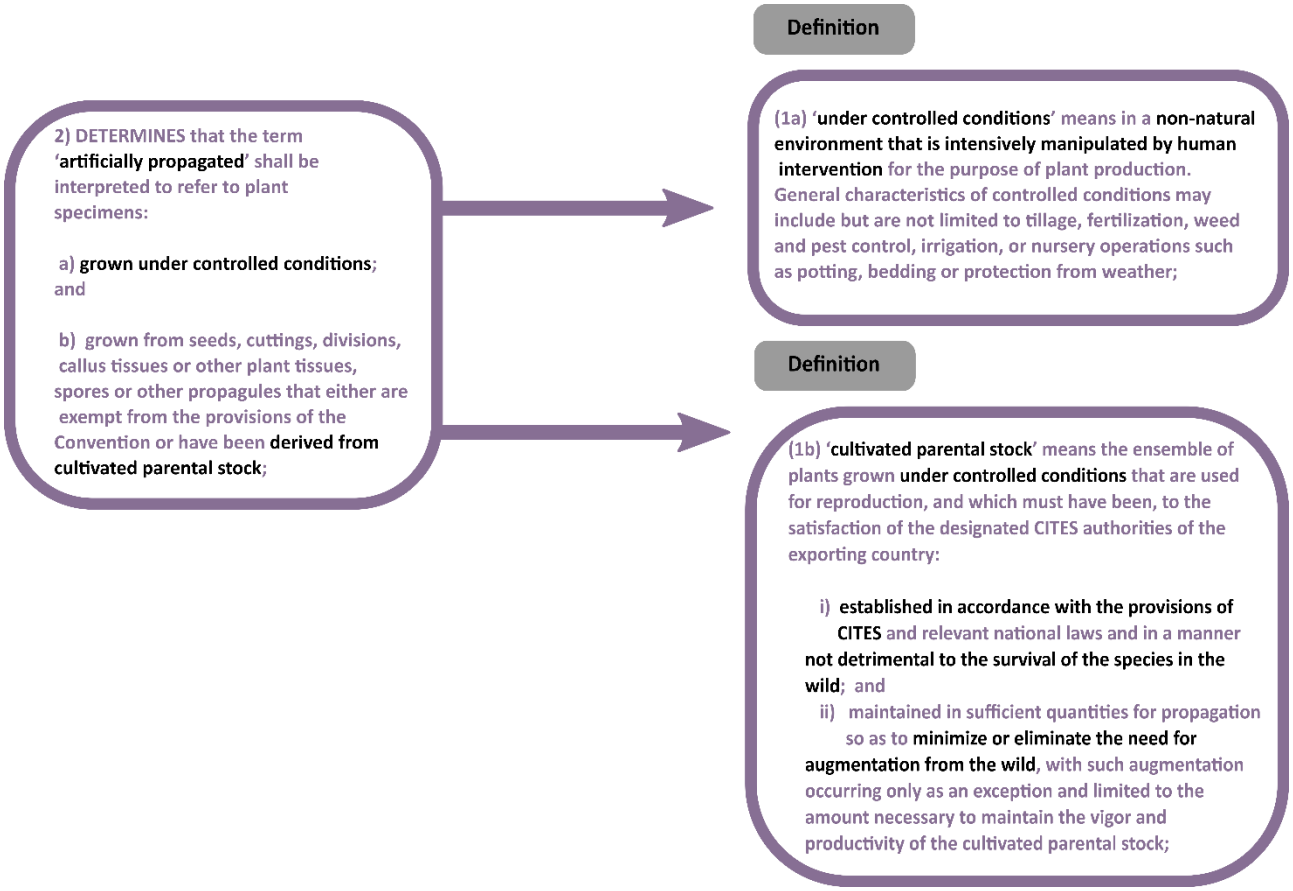


Figure C: Definition of "artificially propagated" for timber and other wood products-producing trees [Resolution Conf. 10.13 (Rev. CoP18)].

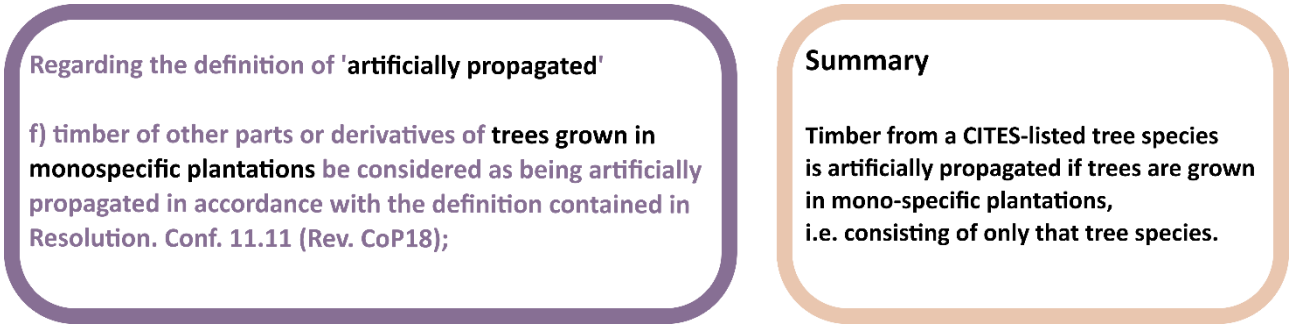


Figure D: Definition of "artificially propagated specimens" for agarwood-producing taxa of the genera *Aquilaria* and *Gyrinops* (Resolution Conf. 16.10).

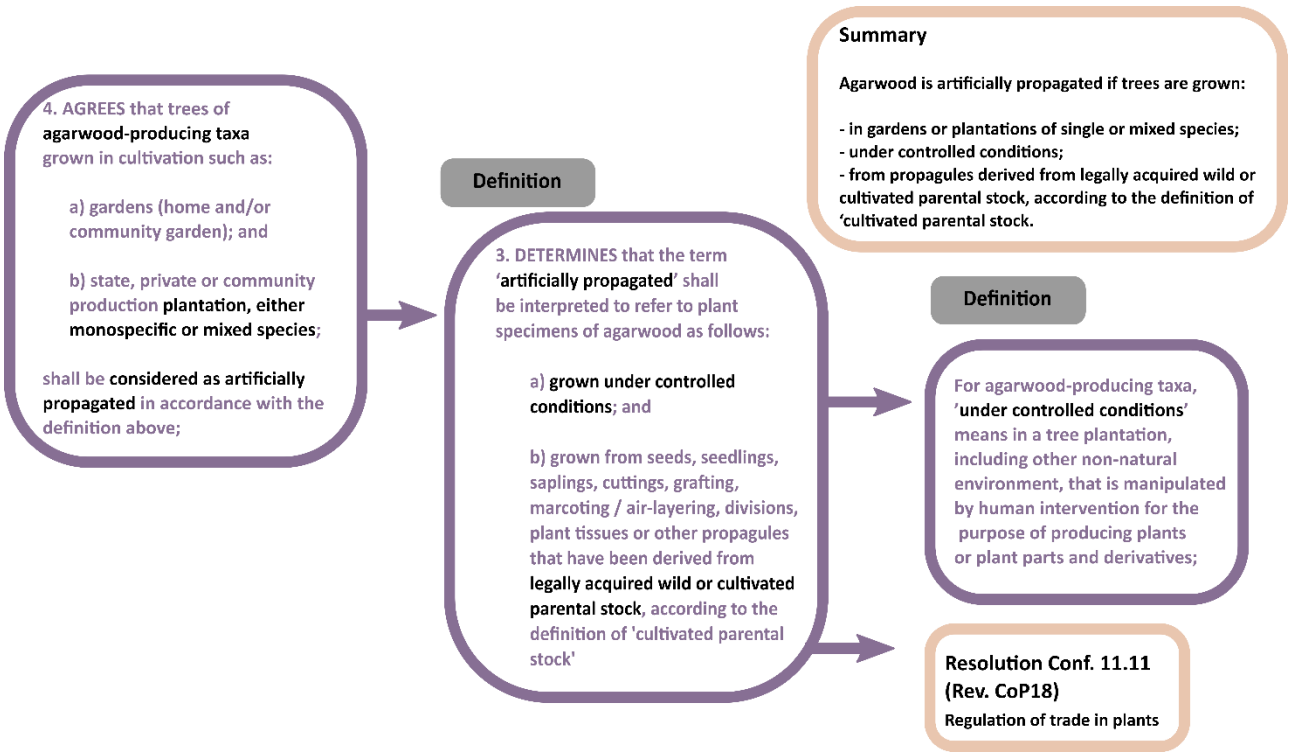
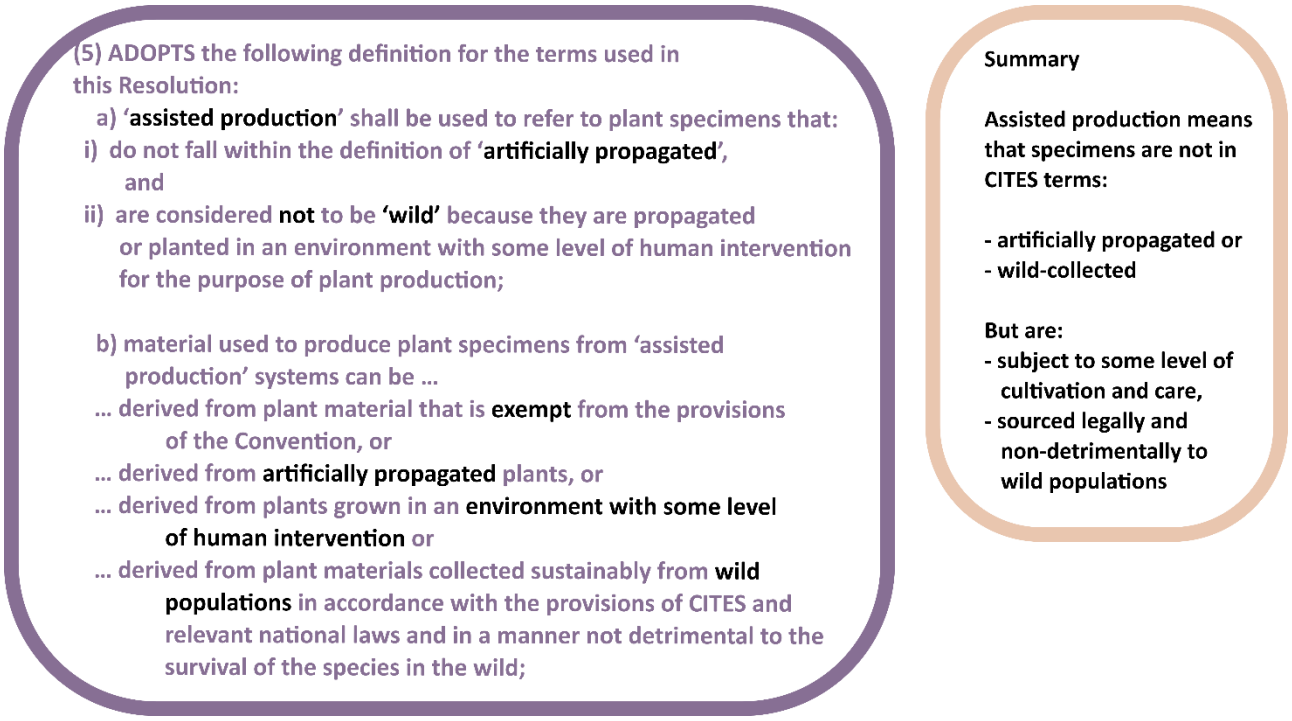


Figure E: Main criteria for plants (including parts and derivatives thereof) obtained through 'assisted production' (source code Y) is that plants are propagated or planted in an environment with some level of human intervention for the purpose of plant production.



Annex II: Case studies on the use of source code Y

This Annex addresses paragraph a) of Decision 19.182 to inform CITES Authorities on the variety of plant production systems qualifying as 'assisted production' that are already in use, together with best practises on the use of source code Y to date.

Four case studies on the use of source code Y for perennial and timber species, based on the experience of CITES Parties, are presented. Case studies were collected via consultations with Parties and regional representatives of the CITES Plants Committee in all CITES regions (the consultations were carried out by UNEP-WCMC in March 2024).

The four case studies on the use of source code Y cover a range of taxa, including perennial plants and timber species, across a geographical spread, as follows:

Case Study	CITES Party	CITES Region	Species
1	Mexico	North America	*Cedrela odorata* (Spanish cedar) and *Swietenia macrophylla* (Big-leaf mahogany)
2	China	Asia	*Rhodiola rosea* (Golden root)
3	India	Asia	*Aquilaria malaccensis* (Eaglewood)
4	Peru	Central and South America and the Caribbean	*Aniba rosaeodora* (Brazilian rosewood)

Case studies presented provide a summarised version of the initial Party submissions; inverted commas " - " indicate direct excerpts from the case studies as submitted by CITES Parties.

In applying source code Y, Parties indicated the following best practices:

- The formulation of NDFs for Y-sourced specimens is similar in rigour to the approach followed for wild-sourced specimens;
- The precautionary principle should be applied for Y-sourced specimens, when these cannot be clearly distinguishable from specimens grown from the wild;
- Attention should be paid to the origin of the founder stock used to replenish the cultivation parental stock, and to the amount of human intervention/silvicultural practices in use for the specimens to qualify as assisted production/ Y-sourced.

Case study 1: *Cedrela odorata* (Spanish cedar) and *Swietenia macrophylla* (Big-leaf mahogany) in Mexico	
Institution	CITES Scientific Authority of Mexico: CONABIO.
Species lifeform in trade	Bark, carvings, longs, plywood, sawn wood, timber, veneer, wood product. [Mexico has not yet exported both species under source code Y].
Geographic location	*Cedrela odorata* occurs across Mexico from the north to the southeast of the country. Both species can be found in the Yucatan Peninsula. *S. macrophylla* is naturally distributed in the southeast of the country, and it is primarily exported from the State of Quintana Roo.
Motivation for using source code Y	The CITES Scientific Authority of Mexico reported that in 2023 a project focused on Mexican timber species was developed to understand and interpret the definition of source code Y and its applicability to their national forest management scheme. The definition was found to be applicable to all cultivated perennial and timber species from "manipulated seeds not wild / naturally grown" in their natural habitat in Mexico. Mexico aims to maintain its forests, with the exception of commercial plantations, in a natural state. However, management measures (e.g., human interventions) are often needed to help forests recover from harvesting cycles and increase production. Commercial forest plantations of timber species, such as *Cedrela odorata,* can be established within the natural habitat of the species, and cultivated seedlings are left to grow and develop naturally. Seedlings are not of wild origin and are not intensively managed; therefore, source codes W and A are not applicable and source code Y is more appropriate.
Management / production system in place for source code Y specimens	At early developmental stages, plants are propagated under controlled conditions; later, young plants are left growing in their natural habitat with a certain degree of human intervention (e.g., low-density planting, uneven age management).
Considerations for undertaking NDFs under source code Y	The Scientific Authority of Mexico noted that: - Planted/cultivated trees (under the forest management scheme) would meet the definition of assisted production (Y); - Trees growing from naturally dispersed seeds in their natural ecosystems would meet the definition of wild-sourced specimens (W). The Scientific Authority of Mexico develops species-specific NDFs. Formulating an NDF and establishing a sustainable harvesting rate for wild-sourced specimens involves gathering data on, *inter alia*, species biology, pre-harvest evaluation and estimates, harvesting area inventory/sampling data, and conservation management measures in place. The making of NDFs for source Y specimens is similar to the approach followed for wild-sourced specimens; however, greater attention is given to the composition and structure of the populations of the species concerned over time.
Recommendations and best practices in applying source code Y	Source code Y should be applied to specimens propagated from seeds in a controlled environment that are then planted in an environment with a certain level of human intervention (e.g., forest management scheme). They must be clearly distinguishable from specimens grown in the wild (i.e., those from wild-dispersed seeds that are grown in natural forests and without any human interventions at any developmental stage). When this distinction cannot be made, the CITES Scientific Authority of Mexico notes that source code W should be applied in line with the precautionary principle.

Case study 2: *Rhodiola rosea* (roseroots), in China	
Institution	CITES Scientific Authority of China: Chinese Academy of Science[31].
Species lifeform in trade	Extract, roots. [China reported to have started exporting Y-sourced specimens of *R. rosea* in 2023, when the Appendix II listing became applicable; this trade is not yet visible in the CITES Trade Database as annual reports for 2023 are due only in October 2024].
Geographic location	Wild populations of *R. rosea* are reported to be small and scattered in North China, with the few remaining wild populations located mainly within protected areas in northern China, including within nature reserves and temples.
Motivation for using source code Y	The harvesting of wild whole plants of *R. rosea* is prohibited in China (in 2021 the species was listed in the List of China's National Key Protected Plants list, Class II), and seed collection from wild populations is granted only for scientific research and 'rescue breeding'.
Management / production system in place for source code Y specimens	Local commercial plantations are reported to be well established in China and under further development. With the permission and supervision of rangers and monks, seeds from wild plants may be harvested in protected areas or temples *to "maintain the cultivation quality"*. Plants grown from seeds are then cultivated in *a "*farmland environment that is intensively manipulated by human intervention for the purpose of plant production*"*. After a period of 3–4-years, whole plants are ready to be harvested. Since high yields of seeds and seedlings are produced in cultivation, these are often sold in the interim to allow producers to recover from the cost of waiting for the plants to reach harvestable size.
Considerations for undertaking NDFs under source code Y	For NDF formulation, the CITES Scientific Authority of China reported that plants or specimens traded under source code Y should be assessed with higher rigour and being considered as wild specimens (W) while determining, for example, identification and taxonomy, conservation concern, intrinsic biological risk, and harvest impact on individual plants.
Recommendations and best practices in applying source code Y	The CITES Authorities of China noted that source code Y "can be applied to specimens produced through some particular silviculture practices, such as enrichment plantings and assisted natural regeneration*"*. Cultivated specimens of *R. rosea* from verified plantations have been exported from China under source code Y and as pre-Convention specimens (source code O) since summer 2023.

[31] Source of information: 'Non-detriment Finding for Roseroots/Rhodiola Rosea/ North China', available on the CITES Website at: https://cites.org/sites/default/files/ndf/NDF_workshop_2023/NDF%20case%20study%20on%20Rhodiola%20rosea.pdf and CITES COP19 Inf. Doc.15, available at https://cites.org/sites/default/files/documents/E-CoP19-Inf-15_0.pdf.

Case study 3: *Aquilaria malaccensis* (Eaglewood) in India	
Institution	CITES Scientific Authority of India: Botanical Survey of India (BSI)[32].
Species lifeform in trade	Carvings, chips, derivatives, extract, live, logs, medicine, oil, powder, roots, sawn wood, seeds, stems, timber, veneer, wax, wood product. [Although at present no trade data in Y-sourced specimens of *A. malaccensis* has been reported, India indicated that the use of source code Y has started in the country].
Geographic location	Wild trees of *A. malaccensis* can be found in the following north-eastern States of India: Arunachal Pradesh, Assam, Manipur, Nagaland, and Tripura. The species can be found in cultivation throughout the country, in ~22 States: Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Goa, Gujarat, Karnataka, Kerala, Maharashtra, Manipur, Mizoram, Meghalaya, Nagaland, Odisha, Punjab, Tamil Nadu, Telangana, Tripura, Uttarakhand, Uttar Pradesh, West Bengal, and potentially also in Jharkhand and Rajasthan.
Motivation for using source code Y	Currently, trade in *A. malaccensis* consists of specimens harvested only from trees cultivated in "home/community gardens, private or community production plantations, and from plantations in leased lands". India does not use source code W for *A. malaccensis* because, due to past overharvest, wild populations of *A. malaccensis* are now mostly restricted to protected areas in the north-east of the country, where the harvest of any species is not permitted. Source code A is not applicable, due to the origin of the seeds used in cultivation; seeds are typically derived from cultivated mother plants, but in rare cases are harvested sustainably from the wild, including from protected areas. Thus, in some instances, it is not possible to guarantee with complete certainty whether seeds originated from wild or cultivated parental stocks. The CITES Scientific Authority of India reported that, although source code A could be used under Resolution Conf. 16.10 for agarwood producing species derived from wild propagules and then grown under controlled conditions in gardens and state/private/community production plantations, source code Y is the 'preferred' source code on a "precautionary basis". In addition, *A. malaccensis* is classified as Critically Endangered in the wild at global level in the IUCN Red List, and the CITES MA of India noted that the requirement for NDFs for Y-sourced specimens may help to strengthen monitoring and protection of the remaining wild population.
Management / production system in place for source code Y specimens	*A. malaccensis* is cultivated and harvested in a range of private and community owned lands. Plantations can be either monospecific or mixed species. Cultivated plants are grown from seeds (originating from cultivated mother plants or wild plants) or through coppicing. In some instances, seeds from wild trees growing just outside protected areas, are collected by local people.
Considerations for undertaking NDFs under source code Y	According to the CITES Scientific Authority of India, source code Y should be applied, and NDFs issued, in cases where there is some doubt as to the origin of the specimens' propagules (wild/cultivated).
Recommendations and best practices in applying source code Y	No limitations were encountered in the use of source code Y for this species in India; however, the CITES Scientific Authority indicated that the definition of 'assisted production' in Resolution Conf. 11.11 (Rev. CoP18) could benefit from examples and further clarification regarding the term 'some level of human intervention'.

[32] Information received by the CITES Authority of India were complemented with the information contained in the 2024 Report on Non-Detriment Findings of *Aquilaria malaccensis* in India, available on the CITES website at: https://cites.org/sites/default/files/ndf_material/INDIA%20-%20NDF%20Study%20Report%20of%20A%20malaccensis%20%28Agarwood%29%20in%20India.pdf.

Case study 4: *Aniba rosaeodora* (Brazilian rosewood, Palo rosa) in Peru	
Institution	CITES Management Authority of Peru: National Forestry and Wildlife Services (SERFOR).
Species lifeform in trade	Extract, oil, wood product. [Exports of Y-sourced specimens of *A. rosaeodora* from Peru have been reported since 2021].
Geographic location	Registered plantations of *A. rosaeodora* can be found in Loreto in the northern department of Peru (where the majority of *A. rosaeodora* plantations are located), and in the south-eastern department of Madre de Dios.
Motivation for using source code Y	In Peru, the definition of 'plants obtained through assisted production' is consistent with the definition of forest plantations as defined in their National Regulations, such as the Regulation for the Management of Forest Plantations and Agroforestry Systems. According to the Peruvian Regulation, 'forest plantations' are defined as "ecosystems formed from human intervention through the introduction of one or more native forest species for the purpose of producing wood or non-timber products… and registered in the National Registry of Forest Plantations". Based on this definition, specimens of *A. rosaeodora* (used to produce rosewood oil for export) originating from registered forest plantations meet the definition of 'assisted production' and can be exported under source code Y.
Management / production system in place for source code Y specimens	The use and management of all CITES-listed species originated in forest plantations is regulated by national regulations (e.g., the National Registry of Forest Plantations) and the provisions of CITES. To ensure the legality of specimen exploitation, all human interventions in forest plantations must be authorised and recorded by the Regional Forestry Authorities.
Considerations for undertaking NDFs under source code Y	NDFs issued by the CITES Scientific Authority are required for all CITES-listed species originating in forest plantations prior to the granting of export permits by the Management Authority.
Recommendations and best practices in applying source code Y	The CITES Scientific Authority should be consulted when doubts around the definitions of 'assisted production' and 'artificial propagation' arise; additional procedures around the determination of source code Y might be needed.