

*Pericopsis elata* (Harms) Meeuwen (Fabaceae)



Democratic Republic of Congo

Congolese Institute for Nature Conservation (CITES Scientific Authority)

General Secretariat for Environment and Nature Conservation, Ministry of the Environment, Nature Conservation and Tourism (MECNT)

Non-detriment finding on *Afrormosia* (*Pericopsis elata*) in the Democratic Republic of Congo

Kinshasa, May 2014

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*The views and opinions expressed in the present document are those of the Congolese Institute for Nature Conservation (CITES Scientific Authority) and the General Secretariat for Environment and Nature Conservation, Ministry of the Environment, Nature Conservation and Tourism of the Democratic Republic of Congo.*

*Under no circumstances can these views and opinions be considered as reflecting the official opinion of the European Union (EU), the International Tropical Timber Organisation (ITTO), the United Nations Food and Agriculture Organisation (FAO) or the Royal Museum for Central Africa, Tervuren (RMCA).*

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(RMCA)



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VOOR MIDDEN-AFRIKA  
MUSÉE ROYAL  
DE L'AFRIQUE CENTRALE

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## List of acronyms

AAC	Annual Allowable Cut
ACIBO	Lumber felling licence
NDF	Non-Detriment Finding
AFD	French Development Agency
AGEDUFOR	Support project for the Sustainable Management of Forests (AFD - MECNT, 2011 - 2014)
ANR	National Intelligence Agency
VPA	Voluntary Partnership Agreement (part of the FLEGT action plan)
ATIBT	International Technical Tropical Timber Association
WB	World Bank
Cellule E	Environment unit of the MECNT
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COP	Conference of the Parties
TC-VPA-FLEGT	Technical Committee on Negotiations between the DR Congo and the EU
TC-NDF	Technical and Scientific Committee responsible for NDF coordination for <i>P. elata</i> in RD Congo (established by the SG of the MECNT on 21 Feb. 2014)
DCN	Directorate for Nature Conservation (MECNT)
DCVI	Directorate for Internal Monitoring and Audit (MECNT)
DGDA	Directorate-General for Customs and Excise
DGF	Directorate of Forest Management (MECNT)
DGRAD	Directorate-General of Administrative and Estate Revenues
BHD	Breast Height Diameter, i.e. 1.3 m from the ground
DIAF	Directorate for Forestry Inventories and Amenities (MECNT)
MDE	Minimum diameter for exploitation set by the management
DME	Legal Minimum diameter for exploitation ( $DME \leq DMA$ )
DUE	Delegation of the European Union in DR Congo
RWE	Round Wood Equivalent
eq. L	log equivalents
FAO	<i>Food and Agriculture Organization of the United Nations</i> Food and Agriculture Organization of the United Nations
EDF	European Development Fund
FIB	Federation of Timber Companies ( <i>Fédération des Industriels du Bois</i> )

FLEGT	Forest Law Enforcement, Governance and Trade ( <i>Application of the Forest Law Enforcement, Governance and Trade measures for timber and related products</i> ).
FORAFRI	Project to support the sustainable management of African forests (CIRAD, 1990 - 1998)
FRMi	FRMi consultancy (Forests Resource Management Engineering)
SRG	Scientific Review Group
ICCN	Congolese Institute for Nature Conservation
Declaration EB	Declaration of Export Goods
MECNT	Ministry of the Environment, Nature Conservation and Tourism
RMCA	Royal Museum for Central Africa, Tervuren (Belgium)
OCC	Congolese Control Office
OFAC	Central Africa Forest Observatory
ITTO	International Tropical Timber Organisation
PBF	Forest Biodiversity Project (GTZ)
PCPCB	Timber Production and Marketing Control Programme
PFCN	Forests and Nature Project (World Bank)
PG	Management Plan
REDD	Reduction of Emissions from Deforestation and Degradation
SIGEF	Forestry Information and Management System (integrated digital database for PCPCB traceability)
SG	Secretary General
SGS	Société Générale de Surveillance
SRG	<i>Scientific Review Group</i> (CITES body of the European Commission)
LAS	Legality Assurance System
WRI	World Resources Institute
%RE	Recovery rate (as a %)

## Executive Summary

*Pericopsis elata* faces regeneration problems in the Democratic Republic of Congo that are similar to those described and documented for the species in other Congo Basin countries and in West African forests.

From 1 January 2015, the Democratic Republic of Congo will only authorise exports of *P. elata* timber according to the CITES Convention framework, provided that such timber is sourced from forest concessions where, in compliance with legal requirements, inventory management reports have been submitted to the national forestry administration.

Furthermore, authorised export volumes of *P. elata* timber will be strictly limited to a yearly sustainable quota determined on the strength of results provided by submitted management inventories. From 2015, the annual CITES quota for the species will be established on the same basis.

As of 31 May 2014, comprehensive and systematic management inventory reports have been compiled for six forest concessions located in the natural distribution area of *P. elata*. The combined productive area covered by these concessions is 1 072 598 hectares. On the basis of results provided by respective management inventories, those six concessions could be allowed sustainable felling of *P. elata* totalling a yearly cumulative volume of 16 690 m<sup>3</sup>.

Management inventories are currently being conducted in six additional forest concessions located in the natural distribution area of *P. elata*, covering a combined total area of 784,811 hectares.

For those six additional concessions to be taken into account for the establishment of the quota and to be eligible for the export of *P. elata* with respect to CITES in 2015, the title holders will have to lodge their management inventory reports by 31 October 2014.

By 30 November 2014 at the latest, the DRC CITES Management Authority will inform the CITES Secretariat of an annual 2015 quota for exports of *P. elata* equivalent to an allowed volume of sustainably felled *P. elata* established on the basis of the data contained in inventory management reports that will have been submitted.

Traceability monitoring procedures will be introduced to ensure that as from 1 January 2015, the CITES export permits issued by the DR Congo for *P. elata* will only cover volumes harvested in the forestry concessions for which management inventory reports have been submitted.



## Introduction: the general context of forestry activities in DR Congo and the aim of the NDF

According to the Forest Code adopted by the RD Congo in 2002 "The exploitation of any national forest is subject to the prior existence of a forest inventory." (Article 65) and "All forestry exploitation and management activities are subject to the prior preparation of a forest development plan" (Article 71).

Although the implementing legislation for these requirements was only adopted from 2006 onwards (1), the sustainable management of forests for timber production only developed very slowly in the following years and has not started for timber harvested in what is known as the 'artisanal' forestry sector.

This discrepancy is mainly due to the delay in the process started in 2005 to convert former forest concessions in order to rehabilitate the sector. Although it was envisaged that this process would take one year, the concession contracts awarded in respect of recognised convertible titles were only signed from 2011 onwards. The long period of legal uncertainty which prevailed for these six years was detrimental to obtaining the commitment of forestry operators to manage their concessions sustainably (3).

In accordance with the regulations, the forest concessions currently under contract and which have not in the meanwhile been subject to a request for a return to State ownership are currently managed under 'provisional' management plans(4). These provisional management plans are for a four-year period with a possible one year extension and are intended

(<sup>1</sup>) The main implementing legislation includes the Ministerial Decrees 035 and 036 of 5 October 2006, covering respectively the organisation and exploitation of industrial and 'artisanal' forestry (Ministerial Decree 035/CAB/MIN/ECNEF) and on sustainable management (Ministerial Decree 036/CAB/MIN/ECNEF), as well as Ministerial Decree 028/CAB/MIN/ECNT/27/JEB/08 of 11 August 2008 defining the terms of an exploitation contract and related specifications.

(<sup>2</sup>) The new 2002 Forest Code envisages two types of timber exploitation for the country's forests: sustainably managed exploitation for permanent production in the industrial sector; exploitation in local community forests currently limited to artisanal exploitation.

Pending regulation of community forestry, logging in local community forests can only be undertaken by small-scale 'artisan' loggers, which the regulations define as individuals of Congolese nationality working with annual cutting permits of maximum 50 ha and using whipsaws or chainsaws.

Very weakly supervised and monitored by the administration, this artisanal exploitation serves as a cover for a wide range of fraudulent logging activity for timber production, ranging from local operations for domestic markets to large-scale operations using heavy industrial equipment to supply urban, sub-regional and even traditional export markets in Europe or Asia. It is estimated that these fraudulent activities represent a significantly higher volume than the industrial logging concessions arising from the conversion process.

(<sup>3</sup>) For a full analysis of the conversion process between 2006 and 2009, see WRI/AGRECO (2009).

(<sup>4</sup>) For more information see section 6.1.1.

to regulate the exploitation of the concessions subject to contract during the drafting of the management inventories and the development plans (5).

The provisional management plans constitute, together with the social provisions of the specifications (which aim to ensure that forest exploitation contributes *ab initio* to the development of local communities) (6), compulsory appendices to the forest concession contracts. Since May 2011 (7) the contracts and their annexes must also be published on the internet site of the Ministry of the Environment (8).

Although the provisional management plans are indispensable to regulate forest management during the initial years of operations, during which it is envisaged that the management inventories will be produced, they cannot - and it is not their purpose - to offer the same guarantee of sustainability as will be provided by the implementation of the development plans (9). Any delay with the entry into force of the development plans will be prejudicial to the sustainability of the exploitation of the concessions concerned.

As the vast majority of forest concession contracts currently in force were signed in 2011, 2015 should be a landmark year for the entry into force of the first sustainable forest development plans in the DR Congo, particularly in the natural distribution area of *P. elata*.

At present, twenty-three forest titles have been awarded in the distribution area for a combined total area of 3 378 million hectares. The references and characteristics of these concessions, particularly with respect to the progress of the management inventories, are set out in Table 1.1 on the following page (10).

The level of progress made for the management inventories is far from being the same for the 23 concessions. The results of the management inventories are only available for six concessions (highlighted in green in the table) and the management inventories are underway for six further titles (highlighted in yellow on the table). For eleven concessions the management inventories have not yet been started (highlighted in orange).

(<sup>5</sup>) The current provisions for forest management in the DR Congo are described in Section 3.

(<sup>6</sup>) See Section 5 'Use and marketing'

(<sup>7</sup>) Prime Minister's Office *Decree No. 011/26 of 20 May 2011 on the compulsory publication of any contract relating to natural resources* signed by the Prime Minister, the Minister of Mines, the Minister of Hydrocarbons and Minister of the Environment.

(<sup>8</sup>) The forest concession contracts and their annexes are available on the MECNT website at [www.mecnt.gouv.cd](http://www.mecnt.gouv.cd).

(<sup>9</sup>) This is particularly true because, firstly, the exploitation of a concession often starts in the area with the most valuable species (i.e. *P. elata* when the concession in question is at the centre of the distribution area of the species) and also when the annual felling permits in the converted forest concessions continue to be based on ad hoc lumber felling licences (the ACIBO) rather than based on the AACs and logging volume ceilings established in the provisional management plans. See section 6 "Control and monitoring of exportation".

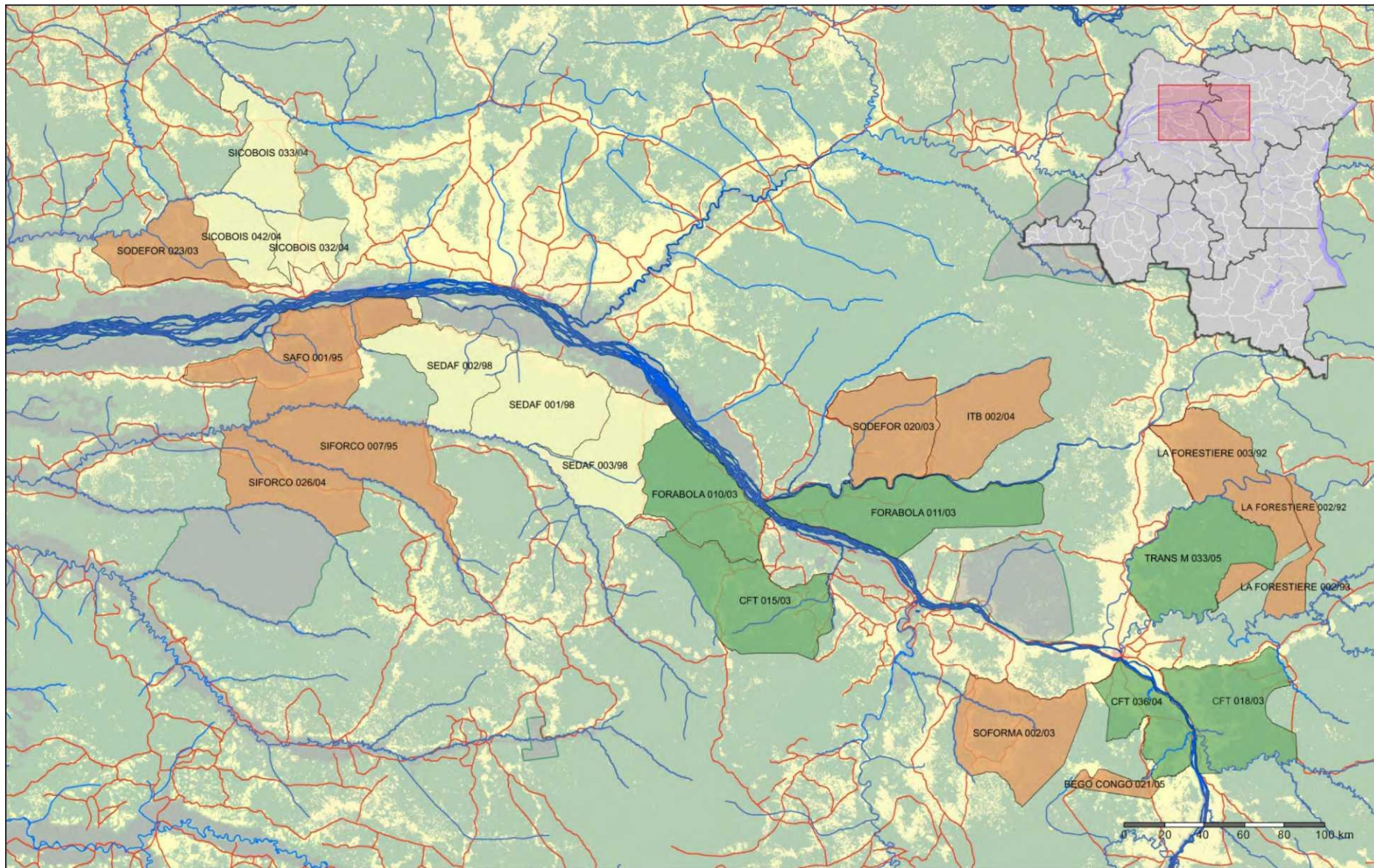
(<sup>10</sup>) For a location map of these 23 concessions, please consult Map, 1.1 below. The forest concession contracts, the provisional management plans and the social provisions of the specifications in force for the 23 concessions are contained in the CD attached as an appendix to the NDF.

**Table 1.1** References and features of the 23 forest concessions located in the natural distribution area of *P. elata*, including the state of progress of the management inventories

Titulaire du titre forestier	N° de contrat	N° GA	Province	Superficie totale PG (ha.)	Superficie utile PG (ha.)	% SU/ST	Situation dans le processus de Conversion	Situation dans le processus d'aménagement	Observations
COTREFOR	018/11	033/05	Orientale	277.031	215.593	78%	PG provisoire Valide	Rapport d'inventaire valide (sous reserve)	Titres dont les donnees d'inventaire ont ete utilisees pour l'estimation du quota pour <i>P.elata</i> en 2015 (voir section 4)
CFT	047/11	018/03	Orientale	243.794	170.154	70%	PG provisoire Valide	Rapport d'inventaire depose	
CFT	046/11	036/04	Orientale	156.714	94.281	60%	PG provisoire Valide	Rapport d'inventaire depose	
FORABOLA	042/11	011/03	Orientale	311.410	206.168	66%	PG provisoire Valide	Rapport d'inventaire depose	
FORABOLA		010/03	Orientale	262.760	204.995	78%	PG provisoire Valide	Plan de sondage depose / inventaire termine	
Nouvelle CFT		015/03	Orientale	288.404	181.407	63%	PG provisoire Valide	Plan de sondage depose / inventaire termine	Titres dans lesquels les inventaires sont en cours Titres susceptibles d'etre pris en compte pour le calcul du quota pour <i>P.elata</i> en 2015 (voir section 4)
SEDAF		001/98	Orientale	251.806	202.098	80%	PG provisoire Valide	Plan de sondage valide / inventaire en cours	
SEDAF		002/98	Equateur	212.401	167.977	79%	PG provisoire Valide	Plan de sondage valide / inventaire en cours	
SEDAF		003/98	Orientale	212.696	167.376	79%	PG provisoire Valide	Plan de sondage valide / inventaire en cours	
SICOBOIS	033/11	032/04	Equateur	100.809	55.235	55%	PG provisoire Valide	Plan de sondage valide / inventaire en cours	
SICOBOIS	051/14	033/04	Equateur	166.453	99.687	60%	PG provisoire Valide	Plan de sondage valide / inventaire en cours	Titres dont la prise en compte pour le calcul du quota pour <i>P.elata</i> en 2015 est peu probable en raison du retard pris dans le processus d'aménagement
SICOBOIS	014/11	042/04	Equateur	110.108	92.438	84%	PG provisoire Valide	Plan de sondage valide / inventaire en cours	
SIFORCO	026/11	007/95	Equateur	291.848	246.104	84%	PG provisoire Valide	Plan de sondage depose	
SIFORCO	027/11	026/04	Equateur	210.652	157.545	75%	PG provisoire Valide	Plan de sondage depose	
BEGO CONGO	022/11	021/05	Orientale	37.942	24.484	65%	PG provisoire Valide	Plan de sondage depose	
SODEFOR	037/11	020/03	Orientale	218.935	173.200	79%	PG provisoire Valide	Plan de sondage depose	
ITB	006/11	002/04	Orientale	223.760	173.936	78%	PG provisoire Valide	Aucun plan de sondage depose	
La Forestiere	001/11	002/92	Orientale	190.629	140.366	74%	PG provisoire Valide	Aucun plan de sondage depose	
La Forestiere	003/11	002/93	Orientale	141.801	110.373	78%	PG provisoire Valide	Aucun plan de sondage depose	
La Forestiere	002/11	003/92	Orientale	147.447	90.026	61%	PG provisoire Valide	Aucun plan de sondage depose	
SAFO	010/11	001/95	Equateur	326.953	189.509	58%	PG provisoire Valide	Aucun plan de sondage depose	
SODEFOR	036/11	023/03	Equateur	182.751	115.283	63%	PG provisoire Valide	Aucun plan de sondage depose	
SOFORMA	043/11	008/03	Equateur	164.861	99.848	61%	PG provisoire Valide	Aucun plan de sondage depose	
				<b>4.731.965</b>	<b>3.378.083</b>	<b>71%</b>			

Map 1.1 Location of the 23 forest concessions in the natural distribution area of *P. elata*

Source: OFAC



However, when a concession is still being exploited under a provisional management plan, as is the case for the 23 concessions located in the natural distribution area of *P. elata* in the DR Congo, it is not possible to rule in a rigorous and scientifically-based manner on the long-term sustainability of forestry in the concession concerned, unless the results of the management inventory for that concession are already available. Only these results will make it possible to calculate sustainable quotas for each species of tree harvested in the concession concerned.

To be eligible for CITES trade the specimens of *P. elata* exported by the DR Congo must also have been exploited in rigorously respected sustainability conditions.

Members of the TC-NDF have discussed in depth the implications of this requirement with respect to the methodology to be applied to calculate a national quota for *P. elata* <sup>(11)</sup>. They finally decided collectively that the prior availability of the management inventory data was indispensable to enable them to decide on a concession by concession basis on the sustainability of exploitation of *P. elata*.

With respect to current progress made in the management process in the DR Congo, they also consider that the prior availability of management inventory data should be the sole valid criterion for the formulation of a rigorous, national quota as part of the NDF <sup>(12)</sup>.

As a result, they recommended that as from the next year of exploitation, i.e. from 1 January 2015:

1. From 1 January 2015, the Democratic Republic of Congo will only authorize exports of *P. elata* timber according to the CITES Convention framework, provided that such timber is sourced from forest concessions where, in compliance with the legal requirements, inventory management reports have been submitted <sup>(13)</sup>.
2. Export volumes of *P. elata* timber authorized by the DR Congo will be strictly limited to a yearly sustainable quota determined on the strength of results provided by submitted management inventories.
3. That the annual CITES quota for *P. elata* will be calculated on this basis for 2015 <sup>(14)</sup>.

The approach taken also has a strong evolutionary dimension, and in strict compliance with the recent recommendation made at the 16th meeting of the Conference of the Parties to CITES for the scientific authorities responsible for the formulation of the Non-Detriment Findings.

<sup>(11)</sup> The NDF drafting process is described in greater detail in section 1.

<sup>(12)</sup> The methodology for calculating the national quota is explained in detail in section 4 and Appendix I.

<sup>(13)</sup> By respecting, in particular, Article 19 of Decree No. 036/2006 setting out the procedures for drafting, approving and implementing the development plans for the forestry concessions producing timber, which stipulates that the "concessionaire is required to submit, in addition to the report, a digital record containing all the management inventory and planimetric data."

<sup>(14)</sup> The provisional results proposed for the CITES 2015 quota are presented in section 4.

Non-Detriment Findings <sup>(15)</sup>. The approach's evolutionary dimension has the three following levels:

1. the number of concessions for which management inventory data are available should increase progressively as and when the concessionaires fulfil their legal requirements with respect to the sustainable management of their concessions. The quota volume should therefore be gradually adjusted to take into account the results of the inventories for which the reports will be submitted in the future.

At the time of finalising the current NDF (end May 2014), management inventories are underway in six of the concessions located in the natural distribution area of *P. elata*, covering a combined total area of 784,811 hectares. It should be possible to take these concessions into account in the calculation of the quota and to be eligible for the export of *P. elata* with respect to CITES in 2015, provided the concessionaires have submitted their management inventory reports in time <sup>(16)</sup>. In this regard, it is suggested that:

- (i) the forestry administration requires forestry concession title-holders whose management inventories are underway to respect the deadline of 31 October 2014 if they wish their concessions to be eligible for inclusion in the calculation of the 2015 quota.
  - (ii) by 30 November 2014 at the latest, the DRC CITES Management Authority will inform the CITES Secretariat of potential re-assessment of the annual 2015 quota for *P. elata* equivalent to an allowed volume of sustainably felled *P. elata* established on the basis of the data contained in the management inventories for which reports will have been submitted.
2. The exercise proposed at point 1 above should be repeated annually in subsequent years.
  3. In the mid-term, when the development plans enter into force in the forestry concessions, the management of logging - in particular the harvesting levels of the species managed - can be adjusted sustainably as an articulation of the development plans, first as five-year management plans and then as annual operational plans. It will then be possible to define the quota volume in greater detail on this basis rather than calculating it from the gross results of the management inventories.

Because they overlap with the requirements formulated in the Forest Code and its implementing provisions for sustainable forest management, the CITES requirements for the sustainable management of *P. elata* can act as a key driver to strengthen the enforcement of the legal and regulatory framework for forest exploitation and management in the DR Congo..

The aim of the present NDF is to ensure that these requirements are effectively implemented for *P. elata* in the forestry concessions in which the species is harvested. The NDF is therefore resolutely founded on the intention to support the improvement of forestry management in the DR Congo.

<sup>(15)</sup> See section 2 on "The NDF drafting process".

<sup>(16)</sup> See section 4 for an estimate of the volume of *P. elata* which could be sustainably harvested in the six concessions whose management inventories are underway, and which might therefore be included in the quota for 2015.

# 1 The NDF drafting process

## 1.1 Context of the NDF drafting process

The drafting of the NDF for *P. elata* in DR Congo should be considered in the context of the exchanges between the DRC CITES Management Authority and the Secretariat and with the CITES Plants Committee, following the inclusion of the species in the Significant Trade Review procedure at the 14th meeting of the Conference of the Parties of CITES (The Hague, 2007).

In the wake of the 14th meeting of the Conference of the Parties, the CITES Plants Committee formulated a recommendation for the DRC CITES Management Authority. It was requested that by no later than 8 December 2011, the DRC CITES Management Authority:

- a) inform the CITES Secretariat of the methodology used to formulate the non-detrimental findings and to define reasonable quotas for harvesting and export;
- b) Communicate to the CITES Secretariat a reasonable quota for *P. elata* in order to include it in the national export quotas published on the CITES internet site.

In February 2011, the DRC CITES Management Authority communicated to the CITES Secretariat an export quota of 50 000 m<sup>3</sup> without, however, providing an NDF against which this volume could be judged, nor *a fortiori* information about the methodology used.

Despite demands from the Secretariat, the NDF for *P. elata* had still not been transmitted when the Secretariat presented its report on progress with the Significant Trade Review at the 62nd session of the Standing Committee in July 2012.

Indicating that "the proposed export quota does not seem reasonable given the lack of an NDF, the Secretariat suggested that the Standing Committee "recommend that all parties suspend trade in *P. elata* from the DR Congo until the DRC has provided proof that it has respected the provisions of Article IV, paragraphs 2(a) and 3 for this species and provides the Secretariat with all information on the manner in which it applies the recommendations of the Plants Committee (CITES 2012a).

Given the favourable opinion of the European Union's SRG, in place since the end of 2009, on trade in the species (<sup>17</sup>), the EU intervened at the Standing Committee to propose a compromise. The Standing Committee agreed on the compromise and took the following decisions:

<sup>(17)</sup> In August 2009, the EU's SRG requested from the DRC that it would like to "receive precise information to indicate that the species was not being over-exploited in any part of the DRC" before being able to take a position on import levels into the EU. The SRG also indicated that it was difficult to provide guarantees as long as "the inventories [were] still being drafted." (SRG, 2009).

Following this request, the MECNT sent a document to the SFG, which had been produced jointly with the ATIBT and entitled "Importation of Afrormosia into the European Union / the case of the DRC" (ATIBT, 2009) which provided some information on the assessment of the productive potential of the species in the DRC without, however, constituting a Non-Detriment Finding for the species.

Considering that this information prefigured the NDF and also came well before the initial deadline of February 2011 set by the Plants Committee, the SRG then decided to give a favourable opinion for trade of the species into the EU on the basis of the ATIBT document.

"The deadline for the application of the recommendation a) of the Plants Committee is postponed until 31 May 2014 to enable the Democratic Republic of Congo to submit to the Secretariat the final project report on the Non-Detriment Finding for *Pericopsis elata* (Harms) Meeuwen (Fabaceae) in the country (<sup>18</sup>) and to give effect to this recommendation. With respect to recommendation b) of the Plants Committee, the export quota for *P. elata* of the Democratic Republic of Congo will be 25 000 m<sup>3</sup> for 2012 and until the results of the above-mentioned project are available. The Secretariat was to publish this quota on the CITES website. (CITES 2012b).

The 25 000 m<sup>3</sup> quota was then renewed for 2013 and 2014, without any further scientific input being required.

At the 64th session of the Standing Committee which will be held in July 2014, the CITES Secretariat will present a new report on progress with the Significant Trade Review. In particular it will report on the follow-up made by the DRC on the 2012 recommendations which arose from the compromise achieved after the intervention of the EU's SRG and the present NDF.

### 1.2 Stages in the formulation of the NDF

The above-mentioned ITTO-CITES activity for the drafting of the NDF (see footnote 18) started in August 2013 as part of a financing agreement between the ITTO and the MECNT.

This was a follow-up activity to the actions planned in the Kribi Declaration, made in 2008 as part of the ITTO-CITES programme, and in particular relating to the following thematic axes:

1. improve knowledge of the ecology and forestry of *P. elata*;
2. promote assisted regeneration programmes for *P. elata*;
3. build capacity to implement CITES and to produce Non-Detriment Findings.

The activity was also part of the action plan drawn up at the second ITTO-CITES workshop held in Limbe, Cameroon in October 2010, in particular with respect to the A1 activity for *P. elata*: "to produce inventories, define the distribution area, and undertake dendrological, ecological, phenological and biological studies".

Launched in August 2013 for a duration of 12 months, the activity was implemented by the DCN (the DRC CITES Management Authority) in collaboration with the ICCN (the DRC CITES Scientific Authority), the Directorate for Forestry Inventories and Amenities (DIAF) and the FIB (Federation of Timber Companies). The activity document envisaged the establishment of a National Technical Committee under the auspices of the MECNT, for follow-up on the implementation of the activity.

The DCN was tasked with coordinating this National Technical Committee and recruited several consultants in November 2013 in order to produce initial reports on (i) the current status, (ii) the

(<sup>18</sup>) This is the "Drafting of a Non-Detriment Finding on *Pericopsis elata* project in the Democratic Republic of Congo" implemented by the ITTO- CITES programme (see point 1.2 below).



regulatory provisions, (iii) the inventory work on *P. elata*, (iv) research into the biology, phenology and ecology of *P. elata*, and (v) cartography.

Recognising the difficulties in making progress with the work started under the auspices of the DCN and the risk that it would not be possible to draft a credible NDF to meet CITES expectations by 31 May 2014, the MECNT Secretary General set up a "Scientific and Technical Committee in February 2014 tasked with drafting the NDF for *P. elata* in DR Congo" (TC-NDF), with support from the DUE and the FLEGT Facility in DR Congo.

On 15 March 2014 the MECNT Secretary General also made a direct request for assistance from the EU FAO FLEGT Programme to support the final formulation of the NDF for *P. elata* by financing a short-term activity (2 months) entitled "formalisation of the follow-up of harvesting and exporting *Afrormosia* under CITES as a preparatory phase of the VPA Legality Assurance System (LAS) being negotiated between the DR Congo and the European Union."

This activity, implemented with RMCA's scientific support made it possible to (i) take advantage of the work already accomplished as part of the ITTTO-CITES project, (ii) to provide better information to stakeholders in the Congolese forestry sector on the prime importance of the strategic and methodological options to make sure that the NDF is credible and (iii) to conduct a scientific field survey so that the NDF might contribute to a better understanding of the biology of *P. elata* in RD Congo.

During its work, the TC-NDF established by the SG also decided to implement fully the recommendations of the 16th COP (Bangkok, 2013) calling on the scientific authorities to give special consideration to adaptive management, including monitoring, when formulating the Non-Detrimental Finding (CITES, 2013) <sup>(19)</sup>.

<sup>(19)</sup> On this matter, see section 6.2 on the follow-up and control measures put in place by the NDF.

## 2 Some biological data on the species

### 2.1 General description of the species

*P. elata* is a great iconic tree of the dense, damp, semi-evergreen African forests, particularly in Cameroon and DR Congo where its most extensive natural stands are found. The tree grows from 150 to 170 cm BHD and 30 to 50 m in total height depending on the geographical location (photo 1A). The DME for this species in DR Congo is 60 cm.

From a BHD of 15 - 20 cm, it is easily recognisable by its cream or grey-coloured bark, which flakes off in fine strips, leaving reddish-brown marks (photo 1 B). However, with a BHD of less than 10 - 15 cm, neither the bark nor a section of sliced wood have particular features, which makes it potentially more difficult to identify saplings, for instance while an inventory is being made.

It has small, fragile and fairly ephemeral flowers, which are only visible for 2 - 3 weeks. The flowers are hermaphrodites with fine, white petals and appear in bunches (photo 2A).

The fruit is an oblong pod - linear, smooth, flat and slightly winged around the edges, green (unripe fruit, photo 2B) to brown (when the seeds are mature, photo 2C), containing from 1 to 5 brown discoid seeds (Boyemba, 2011; Bourland *et al.*, 2012a).

The species is described as sun-loving (Swaine *et al.*, 1988; Kyereh *et al.*, 1999; Anglaaere, 2008). Like many of the species exploited, this large, long-lived tree has anemochory seed dispersal.

Boyemba (2011) has shown that for the Kisangani zone, the species prefers clay soils with a high rate of available phosphorous and sulphur, as well as a low rate of exchangeable aluminium.

Furthermore, although the main stands of *P. elata* have been observed on firm terrain, the literature also mentions the presence of specimens in temporary marshes and/or on the banks of waterways (Swaine, 1996; Bourland, 2013).

This last observation is important, given that the national governments of the Congo basin countries have forbidden or strongly advise against exploitation in these zones. Protecting these zones from exploitation will make them potential refuges for growth.

A

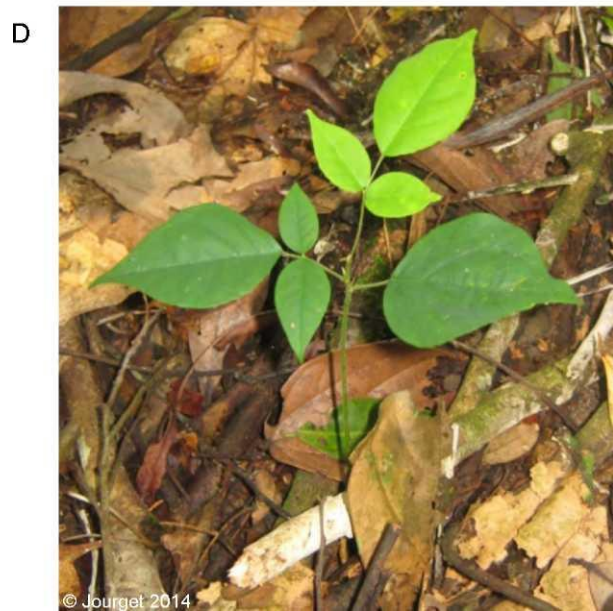
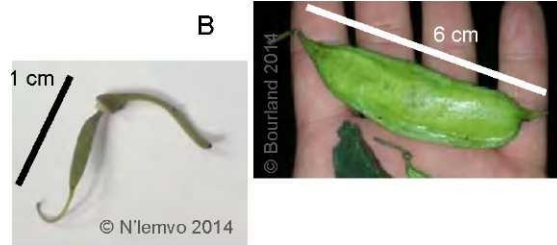


B



**Photos 1A and B.** Details of *P. elata* (photos taken in concession No. GA 002/98 on 4 May 2014):

- (A) a crop tree preserved during felling;
- (B) bark of an adult trunk.



**Photos 2A to D** Details of *P. elata* (photos taken in concession No. GA 002/98 on 2 May 2014)

- (A) flowers;
- (B) fruit in various stages containing unripe seeds
- (C) mature fruit with seed:
- (D) a natural seedling approximately 6 weeks after germination.

## 2.2 Area of distribution of the species

### 2.2.1. Distribution in Africa

Across the continent as a whole *P. elata* is found in a natural state in south-western Ghana, south-eastern Cameroon, the north-west of the Republic of Congo and in the DR Congo. The species has disappeared from the Cote d'Ivoire, Nigeria and the Central African Republic (Howland, 1979; Dickson *et al.*, 2005; Bourland *et al.*, 2012a).

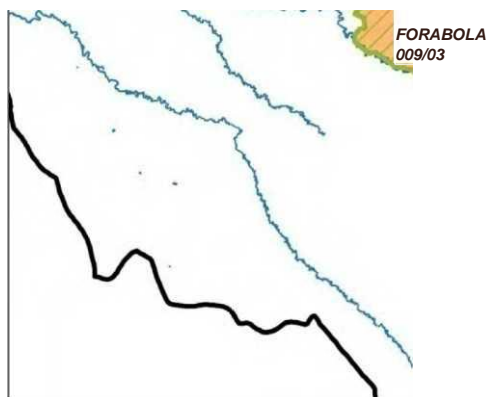
### 2.2.2. Distribution in the DR Congo

For the most part, *P. elata* is found in the central basin of the DR Congo. The species is also present in some forests of the Orientale province and to a lesser extent, the Équateur province. In these two geographic zones, the presence of the species is essentially limited to two strips, each approximately 100 to 150 km wide, located either side of the Congo river.

It is interesting to note that specimens of the species have also been observed on a greater scale, i.e. over a total surface area estimated by the DIAF at about 38 000 hectares (Figure 2.1 on the next page).

Nevertheless, if the latter area is of undeniable interest for the analysis over time of the geographical boundaries of the distribution area of the species, it can in no way be equated with the area in which the species could be exploited either sustainably or in an economically viable manner. In the present document it is therefore only provided indicatively and has not been used for the calculations, the results of which are presented in Section 4.





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 0.071001 - 0,287000 tige.na -1  
 0.287001 - 0.720000 tige.na  
 Hydrographie  
 Aire d'occupation de *P. elata*  
1 Limites des provinces

Sources : DIAF, FRM & Dickson et al. (2005)

### 2.3 Autecology of the species2.3.1.

#### Phenology

The study of phenological events (intensity, duration, periodicity) <sup>(20)</sup> that characterise a species is of particular importance when studying its sustainable management. For example, knowing the mature fruiting period allows a nursery to schedule the best time to harvest seed in a forest, an essential step in any reforestation programme.

Several works have focussed on the phenology of *P. elata*, mainly with respect to Ghana (Taylor, 1960), Cameroon (Kouadio, 2009; Bourland *et al.*, 2010; Bourland *et al.*, 2012b) and DR Congo. In the above works, the studies were all carried out in the Yangambi region (Louis *et al.*, 1943; Vangu-Lutete, 1985; Pieters, 1994; Tshibangu, 2004) and more recently in the Kisangani region (Boyemba, 2011). It is important to note, that to the TC-NDF's knowledge, no scientific studies have been undertaken of the stands in the Equateur province.

In general, the above-mentioned differences indicate a significant variability in the periods of onset of phenological events and their duration.

#### 2.3.1.1 Flowering

The field trip organised from 30 April to 7 May, 2014 as part of the NDF process observed in concession No. GA 002/98 that the flowering period generally seems to occur from February to April. Indeed, on this occasion a few flowers (already pollinated) were observed, indicating the end of the flowering period in this part of DR Congo (Photos 2A and B).

#### 2.3.1.2 Fructification

Then follows a long period when the fruit ripens and the seeds that can potentially germinate are dispersed by wind as the rains arrive. Boyemba (2010) mentions the dispersal of ripe fruit from June onwards in the Kisangani region, whereas the results of the field trip undertaken as part of the NDF in concession No. GA 002/98 tend rather to indicate the dispersal of the diaspores from November to March. This last observation is backed up by Howland (1979, Ghana), Kouadio (2009, Cameroon), Tshibangu (2010, RD Congo) and Bourland *et al.* (2012b, Cameroon).

#### 2.3.1.3 Germination

Fructification and germination were described as potentially being periodically massive in the Kisangani region (Louis *et al.*, 1943; Boyemba, 2011). In Cameroon, for a given seed tree, Kouadio (2009) and Bourland *et al.* (2012b) have shown that the production of mature seeds does not occur every year, but rather with a frequency of one in five years. The same is the case for Pieters (1994), who found that in the Yangambi region a dispersal of mature seeds occurred every 2 to 4 years.

<sup>(20)</sup> Phenology is the study of flowering, fructification and foliation / defoliation. According to Doucet (2003) for a given tree, the state of flowering, fructification (ripe and/or unripe fruit) and foliation can be considered by assessing the rate of canopy cover of the organs studied.



Finally, research undertaken in south-east Cameroon initially by Sepulchre *et al.* (2008) and Kouadio (2009), subsequently refined by Bourland *et al.* (2012b), have made it possible to determine the normal diameter of fructification for the species. The estimate of this parameter is very important for forest management and, depending on the author, varies from 34 to 37 cm BHD (from 30 cm, according to Boyemba, 2011). This parameter is crucial to estimate for example (i) the rate of reduction of the seed trees, after felling operations and (ii) the theoretical number of mature fruiting periods of a given tree before it is felled. The high variability of the estimate of this parameter observed in the scientific literature (30 to 37 cm) and its relevance to forestry management show how important it will be to develop these studies over time in forestry concessions in DR Congo.

### 2.3.2. Dissemination strategy of the diaspores and known predator(s)

As indicated in point 2.1, *P. elata* is an anemochory species. Its winged fruit, like heavy gliders, are preferentially dispersed by the wind.

Considering the potential ecological consequences of this type of spatially limited dispersion, Boyemba (2011) showed that on average most of the seeds are found *in fine* on the ground in a radius of approximately 50 m from the seed tree in question without significant difference with respect to the direction. The maximum distance considered by this author in his study was 100 m with no obstacles between the tree crown and the earth. According to these conclusions, only a very small amount of the fruits (< 5% of all the dispersed fruits) could reach such a distance. Although it would have been preferable that Boyemba (2011) had counted the seeds instead of the pods and had maintained the same variable rate from one plot to another in the same sampling corridor, the study does provide an initial glimpse of the species seed shower.

During their study of the seed shower of seed trees of the species in south-east Cameroon, Bourland *et al.* (2010) also highlighted the fact that a significant proportion of dispersed seeds was likely to be destroyed by the larva of a predator. Their study showed that 10 - 95% of the estimated seed production could be attacked/destroyed for respectively isolated seed trees or those in dense stands.

Finally, Bourland (2013) has identified the main predator responsible for these attacks as belonging to the genus *Exechesops* sp. Schoenherr 1947 (Coleoptera: Anthribidae) <sup>(21)</sup>. On this matter, he observed that: "Similar problems have been raised by Pieters (1994) in DR Congo, and by Taylor (1960) in the Ghanaian context. Moreover, the latter hypothesizes that, instead of the lack of light which is often spoken about, the destruction of seeds by insects could provide a better explanation of the regeneration deficit plaguing the species, "but the author qualifies this statement, adding that: "However, this hypothesis remains to be confirmed to the extent that a high mortality due to the predation of seeds could be part of the strategy of natural reproduction of the species" (Bourland, 2013).

Whereas the small dissemination distance could be one of the parameters explaining the gregarious distribution of the species commonly referred to in the literature (see e.g.

<sup>(21)</sup> Beetles of the genus *Exechesops* sp. are also to be found in the stands of *P. elata* located in the Orientale province. Nevertheless this observation deserves to be scientifically validated, as does the potential impact of this predator (if it is one) on the regeneration strategy of *P. elata* in the Congolese environment.

Hawthorne, 1995; Boyemba, 2011), the potentially high predation of its mature seeds and the sun-loving temperament of its seedlings could help to explain the regeneration deficiency generally observed. The field trip made to concession No. GA 002/98 as part of the NDF process made it possible to observe the gregariousness of the species (based on results from the exploitation inventories as well as traces of attacks on seeds).

### 2.3.3. Germination and natural and assisted regeneration

#### 2.3.3.1 Germination

Very little scientific work has been done on the species's germination and its growth and regeneration. During nursery trials, Kouadio (2009) obtained average germination rates of 44% to 77% in the first 10 days after planting the seeds, testifying to the ease with which a nursery can manage this important step in a reforestation programme (no dormancy breaking, rapid germination compared to other woody species, high germination rates, etc.)

While working on his doctorate in the Yangambi region, Pieters (1994) showed that natural seed germination for *P. elata* takes place mainly in February and March (87% germination rate), that is during the rainy dispersal period of the mature seeds (March marks the beginning of the short rainy season in the Yangambi region). This author also highlights the importance of humidity in germination:

1. the undisturbed forest microclimate, with shade and significant soil humidity, is most conducive to the germination process.
2. whereas the environment created immediately after a complete cut (full sunlight, which is found, for example, where a clearing has been made for a forestry road) is extremely unfavourable to the same process (Pieters, 1994).

#### 2.3.3.2 Natural regeneration

With respect to changes in natural regeneration, Boyemba (2011) explains that the seeds can germinate in large numbers under seed trees or nearby, but after a period of time it is difficult to find a plant exceeding 1 m in total height under the canopy. The results of his observations led to the conclusion that young seedlings disappear between 1 and 3 months after germination in low sunlight conditions.

Pieters (1994) notes that seedling mortality continues for over a year after germination. Whatever the author, it is clear that seedlings have little chance of survival in undisturbed conditions. Based on this observation, Boyemba (2011) estimated at some 10 000 m<sup>2</sup> minimum area of contiguous opening in the canopy that would be needed to increase both the probability of seedlings surviving and growing. When this threshold value is compared with the average area of the canopy gap created during the controlled felling of a tree (a little more than 250 m<sup>2</sup>; Kouadio *et al.*, 2009), it is easy to understand that the disturbance caused by felling cannot promote regeneration of the species without additional forestry intervention.

Batsielili (2008) and Boyemba (2011) indicate the presence of seedlings with well-developed pinnate leaves in open places where human action has been clearly evident (highly disturbed access roads or clearings), the

field trip undertaken as part of the NDF in concession No. GA 002/98 has not convincingly demonstrated for the medium term (10 years) the positive impact of these disturbances on the viability of regeneration.

#### 2.3.3.3 Growing seedlings in a nursery

In controlled conditions (nursery), Kouadio (2009) showed that vigorous plants 50 to 60 cm in average total height can be obtained without fertilization within a period of 9 to 12 months after germination. These results confirm the possibility for forestry companies involved in the exploitation of *P. elata*, to obtain without too many constraints quality plants suitable for reforestation (but see nevertheless Howland, 1979, Wagner *et al.*, 2008 and Bourland *et al.*, 2012 on potential damage from defoliating insects).

2.3.4. Key parameters for management: population structure, diameter growth and natural mortality.

Apart from the normal diameter of fructification mentioned in point 2.3.1 successful forestry management requires that for each species exploited, the structure of the stand, the diameter growth and natural mortality need to be estimated, and in conditions as close as possible to the growing environment in question. Knowledge of these three parameters will make it possible to calculate the recovery rate.

#### 2.3.4.1 Structure and origin of the species's populations

In the case of a given managed area, the stand structure, usually presented as the number of trees per diameter class, is used to calculate the recovery rate. It also makes it possible to undertake an initial diagnosis for regeneration. A population structure with, for example, the general appearance of a Gaussian curve (this is the case for several long-lived, sun-loving species exploited) reflects a deficiency of small and large trees.

In the specific case of *P. elata*, the scientific and/or technical literature discusses (i) in Cameroon, the widespread occurrence of Gaussian structures (Bourland, 2013; see also the development plans of the managed forestry units in which the species is present) and (ii) in DR Congo, contrasting situations with, in some places less unfavourable structures characterized by more trees with small diameters (Boyemba, 2011) <sup>(22)</sup>.

If we assume that all the data sources mentioned are correct / reliable, the variability observed in the population structures of *P. elata* is significant, firstly, between the situation in Cameroon (widespread lack of regeneration) and in the Congo (significant regeneration in some locations) and, secondly, between zones / regions of DR Congo located in the natural distribution area of the species.

This observation is clearly of scientific interest. Indeed, with all the reservations required given the current state of knowledge <sup>(23)</sup>, the relative abundance of small trees in some Congolese forests

<sup>(22)</sup> See on this subject Figures 1.5 and 2.2 respectively presented on page 50 and 69 by Boyemba (2011).

<sup>(23)</sup> Only a multidisciplinary study taking an anthracological and archaeological approach could produce convincing evidence.

could be the result of more recent disturbances (potentially the result of human activity, *cf.* photo 3) than those which produced the stands located in Cameroon. Initially this finding may also lead us provisionally to prefer and even recommend using data collected "locally" (e.g. concession by concession) rather than extrapolations of large scale data, particularly with regard to the assessment of commercial stocks (*cf.* the usefulness of data from management inventories in Section 4) and more generally to make a diagnosis of the sustainability of the exploitation.



**Photo 3.** Photo taken in concession No. GA 002/98 May 3, 2014, illustrating the presence in the top layers of soil in an area rich in *P. elata* trees (elements uncovered when clearings were made for forest roads):

- many pieces of coal which may be evidence of ancient human activity (presence of fire undated at the time of writing);
- fragments of pottery, proof of ancient human presence.

#### 2.3.4.2 Increase in diameter

Estimates for the increase in diameter of *P. elata* are available both for natural stands and plantations. For the latter, Donis (1956; DR Congo), Howland (1979 Ghana) and Anglaaere (2005; Ghana) put forward estimates on the first years after planting, In these particular full sun conditions, average results found by the study ranged from 3.9 (13 years' monitoring, RD Congo) to 13.1 mm.year<sup>-1</sup> (7 years, Ghana).

With regard to the species's growth in natural environments, the estimates are given more for the pre-adult and adult developmental phases. In DR Congo and more particularly in the Kisangani-Yangambi region Schmitz (1962), Vangu-Lutete (1974) and Boyemba (2011) give rates for *P. elata* of average diameter growth respectively 6.8 (11 trees monitored), 4.5 (101 trees) et 4.2 ± 1.4 mm.year<sup>-1</sup> (422 trees). Bourland *et al.* (2012b) obtained slightly lower results in the natural forests of south-east Cameroon: 3.1 ± 0.5 mm.year<sup>-1</sup> (51 trees).

In the framework of the present work, the reference value of  $4.2 \pm 1.4 \text{ mm}\cdot\text{year}^{-1}$  (Boyemba, 2011) was chosen to perform the calculations (see Section 4 and Appendix 1) with respect to the geographic location of equipment and the large number of trees monitored.

In a similar vein to the comments on population structure, the observed differences in growth between geographically-distant populations would be an argument in favour of installing equipment in the Congolese concessions (or groups of concessions) according to consistent criteria (including soil and rainfall) to refine the estimates particularly of the recovery rate. The increase should also be estimated by diameter class when the matrix model (Picard *et al.*, 2008a and Section 4) is used to calculate the recovery rate of trees.

#### 2.3.4.3 Natural mortality rate

For management purposes, the annualised natural mortality rates of exploited species can be used in the same way as diameter growth figures to calculate recovery rates.

In the DR Congo, Vangu-Lutete (1974) estimated the average annualised mortality rate at 0.85% (137 trees monitored over 30 years in the Yangambi region). After three years of monitoring, Boyemba (2011) estimated this rate at 0.60% (422 trees, Kisangani region).

When the annualised natural mortality rate is not known for a given location, the foresters use an average reference value of 1.00% of trees (SPIAF, 2007). This wide variability (0.60 to 1.00%), coupled with the importance of knowing the mortality for each diameter class when the recovery rate is estimated according to the matrix method (<sup>24</sup>), has prompted the TC-NDF to recommend that foresters measure this parameter as accurately as possible. It should be possible to take this measurement at the same time as monitoring the growth of specimens of the species.

(Picard *et al.*, 2008b).

(<sup>24</sup>) Picard *et al.*, 2008a; see also Section 4 and Appendix 1.

### 3 Legal considerations for the organisation of sustainable forestry of *P. elata* in DR Congo

DR Congo has a modern legal and regulatory armoury for sustainable forestry exploitation and management, which applies to *P. elata* in the same way as to all tree species exploited and marketed in the country's forests. This general legal framework for forestry is very demanding in terms of environmental sustainability and is potentially sufficient - if applied correctly, it goes without saying <sup>(25)</sup> - to regulate and ensure the sustainability of *P. elata* harvests in Congolese forests.

The Congolese government has repeatedly stated this in official exchanges with CITES over the past decade about its exports of *P. elata* under the Convention.

In the inventory on the potential of the species the SPIAF (Permanent Department for Inventories and Forest Management of the Ministry of Environment) sent to CITES in 2004, it already emphasised that "with the return of peace and the resumption of logging, Afrormosia production would substantially increase and the measures recommended in the new Forest Code for low-impact sustainable logging is (sic) a guarantee for the preservation of the species "(SPIAF, 2004) <sup>(26)</sup>.

In a letter sent to the SRG in November 2009, the Minister of Environment of the Congolese government pointed out that "current logging does not endanger the Afrormosia populations in the medium term [...] as long as loggers comply with the minimum diameter for exploitation of Afrormosia as defined in the DRC Forest Code" (Letter from the Minister of the Environment of the Congolese government to the SFG of the European Commission, 2009).

Finally in early 2014, in an email correspondence to the SRG of the European Commission, the DR Congo CITES Management Authority stressed that "it is also acting on the laws and provisions which require legality and traceability in the export of natural resources, and particularly on the basis of law enforcement with respect to timber products "(Correspondence of the DR Congo CITES Management Authority with the SRG, 2014).

#### 3.1 General information on the development plans

As is the case today in the legislation of the vast majority of the planet's tropical forest countries, the exploitation of the DRC's dense forests must take place in accordance with the principle of sustainability of the forest, that is, with the objective to maintain and, where possible, improve the forest's capability with respect to all its ecological, economic and social functions, whilst preserving its potential for future generations.

<sup>(25)</sup> See Section 6 "Control and monitoring of harvesting and exportation".

<sup>(26)</sup> Page 4, accessible on the CITES website under reference PC14 Inf. 18

The development plan is a contractual document between the State, the forest owner and the concessionaire, who is responsible for the management of a forest concession. Every development plan must:

- describe the concession and its environment: physical environment, socio-economic context, timber resources, wildlife, land use and biodiversity;
- present decisions on land assignment: definitive boundaries of the concession, definition of series boundaries and objectives for each series;
- indicate the management decisions for the series production of lumber: rotation duration, list of managed species, minimum diameters for exploitation set by the management (MDE);
- schedule harvests in space and time: define the parcels (multi-year blocks for exploitation) and harvest forecasts;
- set the management measures for the different series: low-impact logging rules; management measures for the series for protection, conservation or agricultural use; applied research programme; wildlife management measures, etc.
- provide industrialization guidelines in conjunction with the available resource and more generally all measures planned for the better use of the resource (reduction of losses, development of lower grade timber which was traditionally discarded, diversification of the range of exploited species, energy recovery from industrial waste, etc.)
- draft an action plan for the socio-economic component: ongoing consultation measures, specific measures for remote sites, measures for better sustainable management by local people, etc.

In July 2007, the SPIAF (Permanent Department for Inventories and Forest Management), which is now the Directorate for Forestry Inventories and Amenities (DIAF) <sup>(27)</sup> published a series of operational guides covering, in particular:

- drafting standards of the sampling plan of the management inventory;
- forestry stratification standards;
- the template to calculate the allowed volume for felling;
- land use standards;
- the template for the management inventory report;
- the design of the biophysical description of the natural environment,
- the design for the five-year management plan,

These various standards describe the procedure used to produce the development plan.

<sup>(27)</sup> For information on the remit and the role of the DIAF in forestry management and monitoring of logging, see Section 6.1

### 3.2 Current situation of the development plans and conversion process in RD Congo

In 2005 the Government of the DRC decreed <sup>(28)</sup> a moratorium on the granting of logging permits and instructed an ad hoc inter-ministerial committee to prepare the process of converting old forest titles into forest concession contracts and to start by making decisions on their legality.

In late January 2011, at the end of the process, 80 of the 156 older titles were declared convertible with a total administrative area of 12.2 million ha, corresponding to a total area calculated by GIS approaching 15 million hectares.

The forest concession contracts now require concessionaires to prepare development plans within four years, submit them to the forest administration for approval and then to comply with them. Pending approval of the development plans, logging must be carried out in compliance with the requirements of a management plan, which defines the areas that can be exploited annually; these areas may in no case exceed 1/25th of the total area of the concession <sup>(29)</sup>.

The current situation within the natural distribution area of *P. elata* <sup>(30)</sup>, is as follows: of a total of twenty-three convertible titles with a valid management plan, eighteen were converted to forestry concession contracts (these are as follows: BEGO CONGO 022/11; CFT 046/11 and 047/11; COTREFOR 018/11; FORABOLA 42/11; ITB 06/11; LA FORESTIERE 01/11, 02/11 and 03/11; SAFO 010/11; SICOBOIS 014/11, 033/11 and 051/14; SIFORCO 026/11 and 027/11; SODEFOR 036/11 and 037/11; SOFORMA 043/11), five titles should be converted in the coming weeks (these are Nos. GA SEDAF 01/98, 02/98 and 03/98 CFT 015/03; FORABOLA 010/03).

Six titles, including four converted into concession contracts (CFT 046/11 and 047/11; COTREFOR 018/11; FORABOLA 42/11) and two on the point of conversion (CFT 015/03; FORABOLA 010/03) are very advanced in the management process and already have management inventories.

### 3.3 Data available on stands of *P. elata* in DR Congo

The two main types of inventory data in the forestry environment are biodiversity inventories and forestry inventories:

- biodiversity inventories are often produced by researchers with the aim of analysing the plant diversity of the environment or to study a particular precise parameter for a given species;
- forestry inventories are produced by foresters with the aim of drawing up zoning plans, to plan resource management or to harvest trees.

<sup>(28)</sup> Decree 05/116 of 24 October 2005 laying down the provisions for converting old forest titles to forestry concession contracts and extending the moratorium on granting forestry exploitation titles.

<sup>(29)</sup> Order 028/CAB/MIN/ECNT/15/JEB/2008) of 7 August 2008 defining the standard concession contracts for the exploitation of forest products and specifications relating thereto.

<sup>(30)</sup> To locate the titles in the natural distribution area of *P. elata*, see Map 1.1 in the introduction.



Three types of forestry inventories have been produced in the natural distribution area of *P. elata* in DR Congo: reconnaissance, exploitation and management inventories.

#### Data from former inventories of the 1970s and 1980s

National reconnaissance inventories were produced between 1974 and 1991 for 8 227 000 ha, that is 24 % of the distribution area of *P. elata* <sup>(31)</sup>. The sampling rate used at that time to simulate an allowed volume for felling was very low.

#### Data on exploitation inventories

Exploitation inventories are generally conducted "in full" on the totality of the areas that can be exploited annually. Data are only collected for trees which can be felled, of a diameter equal to or greater than the minimum diameter for exploitation (DME). Sometimes the diameter classes are not given with enough accuracy, which then makes it difficult to use them to simulate quotas.

#### Recent data from the management inventories produced between 2005 and 2013

At present, the data is available from management inventories for six concessions, all located in the Orientale province.

The six concessions cover a GIS area of nearly 1 540 000 ha, i.e. one third of the area covered by the 23 concessions located in the natural distribution area of *P. elata*.

The management inventories were carried out in the forestry concessions by counting and measuring all the trees present, including *P. elata*, on plots of 0.5 ha, the surface area of all these plots together being about 1 % of the usable surface area of the concession in question, in accordance with the standards defined in the operational guides. In each of the plots, the trees were inventoried as follows: for all the 0.5 ha plots, for diameters of 40 cm and +; over 0.25 ha for trees of 20 to 40 cm; over 0.0625 ha (in the COTREFOR concession) or 0.1 ha (other concessions) for trees of 10 to 20 cm in diameter.

These management inventory data were used to calculate the allowed volumes for felling presented in Section 4.

<sup>(31)</sup> As understood in section 2.2.2 "distribution area in DR Congo".

## 4 Estimation of an export quota based on the inventory management data available at 31 May, 2014

Harvesting *P. elata* in a forest area can be considered sustainable when the area is exploited in compliance with the rules and principles of sustainable management summarized in Section 3.

The annual allowed volume for felling is determined <sup>(32)</sup> during the preparation of the management process, by considering the existing potential.

The management process for the forestry concessions in DR Congo is currently underway. With respect to the 23 concessions located in the natural distribution area of *P. elata*, the state of progress is as follows:

- management inventories have been produced for six concessions, which are: CFT 46/11 (ex-GA 36/04), 47/11 (ex-GA 18/03) and GA 15/03; FORABOLA 42/11 (ex-GA 11/03) and GA 10/03; COTREFOR 18/11 (ex-GA 33/05);
- the sampling plans have been validated and the inventories are currently being produced for six other concessions: SEDAF GA 01/98, 02/98 and 03/98; SICOBOIS 14/11 (ex-GA 42/04) and 33/11 (ex-GA 32/04), 051/14 (ex-GA 33/04).

### The six concessions with a management inventory

The structures of the stands of *P. elata* in the six concessions for which there are already inventories are presented in Figure 1.

The estimation of the annual allowed volume for *P. elata* was calculated using the matrix model presented in Appendix 1, which simulates the evolution of a stand according to various parameters (mortality rate, felling damage, harvesting rate, etc.) and calculates the recovery rate according to the minimum diameter for exploitation (DME) and the harvesting rate.

The gross volumes per hectare, available in each of the six concessions, have been calculated by adding together, for each diameter class greater than or equal to the Minimum Diameter for Exploitation set by the management (MDE), the products of average densities of trees inventoried times the unit volumes for the corresponding cubic area <sup>(33)</sup>, the MDE thus calculated should permit a recovery index of at least 50% after a 25 year rotation.

The annual allowed volumes for felling have been estimated by comparing the gross volumes calculated in this manner with the usable surface areas of the concessions and by applying an 80% harvesting rate (which was also used to calculate the recovery index) and a marketing coefficient of 85%.

<sup>(32)</sup> MECNT/SPIAF, *Guide operationnel, modele de calcul de la possibilite forestiere (Operational guide on the method to calculate allowed felling volumes)*, July 2007

<sup>(33)</sup> The cubic area is calculated according to the median diameter of the class in question: 15 cm for class 1; 25 cm for class 2; etc.

### The six concessions currently involved in the management inventory process

It is proposed that in addition to the main quota determined on the basis of data from the management inventories of six concessions, a conditional quota should be considered to reflect the fact that six other concessions are also involved in the management process and are producing inventories.

The award conditions would then be linked to the continued involvement in the process, which means that the management inventory reports would be made available. The national quota would be adjusted on a concession by concession basis by taking into account the available management inventory data.

On a purely indicative basis, it is already possible to estimate this conditional quota by an extrapolation of the results produced for the six inventoried concessions to the six others for which data should become available in the coming months.

In detail, this would consist, for each diameter class greater than or equal to the MDE, in multiplying the average density of the inventoried trees, with weighting for the usable surface area indicated in the inventory report of each of the six concessions, by the unit volume of the corresponding cubic area, to obtain the average gross volume available per hectare, and then to extrapolate it for the total combined usable surface area of the six concessions, as indicated in their respective management plans.

### Conclusion

The results of these estimates are set out in Table 4.1 below: They show that:

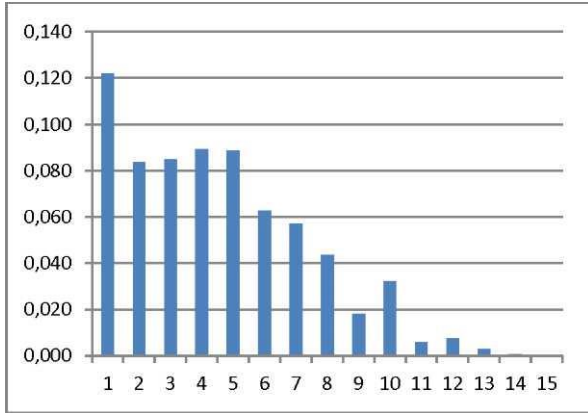
- The annual allowed volume for felling for the usable surface area of 1.073 million ha, corresponding to the six titles already subject to a management inventory, totalled 16 700 cubic meters log equivalent ( $\text{m}^3$  eq. L), and that five titles should be exploited to an MDE of 70 cm, the sixth to an MDE of 80 cm, in order to comply with Congolese law (% Re  $\geq$  50%).
- For information, the annual allowed volume extrapolated to the usable surface area of the six other concessions involved in the management inventory process, i.e. 785 000 ha, has been calculated at 12 500  $\text{m}^3$  eq. L to an MDE of 70 cm.

**Table 4.1:** Estimates of the annual allowed volumes for felling of the 6 concessions with inventories and the 6 concessions for which the inventories are being produced.

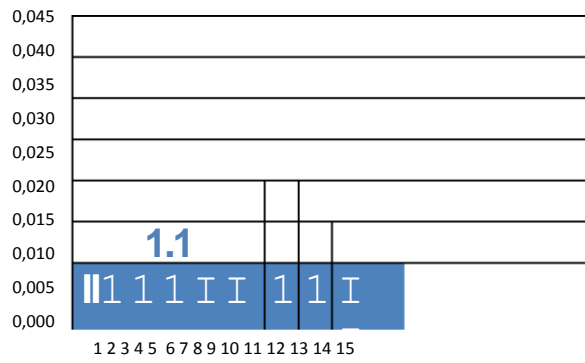
				DMA 70			DMA 80		
Attributaires	N° GA	N° CCF	superficie utile	%Re	volume brut disponible / ha	possibilite annuelle sur titre	%Re	volume brut disponible / ha	possibilite annuelle sur titre
inventaire d'amenagement realise									
COTREFOR	33/05	18/11	215 593	50%	1,299	7 617	61%	1,010	5 924
CFT	36/04	46/11	94 281	37%	0,673	1 727	50%	0,541	1 387
CFT	18/03	47/11	170 154	54%	0,096	445	100%	0,055	255
FORABOLA	11/03	42/11	206 168	50%	0,448	2 513	65%	0,330	1 849
CFT	15/03	-	181 407	53%	0,684	3 376	67%	0,517	2 552
FORABOLA	10/03	-	204 995	90%	0,243	1 352	157%	0,133	742
6 titres			1 072 598		0,584	17 030		0,436	12 709
						15 303			1 387
plan de sondage valide/ inventaire en cours									
SEDAF	01/98		202 098						
SEDAF	02/98		167 977						
SEDAF	03/98		167 376						
SICOBOIS	33/04	51/14	99 687						
SICOBOIS	32/04	33/11	55 235						
SICOBOIS	42/04	14/11	92 438						
6 titres			784 811		0,584	12 461		0,436	9 299

Note: given the unbalanced structure of the *P. elata* population in the CFT 36/04 concession, characterised by relatively few specimens in the 4 and 5 classes and greater numbers in the classes 6 and +, the recovery rate remains below 50% for an MDE of 70 cm. While the development plan is being produced, the company could combine this increase in the MDE with other technical options, such as reducing the harvesting rate or increasing the rotation period.

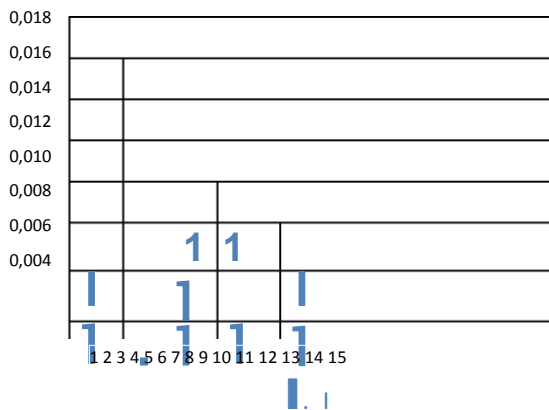
**Figure 4.1** Structure of the populations, minimum management diameters and recovery indices for the inventoried concessions.



COTREFOR 18/11 (ex-GA  
33/05) DMA = 70 cm %Re =  
50%

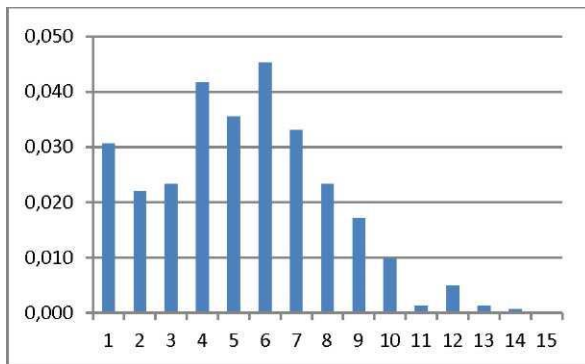
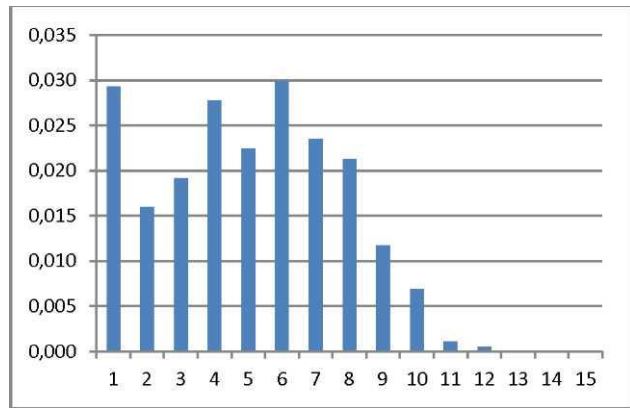


CFT 46/11 (ex-GA  
36/04) DMA = 80 cm  
%RE = 50%



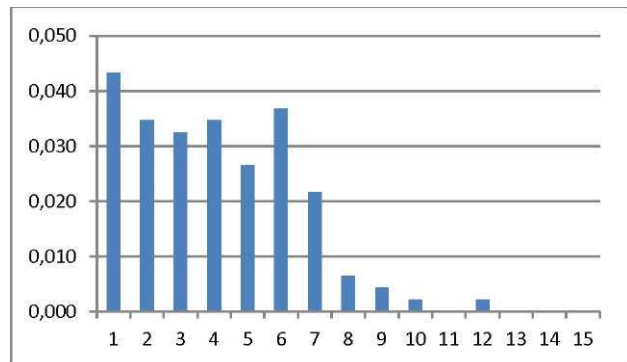
CFT 47/11 (ex-GA  
18/03) DMA = 70 cm  
%Re = 54%

FORABOLA 42/11 (ex-GA  
11/03) DMA = 70 cm %Re =  
50%



CFT GA  
15/03 DMA =  
70 cm %Re =

FORABOLA GA  
10/03 DMA = 70 cm  
%Re = 90%



## 5 Use and marketing

Given its excellent technical and aesthetic qualities <sup>(34)</sup>, timber from *P. elata* is highly valued and commands top prices in the international tropical timber markets. *P. elata* is therefore one of the key species in the forestry sector in DR Congo, where Afrormosia (the common name for *P. elata* in the country) is relatively more present than in the other African countries of its natural distribution area <sup>(35)</sup>.

Given this relative abundance, and unlike the prevailing situation in other Central and West African countries where *P. elata* is currently logged, the exploitation and marketing of the species in DR Congo is one of the main market outlets of the industrial forestry sector. Exports are vital to the profitability of the loggers who operate in its natural distribution area, where they largely determine the financial feasibility of sustainable forest management, including its social aspects (employment in forest areas and supply of local development funds, see below).

According to the DRC Federation of Timber Companies (FIB) exports of *P. elata* are the last resource of the formal forestry sector which has been in constant decline for years. The last formal companies in the forestry sector, still involved in the sustainable management of their concessions in the distribution area of *P. elata* would have to revise their prospects for profitability significantly downward, partly because of the isolation of these concessions and costs related to evacuation, should they find themselves unable to sell *P. elata* in international markets due to a suspension of trade by CITES. At the risk of closing down and reducing the forestry sector

<sup>(34)</sup> "In solid form or as veneer, Afrormosia is used in woodworking, decoration and furniture. It can also be used for parquet floors, wood panelling and staircases. It is used in shipbuilding, particularly as edging for ship decks and is sometimes as highly prized as Teak. It is appreciated for turnery and is also an excellent upmarket joinery wood, both for internal and external purposes (entrance doors, external closures, windows, patio doors, internal doors, stairs, flooring, fire doors, etc.). It can be used as a decorative timber or for external construction (gates, terraces, verandas, pergolas, walkways, recreational areas, urban furniture and design, bungalows). (GERARD 1998, page 24)

<sup>(35)</sup> The population and stocks of *P. elata* which are available in DR Congo may seem quite large when compared to those in the other African countries which are within the species's natural distribution area. This relative abundance is explained both by the extent of the species's distribution area in DR Congo, but most probably also by the specific history of the forests and the development of the stands of *P. elata* in the country.

As discussed in Section 2 on the species's biology, its relative abundance in DR Congo does not mean that its regeneration is any better there than in the other countries where it has been studied in detail. On the contrary, the current development of forestry linked to the sedentarisation of agricultural activity has created unfavourable conditions in the DRC and elsewhere for the maintenance and natural renewal of the current populations of *P. elata*.

Despite their relatively large size, the stocks of *P. elata* currently available in DR Congo are undoubtedly at an historical high. Provided that there are adequate support measures for regeneration, the sustainable management of the open exploitation zones would only be capable of stabilising populations at a lower level that we currently observe, but nevertheless widely acceptable to ensure the survival of the species in its natural distribution area in DR Congo.



in much of the Orientale and Equateur provinces, to a large-scale area of informal economic activity where the promotion of sustainable management objectives becomes *de facto* impossible.

In the course of 2011 and 2012 <sup>(36)</sup>, the DRC CITES Management Authority issued a total of 419 CITES permits authorising the export of shipments of *P. elata* to international markets <sup>(37)</sup>. Based on the DRC CITES Management Authority's annual permits for these two years, almost all the export permits for *P. elata* issued in DR Congo were awarded to a number of industrial forestry concerns <sup>(38)</sup>, amounting to about ten companies in all <sup>(39)</sup>.

Some additional data on exports of *P. elata* are given in the study by Dickson for the 1993-2003 period and more recently by the Directorate of Forest Management (DGF).

According to Dickson *et al.* (2005), the volumes exported (in m<sup>3</sup> logs and sawn timber) for the 1993-2003 period totalled 118 758 m<sup>3</sup> (cf. Table 5.1) with a peak of 25 000 m<sup>3</sup> in 1995.

**Table 5.1: Exports of *P. elata* in logs and sawn timber between 1993 and 2003**

Year	1993	1994	1995	1996	1997	1998
Volumes exported (m <sup>3</sup> logs and sawn timber)	17,733	11,853	25,099	22,033	20,231	11,597
	1	1	1	1	1	1
Year	1999	2000	2001	2002	2003	Total
Volumes exported (m <sup>3</sup> logs and sawn timber)	5,321	0	83	0	4,808	118,758

As the war interrupted logging in all the concessions in the occupied zone (Equateur and Oriental Provinces), activities were only resumed in 2005.

For the 2005-2012 period, *P. elata* was exported as logs, sawn timber, parquets, battens and veneer (cf. Table 5.2).

<sup>(36)</sup> The last years for which the annual reports of the DRC CITES Management Authority are currently available.

<sup>(37)</sup> A statistical table of the CITES permits issued by the DRC in the course of 2011 and 2012 (source: annual reports of the DRC CITES Management Authority) is provided in Appendix 2. This table analyses the exports of *P. elata* authorised by the Management Authority by beneficiary (export companies), by volumes, by product types (logs or sawn timber) and by country of destination.

<sup>(38)</sup> 207 permits out of 213 in 2011, and 180 permits out of 203 in 2012.

<sup>(39)</sup> They were, in alphabetical order, the following companies: CFT, COTREFOR (ex Trans-M), FORABOLA, La Forestiere, SAFBOIS, SEDAF, SICOBOIS, SIFORCO, SODEFOR, Tala Tina. For further information, see the export statistics for *P. elata* in Appendix 2.

**Table 5.2. Exports of *P. elata* between 2006 and 2012 (in m<sup>3</sup>)**

Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | Total | average

Logs	7,071	12,105	18,344	16,295	11,555	16,575	20,048	15,853	110,775	15,825
Sawn timber	934	3,894	5,373	7,258	1,556	2,628	1,505	3,154	25,368	3,624
Parquets	1,793	2,042	2,494	1,944	559	112	0	0	7,151	1,022
Battens	40	166	215	112	60	21	0	0	574	82
Veneer	64	137	0	126	0	0	0	0	263	38
L + sawn timber in eq. L	10,184	25,085	36,254	40,488	16,742	25,335	25,065	26,366	195,335	

Source: MECNT/Directorate of Forest

The main markets for friezes and tiles were the countries of Southern Europe (Italy, Spain and Portugal). However, the global economic crisis of 2008 led to a sharp drop in the market for export quality friezes and tiles.

The three local parquetry manufacturers, one of which was the second largest in Central Africa, have closed for various reasons, as has the SIFORCO sawmill, which explains why exports of flooring, battens and veneers have stopped.

Companies have reverted to the less profitable local market as an outlet for their production of friezes and tiles.

In addition to this commercial setback, companies are technically limited by problems with electricity supply, which disrupt drying cycles in particular, as well as the local workforce's lack of technical expertise.

It is important to stress again the importance of the logging companies' commitment to local development, particularly in the remote or isolated areas of the Orientale and Equateur Provinces.

According to the mission facilitating negotiations of the social clauses of the specifications for forest concession contracts for all forest concessions, whether or not located within the natural distribution area of *P. elata*, the levies to be paid by the logging companies into local development funds established in the framework of the implementation of social clauses in forest concession contracts are estimated at about 13 million dollars. These levies are intended to finance the following facilities: 1163 school classes, 120 health centres, 29 modern water points, 787 km of rural roads, 6 markets, 15 cultural and sports centres. A provision of 8% for the maintenance of this infrastructure is also included.

Levies from the exploitation of *P. elata* account for a significant part of this infrastructure for the concessions located in its natural distribution area, particularly for those whose management inventories were taken into consideration to estimate the quota (cf. Table 5.3. on the following page).

**Table 5.3.** Social infrastructure financed by the exploitation in the 23 forest concessions located in the natural distribution area of *P. elata* (Source: social clauses of the specifications)

Titre forestier		Groupement	Total Fonds previsionnel	Montant fonds entretien	Montant fonctionnement CLG/CLS	Montant realisation	Ecoles (Nombre de classes)	Centres de sante Maternites	Pistes (km)	Moulins Rizeries	Centres culturels Terrains sportifs	Presse a brique	Marches	Points d'eau modernes
COTREFOR	18/11	Alibuku	\$ 365.582	\$ 45.000	\$ 28.711	\$ 291.871	14	1			1	5	1	2
CFT	47/11	Bakumu Mai'ko	\$ 35.367	\$ 1.023	\$ 3.120	\$ 31.224		1		6		1		5
		Bakumu Kabalo	\$ 45.482	\$ 2.454	\$ 2.960	\$ 40.068	6				1			2
CFT	46/11	Bambudje	\$ 184.254	\$ 6.784	\$ 5.600	\$ 97.336	15	1		2				
		Babusoko	\$ 112.827	\$ 5.403	\$ 5.293	\$ 56.491	6	1		2	1			
FORABOLA	42/11	Mongandjo	\$ 91.722	\$ 11.991	\$ 6.840	\$ 72.891				5				
		Yambuya	\$ 226.189	\$ 4.476	\$ 17.240	\$ 204.473	6	1		4	2	2		
FORABOLA	GA 10/03	Bogemba	\$ 189.585	\$ 5.531	\$ 8.400	\$ 175.654	24	1				8	1	
Nouvelle CFT	GA 15/03	Yembu, Bolesa	\$ 112.845	\$ 3.050	\$ 3.105	\$ 106.690	6	4		1				
		Mwando	\$ 56.715	\$ 513	\$ 2.860	\$ 53.342		3		2				
SEDAF/ SIFORCO	GA 01/98	Yanduka	\$ 699.177	\$ 65.178	\$ 21.547	\$ 612.452	36	4	46					
SEDAF/ SIFORCO	GA 02/98	Boonga	\$ 212.978	\$ 3.923	\$ 3.637	\$ 205.418	14	2		1				
		Mombeka	\$ 82.234	\$ 1.017	\$ 6.749	\$ 74.468		2						
		non identifie	\$ 109.055	\$ 4.907	\$ 6.543	\$ 97.604								
SEDAF/ SIFORCO	GA 03/98	Bokala	\$ 443.329	\$ 45.991	\$ 25.534	\$ 371.804	21	1	33	2				
		Mondimbi	\$ 127.753	\$ 25.801	\$ 9.094	\$ 92.858	6		20					
SICOBOIS	33/11	Mondunga	\$ 166.780	\$ 11.903	\$ 6.381	\$ 148.496	36	4				6		
SICOBOIS	51/14	Gumba Ekongo	\$ 167.266	\$ 5.854	\$ 4.381	\$ 157.030	30							
SICOBOIS	14/11	Popolo	\$ 150.903	\$ 5.814	\$ 8.496	\$ 136.593			5	2		4		

Titre forestier		Groupement	Total Fonds previsionnel	Montant fonds entretien	Montant fonctionnement CLG/CLS	Montant realisation	Ecoles (Nombre de classes)	Centres de sante Maternites	Pistes (km)	Moulins Rizeries	Centres culturels Terrains sportifs	Presses a brique	Marches	Points d'eau modernes
SIFORCO	26/11	Lilangi, Bokenda	\$ 371.461	\$ 31.592	\$ 23.469	\$ 316.400	24	4						
SIFORCO	27/11	Songomboyo	\$ 429.708	\$ 55.618	\$ 27.800	\$ 346.290	24	3						
BEGO CONGO	22/11	Babusoko	\$ 114.605	\$ 4.750	\$ 3.040	\$ 106.815	12							
SODEFOR	37/11	Bahnaga	\$ 445.862	\$ 26.388	\$ 25.000	\$ 394.474	24	1	25	4				
		Likombe	\$ 28.966	\$ 2.488	\$ 2.400	\$ 24.078	3	1			5	5		
		Ilongo	\$ 50.221	\$ 4.024	\$ 4.080	\$ 42.117	6				1			
ITB	6/11	Bangelema	\$ 263.500	\$ 19.362	\$ 4.914	\$ 239.224	24	2	30	3				3
LA FORESTIERE	1/11	Bewenzeke	\$ 216.950	\$ 9.763	\$ 13.017	\$ 194.170	6	1	48					
	3/11													
LA FORESTIERE	2/11	Bavatende	\$ 130.140	\$ 5.856	\$ 7.808	\$ 116.475	6	1	20					
SAFO	10/11	Bodala	\$ 108.746	\$ 4.894	\$ 6.525	\$ 97.328	12	2						
SODEFOR	36/11	Ndeke	\$ 33.201	\$ 1.101	\$ 800	\$ 31.300	0					16		
		Bwela	\$ 140.572	\$ 8.446	\$ 9.427	\$ 122.699	27	3		1				
SOFORMA	43/11	Mowema	\$ 306.143	\$ 61.005	\$ 15.242	\$ 229.896	22	1	11					
<b>TOTAL</b>			<b>\$ 5.854.536</b>	<b>\$ 446.900</b>	<b>\$ 291.303</b>	<b>\$ 4.996.158</b>	<b>396</b>	<b>44</b>	<b>238</b>	<b>35</b>	<b>10</b>	<b>42</b>	<b>1</b>	<b>10</b>
				<b>8%</b>	<b>5%</b>	<b>85%</b>								

## 6 Control and monitoring of harvesting and exportation

In Section 3 above we saw that DR Congo now has a modern legal and regulatory armoury with respect to forestry management and exploitation, and that this armoury theoretically guaranteeing the sustainability of harvests applies to *P. elata* in the same manner as to all the other forest species of the country which are exploited and marketed <sup>(40)</sup>.

The effective application of these regulatory requirements in the field, which are relevant to the monitoring and control of the harvesting and exports of *P. elata*, is still, however, in a precarious transition phase countrywide.

On the one hand, significant progress has been made with regard to respect for legality and the effective assimilation of sustainability in forestry by an increasing number of loggers, as well as with the reinforcement of procedures implemented by the administration and public services involved in the management, monitoring and control of sustainability <sup>(41)</sup>. It is precisely this positive turn of events which has made it possible to collect relevant scientific data on *P. elata* which have been used to draft the present NDF and to set a reasonable quota <sup>(42)</sup>.

On the other hand, in vast tracts of forest land, including those in the natural distribution area of *P. elata*, significant volumes of timber are still illegally harvested and marketed, without planning, management or monitoring in line with

<sup>(40)</sup> The DR Congo does not have a fauna and flora conservation law that specifically addresses *P. elata*.

It should, however, be noted that *P. elata* is a timber species protected under Articles 1 and 2 of Annex II of Ministerial Order No. CAB/MIN/AF.F-E.T/276/2002 of 5 November 2002 determining protected forest species, made under section 49 of the Forest Code of 2002

The status of protected forest species has extremely ambiguous legal implications regarding the legality of harvesting *P. elata* as part of the forest exploitation of DR Congo.

- Article 50 of the Forest Code stipulates that "throughout the national forests the felling, grubbing and mutilation of protected forest species are prohibited."
- Furthermore, Article 3 of Ministerial Order 276 of 5 November, 2002 states that "the destruction of fruit and seeds, the grubbing, mutilation and damage, of whatever kind of plants or tree species covered by Articles 1 and 2 of this order are prohibited."
- Finally, Article 4 of the same order stipulates that "the species registered in Annexes 1, 2 and 3 of the present order may only be exploited pursuant to a special order issued by the Secretary General of the Ministry in charge of forests".

It is imperative that these legal ambiguities be resolved (possibly by amendment of Order 276 of 5 November 2002) before the entry into force of the quota for 2015.

The DR Congo will inform the CITES Secretariat of the measures it will have taken in this regard in a letter setting the 2015 quota and which will be sent no later than 30 November 2014.

<sup>(41)</sup> International initiatives such as the VPA negotiations under the FLEGT Action Plan or support for the development of a system of integrated traceability of exploited volumes (see Box 6.1 below) contribute to this favourable trend.

<sup>(42)</sup> See the data used to estimate the quota in Section 4.

the procedures introduced by the competent authorities and administrations. Some of the volumes of *P. elata* available for export to international markets are produced using these casual harvesting practices, which may be locally detrimental to the renewal of the species in its natural distribution area.

The scale of illegal logging in RD Congo has recently been assessed in a study undertaken at the initiative of Chatham House (Lawson, 2014).

Without sharing all the findings and conclusions of the above-mentioned study, the Congolese authorities are nevertheless well aware of the enormous challenges related to the implementation of the legal and regulatory framework in the forest exploitation sector.

As the Prime Minister of the DR Congo recently lamented in a speech at the launch of the national workshop on the Illegal exploitation of natural resources, held in Kinshasa from 11 to 13 September 2013, "the illegal exploitation of forest resources [...] has become a real scourge". "The problem," added the Secretary General of MECNT, has "become a real gangrene preventing the government from collecting rightful tax revenue [and] undermining the sustainability of resources as a result of unsustainable exploitation practices."

The officially recognized extent of illegal logging by forest operators, who are mostly active in the informal economy, is unfortunately accompanied by many failures in the department and administrations responsible for planning, management, monitoring and control of logging in the country, without it being easy to establish a causal link between the two sets of problems.

Although, as noted in Section 3, the strict application of the legal and regulatory provisions in force in DR Congo could ensure the sustainable exploitation of *P. elata*, these provisions are indeed far from serving as a systematic basis for the monitoring and control conducted by the administrations involved in monitoring the exploitation and marketing of volumes actually harvested by the loggers.

On the contrary, the procedures used by these administrations are generally not sufficiently coordinated with each other, nor with the legal obligations that should be checked to ensure the legality of the harvesting (43). They also very

<sup>(43)</sup> In many respects the following observation made by Dickson in 2005 still remains topical ten years later. "Most observers concur that the Ministry of the Environment lacks the staff and resources necessary to implement the 2002 Forest Code. It is also said that there needs to be serious improvement in the circulation of information among the Ministry's various departments. The administration's capacity to control forest exploitation on the ground is very weak [...]. There is talk of corruption in the Ministry" (Dickson 2005, p.37).

On a much more encouraging note, however, Dickson also regretted in his 2005 study that "it [had] not been possible to check the information supplied by the forestry companies". This observation no longer holds today and it is precisely the availability of management data provided by the forestry companies involved in the sustainable management of their concessions that is the basis of the present NDF and makes it possible to see a realistic and credible way out of the logging crisis in DR Congo.

uncoordinated with the new regulatory instruments set up with the support of the international community to ensure the traceability of forest production <sup>(44)</sup>.

In this context, and if we ignore the purely accounting approach of the monitoring of volumes exported by the Management Authority (DCN), which is itself far from perfect as shown by the experience of recent years, there is currently no reliable strategy for the monitoring and control of *P. elata* by the authorities concerned, despite its inclusion in Appendix II of CITES <sup>(45)</sup>.

Section 6.1 briefly outlines the competences of the various administrations involved in the monitoring and control of logging and the marketing of timber products in DR Congo. It shows how the shortcomings in collaboration between these administrations is detrimental to the efficacy and reliability of the monitoring and control of activities in the sector, including those for *P. elata*.

Sub-section 6.2 formulates a series of recommendations aiming to correct these shortcomings and to ensure effective monitoring and control of the volumes of *P. elata* which will be exported to international markets as part of the quota entering into force on 1 January 2015.

### 6.1 Monitoring and control of forest exploitation by the competent administrations

#### 6.1.1 Directorate for Forestry Inventories and Amenities (DIAF)

The remit of the DIAF makes it an absolutely essential directorate for monitoring the sustainability of logging in the converted concessions, and therefore in the forest concessions in the natural distribution area of *P. elata*. The DIAF is responsible for the validation and monitoring of all documents relating to the sustainability of logging and the management of the concessions. The main documents are:

1. the four-year management plans (sometimes called provisional management plans) established as part of the transitional period during which the management inventories and development plans are produced, following signature of a forest concession contract with the State <sup>(46)</sup>. These management plans indicate the Annual Allowable Cut (AAC) and the maximum exploitable volume by species - according to a calculation which is not specified in the regulations - during the transitional period;
2. the sampling plans for the production of the management inventories;
3. the management inventory reports;
4. the development plans;

<sup>(44)</sup> See Box 6.1 below on the importance of traceability.

<sup>(45)</sup> As a result, official documents attesting to the legality of shipments of *P. elata* exported by DR Congo at present only provide very patchy safeguards, notwithstanding the presence of a CITES export certificate.

<sup>(46)</sup> The four-year management plans of the 23 forest concessions in the distribution area of *P. elata* are provided in the enclosed CD attached to this NDF.

5. five-year management plans, which will be a requirement for the future implementation of the development plans and which will establish AACs according to the sustainability limits set by the development plan;
6. annual operational plans, which will be a requirement for the future implementation of the development plans and which will establish the ceiling of exploitable volumes per species in the AAC of the year in question according to the sustainability limits set by the development plan;

At present, the DIAF performs primarily the duties 1, 2 and 3 listed above. To this end, it receives significant support from the French Development Agency (AFD) through the AGEDUFOR project.

#### *6.1.2 The Directorate of Forest Management (DGF)*

The DGF's primary responsibility is to establish and monitor timber permits which make it possible to track the annual harvesting levels more from an economic point of view (production monitoring) rather than in terms of sustainability, which is managed by the DIAF.

Once the development plan has been implemented, the Annual Allowable Cuts are governed by the provisions of Article 7 of Ministerial Order 035 of 5 October 2006 on Forest Exploitation. During the current transitional period preceding the entry into force of the development plans, the AACs are governed by Ministerial Order 011 of 12 April 2007 on the regulations for felling industrial timber.

One of the main problems at the moment is that Ministerial Order 011 does not require the DGF to "calibrate" (in surface area and volume by species exploited) the annual cut permits with the limits set by the AACs in the four-year management plan established by the DIAF for the transitional period. The few elements of sustainability that could have been determined by the four-year management plan do not therefore "limit" logging as long as the concession in question is not managed according to its development plan. In other words, the four-year management plan is currently of no use from the sustainable management point of view.

The DGF also has the responsibility of validating the quarterly returns indicating the volumes felled, which are made at the provincial level by loggers, as well the commercial contracts, so that the volumes of timber felled, bought and sold are recorded and counted in the national statistics. The DGF also validates - and shares this responsibility with the National Forest Fund - the export contracts to enable exporters to obtain the EB licence (Export of Goods) and to establish the reforestation tax base <sup>(47)</sup>.

<sup>(47)</sup> The amounts collected under this reforestation tax, however, are not assigned to any afforestation or improvement activities by the National Forest Fund, although this is its main remit. This is extremely detrimental to the establishment of support activities for the regeneration of *P. elata* in concessions operating in the species's natural distribution area, as the concessionaires use the pretext that they pay this tax to the State for reforestation not to take any initiatives themselves (establishment of nurseries / sufficiently thinned pilot improvement areas to enable effective regeneration of *P. elata*). In this connection see Section 8 on the strengths and limitations of the proposed approach and prospects.



Finally, DGF issues certificates of origin and phytosanitary certificates required in the export documentation to authorise shipments of timber (including exports of *P. elata*).

However, for none of these three levels of validation does the DGF perform counter-checks with the DIAF. It issues the certificates of origin as a 'simple administrative formality'.

### 6.1.3 Directorate for Internal Monitoring and Audit (DCVI)

The DCVI exercises control over the implementation of the forest law and sectoral laws (including Order 056/CAB/MIN/AFF-ECNPF/01/00 of 28 March 2000 on the regulation of international trade in endangered wildlife and flora species) as part of its four main responsibilities, which are to:

- Search, detect and act on, in the manner specified by the procedure, all violations relating to the environment and nature conservation brought to its attention;
- Enforce judicial police powers in environmental protection and nature conservation;
- Issue tickets for infringements and collect fines;
- Provide cross-checks for contested measures and litigation in the following areas: forests, environment, nature conservation, biodiversity, water and sanitation.

Potentially the greatest impact of the exercise of these responsibilities on the harvest and export of *P. elata* should be considered with respect to the circular of 12 April, 2012 from the MECNT Minister "to forest concessionaires holding titles deemed convertible, artisanal loggers and others." "This circular letter "instructed" these operators as follows:

1. Copies of the quarterly returns, the detailed reports including the volume of timber harvested, bought, sold and exported shall also be forwarded to the DCVI for monitoring;
2. Henceforth all timber stuffing operations will be attended by national inspectors / DCVI judicial police officers and a certificate made out and approved by the Director, Head of Department;
3. The Directorate-General for Customs and Excise (DGDA) and other border agencies <sup>(48)</sup> shall require the above-mentioned certificate before allowing any export of timber overseas.

The obligation for the DCVI to be present and issue a stuffing certificate (for containerised export of logs or sawn timber), which takes place when sealing containers in Kinshasa, was subsequently complemented by the obligation to issue a certificate for export in conventional mode (uncontainerised export of logs or sawn timber). In this case, a certificate for shipping timber in conventional mode is issued by the DCVI for all logging trucks leaving Kinshasa for the Matadi export port.

<sup>(48)</sup> N.B. The other border agencies are the Congolese Control Office (OCC) and the National Intelligence Agency (ANR).

The stuffing certificate and certificate of shipping in conventional mode check the compliance of exports of timber products by requesting a copy of relevant official documents, a copy of the applicant's declarative documents or by a factual verification against the criteria listed in Table 6.1 below

**Table 6.1** Verification of compliance criteria used by the DCVI to fill in certificates.

	Information and documents to be verified	Type of verification of compliance
1	Lumber felling licence (ACIBO) drawn up by the DGF	Copy of the official document
2	If the export concerns <i>P. elata</i> : CITES permit drawn up by the DCN	Copy of the official document
3	Proof of payment of surface area levy to the province (5.50 US\$ per hectare of a concession) drawn up by the DGRAD	Copy of the official document
4	The applicant's quarterly returns of volumes of timber felled	Copy of the declarative document validated by the province
5	Packing list or shipping docket	Copy of the declarative document Factual verification
6	Proof of payment of the reforestation tax to the National Forest Fund (percentage of the export volume) drawn up by the DGRAD	Copy of the official document
7	Phytosanitary certificate drawn up by the DGF	Copy of the official document
8	Certificate of Origin drawn up by the DGF	Copy of the official document
9	Export sales contract approved by the DGF	Copy of the official document
10	EB Export licence of a commercial bank	Copy of the official document
11	Export-ready batch report drawn up by the OCC	Copy of the official document
12	Name of the species	Copy of the declarative document Factual verification
13	Volume transported (logs or sawn timber)	Copy of the declarative documents (Packing list / docket) Factual verification
14	Number of logs or number of packages	Copy of the declarative documents (Packing list / docket) Factual verification
15	Container transport (stuffing): Container Number and seal Conventional transport: registration plate numbers of the truck and trailer	Factual verification
16	Destination country	Copy of the declarative document validated by the province Copy of the official document (EB export licence)

The verification of these different elements of compliance and the issuance of certificates undeniably constitute a step in the right direction to check the legality of timber exports from DR Congo.

Nonetheless these procedures do not go far enough, for the reasons given hereafter:

1. Firstly, the volumes checked are not recorded in databases which would make it possible to cross-check the exports of operators against the limits per volume and per species established by DIAF in the management plans and by the DGF in setting the annual allowable cuts.
2. Secondly, the controls performed do not enable the DCVI to establish the legality of the logging operations that took place before this marketing phase and *a fortiori*, on their sustainability. It is symptomatic in this respect that the "provisional" management plans <sup>(49)</sup> are not included in the documentation which has to be checked by the DCVI.
3. Finally, the main weakness of the checks performed is that the question of the traceability of the products is completely overlooked. The DCVI is satisfied with verifying that the products actually refer to a concession contract and that a timber felling permit has actually been issued (marking for logs / declaration for sawn timber).

And in so doing, the DCVI does not have to make a precise ruling about the real origin of the products which it is authorizing for export. The fact that the DCVI requires the applicant to produce a certificate of origin issued by the DGF (see 6.1.2 above), proves *a contrario* that it does not itself rule on traceability.

Two other types of information should be checked - and recorded in databases - so that the DCVI's controls are effective, as far as the timber's origin is concerned. On the one hand, this means recording the felling numbers of the harvested trees, which are used to make up the checked shipments of timber <sup>(50)</sup> and, on the other hand, the SIGEF bar code numbers, the use of which has been compulsory since December 2012 <sup>(51)</sup>.

Until these weaknesses have been corrected, the compliance checks conducted by the DCVI when preparing stuffing certificates and conventional mode shipping certificates cannot be the basis for the effective control of *P. elata* exports in the context of this NDF.

<sup>(49)</sup> See the introduction to the NDF.

<sup>(50)</sup> The link between the felling numbers of the harvested trees does, however, exist in the packing lists drawn up by the forestry companies most committed to the sustainable management of their concessions.

<sup>(51)</sup> See the Box below on transport traceability and monitoring.

**Box 6.1** *The importance of transport traceability and monitoring*

Although it offers a science-based quota, the Non-Detriment Finding cannot be credible unless it provides, at the same time, guarantees that the procedures for monitoring and control are effectively implemented to ensure that the shipments of *P. elata* it authorises for export do, in fact, come from the forest concessions whose inventory results have been used to calculate the quota.

The experience of recent years has sufficiently shown that the fact that exports of *P. elata* from RD Congo are accompanied by CITES certificates and are for a total volume which remains within the quota's limits is far from being sufficient to guarantee that the true origin of these exports is really known.

Otherwise, if the volumes exported "under cover" of CITES certificates within the quota do not necessarily come from sources authorized by the NDF, the credibility of the NDF and its added value for the survival of the species will inevitably be questionable. The traceability of authorised export volumes is therefore of paramount importance to the NDF's acceptability.

Theoretically, traceability should be the responsibility of the SIGEF (Forestry Information and Management System), which has been in development since 2010 as part of the PCPCB (Timber Production and Marketing Control Programme) and operational since the beginning of 2013.

For this purpose, the TC-NDF asked the PCPCB whether it would be able to provide traceability for the volumes of *P. elata* intended for export under the present NDF. In the reply dated 2 April 2014, the programme coordinator gave the following confirmation: As planned, the SIGEF is a tool which, when it is used by all forest operators, as is required by the joint order of the MECNT and the Ministry of Finance of 5 December 2012 on the establishment of the PCPCB <sup>(52)</sup>, will indeed be able to provide by operator, permit, species, etc., all statistics relating to the sector [...], including those for Afrormosia."

At the time of finalizing this NDF, the continued funding of the PCPCB cannot be taken for granted, and it is therefore not certain that the programme will be able to ensure the traceability of *P. elata* volumes under the quota to be established in 2015 as part of the NDF <sup>(53)</sup>.

<sup>(52)</sup> Order 001/CAB/MIN/ECNT/15/BNME/2012 and 615/CAB/MIN/FINANCES/2012.

<sup>(53)</sup> In the correspondence establishing the 2015 quota that the DRC CITES Management Authority will send to the CITES Secretariat no later than 30 November 2014 (See introduction to the NDF), it will inform the CITES Secretariat of progress with the PCPCB and whether it will be possible to use the programme operationally to ensure the traceability of volumes of *P. elata* in the 2015 quota.

In these circumstances and given the inherent weaknesses in the controls performed by the DCVI when preparing the stuffing certificates and the certificates for shipment in conventional mode, additional arrangements must imperatively be made to ensure the traceability of volumes of *P. elata* for which applications for CITES permits have been made for the quota which will be set in 2015 in accordance with the present NDF <sup>(54)</sup>. These additional arrangements are set out in point 6.2 below.

#### 6.1.4 The Directorate for Nature Conservation (DCN) - CITES Management Authority

As the DCN was designated CITES Management Authority by Order 056/CAB/MIN/AFF-ECNPF/01/00 of 28 March 2000 on the regulation of international trade in fauna and flora species threatened with extinction, the issuance of CITES export permits falls within its remit.

Obtaining a CITES permit is the first step to be performed by a forest concessionaire wishing to export *P. elata*. The procedure to obtain a permit is formally established as follows:

1. The applicant submits a detailed application (see the recommendations for improvement in 6.2 below, to ensure the credibility of the NDF);
2. A debit note is drawn up by the DCN and a tax collection note is drawn up by the DGRAD;
3. The applicant presents proof of payment to a bank approved by the Central Bank of the Congo and on this basis the DCN draws up the CITES permit;
4. The applicant starts the process to obtain documents 6 to 11 specified in Table 6.1 above, which enable the DCVI to produce the certificate;
5. Applicants shall make themselves available to the border agencies (DGRAD, ANR and SCTP) for the customary formalities before the actual export.

<sup>(54)</sup> This is all the more necessary given that the measures relating to the transport of timber products, included in the implementing orders of the Forest Code, have so far only been partially taken. These include:

- the production of field documents. According to Article 50 of the Order 035 of 2006 on forest exploitation, "*For each annual allowable cut the holder of a timber felling licence must keep an up-to-date field document including sheets, in four copies, provided by the administration in charge of forests and for which the template is appended to the present order*". Although a template for the field document was provided for in Order 105 of 17 June 2009, the secure, numbered forms for the field documents including sheets in four copies have not been produced and distributed by the administration. For the time being, each operator produces its own documents.
- the production of transport permits. According to Article 54 of Order 035 of 2006 on forest exploitation, "*No timber forest product may be transported from the place of felling to the place of sale or storage unless it is accompanied by a transport permit issued free of charge by the forestry administration at the place of felling. The transport permit must be produced by the carrier at the request of competent forestry agents or officials. The provisions of the present article do not apply to the transportation of forest products within the boundaries of the logger's concession.*" The observations made on the production of field documents below also apply to the transport permits.

In this regard also, the DRC CITES Management Authority will inform the CITES Secretariat of the measures which will have been taken by the DR Congo to overcome these shortcomings in the letter setting out the 2015 quota which will be sent no later than 30 November 2014.

Due to the lack of coordination between the government agencies responsible for monitoring logging in DR Congo, it is proving extremely difficult for the country's CITES Management Authority to fulfil its obligations in checking the legality of every shipment of *P. elata* timber that it authorises for export to international markets.

At present, the CITES Management Authority has neither the material resources nor the technical means to verify that the regulatory provisions and follow-up administrative procedures in force have been applied to many shipments of *P. elata* for which it has received applications for export permits.

In this regard it is also quite dysfunctional that obtaining a CITES permit is the first step in the export control process currently applied in the DR Congo rather than the last. This inconsistency is also very detrimental to the transparent, healthy management of CITES permits for *P. elata* exports from DR Congo.

Given that the validity of CITES permits is limited to six months, the slow pace and complexity of administrative procedures prior to the actual export of cargo have regularly led to the cancellation and replacement of expired permits, with all the risks of incoherence and possibilities of fraud that this entails.

It should also be pointed out that Article 7 of Order 056 of 2000 directs the CITES Management Authority to take the necessary measures to comply with certain additional obligations of the Convention, namely:

1. Draft an annual report containing a summary of the information on the number and type of permits or certificates issued and a biennial report on legislative, regulatory and administrative measures taken to enforce the provisions of the Convention;
2. Transmit these reports to the CITES Secretariat no later than the end of October of the year following the period in question.
3. In accordance with Article VIII, point 6, maintain a register which should include:
  - a) The names and addresses of exporters and importers;
  - b) The number and type of permits and certificates issued;
  - c) The States with which such trade occurred;
  - d) The number or quantities and the types of specimens;
  - e) The names of the species as included in Appendices I, II and II and, where applicable, the size and sex of the specimens in question.

#### 6.2 Procedures which will be in force to manage *P. elata* under CITES from 1 January 2015

In order to overcome the structural shortcomings in governance which mean that it is not possible to guarantee that shipments of *P. elata* exported by the DR Congo come from zones in which logging respects the rules of sustainable management as set out in the present NDF, the Secretary General for the Environment of the MECNT (on behalf of the DRC CITES Management Authority) and the Director General of the ICCN (the DRC CITES Scientific Authority) will take the measures

necessary to ensure that the following recommendations are effectively applied from 1 January 2015 <sup>(56)</sup>:

1. Concessionaires whose concessions were taken into account for the calculation of the 2015 quota have been informed of the maximum volume of *P. elata* they may be able to export in 2015 for each concession concerned, given the results of management inventories and provided that the inventory reports are usable.
2. Any application for a CITES permit to export a shipment of *P. elata* is to be submitted by the applicant using the template included in Appendix 3 of the NDF. This application is documented by the following information:
  - a. references of the contract for the forest concession from which the volume of *P. elata* has been harvested and for which the CITES permit is requested;
  - b. references to the AAC of the four-year management plan drawn up for the transitional period and from which the volume of *P. elata* has been taken and for which a CITES permit is requested, mentioning the maximum allowed volume of *P. elata* in the AAC in question;
  - c. references of the felling licence(s) <sup>(57)</sup> for the volume of *P. elata* for which the CITES permit is requested, mentioning the maximum allowed volume of *P. elata* the felling licence(s) in question;
  - d. if the application for the CITES permit is to export logs of *P. elata*: the felling numbers of the trees that have been harvested to constitute the volume *P. elata* for which the CITES permit is requested;
  - e. if the application for the CITES permit is to export sawn timber of *P. elata*: the felling numbers of the trees that have been harvested to constitute the volume of sawn timber for which the permit is requested.

The application for a permit including this information forms a compulsory appendix to any permit granted. Any permit which does not have this appendix is deemed irregular and cannot be used to trade *P. elata* under CITES.

3. A simple electronic database (e.g. a spreadsheet) is to be used to monitor exports of shipments of *P. elata* under CITES. This database will make it possible to monitor immediately the exports of *P. elata*, both with respect to the national quota and to the allowed volume for felling determined for each concession from the results of the management inventory.

<sup>(56)</sup> The DR Congo will also inform CITES of progress with the implementation of these recommendations in the correspondence establishing the 2015 quota which will be sent no later than 30 November 2014.

<sup>(57)</sup> The felling licences currently in force are the ACIBO (ad hoc lumber felling licences) governed by Ministerial Order 011/CAB/MIN/ECN-EF/2007 on the regulations for felling industrial timber. Additional measures should, however, be taken as soon as possible so that the felling licences are "calibrated" in surface area and volume with the limits set by the AAC of the four-year management plan for the transitional period (See Section 6.12. above for the remit of the DGF)

When a permit is granted for sawn timber from *P. elata*, its record in the database automatically converts the volume of sawn timber into RWE, by using a provisional yield set provisionally at 30% <sup>(58)</sup>. It is this RWE volume which is taken into account to monitor the national quota and the individual concession quotas <sup>(59)</sup>.

- 4 This database is online at an official, secure, dedicated website. Access to the site is granted to the CITES Secretariat and to any CITES national authority of a country party to the Convention which requests it. Following approval by the CITES Management Authority each export permit and its documentary appendix (see point 2 above) is scanned and uploaded to the database in the official website.

<sup>(58)</sup> See section 8 on the limitations of the proposed approach and future prospects.

<sup>(59)</sup> See section 4 on the calculation of the quota.



## 7 Integral conservation

### In the protected areas

According to Dickson et al. (2005), the main protected areas located in the distribution area of *P. elata* are:

- the Yangambi Biosphere Reserve (235 000 ha), managed by UNESCO's MAB;
- The Rubi-Tele hunting estate (908 000 ha), managed by ICCN/ MECNT;
- The Maiko National Park (1 083 000 ha), managed by ICCN/ MECNT;

The Maringa/Lopori/Wamba landscape where *P. elata* is present at Bongadanga, can also be mentioned.

Although this network of protected areas guarantees total protection for significant populations of *P. elata* in DR Congo, it is also important to quantify those stands of *P. elata* which are in the reserves and other zones excluded from exploitation in relation to its natural distribution area in the country. In their contribution to a forthcoming publication, Doucet *et al.* point out that that "the distribution area of Assamela [trade name of the species also used in other countries of the Congo Basin] is partially located in protected [... areas], 7% of the Assamela area in the DR Congo is in protected areas, against 40% Congo and 46% in Cameroon. "

### In conservation or protection zones within forestry concessions

As already indicated in Section 2 of the present document, it is worthwhile noting here that there are marshy zones in which *P. elata* is present. As these zones are not used for production they contribute *de facto* to the preservation of the species.

Furthermore, the results of studies conducted for the preparation of the development plan of concession 46/11 (ex-GA 36/04) provide for the definition of an integral conservation series of nearly 7,000 ha, representing 7.5% of the area under management (94 000 ha) and containing a large population of *P. elata* (in which volumes per hectare may locally exceed 5 m<sup>3</sup>/ha). This area has been classified as the Yoko forest reserve, in which research is being conducted with the help of concessionaire CFT.

## 8 Strengths and limitations of the proposed approach and future prospects.

### 8.1 Advantages of the proposed approach compared with a large-scale extrapolation

The approach adopted by the TC-NDF, based on the results of the management inventories undertaken in six concessions in the natural distribution area of the species, has made it possible to avoid the following major problems/biases, which mainly occur when extrapolating data.

1. Uncertainty about the representativeness of the six concessions selected vis-à-vis the area for which the inventory results could be extrapolated. In other words, the zone covered by these six concessions might be one of the richest in *P. elata* trees.
2. The extrapolation could only have been made using an average population structure (average notional structure for the six concessions), which would in itself have been an approximation. Moreover, and according to the TC-NDF's estimates the recovery rate calculated on the basis of this average population structure would have been above 50%, which, in the first instance, would have guaranteed the legality of the approach. However, a major drawback of this approach would have been the inclusion of concessions for which this legal threshold value could not be verified due to lack of available management inventory data.
3. Furthermore, using a process of extrapolation would have meant that companies not yet involved in the planning process for their concessions would have benefited from the investments made by the most advanced companies without being asked for anything in return.

### 8.2 limitations of the proposed approach

#### 8.2.1 Bias in the use of management inventory data

It was not possible to differentiate the strata in which the sampling units were located, using the raw data submitted to the Administration by the companies managing the six concessions.

This limitation meant that it was not possible to differentiate between *P. elata* trees inventoried in swamps and those inventoried in firm terrain. The TC-NDF was informed that these trees had been removed from datasets in some cases, and maintained in others, but their exact locations had not been communicated in order to correct the data. As a result, in some places trees have been incorrectly included in the usable surface area (productive layer), and there is therefore a potential overestimation of the density of *P. elata* trees and it is not possible to correct the bias. Nevertheless, as the vast majority of the trees grow in firm terrain, the decision was made to consider the impact of this bias as potentially weak.

In the analysis of population structure, as indicated in section 2.3.4.1, one of the factors to be taken into account is the relative proportion of tree numbers in the smaller diameter classes. However, during the production of the management inventories, these crop trees

(diameter <20 cm) were listed in sub-plots with reduced dimensions. Apart from the fact that companies do not all work with the same type of sub-plots (different sizes), which leads to difficulties when trying to compare the data (from one class to another and one company to another for the same diameter class), reliability is disputed by some of the scientific community. Some remarks/limitations have been put forward, mainly to describe regeneration, including the following:

1. regeneration data are not directly relevant to logging operations and as such they are generally not valued by logging companies (this observation is made throughout the countries of the Congo Basin and is therefore not specific DR Congo). As such, prospectors tend not to carry out these surveys as rigorously they do for exploitable trees.
2. In addition, many people fail to recognize / differentiate tree species in their younger stages (leaves, bark, discharges, etc., possibly very different compared to adult stages), but few dare to admit this and thus under estimate overall regeneration or confuse species <sup>(60)</sup>;
3. Finally, these inventories were primarily designed to estimate exploitable or nearly exploitable resources, so this type of sampling (sub-plots) is not perhaps best suited to a regeneration inventory.

## 8.2.2 From numbers of trees inventoried to exploitable/exploited volumes

### 8.2.2.1 Cubic area scaling

The cubic area scaling table used to calculate the volumes on the basis of diameters estimated/measured during the preparation of the management inventories (See section 4 and Appendix I) is provided by the Administration for *P. elata*, in Orientale province. The use of this scaling table has prompted the following observations:

1. the parameters establishing the scaling table (validity in terms of diameter classes, distribution of number of trees sampled by diameter class, spatial representativeness of the sample compared to the population to be measured in cubic metres, etc.) are not known;
2. Information on the quality of the adjustment is not available (unspecified coefficient of determination and / or residual standard deviation; on this issue see the approach proposed by Fayolle *et al.*, 2013)
3. precise details about the estimated volume are not given (from the ground level or the average height of the kerf? over or under bark? up to what cut? etc.).

<sup>(60)</sup> In their juvenile stages *P. elata* trees do not yet have the features which make them easily recognisable later.

#### 8.2.2.2 *Harvesting rate*

In the present approach used by the TC-NDF, it is proposed that the harvesting rate be limited to a maximum of 80% of harvestable trees. This limitation, combined with a cutting diameter of 70 or 80 cm depending on the concession, should achieve a 50% recovery rate (legal threshold). However, when performing the calculations, the 80% ratio is no longer applied to a number of trees, but to a volume.

#### 8.2.2.3 *Marketing coefficient*

The present approach also includes a marketing rate. This rate defines the amount in the volume calculated by the cubic area scaling table which has actual value. On the basis of discussion with the stakeholders, particularly in the timber industry, this rate has been set at 85% without it currently being possible to justify this value with the results of a robust study.

#### 8.2.3 From the exploitable/exploited volume to the volume of sawn timber

In order to apply the quota correctly, it is important to transform the volumes of sawn timber into round wood equivalent volumes. To do this, and following discussions with stakeholders (*see section 8.2.2.3*), the sawmill yield was set at 30% for *P. elata* (see section 6.2), and again it is not possible to validate this value with a scientifically robust study.

#### 8.2.4 Data from scientific installations

The TC-NDF has learnt, but has not been able to obtain more detailed information, that plots for scientific research, each covering a surface area of 400 ha are being installed in the natural distribution area of *P. elata*, as part of the DynAfFor project (<sup>63</sup>).

Sharing information of the research conducted in these plots could (i) provide scientifically relevant information of the state of regeneration, (ii) demonstrate the goodwill of the companies involved in promoting scientific research and (iii) provide a source to validate the data produced by the management inventories.

#### 8.2.5 Recovery rate

The TC-NDF considers that the minimum legal recovery rate of 50% is acceptable. This precaution does not, however, prejudice the sustainability of exploitation. In general, when the population structure is unfavourable (Gaussian curve), support for natural regeneration is highly recommended, especially if the recovery rate is around 50%.

(<sup>63</sup>) <http://www.atibt.org/certificationlegalite/dynafor/>. This initiative is funded by the French Development Agency (AFD) and the French Global Environment Facility (FGEF).

## 8.2.6 Legality and administrative requirements

A number of points pertaining to the legal requirements are among the limitations of the methodology used and therefore deserve to be mentioned:

1. At present, the management inventory data, which were used to calculate the allowed volume for felling of *P. elata*, concession by concession, have not yet been translated into logging restrictions. The provisional management plans which, excluding development bases, set these restrictions for a transitional period of four years, during which the development plans are to be drawn up (cf. Section 3.2) If this situation should last longer than the transitional period, the sustainability of the exploitation would be called into question.
2. Ongoing planning based on ACIBOs (ad hoc lumber felling licences) is irrelevant from the sustainability point of view, especially as there is currently no linking between the ACIBOs granted and the annual allowable cut, which should also be established on the basis of development restrictions (volumes / trees concerned / surface areas), which is not the case at present (provisional management plan);
3. the ACIBOs are routinely granted beyond the date specified in the regulations (31 December of the previous year, according to ministerial order 011, April 12, 2007);
4. Finally, of the six concessions for which management inventories have been made, none has an approved development plan and only one has submitted its inventory report.

## 8.3 Future prospects

### 8.3.1 Validation of the inventories

Since the quota is calculated using inventory data which have yet to be approved by the Administration, it is recommended that as part of the validation process, an audit is carried out on all or part of one of six inventories on which the approach is based, in order to confirm (i) the overall quality of the inventories and (ii) the apparently favourable population structures in the concessions concerned (regeneration / abundant crop trees).

### 8.3.2 Diameter growth and natural mortality

When calculating the recovery rate, the strength of the matrix model is its capability to take into account the growth and natural mortality of each of the diameter classes.

In a similar vein to the comments on population structure, the observed differences in growth between geographically-distant populations would be an argument in favour of installing equipment in the concessions (or groups of concessions) according to consistent criteria (including soil and rainfall) to refine the estimates, particularly of the recovery rate.

When the annualised natural mortality rate is not known for a given location, the foresters use an average reference value of 1.00% of trees (SPIAF, 2007). The high variability found in the literature (0.60 to 1.00%), coupled with the benefit of knowing the mortality for each diameter class when the recovery rate is estimated by the matrix method (Picard *et al.*, 2008a; see also section 4 and Appendix 1), has prompted the TC-NDF to recommend

that foresters measure this parameter as accurately as possible. This step can be considered in conjunction with monitoring of tree growth of the species (Picard *et al.*, 2008b).

### 8.3.3 Phenology and support for natural regeneration

The high variability of the estimate of this parameter observed in the scientific literature (30 to 37 cm depending on the source) and its relevance to forestry management show how important it will be to develop these studies over time in forestry concessions in DR Congo. Furthermore, as far as the TC-NDF is aware, no such study scientific study has been performed within stands present in the Equateur province, to rigorously determine the normal diameter of fructification.

To compensate for the lack of natural regeneration of the species more or less throughout its natural distribution area, pragmatic reforestation programmes should be implemented. These programmes should include (i) the harvest of healthy seeds, (ii) the nurturing of seedlings in nurseries, (iii) the preparation (clearing) of sufficiently open rehabilitation zones (at least one hectare in one piece) to meet the species's light requirements, and (iv) transplantation in the most vigorous zones during the rainy season. In this context, research should be conducted to develop pragmatic reforestation methods which can be implemented by forestry companies.

Finally, a study of the seed predators of the species should be carried out. This study could confirm / refute the observations that beetles of the *Exechesops* sp. genus are present in the stands of *P. elata* located in Orientale province (to be confirmed for the Equateur province), as well as the potential impact (if any) of this predator on the regeneration strategy of *P. elata* in the Congolese context.

