# MANAGEMENT MEASURES FOR *PERICOPSIS ELATA (ASSAMELA)* IN CAMEROON

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# PLAN

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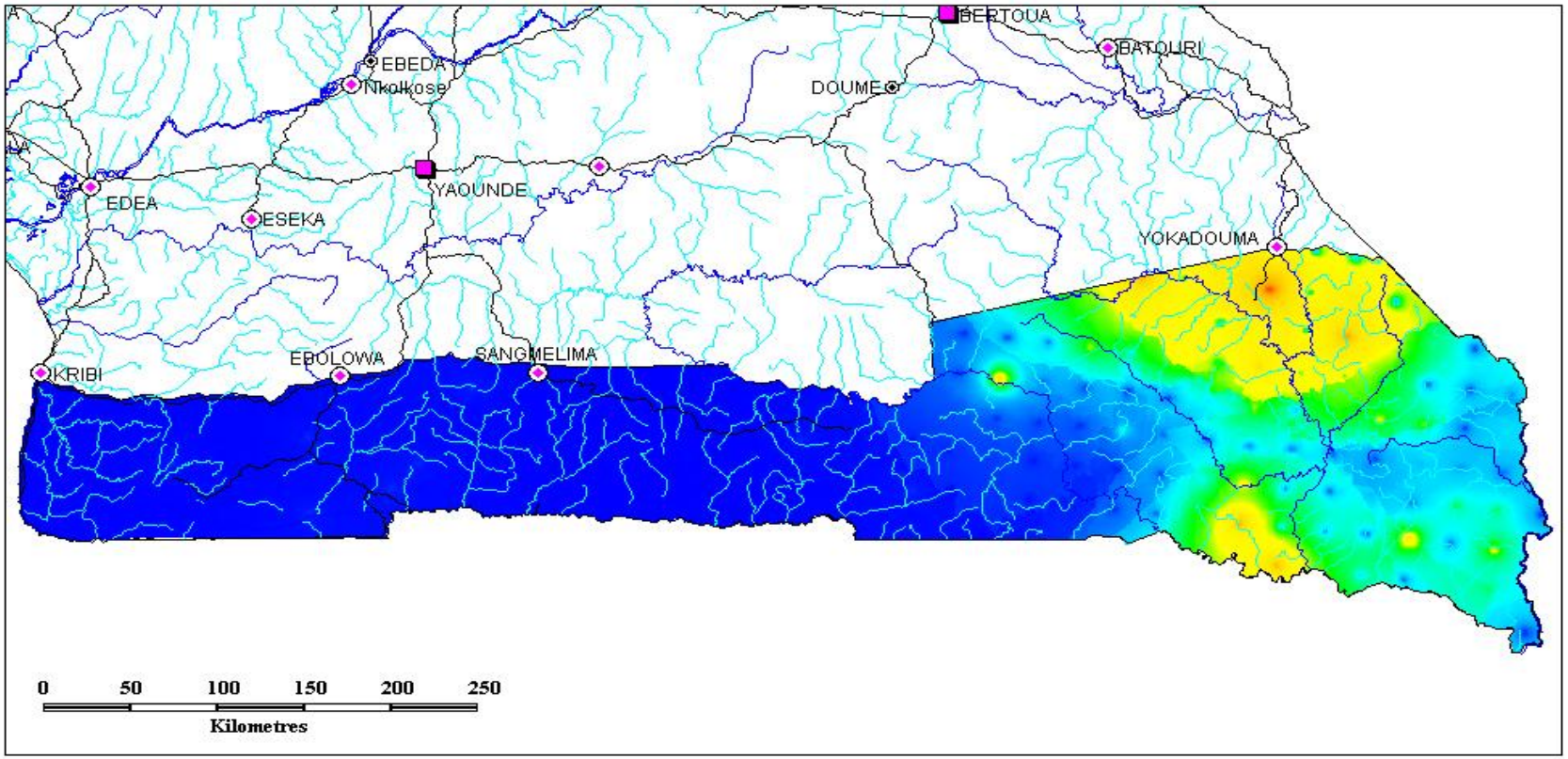
- CALCULATION OF THE FOREST POSSIBILITY
- OTHER ALLEVIATION MEASURES
- SPECIFIC CASE OF *PERICOPSIS ELATA*
- CONCLUSIONS

## Variation de la densité de l'Afrormosia dans les forêts du Sud Cameroun au début des années 1980




Sources: Inventaire sud Cameroun 1983 et 1985

**Effectifs par ha**

Diamètres > ou = à 40 cm

- 0
- 0.22
- 0.33
- 0.44
- 4.35

Route Principale

Réseau hydrographique

- Principal
- Secondaire

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# HISTORY OF THE MANAGEMENT PLAN

- Knowledge of the resources – forest inventories in 1983, 1985
- Zoning of the country with determination of land uses in 1988 – Forest Management Units (FMU)
- Enhancement of timber and wildlife control
- Enhancement of forest revenues in 1998

# GENERAL ELEMENTS OF THE MANAGEMENT PLAN

5 components in the document:

(1) Description of the natural milieu of the forest concession

(2) Mapping

(3) Management inventory

(4) Identification of soils & use rights

(5) Calculation of forest production potential

# MANAGEMENT INVENTORY

- The list of tree species to assess obligatory are contained in the technical files (sheets) published by the forest administration
- Counting & measurement of stems with DBH >20 cm
- Stems are classified in 10 cm diameter classes (20-30, 30-40, 40-50, …)

# MANAGEMENT INVENTORY

- Data analysis is done with a computer package validated by the forest administration: TIAMA.
- The sampling rate for the management inventory should not be < 1% for a forest concession smaller than 50,000 ha, and not < 0.5% for a concession larger than 50,000 ha.

# CALCULATION OF FOREST PRODUCTION POTENTIAL

- The basis of restoration & alleviation measures is outlined in the arête *n° 0222/A/MINEF/ of 25th may 2001,* article 6, element 5;
- The production potential is the quantity of wood that can be harvested per hectare per cutting cycle

# CALCULATION OF FOREST PRODUCTION POTENTIAL ('POSSIBILITY')

- The calculation of the annual production potential is an iterative process of optimization, aiming to determine the rotation length & the minimum exploitable diameter for managed trees.
- This diameter is called the managed minimum exploitable diameter = MED/AME or the minimum managed diameter = MMD)

# CALCULATION OF FOREST PRODUCTION POTENTIAL

The forest management inventory distinguishes trees in 5 groups:

Group 1: principal managed species which will be used for calculation of forest production potential

Group 2: complementary principal species

Group 3: potential future commercial species

Group 4: special species subjected to particular silvicultural regimes

Group 5: remaining species

# CALCULATION OF FOREST PRODUCTION POTENTIAL

- For analysis, all principal timber species are arbitrarily classified in group 2.
- The forest manager may then include in group 1 (managed species) a minimum of 20 species for which the exploitable volume is not less than 75% of the initial exploitable volume of the principal tree species.

# CALCULATION OF FOREST PRODUCTION POTENTIAL

- Parameters used for this & for determination of the MED/AME include:
  - selection of the managed trees
  - rotation length
  - diameter growth rate
  - cubage factor (‘tariff de cubage’ in French)
  - damage & mortality rates

# CALCULATION OF FOREST PRODUCTION POTENTIAL

- Rotation length is the period between two successive harvests = 30 years in Cameroon
- Growth rates are published in technical files by the forest administration. For *Pericopsis elata*, the growth rate = 0.4 cm/year
- Cubage factor for *Pericopsis*: $V = - 0.609 + 9.668*D^2$

# CALCULATION OF FOREST PRODUCTION POTENTIAL

- The minimum exploitable diameter of managed trees (MED/AME) proposed by the forest manager may not be less than that fixed by the forest administration
- The administrative minimum exploitable diameter (MED/ADM) fixed for *Pericopsis elata* in Cameroon is 100 cm, which is the largest in the Congo basin

# CALCULATION OF FOREST PRODUCTION POTENTIAL

- For managed species, stems with diameter larger than MED/ADM + 40 cm, are moved from the initial population table which serves to simulate the forest possibility.
- These stems are called the “bonus”.

# CALCULATION OF FOREST PRODUCTION POTENTIAL

- Trees of the “bonus” group are subjected to technologic inventory aiming to evaluate timber quality, and to allow the selection of seed trees which will be retained during exploitation in the concession

# CALCULATION OF FOREST PRODUCTION POTENTIAL

- Species recovery rates, the managed minimum exploitable diameter (MED/AME), and the rotation length interact with one another for determination of forest production potential

# CALCULATION OF FOREST PRODUCTION POTENTIAL

**%RE = (No (1-Δ) (1-α)T)/Np**

- No: number of stems of diameter classes < MED, which are used for the reconstitution (reestablishment) of the woody resource;
- α: natural mortality (1%) per year
- **Δ** : mortality caused by logging damage
- **T** : rotation length (30 years)

# CALCULATION OF FOREST PRODUCTION POTENTIAL

- **%RE = (No (1-Δ) (1-α)T)/Np**
- **Np**: total exploitable stems (MED + 3) to be reconstituted
- **%Re**: percentage of recovery (reestablishment)
- The recovery (reestablishment) is good when %Re is > 50%

# CALCULATION OF FOREST PRODUCTION POTENTIAL

- The principle of the simulation consists of increasing progressively the administrative minimum exploitable diameter (MED/ADM) to achieve %Re ≥ 50%.
- The new minimum exploitable diameter which provides the best simulation (%Re ≥ 50%) is called the managed minimum exploitable diameter (MED/AME).

# OTHER ALLEVIATION MEASURES

The forest delimitation is done on a map at scale of 1:50 000 based on the results of the management inventory, in two steps:

**Step 1**. The forest concession is divided into 5-year blocs to obtain a difference of less than 5% of the exploitable volume for the principal tree species (managed & complementary)

# OTHER ALLEVIATION MEASURES

**Step 2.** 5-year blocs are then divided to allow a continuous progression of logging activity in space & time.

- Each 5-year bloc is divided in 5 logging units (‘assiette de coupe’ in French) which are contiguous & cover equivalent areas

# OTHER ALLEVIATION MEASURES

- Silvicultural treatments, additional to the MED, must be conducted to ensure forest recovery (reestablishment) by the end of each rotation.
- The nature, objectives, intensity & planning of silvicultural operations are described in the 5-year & annual management plans.
- The annual operational plans describe the areas managed, the forest strata logged, and the planning of future interventions.

# SPECIFIC CASE OF ASSAMELA

- Data compiled from 10 management plans tend to show that Assamela is not threatened in the eastern province of Cameroon.
- Its density is 0.53 stems/ha & is high compared to what was suggested for threatened plant species (< 0.05 stems/ha) in Cameroon.

# SPECIFIC CASE OF ASSAMELA

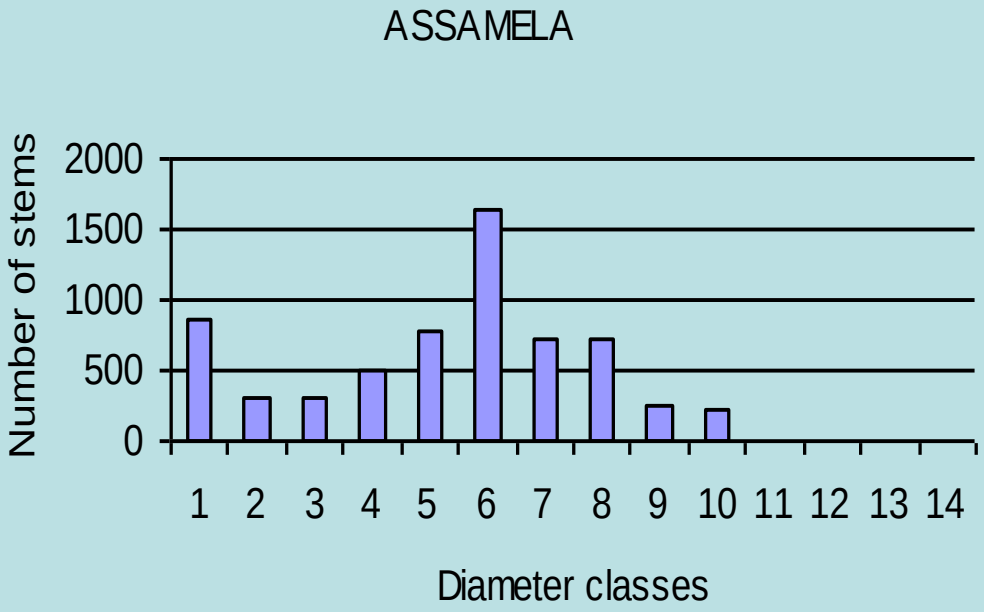
- The value of the percentage of reconstitution is too high (average 185%) compared to the limit required by the forest administration for sustainable management which is ≥ 50%.
- This high level of %Re is due to the high value of the MED which is 100 cm.

# SPECIFIC CASE OF ASSAMELA

- Assamela is one of the scarce tree species for which the manager does not need to increase the MED/ADM.
- Rather, this MED is too high according to most of the forest concessionaires

# SPECIFIC CASE OF ASSAMELA

class 6 = 75 cm,…,class 9 = 105 cm



# SPECIFIC CASE OF ASSAMELA

- Assamela is a light-demanding tree species. Small diameter trees are less represented compared to medium size classes. This frequency distribution is characteristic of species with low regeneration levels
- Assamela is one of the scarce species for which the most abundant size class (70-80 cm diameter) is located to the left of MED/ADM = 100 cm.

# CONCLUSIONS

- The restoration & alleviation measures adopted by the Cameroon Government for the development & implementation of management plans are relevant to ensure sustainable logging of *Pericopsis elata*.
- The method used to calculate forest production potential & the managed MED can be advised for a Non-Detriment Findings protocol for CITES plant species.

# OTHER ALLEVIATION MEASURES

- The managed trees cannot be exploited under the MED fixed during the calculation of the forest possibility (MED/AME).
- All other tree species can be exploited in respect of the MED fixed by the forest administration (MED/ADM).