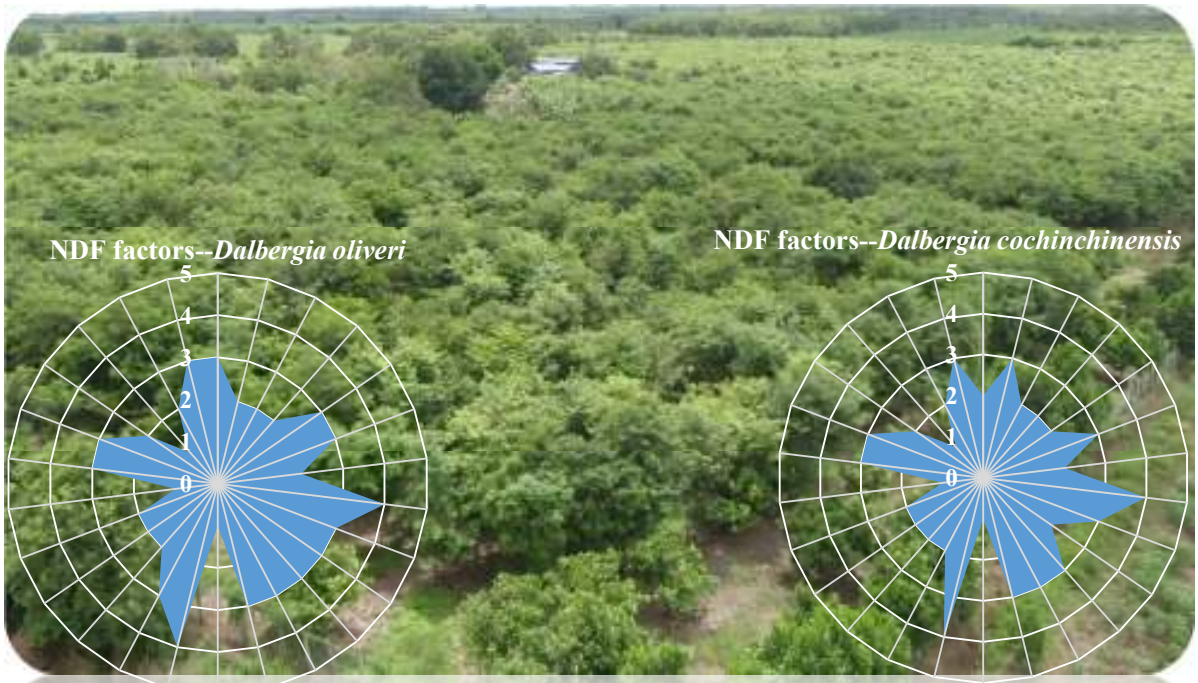
Report on the Virtual Training Workshop on the CITES Non-detriment Findings Report on *D. cochinchinensis* and *D. oliveri* and the Economic Analysis and Comparative Advantage of Plantations of *D. cochinchinensis*



April 2022

Report on the Virtual Training Workshop on the CITES Non-detriment Findings Report on *D. cochinchinensis* and *D. oliveri* and the Economic Analysis and Comparative Advantage of Plantations of *D. cochinchinensis*

Financial Support: Forestry Administration, Cambodia; the European Union and the CITES Tree Species Programme, CITES Project No. S-568: Integrating the Development of Guidelines and Incentives for Piloting the Establishment of Small-scale Private *Dalbergia* Plantations with the Determination of a Non-detriment Findings Report in Preah Vihear Province, Cambodia.

Implementing Agency: Forestry Administration of the Ministry of Agriculture, Forestry and Fisheries (MAFF).

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I. Introduction

1.1 Background

Rosewood, which in international markets includes *Dalbergia cochinchinensis* and *Dalbergia oliveri* (considered to be synonymous with *Dalbergia bariensis*), as well as several other species of *Dalbergia* and a number of other genera, has become the world's most trafficked wild product. In reaction to that trafficking, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) has listed the 300 species that are referred to as rosewood under trade restrictions.

In the past several decades, the illegal trafficking and trading of high-commercial timber species in Cambodia has increased the vulnerability and reduced the populations of some indigenous timber species, including rosewood. There is nevertheless still remarkably limited documentation about the current status of *Dalbergia* species in the country. In reacting to the recognized declines of both *D. cochinchinensis* and *D. oliveri* and to determine the current status of those and other endangered tree species listed in the CITES Appendix II, the implementation of the project for "Integrating the Development of Guidelines and Incentives for Piloting the Establishment of Small-scale Private *Dalbergia* Plantations with the Determination of a Non-detriment Findings Report in Preah Vihear Province in Cambodia" was envisaged to hasten the establishment of small-scale private plantations of *D. cochinchinensis*.

Cambodia has been a member of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) since 1997. The Ministry of Agriculture, Forestry and Fisheries has been assigned the role as the Cambodia's CITES Management Authority and the Forestry Administration has been designated as the Cambodia's CITES Technical Scientific Authority. The species that are covered under CITES are listed in one of its three Appendices according to the degree of protection required.

The member countries of CITES are obliged to comply with the CITES regulations, especially controlling the distribution of species that are included in the CITES Appendices with regard to both exports and imports from and to the member country. Appendix I contains a list of species that are most endangered and threatened with extinction, while Appendix II includes species not necessarily threatened with extinction, but for which trade must be controlled in order to avoid utilization that is incompatible with their survival.

One of the purposes of this training workshop was to increase the understanding of the resources and processes required to prepare NDF reports that adhere to the compulsory nine-step process supporting the CITES Scientific Authorities in their efforts to establish science-based determinations. The other objective was to build the participants' capacity with simple guiding steps related to economically and theoretical analysis of the advantage of plantations of *D. cochinchinensis* as compared to other fast-growing tree species.

This pilot study on the CITES Non-Detriment Findings Report for *Dalbergia cochinchinensis* and *Dalbergia oliveri* reflected the conservation status and management of the species in the Choam Ksant District, Preah Vihear Province. The assessment systematically followed the IUCN Checklist of NDFs. Nevertheless, some factors and parameters' ordinal conditions were modified to some extent to conform to the conditions in Cambodia. Most of the short descriptions of each parameter related to species characteristics that were used in the scoring system in the assessment followed the factors of sustainability in the guidelines on Non-detriment findings for timber, medicinal plants and agarwood (CoP15 Doc. 16.3) and the Indonesian Guidelines for Non-Detriment Findings Assessment of Ramin *Gonystylus* spp. The factors affecting the management of the harvesting regime consisted of biological characteristics; the current status of the species; harvest management; harvest regime;

harvest monitoring; logging impact to the environment and ecological condition; and conservation and protection.

One of the project outcomes was to conduct a workshop to disseminate the NDF of *D. cochinchinensis* and *D. oliveri* in the Choam Ksant management district in Preah Vihear province, as well as business-related training to prepare private sector entities and small-scale farmers to participate in the establishment of small-scale private plantations of *D. cochinchinensis* and *D. oliveri.* Therefore, a training workshop on CITES Non-Detriment Findings Report on *D. cochinchinensis and D. oliveri* in the Choam Ksant management district in Preah Vihear province and the Economic Analysis and Comparative Advantage of Plantations of *D. cochinchinensis* was organized virtually on 24 November 2021. A total of 65 participants from provincial cantonments and departments of the Forestry Administration, non-governmental organizations (NGOs), academic institutions, and the private sector attended the workshop. The Workshop Program and the List of Participants are as attached in **Annex 1** and **Annex 2** respectively.

1.2 Objectives

The virtual Training Workshop on the CITES Non-detriment Findings Report on *D. cochinchinensis* and *D. oliveri* and the Economic Analysis and Comparative Advantage of Plantations of *D. cochinchinensis* was organized with the following objectives:

- Raising awareness of CITES Non-Detriment Findings Report, CITES' Listed Tree Species, guidelines for preparing a CITES NDF report and practical procedures for NDF assessment.
- Sharing knowledge/case study related to the NDF of *D. cochinchinensis* and *D. oliveri* in the Choam Ksant management district in Preah Vihear province and business-related opportunities to prepare private sector entities and small-scale farmers to participate in the establishment of small-scale private plantations of *D. cochinchinensis* and *D. oliveri*.
- Providing participants with the economic analysis of investment and comparative advantage of *D. cochinchinensis* plantations.

1.3 Participants

The Forestry Administration organized a virtual training workshop on the CITES Non-detriment Findings Report on *D. cochinchinensis* and *D. oliveri* and the Economic Analysis and Comparative Advantage of Plantations of *D. cochinchinensis* with 65 participants in attendance, who were representatives from:

- 3 Deputy Director-Generals of the Forestry Administration.
- 29 officials from Provincial Cantonments of the Forestry Administration.
- 5 officials from Divisions of the Forestry Administration.
- 25 officials from Line Departments of the Forestry Administration.
- 2 lecturers from Prekleap National Agricultural Institution.
- 1 person from the private sector and NGO.

II. Summary of the Training Workshop

2.1 Welcome Remark at the Opening Sessions

Dr. Chheang Dany, Deputy Director-General of the Forestry Administration on behalf of **H. E. Dr. Keo Omaliss,** Delegate of the Royal Government of Cambodia (RGC)in charge as Head of the Forestry Administration, welcomed all participants attending this workshop organized by the Forestry Administration with support from the CITES Tree Species Programme (Figure 1).

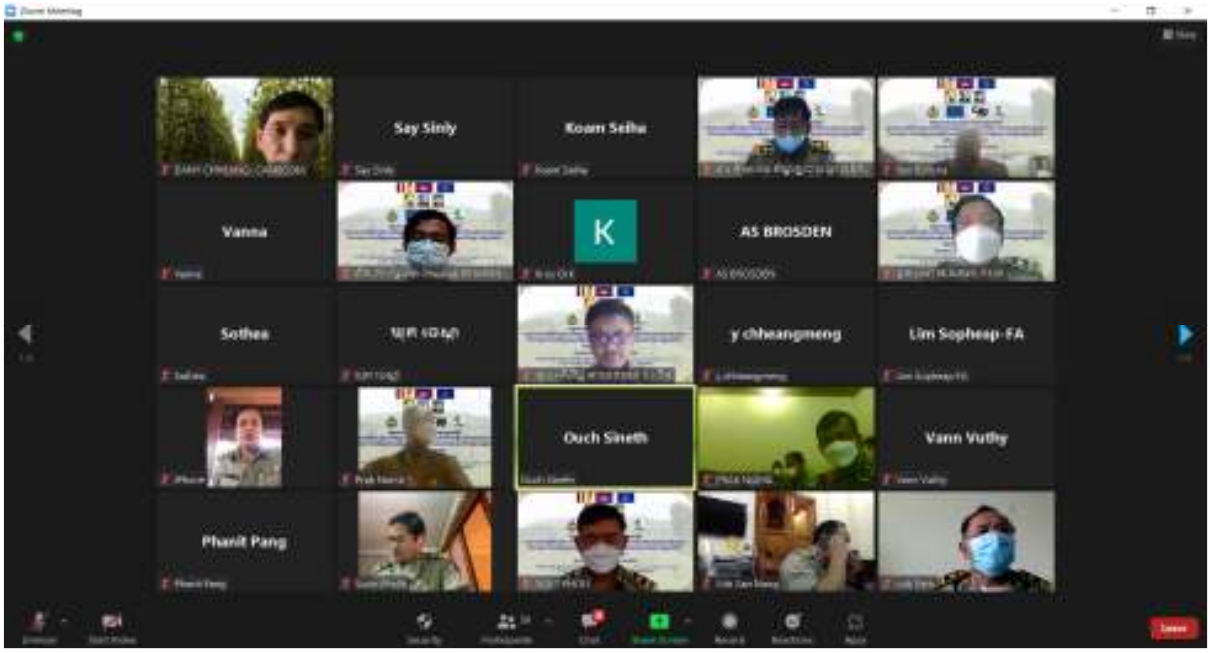


Figure 1. Participants attending the training workshop

He stressed that the extension of a case study associated with the preparation of the NDF report of *D. cochinchinensis and D. oliveri* in Choam Ksant District, Preah Vihear province is very important for all participants from different stakeholders, especially from the Cantonments and Divisions of the Forestry Administration of Cambodia. The preparation of the NDF report of *D. cochinchinensis* and *D. oliveri* in Choam Ksant District was made in accordance with the guideline on Non-detriment findings for timber, medicinal plants and agarwood produced by CITES and it is the first time that a NDF report has been produced for CITES-listed tree species in Cambodia.

If a member of CITES wants to trade and export CITES-listed tree species, a NDF report should be prepared to assess whether the trade and export of CITES-listed tree species will affect its population in the natural habitats. Similarly, whether trade of propagation of CITES-listed tree species requires NDF to be prepared and whether policies in Cambodia allow propagation of CITES-listed tree species to be exported.

In addition to the dissemination of the NDF findings report of *D. cochinchinensis* and *D. oliveri*, Mr. Dany highlighted the importance to build the capacity of the participants on economic analysis of investment in *D. cochinchinensis*, challenges and opportunities, advantages and favorable conditions and incentives for investment in *D. cochinchinenis*.

2.2 Presentation 1: CITES Non-Detriment Findings Report on *D. cochinchinensis* and *D. oliveri* in the Choam Ksant District, Preah Vihear Province

Mr. Say Sinly, who is a vice chief of the Private Forest and Partnership office of the Department of Private Forest and Forest Plantation Development as well as a project staff, presented a summary of the project and elucidating the CITES non-detriment findings making guidelines and a case study in preparing the CITES Non-detriment Findings Report on *D. cochinchinensis* and *D. oliveri* in the Choam Ksant District, Preah Vihear Province. His presentation is as attached in **Annex 3**.

2.2.1 Summary of the project

- **Project title: "**Integrating the Development of Guidelines and Incentives for Piloting the Establishment of Small-scale Private *Dalbergia* Plantations with the Determination of a Non-

detriment Findings Report in Preah Vihear Province, Cambodia**",** which is funded by the EU through the CITES Secretariat's CITES Tree Species Programme.

- **Objective**: The objective of the project is to develop an initial non-detriment findings report on *D. cochinchinensis* and *D. oliveri*, and institutionalize an enabling environment to support the establishment of small-scale private plantations of the species.
- **Duration**: 18 months (Late 2019 – March 2021), but it has been extended until June 2022.
- **Achievements**: Prepared the Guidelines on Private Forest Registration, including private forest registration practical procedures; organized a National Extension and Consultation Workshop on Rules and Guidelines for Private Forest Plantation Registration in Cambodia from 26-27 November 2020 with 125 participants; completed the inventory of rosewood (*D. cochinchinensis* and *D. oliveri*) in the Choam Ksant district, Preah Vihear province; distributed 48,940 *D. cochinchinensis* seedlings and 1,500 fruit trees to local communities, pagodas and institutions in Choam Ksant district.
- **Reports Produced**: The project has produced 6 reports that can be downloaded through the link: https://cites-tsp.org/regions/cambodia/.

2.2.2 Understanding about CITES

- CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten the survival of the species. Website: https://cites.org/eng/disc/what.php.
- The member countries of CITES are obliged to comply with the CITES regulations, such as controlling the distribution of species that are included in the CITES Appendices with regard to both exports and imports from and to the member country. This provides a two-way system for controlling the traffic of the wild plant and animal export and import trade in both the exporting and importing countries.
- The CITES system of control is executed by using the CITES' standard licensing system that is published by the CITES Management Authority, which is *responsible for inspecting goods moving in and out of the country on the basis of the documents and specimens registered in the CITES Appendices I, II and III*. Specific plant and animal species that are covered in CITES are registered in the list included in the Appendices of CITES.
- Cambodia has been a member of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) since 1997; the Ministry of Agriculture, Forestry and Fisheries has been assigned the role as the Cambodia's CITES Management Authority and the Forestry Administration has been designated as the Cambodia's CITES Technical Scientific Authority. The species that are covered under CITES are listed in one of its three Appendices according to the degree of protection required.
- The CITES Scientific Authority is obligated to provide advice related to the export that will not be detrimental to the survival of that species, as stipulated in **CITES Article IV –** "The export of any specimen of a species included in Appendix II shall require the prior grant and presentation of an export permit. A Scientific Authority of the State of export has **advised** that such export will not be detrimental to the survival of that species. A Scientific Authority in each Party shall monitor both the **export permits granted** by that State for specimens of species included in Appendix II and the actual exports of such specimens."

2.2.3 What is Non-detriment Findings Report (NDF)?

Non-detriment Findings Report (NDF) is a kind of practical procedure and/or assessment report on current status, especially in natural habitat, of a species included in the CITES Appendix II. The purpose of such CITES' NDF making tool is to ensure that a CITES Scientific Authority can advise wisely its CITES Management Authority for such export that will not be detrimental to the survival of that species.

2.2.4 CITES Non-detriment Findings making Guidelines

There were four principal NDFs-making guidelines that were used in the case study. They are:

1. The nine-step process to support CITES Scientific Authority making science-based non-detrimental findings (NDFs) for timber/tree species listed in CITES Appendix II (Daniel Wolf, 2018) incorporated into the CITES guidelines for preparing a scientifically-based NDF for timber species; (Steps & worksheet, Figure 2 (Left)).
2. The Non-detriment findings for timber, medicinal plants and agarwood (CITES, 2010) (CoP15 Doc. 16.3); (NDF for different groups of plant & wildlife).
3. The Guidance for CITES Scientific Authorities: Checklist to assist in making non-detrimental findings for Appendix II exports (Rosser and Haywood, 2002); (Factors & Indicators for assessment; plants & animals, Figure 2 (Right)).
4. The Indonesian Guidelines for non-detrimental finding assessment for *Ramin gonystylus* spp., (2010).

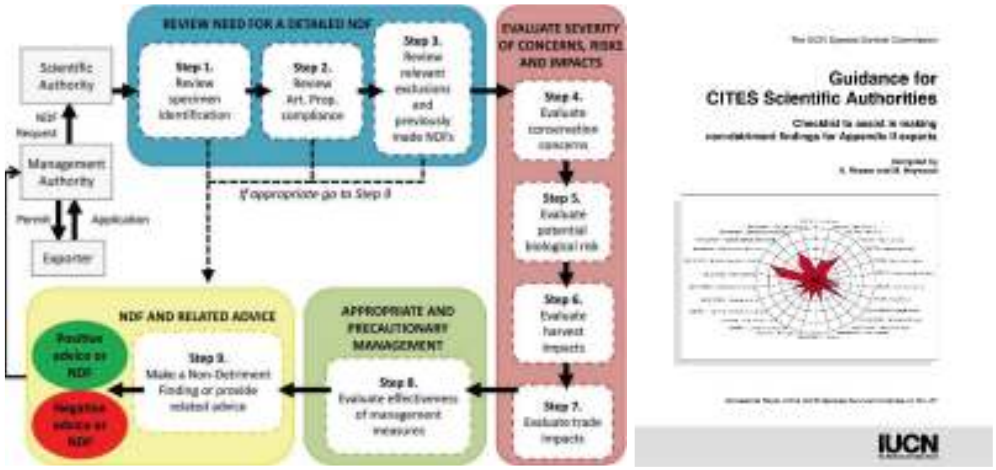


Figure 2. The nine-step process to support CITES Scientific Authority making science-based non-detrimental findings (NDFs) for timber/tree species listed in CITES Appendix II (Left), and The Guidance for CITES Scientific Authorities: Checklist to assist in making non-detrimental findings for Appendix II exports (Right)

- The nine-step process incorporated into the CITES guidelines for preparing a science-based NDF for timber species is fundermental for CITES Scientific Authorities to use its worksheets through subsequent steps for reviewing and providing advices to Management Authorities in relation with export permits for wood speciemen, and the Guidance for CITES Scientific Authorities: Checklist to assist in making non-detrimental findings for Appendix II exports is of importance for cross-refferencing to use factors and indicators for making NDF assessment of plants or animals currenct stautus.
- There were 7 factors composed of 26 parameters that were assessed to produce a visual scoring radar plot to facilitate the determination of the NDF and used in the case study in the Choam Ksant District, Preah Vihear Province of Cambodia. Then, each parameter was explained in the presentation that it should be evaluated based on a scoring system.

2.2.5 Non-detriment Findings on *D. cochinchinensis* and *D. oliveri* in the Choam Ksant District, Preah Vihear Province

- The CITES Non-detriment Findings Report on *Dalbergia cochinchinensis* and *Dalbergia oliveri* in the Choam Ksant District, Preah Vihear Province was prepared with 3 other reports as follows:

- Systematic Survey of *Dalbergia cochinchinensis* and *Dalbergia oliveri* for Piloting Assessment on Sustainable Genetic Conservation in Choam Ksant district, Preah Vihear Province;
- Review of the taxonomy, biology, ecology, and the status, trend, and population structure, of *D. cochinchinensis* and *D. oliveri* in Choam Ksant district, Preah Vihear province, Cambodia; and
- Assessment Report on the Conservation Status, Management Practices, and Harvest Monitoring of *Dalbergia cochinchinensis* and *Dalbergia oliveri* in the Choam Ksant District, Preah Vihear Province.

- Then, the advices to ensure that a CITES Scientific Authority will recommend to its CITES Management Authority are based on the assessment and legal acquisition (the existing regulations).
- The assessments of the case study were explicated with such key factors as biological data; distribution and ecological habitats; current status and trends; population structure and dynamics; biological risks and major threats (habitat specificity, biological risks and vulnerability, management measures); management history (forest management system, authorized harvesting areas, trends in harvesting and trade, master plan or management plan, illegal harvesting and trade); harvest monitoring (harvest regime, methods of monitoring harvests, confidence in harvest monitoring, mortality rate and maturity, legal framework); new forestland management system (reformed forestland zoning and management, law enforcement, species restoration, promotion of establishment of forest plantations, private forest plantation certification, effectiveness of management measures).

2.2.6 Virtual Assessment (NDF not required for specimen export)

- In practice, an NDF is not required to export *Dalbergia* specimens sourced through artificial propagation in plantations. Article VII of the CITES Convention includes provisions for the exceptions of exports of specimens produced as the result of artificial propagation. In such a case, legal acquisition would still prevail, however, so that if the current measure (Regulation No. 601) is not replaced, any specimen of either of the *Dalbergia* species sourced through artificial propagation would not be allowed to be exported.
- In adhering to the nine-step process to support CITES Scientific Authorities to make science-based NDF determinations, it is elaborated below:

    - **Step 1 (Review specimen identification):** The response is that "*The Scientific Authority is confident that the scientific names are: (1) Dalbergia cochinchinensis, which has the synonymous name of Dalbergia cambodiana that is listed in CITES Appendix II and classified as Vulnerable (VU) in the IUCN Red List; and (2) Dalbergia bariensis, which has the synonymous name of Dalbergia oliveri that is listed in CITES Appendix II and classified as Endangered (EN) in the IUCN Red List."* This provides the response to key question 1.1 and refers to Guidance for Step 1 (Figure 3).

<table>
<tr><th>Key questions for step 1</th><th colspan="5">Responses and outcome (Refer to Guidance for Step 1)</th><th>Information sources used</th></tr>
<tr><td rowspan="3">1.1 Is the Scientific Authority confident, that the timber or timber product concerned has been correctly identified, and that the right scientific name has been used for the timber?</td><td>The Scientific Authority is confident about the species identification or has corrected a simple error or outdated name and taxonomic concerns have been resolved</td><td>yes</td><td>x</td><td>Describe concerns or error(s) resolved below</td><td>Go to step 2</td><td rowspan="2">- CITES Appendix List;
- IUCN Red List;
- Van Sam et al. (2004);
- Hartving (2015);
- Niyomdham et al. (1997).</td></tr>
<tr><td>The species is not correctly identified and/or concerns cannot be resolved by the Scientific Authority or referral to the MA or an expert</td><td>no</td><td>x</td><td>Describe concerns or unresolved error(s) below</td><td>Go to Step 9: Decision 9.1</td></tr>
<tr><td colspan="6">Concerns about clear identification:
Yes, the Scientific Authority is confident that the scientific names are:
1. Dalbergia cochinchinensis, which has the synonymous name of Dalbergia cambodiana that is listed in CITES Appendix II and classified as Vulnerable (VU) in the IUCN Red List.
2. Dalbergia bariensis, which has the synonymous name of Dalbergia oliveri that is listed in CITES Appendix II and classified as Endangered (EN) in the IUCN Red List.</td></tr>
</table>

Figure 3. Step 1: Review specimen identification

- **Step 2 (Review compliance with requirements of artificial propagation):** The response is supposed to be "*yes*" to key question 2.1 "*Is the permit application for artificially propagated specimens?*", so go to the subsequent key question "*Is the export of artificially propagated specimens of this species permitted by national or relevant sub-national legislation?*" The response is "*No, it is not allowed*" based on the existing regulation and/or measure (Regulation No. 601). "*The Royal Government of Cambodia has suspended its exporting of all forest products and forest by-products derived from luxury grade timber species until it is informed via a new regulation. This aims to improve sustainable forest resource management and usages*." This provides the response to key question 2.2, and allowed us to go to step 9 (Figure 4).

Key questions for step 2	Responses and outcome (Refer to Guidance for Step 2)					Information sources used
2.1 Is the permit application for artificially propagated specimens?	Supposed to be "yes"	yes	x		Go to Key Question 2.2	NA
		no	x		Go to Step 3	
2.2 Is the export of artificially propagated specimens of this species permitted by national or relevant sub-national legislation?		yes	x	Describe relevant legislation below	Go to Key Question 2.3	A regulation No. 601, dated 24 April 2014, issued by the Council of Minister of the Royal Government of Cambodia
	No, it is not allowed	no	x	Describe relevant legislation below	Go to Step 9: Decision 9.2	
	Describe relevant legislation:					
	The Royal Government of Cambodia has suspended its exporting of all forest products and forest by-products derived from luxury grade timber species until it is informed via a new regulation. This aims to improve sustainable forest resource management and usages.					

Figure 4. Step 2: Review compliance with requirements of arterial propagation

- **Step 9 (Non-Detriment Finding and Related Advice):** The response to key question 9.2 from the outcome of Step 2 is "*The export of artificially propagated specimens of this species is not permitted by national or relevant sub-national legislation".* This negative decision denies export permits, which are supported by this Guidance (Figure 5).

Outcome of NDF Process	NDF Results and Related Advice
9.2. The outcome of Step 2, Key Question 2.2 is: *Export of artificially propagated specimens of this species is not permitted by national or relevant sub-national legislation*	x Negative decision (deny export permit) (supported by this Guidance)
	Justification for advice of Scientific Authority:
	[Summary, or refer to Worksheet 2, Key Question 2.2] *In such a case, a strong recommendation to the CITES Management Authority is that the permit for the exporting of any products derived from these species should not be issued as referred to in the regulation provided in the above worksheet in which the RGC has been suspending all exports of any products extracted from luxury grade timber species, including the specimen from either artificially propagated or natural forests.* *However, a new thorough decision shall be made accordingly if such a restricted measure is lifted and a regulation is renewed allowing exporting specimens of these Dalbergia species that are artificially propagated and fully meet the criteria of CITES' "propagation" definition, an advice regarding a permit of products related to this that is requested to be exported may appear with positive NDFs.*

Figure 5. Step 9: Non-detriment finding and related advice

- In such a case, a strong recommendation to the CITES Management Authority is that the permit for the exporting of any products derived from these species should not be issued as

referred to in the regulation provided in the above worksheet in which the RGC has been suspending all exports of any products extracted from luxury grade timber species (includes both of the *Dalbergia* species), including the specimen from either artificially propagated or natural forests;

- However, a new and thorough decision shall be made accordingly if such a restricted measure is lifted and a regulation is renewed allowing exporting specimens of these *Dalbergia* species that are artificially propagated and fully meet the criteria of CITES' "propagation" definition. The advice regarding a permit of products related to this matter that is requested to be exported may appear with positive NDFs.

2.2.7 Scoring Results of Non-detriment Findings

- The scores of *D. cochinchinensis* and *D. oliveri* generally ranged from 1 to 3, highlighting the relatively severity of the impacts on both the species associated with biological characteristics, current status of the species, harvest management, the harvest regime, harvest monitoring, logging impact on the environment and ecological conditions, and conservation and protection in the Choam Ksant District. The principal difference in the scoring between the two species was that *D. cochinchinensis* exhibited states of greater severity because of its attenuated dispersal distribution, smaller population density, and greater instances of illegal selective logging gleaned from the numbers of cases of forest offenses than did *D. oliveri,* even though the regenerative capacity of *D. oliveri* exhibited considerable vulnerability, as well. On the basis of the assessment, it was recommended that the Scientific Authority should issue a negative Non-detriment Findings Report to the CITES Management Authority in Cambodia to ensure that any requests for exporting specimens of these species should be rejected because of their declining populations in natural habitats (Table 1).

Table 1. Scoring Results of Non-detriment Findings

No.	Factors	Parameters	Response (A)	Response (B)
1.1	Biology	Adaptability	2	3
1.2		Regeneration capacity	3	2
1.3		Dispersal efficiency	2	2
1.4		Habitat	2	2
2.1	Status	Distribution	2	3
2.2		District abundance	3	3
2.3		District population trend	2	2
2.4		Quality of information	4	4
2.5		Major threats	3	3
3.1	Management	Illegal harvest or trade	2	3
3.2		Management history	3	3
3.3		Management plan	3	3
3.4		Aim of harvest in management plan	3	3
3.5		Quotas or area to be harvested annually	1	1
4.1	Control	Harvest in authorized concessions	4	4
4.2		Harvest in conservation and Protected Areas	2	3
4.3		Harvest in Production Forests	2	2
4.4		Confidence in harvest management	2	2
5.1	Monitoring	Methods to monitor the harvest	2	2
5.2		Confidence in harvest monitoring	1	1
6.1	Logging Impact	Benefit to environment	3	3
6.2		Logging impact to environment damages	3	3
6.3		Environment recovery	2	2
7.1	Protection	Protection Percentage	1	1
7.2		Protection effectiveness	2	2

No.	Factors	Parameters	Response (A)	Response (B)
7.3		Harvest control	3	3

- The scoring conducted in the assessment of the NDF associated with *D. oliveri* paralleled that of *D. cochinchinensis* with respect to the severity of the state of most of the parameters impacting the species in natural habitats. The principal difference in the scoring was that *D. cochinchinensis* exhibited states of greater severity because of its attenuated dispersal distribution, smaller population density, and greater instances of illegal selective logging gleaned from numbers of forest offenses cases than did *D. oliveri,* even though the regenerative capacity of *D. oliveri* exhibited considerable vulnerability, as well. The resulting recommendation would, therefore, be for a comparable negative NDF finding for *D. oliveri.*

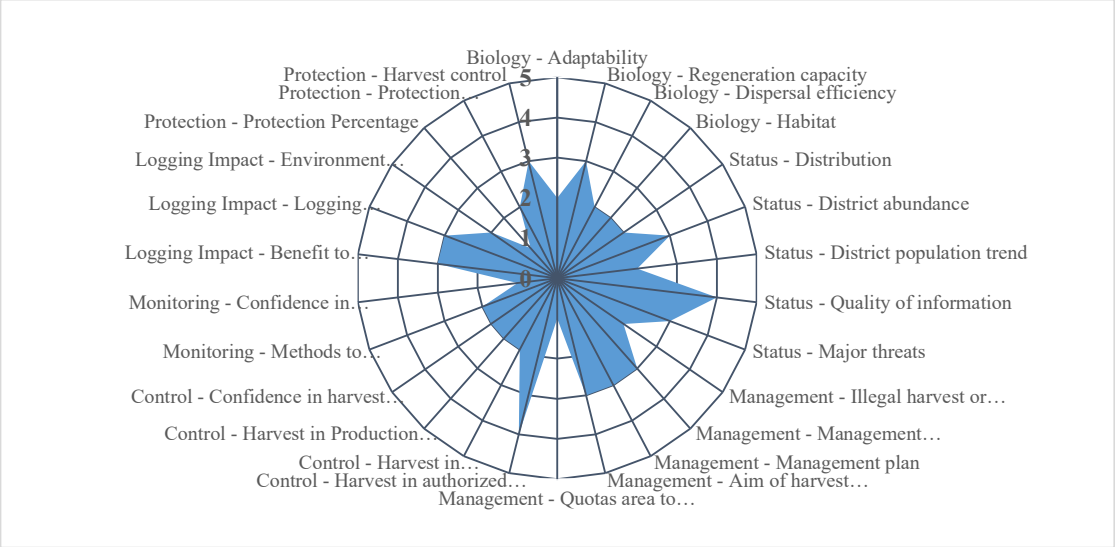


Figure 6. NDF factors used in assessing Dalbergia cochinchinensis

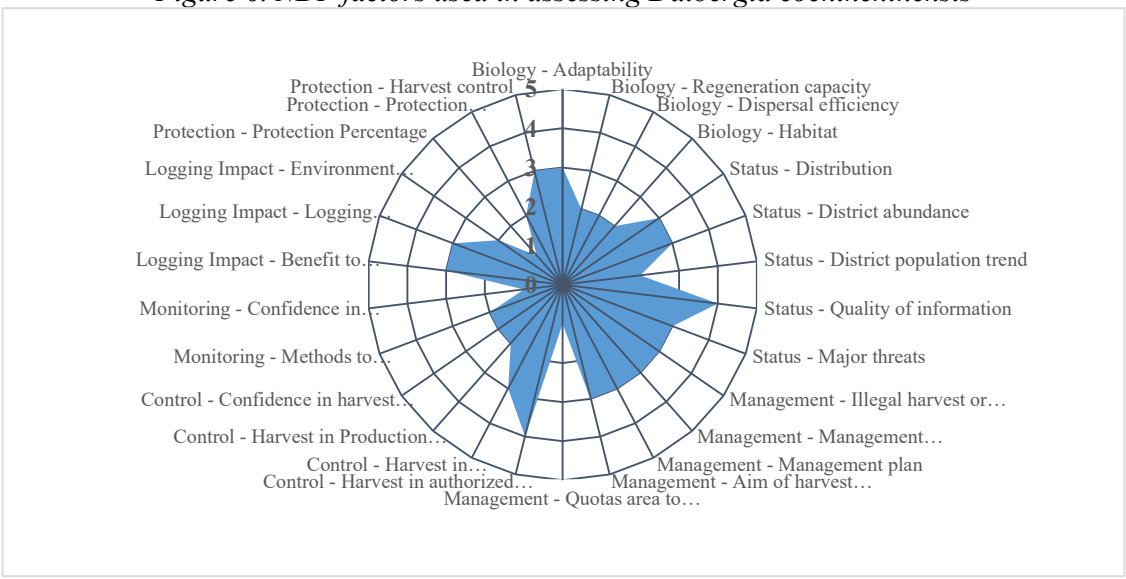


Figure 7. NDF factors used in assessing Dalbergia oliveri

2.3 Presentation 2: Economic analysis and comparative advantage of plantations of *D. cochinchinensis*-challenges, and opportunity

Mr. Hort Sothea, deputy director of the Department of Wildlife and Biodiversity and a project officer, delivered the presentation on the Economic Analysis and Comparative Advantage of Plantations of *D. cochinchinensis* as in **Annex 4**. The presentation is summarized as follows:

2.3.1 Deforestation trend

31% of the earth's surface is covered by forests. Over 420 million hectares of forest have been lost since 1990. Between 1990-2010, an average of 15.5 million hectares of forest were destroyed every year. Between 2010-2015, 12 million hectares of forest were destroyed every year giving a 22.58% decline for the period from 2010-2015 as compared to the period from 1990-2010. Between 2015-2020, 10 million hectares of forest were destroyed every year giving a 35.48% decline for the period from 2015-2020 as compared to the period from 1990-2010 and 16.67% decline as compared to the period from 2010-2015.

Cambodia was covered by forest with the size of 8,502,858 hectares in 2018. Approximately 2.6 million hectares of forest were lost between 2002-2018 with an average of 152,941 hectares of forest destroyed every year. Figure 8 indicates the trend of forest cover assessment since 1965.

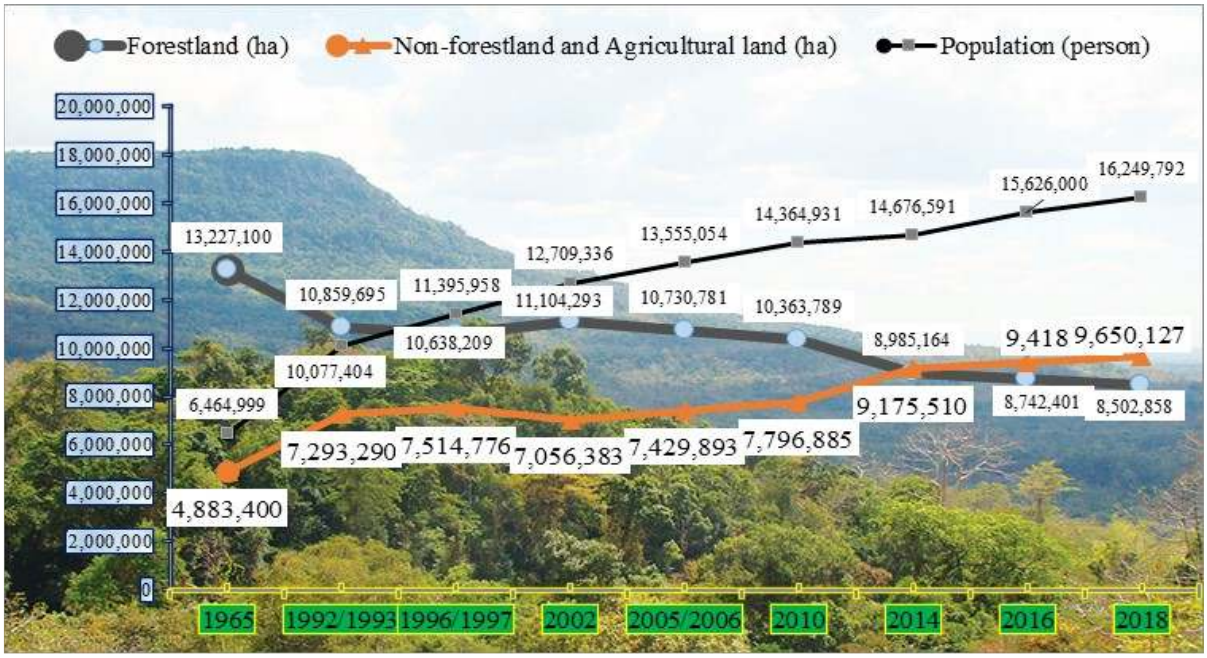


Figure 8. The negative relationship between population growth and forestland

2.3.2 Relation of population growth and wood demand

Population in Cambodia continues to grow steadily as reflected in Figure 8 which indicates the trend of population growth since 1965. Population is predicted to grow further in the next ten years. Wood demand is predicted to increase. Global wood demand will increase more than 50% in 2050 while the demand for wood utilization will grow as well in Cambodia in the future because the majority of the Cambodian people are using wood materials for construction, firewood, furniture and charcoal production. According to an assessment of wood demand in Cambodia, the use of fuelwood is approximately 32% from Forest Plantations and 3% from Agroforestry areas. Wood-based products used for Construction is approximately 34% from Forest Plantations and 1% from Agroforestry areas. Furniture and decoration are approximately 10% from Forest Plantations and 0.5% from Agroforestry

areas, and wood processing for export related to furniture and decoration is approximately 24% from Forest Plantations and 1% from Agroforestry areas.

2.3.3 Understand how to establish tree plantation and do economic analysis and comparative advantages

Mr. Hort Sothea also elaborated how to assess the sites before establishing tree plantations by pointing out to the factors to be considered. The selection of land for a tree planting project is an important point that individuals or legal entities should study carefully before deciding to purchase or undertaking joint venture to establish private plantations and forests, which should consider environmental and socio-economic factors. If private forests are established for commercial plantations, then they can be established where the soil and climatic conditions (quantity and distribution of rainfall) are suitable for the growth of the species. Other locations, such as plantations that are not intended for commercial purposes, could be set up as private forests in response to environmental and social benefits. Site assessment should begin at an early stage prior to land preparation, including reviewing the following:

- Soil conditions, flora and fauna using rapid assessment tools.
- Status of land use in accordance with the land tenure system, not related to the state's permanent forest reserve or forest area of the protected area.
- Economic analysis of labor force.

Possible impacts such as water pollution, water scarcity and/or lack of water sources should be considered. After the site study process, if the private forest owner decides to plant trees, then the next task is to plan the planting. Planning for the establishment of a private commercial plantation should include information on economic efficiency analysis to show that the plantation project will be profitable as a basis for investment decisions. The main points to be analyzed are:

- Based on actual estimates of the area to be planted, excluding environmental costs, and making actual estimates of financial revenues and establishment costs, maintenance and protection costs, etc.
- Consider the impact of topography and accessibility of harvesting and transportation costs.
- Use data from local plantation growth with similar conditions for estimating productivity and yield.
- Assess the potential risks of diseases, fires, pests and other natural disasters.

To assist the participants to easily understand the steps for analyzing economic return from establishing *D. cochinchinensis* and *D. oliveri* plantations as compared to other investment projects, he explained the use of the Built-in Economic Analysis Formulas in MS Excel. The inputs needed were (i) estimated cash-flow (flow-in and flow-out); (ii) duration of investment; (iii) discount rate; (iv) assumptions that determine the market price of products to be sold; and (v) risks to be controlled. The key Economic Analysis Formulas that should be used were (i) Internal Rate of Return (IRR); (ii) Profitability Index (PI); and (iii) Net Present Value (NPV). Detailed explanations were provided to the participants with illustrations in Figure 9. The comparative advantages were conducted against the economic analyses, so that all participants were aware of which species of tree plantations or crops would be more profitable.

In general economic analysis, the formulas are expressed as follow:

- the Net Present Value (NPV) = $\frac{R_t}{(1+i)^t}$ where,
  R_t = net cash flow at time t; i = discount rate; t = time of the cash flow
- the Internal Rate of Return (IRR) = $\sum_{t-1}^{t} \frac{C_t}{(1+r)^t} - C_0$ where,

C_t = net cash inflow during the period t; r = discount rate; t = number of time periods; C_0 = total initial investment cost

- the Profitability Index (PI) = $\frac{PV\ of\ Future\ Cash\ Flows}{Initial\ Investment}$

He further provided many examples of economic analysis and comparative advantages related to *D. cochinchinensis* and *D. oliveri* plantations with facts and detailed economic analyses. *D. cochinchinensis* and *D. oliveri* plantations are a long-term life investment, at least 30 years, compared to other local high-valued timber species such as teak, at about 20-25 years, and agricultural crops such as paddy rice and cassava which are annual cash crops. Despite such a long-yielding tree planation, they can provide high economic returns at approximately USD 38,500.00/ha for *D. cochinchinensis* plantation, but just USD 26,500.00/ha for Teak or 68.8% of USD 38,500.00/ha for *D. cochinchinensis* plantation, USD 650.00/ha for cassava or 1.7% of that *D. cochinchinensis* plantation, and USD 750.00/ha for rice field or 1.9% compared to that for *D. cochinchinensis* plantation. The Profitability Index (PI) in investing in *D. cochinchinensis* is projected to be relatively high if they can be harvested at USD 9.78, USD 9.35, USD 9.04, USD 7.85, and USD 7.22, for 30, 25, 20, 15, and 10 years, respectively. This means that if one were to invest USD 1.00 today, then it will return an economic profit of USD 7.22 for 10 years, USD 7.85 for 15 years, USD 9.04 for 20 years, USD 9.35 for 25 years, and even USD 9.78 for 30 years. Therefore, the longer the trees are kept for harvesting the higher the profit they will collect. The Internal Rate of Return (IRR) seems to provide various results in terms of economic viability at 28.26%, 28.30%, 28.94%, 30.46%, and 37.29%, for investment duration of 30, 25, 20, 15, and 10 years, respectively (Figure 9). That may be a reason that the current value of both rosewood live trees is over-estimated, while the wood at the time of harvest is under-estimated. The assumption used in the projection is based on the current value of wood of both the *Dalbergia* species which is approximately USD 3,000.00 per cube meter, and the seedlings to be planted is about 2,000 seedlings per hectare. Some other tree species can provide moderately high economic-profit in the short- and medium-term are *Acacia* species, *Eucalyptus* species, paulownia, teak, sandalwood, etc.

Figure 9. Guiding example of economic analysis with built-in Excel formulas (Left) and comparative advantages (Right)

However, he stressed that if small-scale farmers who do not have much start-up capital for investment but wanted to invest in either *D. cochinchinensis* or *D. oliveri* plantations, then they could grow them as agroforestry. In doing so, they could benefit from short-, medium-, and long-term economic returns. In addition, tree plantation contracting with local companies or exporters would not only just sustain their income generation, but would also contribute to their power of bargaining.

2.3.4 Green investment, policies and incentives related to tree plantations

In its efforts to further promote investors to invest in forest establishment and development, the Council of Ministers of Cambodia issued a set of regulations on the reduction of export fees for products and processed products derived from forest plantation in November 2019. This includes a

reduction of 50% of the total obligatory export fees for export of products from forest plantation, and a 100% exemption of export fees for furniture and final processed products produced from forest plantation.

In 2008, a Sub-decree on Rules for Granting Right to Use public forest land for tree planting was issued by the government that aims to increase forest productivity and services, and ensure sufficient wood supply to the general public. The Sub-decree authorizes MAFF to grant part of the public forest land for tree planting.

The individual or company that has been granted the right to use public forest land for tree planting is able to develop, utilize, sell and distribute their products in accordance with the agreement with the FA and MAFF. However, the benefits derived from tree planting on public forest land will be shared between the government and the individual or company as agreed in the agreement during the duration of the agreement which could be for a period not exceeding 50 years.

2.3.5 Challenges

There is currently not enough infrastructural development by the Government of Cambodia. The majority of the land areas granted is located in remote areas with limited developed infrastructures. As such, concessionaires/companies/ individuals have to prepare and develop their own basic infrastructures to facilitate their operations, including transportation of their products to the market and final destination. This will incur additional high cost for the concessionaires in addition to their operational costs. Moreover, commercial production of plantation timber requires high initial establishment cost and it takes many years before it could achieve a positive return. This has, to a certain extent, deterred concessionaires to extensively invest in forest plantation establishment and development.

Market information is not comprehensive, timely and readily available for investors in forest plantation establishment and development in Cambodia. Consumption and the use of forest plantation wood for house construction by the local community are limited, especially those derived from fast-growing species like the eucalyptus. This coupled with fluctuation of prices in the international market has created uncertainty and thus affecting efforts to promote the private sector to substantially invest in forest plantation development.

The investment in *D. cochinchinensis* plantations is required to be long term of up to 30-40 years. This requires large investment because the CITES-listed tree species grows slowly even though the demand for the species of *D. cochinchinensis* in the international market is currently high and has every good price in the regional and international markets. In this regard, to promote the planting of *D. cochinchinensis*, incentives should be provided to the private sector or individuals in the form of monetary or non- monetary incentives.

2.3.6 Opportunities

There is considerable wood demand for domestic uses in Cambodia and export as well. In addition, there is an upward trend towards green investment and tree plantations in Cambodia, especially CITES-listed tree species. There is demand for luxury or CITES-listed tree species in the form of planting trees as gardens in public institutions, public spaces and large residential and housing areas where hundreds of trees are needed. In this connection, investors, private sector, or individuals can invest in tree plantations of luxury tree species and they do not have to wait up to 30 or 40 years to harvest their plantations. They may spend up to ten years and can sell their plantations in the form of live trees.

A number of individuals in Cambodia who own large land areas are interested in investment in medium-term plantations. The purpose of planting is not for harvesting in the medium term. The reason for the planting of *Dalbergia cochinchinensis* is for recreation as the Cambodian people who want to enjoy their weekend with large plantations of luxury wood with their families and relatives.

There are medium-mixed plantations of different species usually comprising two or three species as seen in the coastal areas in the southwest of Cambodia where there are agarwood and *D. cochinchinensis* species in a large area. In addition, there are other options that the private sector or an individual can invest in fast-growing tree species, medium-term tree plantations, and long-term tree plantations.

2.3.7 Preparation of private sector to participate in establishment of tree plantations

After the consultative workshop in November 2020 and while the guidelines itself was in the process of being edited and requesting for the final endorsement, two private companies have applied to register their private forest plantations. In total, there are four locations of private forest plantations with at least 359 hectares where mixed tree species have been planted including *Aquilaria crassna*; *Dalbergia cochinchinensis*; *Dalbergia odorifera; Afzelia xylocarpa*; *Pterocarpus macracarpus*; and *Khaya senegalensis.* This could be an immediate consequence from promotion of private forest registration to prepare small-scale famers and the private sector, especially investors who have a clear long-term insight into their business to invest in tree plantations such as *Dalbergia cochinchinensis*, among others.

If interested in tree plantation investment, individuals should be aware of the forest policy, incentives, opportunities, challenges, and especially the economic profit through analysis of comparative advantages of each tree species that were targeted. For example, small-scale farmers may want to plant trees to supply a company that want to export wood products made from CITES-listed tree species to international markets, so the registration of private forest can be an integral part of the process of compliance assessment for artificial propagation of CITES-listed tree species. This could assist them in the issuance of export permits of CITES-listed tree species that are required by the Cambodian CITES Management Authority.

III. Participants' Inputs

There were some suggestions raised by the participants after the presentations, which could fruitfully be supplementary to the workshop outputs, as follows:

- Additional members from the academia including professors and senior researchers should be considered to be ascribed to the committee of the Cambodian CITES Scientific Authority.
- If there is a study on NDF at the national level for any specific CITES-listed tree species for the international trade purpose, especially all species listed in the CITES Appendix II, the National Forest Inventory Manual should be incorporated in the sampling plot design and the coefficient of variance (CV) must be taken into account.
- The regional climatic conditions inclusive of temperature and rainfall should be employed for the Non-parameter Correlation Test together with those factors that can affect the occurrences of the species.
- Some local research papers from the academia may help to make the NDF study more prolific.
- A certificate of the registered private forests can possibly be used to certify artificial propagated tree species.
- There should be a study on wood density and its characteristics of main timber species (CITES-listed tree species) conducted to technically distinguish between the wood

specimens harvested from natural forest and plantations, which can make NDF reports more viable.

IV. Pre- and Post-Training Evaluation

Pre- and post-training workshop evaluations were conducted to assess the level of understanding as part of the process in capacity building. Prior to the day of commencement of the training workshop, a 10-question survey questionnaire was sent to all the participants through Telegram for them to complete and to be returned before the workshop. After the training workshop was completed, the same questionnaire was sent to the attended participants and requested them to return the completed questionnaire. A scoring was conducted to assess whether the participants' capacity was strengthened and enhanced (Table 2).

Table 2. Pre- and post-training evaluation of participants attending the workshop

No.	Questions for understanding evaluation	Pre-training					Total	Rank	Post-training					Total	Rank
		1	2	3	4	5			1	2	3	4	5		
1	1. Understanding about CITES	28	21	13	3	0	65	1	5	24	27	7	2	65	3
2	2. What is Non-detriment Findings Report (NDF)?	52	9	2	2	0	65	1	11	25	21	8	0	65	2
3	3. CITES Non-detriment Findings making Guidelines	59	3	1	2	0	65	1	17	31	15	2	0	65	2
4	4. Parameters and scoring results of Non-detriment Findings	55	5	4	1	0	65	1	21	18	22	4	0	65	3
5	5. Providing advice regarding the issuing export permit for specimens based Non-detriment Findings	60	2	1	2	0	65	1	23	34	5	3	0	65	3
6	6. Site assessment and selection for tree plantation	12	17	29	6	1	65	3	11	18	28	8	0	65	3
7	7. How to do economic analysis and comparative advantages for investing in tree plantations	61	1	2	1	0	65	1	15	18	26	6	0	65	3
8	8. Green investment, policies and incentives related to tree plantations	9	28	17	9	2	65	2	3	14	17	26	5	65	4
9	9. Challenges and opportunities for tree plantation investment	11	14	26	10	4	65	3	4	10	22	23	6	65	4
10	10. Usefulness of private forest registration for private sector to participate in establishment of tree plantations	2	27	33	2	1	65	3	0	2	22	31	10	65	4
	Average	**34.9**	**12.7**	**12.8**	**3.8**	**0.8**	**65**	**1.7**	**11**	**19.4**	**20.5**	**11.8**	**2.3**	**65**	**3.1**

Note: The level of understanding at pre- and post-training are categorized as follow:
1 = Never known before/did not understand at all.
2 = Used to know little / understood slightly.
3 = Has already known somewhat/ fairly understood.
4 = Has already known more/ Understood very much.
5 = Has already known intensively/ More comprehensive understanding.

One of the training workshop's outcomes was building the capacity of the participants with which the ranks at pre-training workshop were mostly centered at level 1 & 2, indicating the fact that they have never known or used to know little before, and the average ranks at post-training workshop were centered at 3 & 4, indicating they fairly understood or understood very much. The answers to

the question 9 & 10 appear that the participants seemed to have already understood the current issues related to forest plantation investments and the usefulness of private forest registration in Cambodia that provide benefits to private forest registrants, especially for wood product exporters. This is because they had participated in the earlier National Extension and Consultation Workshop on Rules and Guidelines for Private Forest Plantation Registration in Cambodia that was held from 26-27 November 2020. The rest of the questions asked were related to the technical aspects of investing in tree plantations establishment which were hard for them to answer. These topics were "Challenges and opportunities for tree plantation investment", and "Usefulness of private forest registration for private sector to participate in establishment of tree plantations" (Figure 10). In general, the average ranking score of post-training evaluation of building the participants' capacity increased from 1.7 to 3.1 which appeared to outperform their understanding perceived through the presentations during the training workshop (Figure 10).

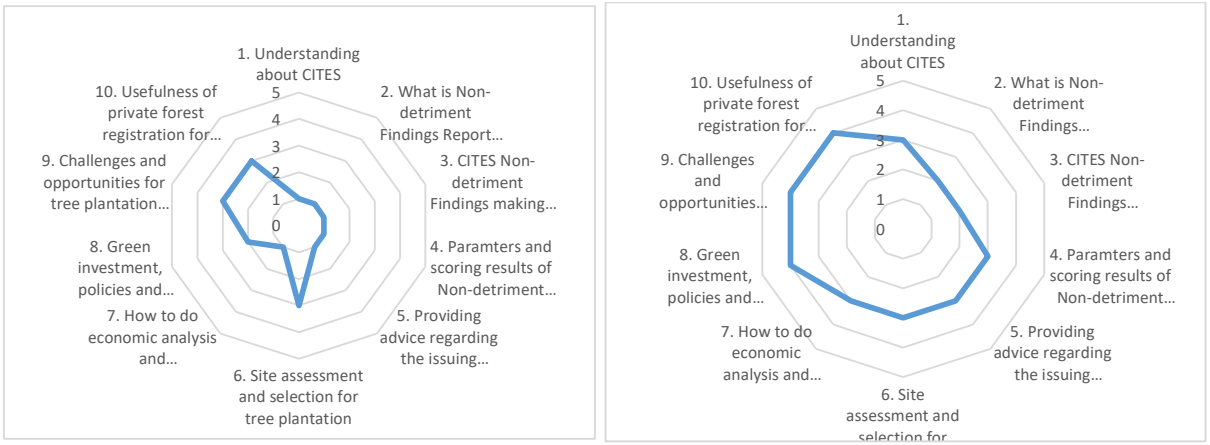


Figure 10. Pre- (Left) and post-training (Right) evaluation of participants attended the training workshop

V. Conclusion

The training workshop consisted of presentations on CITES guidelines for the preparation of non-detriment findings reports with a case study on the assessment of the population of *D. cochinchinensis* and *D. oliveri* in the natural habitats for harvesting in the Choam Ksant District, Preah Vihear Province, and an economic analysis and comparative advantage in investing in on fast-growing tree plantations and CITES-listed trees species. The specific objective of the training workshop was to build the capacity of FA officials, NGOs, academic institutions and other stakeholders through enhancing knowledge on the assessment and preparation of non-detriment findings reports and the economic analysis and comparative advantage of investment in *D. cochinchinensis* species before any decision is made to invest in CITES-listed tree species plantations.

Participants were engaged to learn, willing to put in the effort despite the intensity of the training that was needed to ensure the completion of the workshop program. However, the Non-detriment Findings Report on *D. cochinchinensis* and *D. oliveri* was new to the participants, especially the specific technical assessments. As such, the virtual training workshop of one day might not be sufficient for the participants to understand fully the technical assessments required to make a science-based NDF.

There was limited understanding of CITES in regulating plants and timber in the CITES Appendices and timber trade requirement by CITES among the participants, especially the participants from the local FA offices, the private sector, and NGOs. Thus, it required more time and efforts to build the capacity of stakeholders and those in the private sector and to disseminate CITES-related tree species, plants and wildlife information as broadly as possible. However, some of the participants who profoundly understood the presentations had suggested their wise voices be incorporated into future

national NDF assessments for CITES-listed tree species (Appendix I & II), including members of the CITES Scientific Authority.

Pre- and post-training workshop evaluations were conducted to assess the level of understanding as part of the capacity building process. In general, the average ranking score of post-training evaluation of building the participants' capacity increased from 1.7 to 3.1 which appeared to outperform their understanding perceived through the presentations during the training workshop. The conclusion from the economic analyses and comparative advantages suggested that to ensure sustainable agroforestry in a circular economy, tree plantations mixed with cash crops can provide small-scale farmers the economic return in the short, medium, and long term, as the incomes sourced from crops can help to meet the famers' monthly expenses and that they do not have to wait until the trees are harvested. In addition, tree plantation contracting could further economically incentivize small-scale farmers to participate in the establishment of tree plantations.

VI. Recommendations

- Physical training on CITES Non-detriment Findings for Timber/tree species listed in CITES Appendix II with field practice and demonstration combined with CITES information should be organized at provincial and district levels where there are presence of large population of CITES-listed tree species and good habitats.
- Incentives should be provided in the form of seedlings of *D. cochinchinensis* to individuals, public institutions and those in the private sector to promote the planting of the CITES-listed species through agroforestry, in plantations and public spaces, to restore and conserve the species which would contribute to meeting the obligations in international conventions and promote green growth.
- Technical and financial support should be provided to conduct National NDF assessment for CITES-listed tree species (Appendix I & II).

ANNEX 1

Workshop Program

Virtual Training Workshop
"CITES Non-Detrimental Findings Report on *D. cochinchinensis* and *D. oliveri* in the Choam Ksant District, Preah Vihear Province and the Economic Analysis and Comparative Advantage of Plantations of *D. cochinchinensis*"
Online Zoom Meeting, 8:00 AM – 17:00 PM
24th November 2021

Program

Time	Sessions	Mediators/speakers
8:45-9:00	Zoom Launching	Mr. Say Sinly
9:00-9:10	Opening remarks	Mr. Chheang Dany, Deputy Director General, Forestry Administration
9:10-10:00	Presentation 1: "CITES Non-detriment Findings Report on *Dalbergia cochinchinensis and Dalbergia oliveri* in the Choam Ksant District, Preah Vihear Province"	Mr. Say Sinly
10:00-10:10	Break	Mr. Say Sinly
10:10-11:30	Presentation 1: (Continued) "CITES Non-detriment Findings Report on *Dalbergia cochinchinensis and Dalbergia oliveri* in the Choam Ksant District, Preah Vihear Province"	Mr. Say Sinly
11:30-12:00	Q & A	Mr. Say Sinly & Mr. Chheang Dany
12:00-13:45	Lunch	
13:45-14:45	Presentation 1: (Continued) "CITES Non-detriment Findings Report on *Dalbergia cochinchinensis and Dalbergia oliveri* in the Choam Ksant District, Preah Vihear Province"	Mr. Say Sinly & Mr. Chheang Dany
14:45-15:00	Q & A	
15:00-16:00	Presentation 2: Economic analysis and comparative advantage of plantations of *D. cochinchinensis*-challenges, and opportunity.	Mr. Hort Sothea
16:00-16:30	Q & A	Mr. Hort Sothea & Mr. Chheang Dany
16:30-17:00	Sum-up and closing remarks	Mr. Chheang Dany

ANNEX 2

List of Participants

Virtual Training Workshop
"CITES Non-Detrimental Findings Report on *D. cochinchinensis* and *D. oliveri* in the Choam Ksant District, Preah Vihear Province and the Economic Analysis and Comparative Advantage of Plantations of *D. cochinchinensis*"
Online Zoom Meeting, 8:00 AM – 17:00 PM
24th November 2021

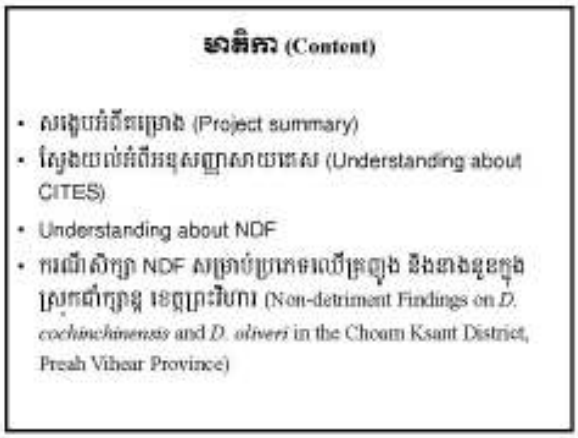
No.	Name and Surname	Position	Organization
1	Dr. Chheang Dany	Deputy Director General	Forestry Administration
2	Ms. Vong Sopanha	Deputy Director General	Forestry Administration
3	Mr. Chann Sovathapheap	Deputy Director General	Forestry Administration
4	Mr. Hem Saravuth	Director	Department of Forest Management and Community Forestry
5	Mr. Suon Phalla	Deputy Director	Forestry Administration
6	Mr. Teang David	Deputy Director	Department of Legislation and Law Enforcement
7	Mr. Bun Rada	Deputy Director	Department of Industrial and International Cooperation
8	Dr. So Thea	Deputy Director	Forest and Wildlife Research and Development Institute
9	Dr. Samreth Vanna	Deputy Director	Department of Forest Management and Community Forestry
10	Mr. Cheav Sophorn	Deputy Director	Department Wildlife and Biodiversity
11	Mr. Chor Phengphao	Deputy Director	Forest and Wildlife Research and Development Institute
12	Mr. Kang Kimly	Deputy Director	Department of Private Forest and Forest Plantation
13	Ms. Lim Sopheap	Deputy Director	Department of Private Forest and Forest Plantation
14	Mr. Cheav Sopheaktra	Deputy Director	Department Wildlife and Biodiversity
15	Mr. Hort Sothea	Deputy Director	Department Wildlife and Biodiversity
16	Mr. Pang Phanith	Office Chief	Department Wildlife and Biodiversity
17	Mr. Ouk Sara	Office Chief	Department of Legislation and Law Enforcement
18	Mr. Say Sinly	Deputy Chief	Department of Private Forest and Forest Plantation
19	Mr. Chhin Navin	Deputy Chief	Department Wildlife and Biodiversity
20	Mrs. Ouch Sineth	Deputy Chief	Department of Private Forest and Forest Plantation
21	Mr. Vann Vean	Deputy Chief	Department Wildlife and Biodiversity
22	Mr. Our Kruy	Deputy Chief	Phnom Tamao Wildlife Rescue Center
23	Mr. Phoung Sophea	Officer	Department of Private Forest and Forest Plantation

No.	Name and Surname	Position	Organization
24	Mr. Buor Vuthy	Officer	Department Wildlife and Biodiversity
25	Mr. As Brosden	Officer	Department of Forest Management and Community Forestry
26	Mr. Sroy Vanna	Officer	Department of Private Forest and Forest Plantation
27	Mr. Khot Chesda	Officer	Phnom Tamao Wildlife Rescue Center
28	Mr. Bou Monkulrengsey	Officer	Department Wildlife and Biodiversity
29	Mr. Koam Seiha	Chief, Phnom Penh Cantonment	Forestry Administration
30	Mr. Vannarith	Deputy Chief, Phnom Penh Cantonment	Forestry Administration
31	Mr. Seng Ly	Deputy Chief, Phnom Penh Cantonment	Forestry Administration
32	Mr. Nget Phou	Chief, Kandal Cantonment	Forestry Administration
33	Mr. Choun Sara	Chief,Kamport Cantonment	Forestry Administration
34	Mr. Kim Chanmaly	Deputy Chief, Kampot Cantonment	Forestry Administration
35	Mr. Dy Sokhom	Chief, Kampong Sam, SHV Cantonment	Forestry Administration
36	Mr. Phal Mony	Chief, Kampong Speu Cantonment	Forestry Administration
37	Mr. Y Cheangmeng	Deputy Chief, Kampong Speu Cantonment	Forestry Administration
38	Mr. Sim Lapin	Chief, Takeo Cantonment	Forestry Administration
39	Mr. Phy Ravin	Deputy Chief, Takeo Cantonment	Forestry Administration
40	Mr. Pea Kimheng	Chief, Kampong Chnang Cantonment	Forestry Administration
41	Mr. Seang Rous	Deputy Chief, Kampong Chnang Cantonment	Forestry Administration
42	Mr. Pit Phearak	Chief, Batambang Cantonment	Forestry Administration
43	Mr. Uch Phirun	Deputy Chief, Batambang Cantonment	Forestry Administration
44	Mr. Om Virak	Chief, Pailin Cantonment	Forestry Administration
45	Mr. Lay Piseth	Deputy Chief, Pailin Cantonment	Forestry Administration
46	Mr. Nuon Sokhom	Chief, Preah Vihear Cantonment	Forestry Administration
47	Mr. Mok Phanha	Deputy Chief, Preah Vihear Cantonment	Forestry Administration
48	Mr. Bun Sothy	Deputy Chief, Kampong Thom Cantonment	Forestry Administration
49	Mr. Noun Peovratana	Chief, Kratie Cantonment	Forestry Administration
50	Mr. Chea Sovannarith	Kratie Cantonment	Forestry Administration
51	Mr. Sarou Ratana	Deputy Chief, Mondulkiri Cantonment	Forestry Administration

No.	Name and Surname	Position	Organization
52	Mr. Ou Sopheakdy	Deputy Chief, Mondulkiri Cantonment	Forestry Administration
53	Mr. Prak Noma	Chief, Kampong Cham Cantonment	Forestry Administration
54	Mr. Keo Muny	Deputy Chief Division, Tambe Cantonment	Forestry Administration
55	Mr. Ben Bollyna	Chief, Thbong khmum Cantonment	Forestry Administration
56	Mr. Heng Namyi	Deputy Chief Division, Memot, Thbong khmum Cantonment	Forestry Administration
57	Mr. Chhuon Chanvuthy	Chief, Svay Reang Cantonment	Forestry Administration
58	Mr. Khim Aun	Chief, Prey Veng Cantonment	Forestry Administration
59	Ms. Kea Ratha	Chief Department	Preak Leap National Institute
60	Mr. Pol Mony	Vice Chief Department	Preak Leap National Institute
61	Mr. Chea Sotharith	Division Chief Kampong Cham	Forestry Administration
62	Mr. Sith Samnang	Deputy Chief, Kampong Cham Cantonment	Forestry Administration
63	Mr. Kao Vutha	Deputy Chief, Kampong Thom Cantonment	Forestry Administration
64	Mr. Van Vuthy	Chief Triange,Svay Reang Cantonment	Forestry Administration
65	Mr. Kiri Vuth	Officer	RECOFTC

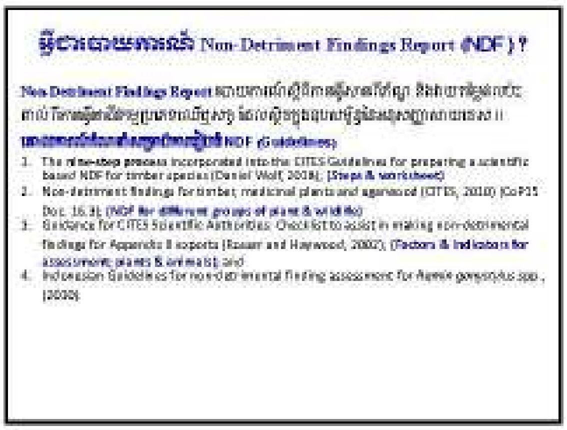
ANNEX 3

Presentation 1: CITES Non-Detrimental Findings Report on *D. cochinchinensis* and *D. oliveri* in the Choam Ksant District, Preah Vihear Province




(Understanding about CITES)
Cambodia has been a member of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) since 1997.


(Understanding about CITES)
CITES Article IV, paragraph 2


Non-Detriment Findings Report (NDF) ?
Non-Detriment Findings Report
NDF (Guidelines)
1. The nine-step process incorporated into the CITES Guidelines for preparing a scientific based NDF for timber species (Daniel Wolf, 2018); (Steps & worksheet)
2. Non-detriment findings for timber, medicinal plants and agarwood (CITES, 2010) (CoP15 Doc. 16.3); (NDF for different groups of plant & wildlife)
3. Guidance for CITES Scientific Authorities: Checklist to assist in making non-detrimental findings for Appendix II exports (Rosser and Haywood, 2002); (Factors & indicators for assessment; plants & animals); and
4. Indonesian Guidelines for non-detrimental finding assessment for ... spp., (2020)


NDF
NDF (Guidelines)
The nine-step process incorporated into the CITES Guidelines for preparing a scientific based NDF for timber species (Daniel Wolf, 2018)


NDF
NDF (Guidelines)
The nine-step process incorporated into the CITES Guidelines for preparing a scientific based NDF for timber species (Daniel Wolf, 2018)


NDF
NDF (Guidelines)
Guidance for CITES Scientific Authorities
Guidance for CITES Scientific Authorities: Checklist to assist in making non-detrimental findings for Appendix II exports (Rosser and Haywood, 2002);
(Factors & indicators for assessment; plants & animals)
There were 7 factors composed of 26 parameters that were assessed to produce a visual scoring radar plot to facilitate the determination of the NDF
IUCN


NDF
NDF (Guidelines)
Each parameter has a score from 1 (the lowest) to 5 (the highest)


NDF
NDF (Guidelines)
Each parameter has a score from 1 (the lowest) to 5 (the highest)


NDF
NDF (Guidelines)
Each parameter has a score from 1 (the lowest) to 5 (the highest)


NDF
NDF (Guidelines)
Each parameter has a score from 1 (the lowest) to 5 (the highest)


NDF
NDF (Guidelines)
Each parameter has a score from 1 (the lowest) to 5 (the highest)

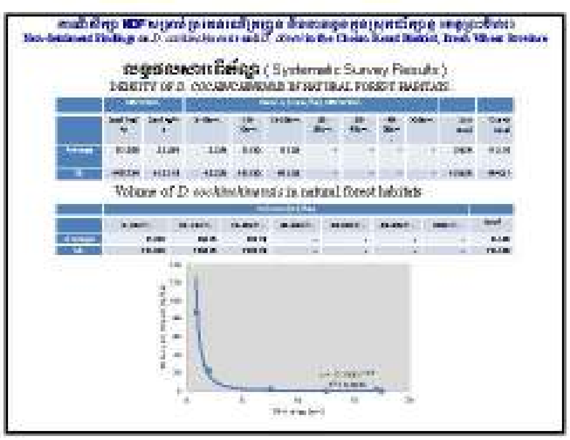

NDF
NDF (Guidelines)
Each parameter has a score from 1 (the lowest) to 5 (the highest)

Assessment On the Conservation Status, Management Practices, and Harvest Monitoring of Dalbergia cochinchinensis and Dalbergia oliveri in the Choam Ksant District, Preah Vihear Province
Review of the taxonomy, biology, ecology, and the status, trend, and population structure, of D. cochinchinensis and D. oliveri in Choam Ksant district, Preah Vihear province, Cambodia.
CITES Non-detriment Findings Report on Dalbergia cochinchinensis and Dalbergia oliveri in the Choam Ksant District, Preah Vihear Province

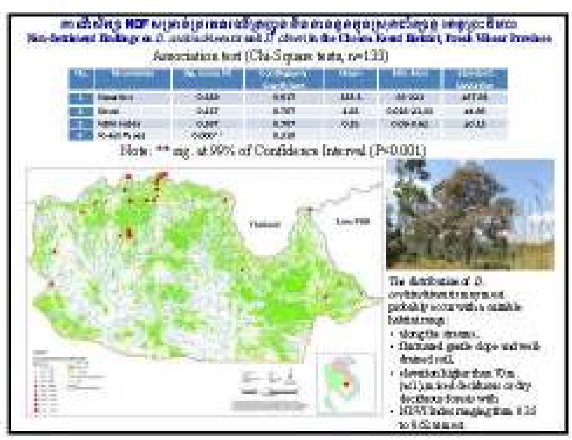
(Timber Species) (Rosewood
(Wildlife)
Compliance Assessment Procedure
(AGARWOOD-PRODUCING TAXA)
(MEDICINAL PLANTS)
Galanthus Species
Taxa: Epiphytic Orchidaceae
GEOPHYTES AND EPIPHYTES

Scientific name: Dalbergia cochinchinensis
Cambodian Commercial grade: Luxury, CITES Appendix: II,
IUCN Red List: Vulnerable (VU)
Preliminary Spot Check
NDVI Index
Normalized Difference Vegetation Index

Sampling Design
NDVI rank (0.4-0.7).
Plot Design

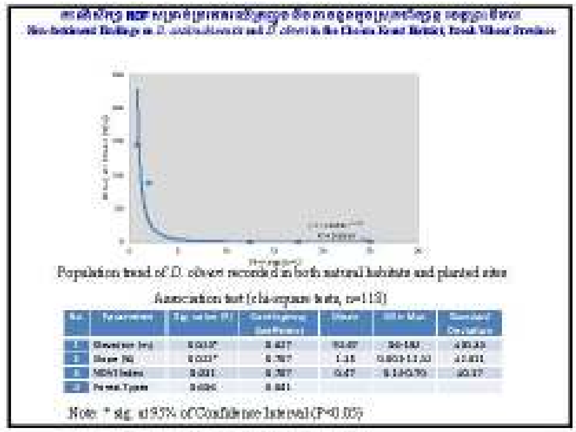


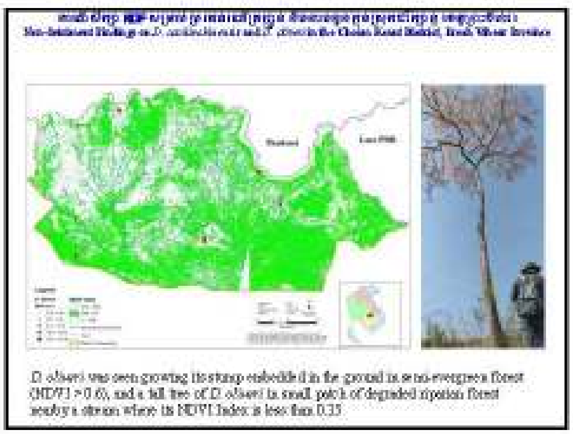
(Systematic Survey Results)
Volume of D. cochinchinensis in natural forest habitats



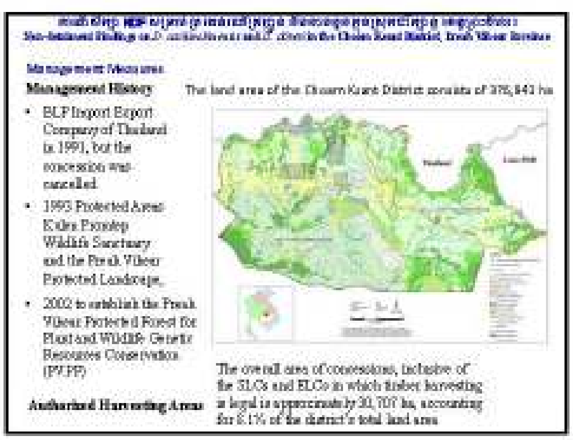
Association test (Chi-Square tests, n=133)
Note: ** sig. at 99% of Confidence Interval (P<0.001)

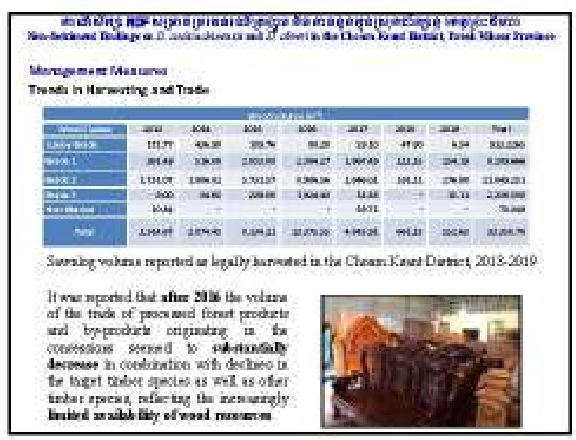

Dalbergia oliveri
Population Size and Diameter Distribution of D. oliveri


Population trend of D. oliveri recorded in both natural habitats and planted sites
Association test (chi-square tests, n=113)
Note: * sig. at 95% of Confidence Interval (P<0.05)


Thailand
Lao PDR
D. oliveri was seen growing its stump embedded in the ground in semi-evergreen forest (NDVI > 0.6), and a tall tree of D. oliveri in small patch of degraded riparian forest nearby a stream where its NDVI Index is less than 0.35


Threats and Biological Risk of D. cochinchinensis and D. oliveri
Threats and ecological constraints affect the reproduction, resilience capacities, and natural growth of D. cochinchinensis, (mortality or increased vulnerability)
Human-Induced activities:
• illegal selective logging,
• forest burning, and clearing forestland for agriculture,
ecological constraints: the limited ecological ranges of both the Dalbergia species in the study area
not enable to blossom and produce fruiting annually and it, similarly was reported by the locals that it could reproduce flowering and fruiting in the next couple years after its once blossoming and fruiting

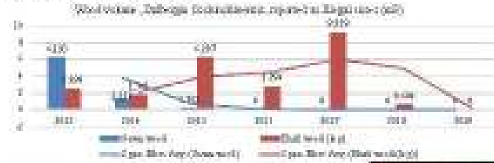

Management Measures
Management History
The land area of the Choam Ksant District consists of 376,843 ha
• BLP Import Export Company of Thailand in 1991, but the concession was cancelled.
• 1993 Protected Areas: Kulen Promtep Wildlife Sanctuary and the Preah Vihear Protected Landscape,
• 2002 to establish the Preah Vihear Protected Forest for Plant and Wildlife Genetic Resources Conservation (PVPF)
Thailand
Lao PDR
Authorized Harvesting Areas
The overall area of concessions, inclusive of the SLCs and ELCs in which timber harvesting is legal is approximately 30,707 ha, accounting for 8.1% of the district's total land area


Management Measures
Trends in Harvesting and Trade
Sawnlog volume reported as legally harvested in the Choam Ksant District, 2013-2019
It was reported that after 2016 the volume of the trade of processed forest products and by-products originating in the concessions seemed to substantially decrease in combination with declines in the target timber species as well as other timber species, reflecting the increasingly limited availability of wood resources

Non-detriment Findings on *D. cochinchinensis* and *D. oliveri* in the Choam Ksant District, Preah Vihear Province

Management Measures

ILLEGAL HARVESTING AND TRADE



Wood volume of D. cochinchinensis and D. oliveri reported as illegally harvested and/or traded in the Choam Ksant District, 2013-2019

The downward trend in the illegal logging and trading of Dalbergia cochinchinensis which fell from 8.687 m³ in 2013 to less than 1 m³ in 2018.

It was recognized that there was a considerable amount of **illegal cutting**, transporting, and trading of *D. cochinchinensis* and, to a lesser extent, *D. oliveri* that was occurring in many parts of the forests **throughout the district** with some of the wood **even crossing the borders into Thailand and Laos.**

Non-detriment Findings on *D. cochinchinensis* and *D. oliveri* in the Choam Ksant District, Preah Vihear Province

Harvest Monitoring

Harvest Regime

Unlike in forest concessions, the timber harvesting systems used in ELCs and SLCs involve **clear cutting** and there is no reason to define a **logging cycle or annual allowable cut** since the principal objective in these types of concessions is to convert forestland into intensive agricultural or residential land.

Methods of Monitoring Harvests > LP is required

While monitoring is commonly conducted by measuring the actual wood collected **on-site at a sawmill**, these measurements are not regularly **cross-referenced with the data originating from the forest inventories** or with regard to verified population estimates of the concerned species in the district.

Non-detriment Findings on *D. cochinchinensis* and *D. oliveri* in the Choam Ksant District, Preah Vihear Province

Harvest Monitoring

Legal Framework

Forestry Law (2002)

Protected Area Law (2008)

Other Relevant Legislations

- Regulation No. 601, dated 24 April 2014, issued by the Council of Ministers of the Royal Government of Cambodia, suspended the exporting of all forest products and forest by-products derived from luxury grade timber species until it would be informed by means of a more recent regulation with the aim of improving sustainable forest resource management and use.
- The Prime Minister's Order 02, dated 22 February 2013, initiated measures and controls on the cutting, transporting, collecting, storing, and exporting of *Dalbergia cochinchinensis* throughout the country.
- The Ministry of Agriculture, Forestry and Fisheries issued Prakas 89 on Prohibited Forest Products and Non-timber Forest Products for harvesting from Reserved Permanent Forests in Cambodia in 2005.

Non-detriment Findings on *D. cochinchinensis* and *D. oliveri* in the Choam Ksant District, Preah Vihear Province

Measures: New Forestland Management System

Reformed Forestland Zoning and Management

In spite of the restricted areas established in Protected Areas, the interviews that were conducted divulged that local authorities recognized the **illegal logging of the target species** not only in **Protected Areas**, but also in those areas originating in Thailand and Laos.

Non-detriment Findings on *D. cochinchinensis* and *D. oliveri* in the Choam Ksant District, Preah Vihear Province

Measures:

Law Enforcement

It is recognized that there are many perpetrators of illegal logging that escape apprehension because of the limited number of foresters and rangers in the district.

Species Restoration

No enrichment planting has been applied in the Protected Areas by the Ministry of Environment nor on forestland by the Forestry Administration, but some forest **restoration** has been accomplished in forest plantations or by **planting trees on public land**.

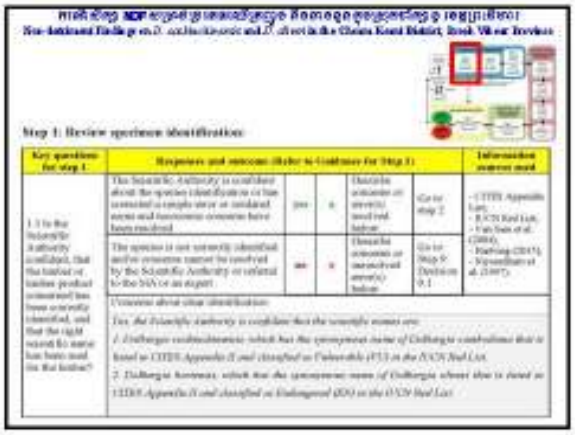
Non-detriment Findings on *D. cochinchinensis* and *D. oliveri* in the Choam Ksant District, Preah Vihear Province

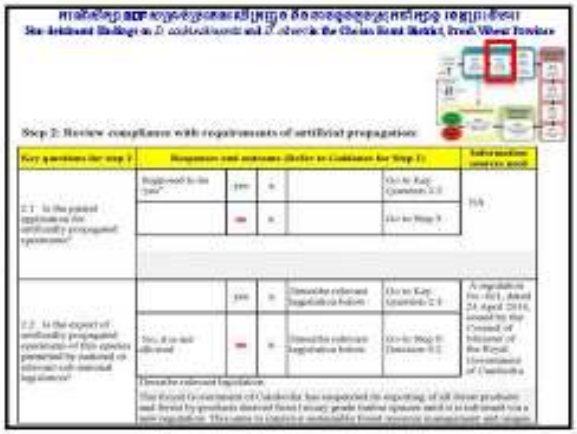
Measures:

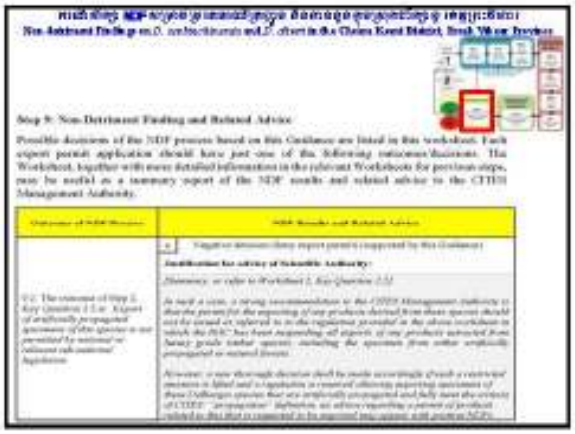
Promotion of Establishment of Forest Plantations

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	2,000	2,600							4,600
[illegible]			7,700	3,730					11,430
[illegible]					2,000	2,000	2,000	2,000	10,000
[illegible]								40,000	40,000
	2,000	2,600	7,700	3,730	2,000	2,000	2,000	42,000	[illegible]

Since 2013, there have been just under 84,000 seedlings of *D. cochinchinensis* that have been distributed to local villagers, monks, and public institutions to plant on their land or that have been planted as forest plantations in the district.

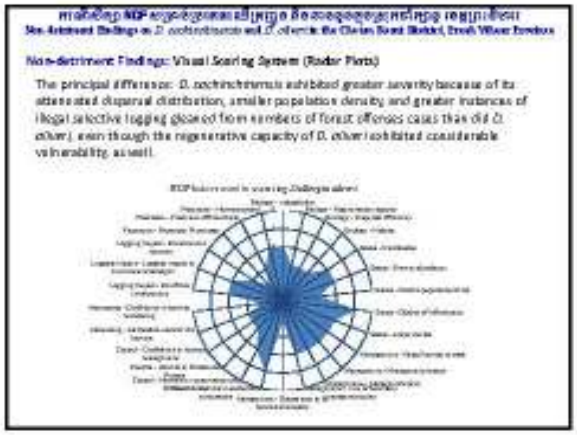

Step 1: Review specimen identification

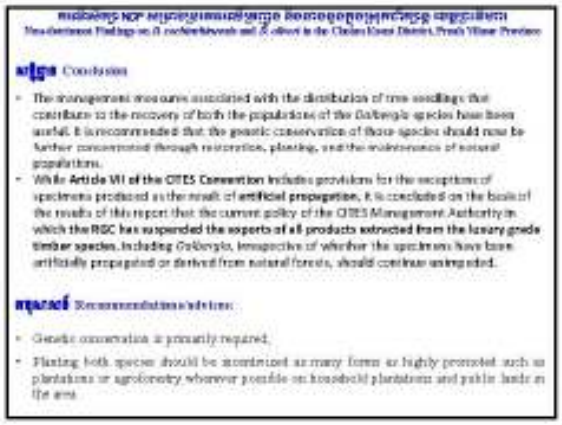

Step 2: Review compliance with requirements of artificial propagation


Step 9: Non-Detriment Finding and Related Advice


Non-detriment Findings: Scoring System


Non-detriment Findings: Visual Scoring System (Radar Plots)
The wide polygon indicates that the harvesting of the species meets NDF requirements and is sustainable, while a narrow polygon indicates that the harvesting of the species is not sustainable and may even have detrimental impacts on the species' populations


Non-detriment Findings: Visual Scoring System (Radar Plots)
The principal differences: D. cochinchinensis exhibited greater severity because of its attenuated dispersal distribution, smaller population density and greater instances of illegal selective logging gleaned from numbers of forest offenses cases than did D. ochrei, even though the regenerative capacity of D. ochrei exhibited considerable vulnerability, as well.



សន្និដ្ឋាន Conclusion

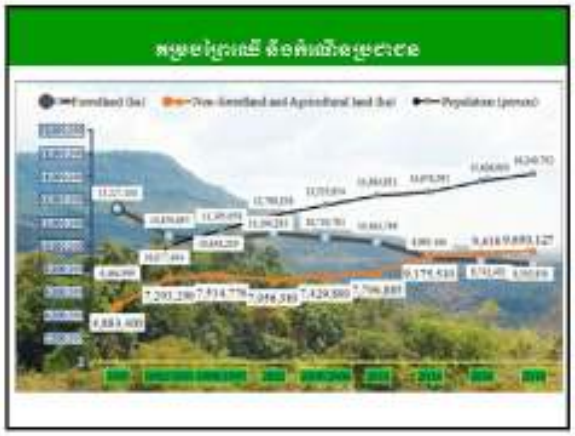
- The management measures associated with the distribution of tree seedlings that contribute to the recovery of both the populations of the *Dalbergia* species have been useful. It is recommended that the genetic conservation of these species should now be further concentrated through restoration, planting, and the maintenance of natural populations.
- While **Article VII of the CITES Convention** includes provisions for the exceptions of specimens produced as the result of **artificial propagation**, it is concluded on the basis of the results of this report that the current policy of the CITES Management Authority in **which the RGC has suspended the exports of all products extracted from the luxury grade timber species**, including *Dalbergia*, irrespective of whether the specimens have been artificially propagated or derived from natural forests, should continue uninterrupted.

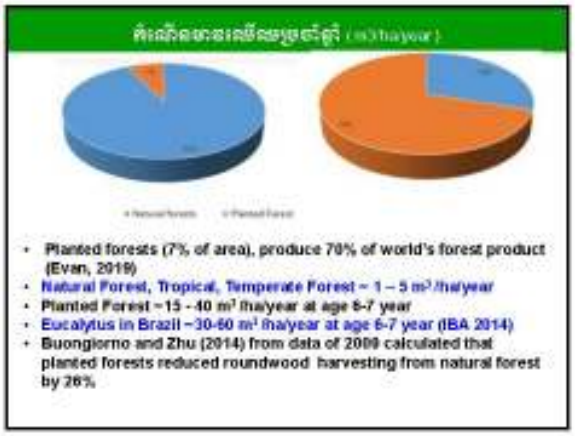
អនុសាសន៍ Recommendations/advices:

- Genetic conservation is primarily required.
- Planting both species should be accelerated as many forms as highly promoted such as plantations or agroforestry wherever possible on household plantations and public lands in the area.

ANNEX 4

Presentation 2: Business-related training to prepare private sector entities and small-scale farmers to participate in the establishment of small-scale private plantations of *D. cochinchinensis* and *D. oliveri*





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Dalbergia cochinchinensis Pierre

Taxonomy and Commercial Grade

Cambodian name	: Kra-gnoung
Scientific name	: *Dalbergia cochinchinensis* Pierre.
Syn	: *Dalbergia cambodiana* Pierre.
Family	: *Leguminosae*
Commercial Grade-Cambodia	: Luxury
IUCN Classification	: VU A1CD
CITES	: **Appendix II**

Dalbergia oliveri

Taxonomy and Commercial Grade

Cambodian name	: Neang Nuon
Scientific name	: *Dalbergia oliveri*
Syn	: *Dalbergia bariensis*
Family	: *Leguminosae*
Commercial Grade-Cambodia	: Luxury
IUCN Classification	: EN
CITES	: **Appendix II**


Dalbergia cochinchinensis Plans
Commercial Grade and Value
Value : 1500-3000 $/m3, depended on quality, diameter & length


Crop | Crop Type | Gross Value Generated
Rice | Agriculture (Current) | $750+
Cassava | Agriculture (Current) | $650+
Sandalwood* | Forestry (Fixed) | $26,500+
Rosewood* | Forestry (Fixed) | $38,500 +


Planting Option:
• Backyard or around houses
• Small to big scale plantation
• Natural Growth is slow,
• Enhancement Plantation (well managed)
• Currently: ~ 5.75 millions stand trees (age of 2-10years, 2.75- 15 meter high) of planted in Cambodia
Private D. cochinchinensis plantation in Kampong Cham province, Cambodia


Private D. cochinchinensis plantation in Kampong Chhnang province, Cambodia
Owners of commercial plant nurseries that sold out to supply seedlings to private sector enterprises to establish D. cochinchinensis plantation in many provinces in Cambodia


CITES project team distributed seedlings to small-scale farmers and public institution to promote the establishment as private D. cochinchinensis plantation in Preah Vihear province


ការលោភផ្ទៃការ
• តម្រូវការទីផ្សារខ្ពស់
• អាចដាំនៅគ្រប់ទីកន្លែងនៅកម្ពុជា
• លើកទឹកចិត្តដាំឈើ
• កាត់បន្ថយការកាប់ឈើខុសច្បាប់


Multiple tree products from diverse trees, crops and animals
Multiple tree products from several tree species
Woody materials include small timber, chip wood, fuelwood, small pole etc.
Private land
- Public state land
- Private land
Private land, ELC, PPP
Household-small scale
Medium scale
Small, medium, and large scale
Many species of trees, bamboo, other native species and associated cash crops e.g., rice, beans, root crops…
Block planting with alternate lines or strips of fast-growing and high economic value
Short rotation harvesting such as Acacia sp., Eucalyptus sp., etc.
Border, line, and block planting
Block planting with alternate lines or strips like
Block planting with high-density
Weeding, pruning and selective cut
Thinning, selective cut or clear cut
Fire protection, pruning and thinning
Agroforestry, integrated farms
Private forest
Home compounds, or Crop fields

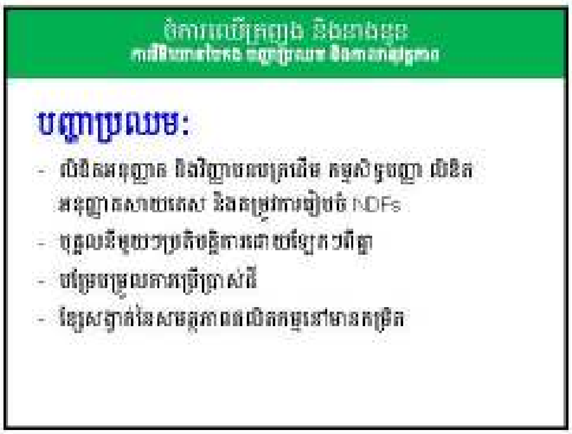

Opportunities: key strategic policies
Relevant authorities shall certify the export license with the scientific and local names of the timber species, and shall certify it as "locally grown timber" or "a wood product made of domestically-gown-tree".
3. The FA has identified indicators and input data to contribute to achieving a long-term Zero Carbon Emissions Strategy (1) establishing CFs, (2) strengthening sustainable forest management; (3) promoting the distribution of seedlings and planting trees in all forms on degraded forest lands and private lands to reduce pressures on natural forests; and (4) developing and promoting agroforestry practices in both community forests and private lands.


Opportunities: key strategic policies
3. The FA has established the practical procedures for the registration of private forests using forms such as private forest registration applications, logbook, and certificates that may meet the requirements of the SITES Convention,
Registration of tree plantations or agro-forestry plantations at the residential land in the rural area in Cambodia may be an incentive set out in the guidelines for the establishment and registration of private forests in Cambodia, which contribute to rehabilitating key high-commercial tree species.


Opportunities: key strategic policies
4. To achieve the target defined in the Agricultural Strategic Development Plan 2019-2023, FA plans to increase tree plantations that can be harvested from 200,000 m3/year in 2019 to 300,000 m3/year by 2023. FA has been customizing the reforestation on state-owned degraded forest land and promoting the participation of private sectors to plant trees on their private land for multi-purpose, especially for commercializing, in the long, medium and short term. These aim to create a variety of supply sources of timber and fuelwood from tree plantations, and help improve living standards of local communities, as well as to reduce their dependence on natural forest sources.


Opportunities: Impact of the implementation of Guidelines on Private Forest Registration
Four locations of private forest plantations that have just been registered in the first semester 2021:
The first location covers an area of 8.92 hectares, situated in Borseth district, Kampong Speu province, and the primarily planted tree species consist of Aquilaria crassna Pierre; Dalbergia cochinchinensis; Afzelia xylocarpa (Kurz) Craib.; Pterocarpus macrocarpus Kurz.
The second location has an area of 200 hectares, located in Sre Ambel district, Koh Kong province, and the mainly planted tree species consist of Aquilaria crassna Pierre; Dalbergia cochinchinensis Pierre; Dalbergia oliveri; Afzelia xylocarpa (Kurz) Craib.; Pterocarpus macrocarpus Kurz; Khaya senegalensis.


Opportunities: Impact of the implementation of Guidelines on Private Forest Registration
Four locations of private forest plantations that have just been registered in the first semester 2021:
The third location is 33 hectares, located in Teuk Chhou district, Kampot province, and the primarily planted tree species consist of Aquilaria crassna Pierre; Dalbergia cochinchinensis Pierre; Afzelia xylocarpa (Kurz) Craib.
The fourth location covers 37 hectares situated in Banteay Meas district, Kampot Province, and the primarily planted tree species consist of Aquilaria crassna Pierre; Dalbergia cochinchinensis Pierre; Afzelia xylocarpa (Kurz) Craib.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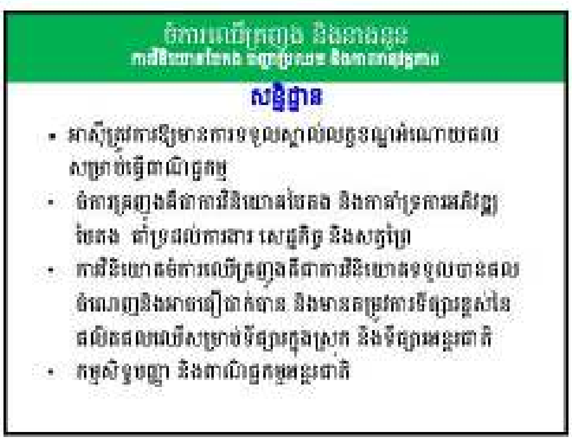
NDFs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Thank you for your attention!
For Further Contact:
wpo@online.com.kh