FONDS FRANÇAIS POUR L'ENVIRONNEMENT MONDIAL

6 RECOMMENDATIONS FOR MORE SUSTAINABLE FOREST MANAGEMENT IN CENTRAL AFRICA

FROM 30 YEARS OF RESEARCH

The Forest Management Plan (FMP) is the main tool for sustainable management of commercial forests in Central Africa. It is designed to ensure the industry is profitable for public and private stakeholders while preserving the goods and services provided by these forests (biodiversity, carbon sequestration, living environment, livelihoods, etc.).

Since 2013, the DynAfFor and P3FAC projects have been studying the forest dynamics at the heart of FMPs. Ahead of the imminent review of the first FMPs, what are the main recommendations?

6 key take-aways from this document

- → Tailor forest management to the **10 major forest types**
- → Standardise a **rotation time of 30 years**
- → Set up data collection routes in all **concessions larger than 50,000 hectares**
- → Promote **forest regenerations**
- → Improve recovery rates for **species harvested for timber**
- → Review and standardise **Minimum Felling Diameters** (MFDs)

CONTEXT

From conceptualisation to optimisation: over 30 years of forest management in Central Africa

Logging in Central Africa is subject to country-specific legislation and standards, which are always centred around the Forest Management Plan (FMP). The earliest FMPs are now due for review.

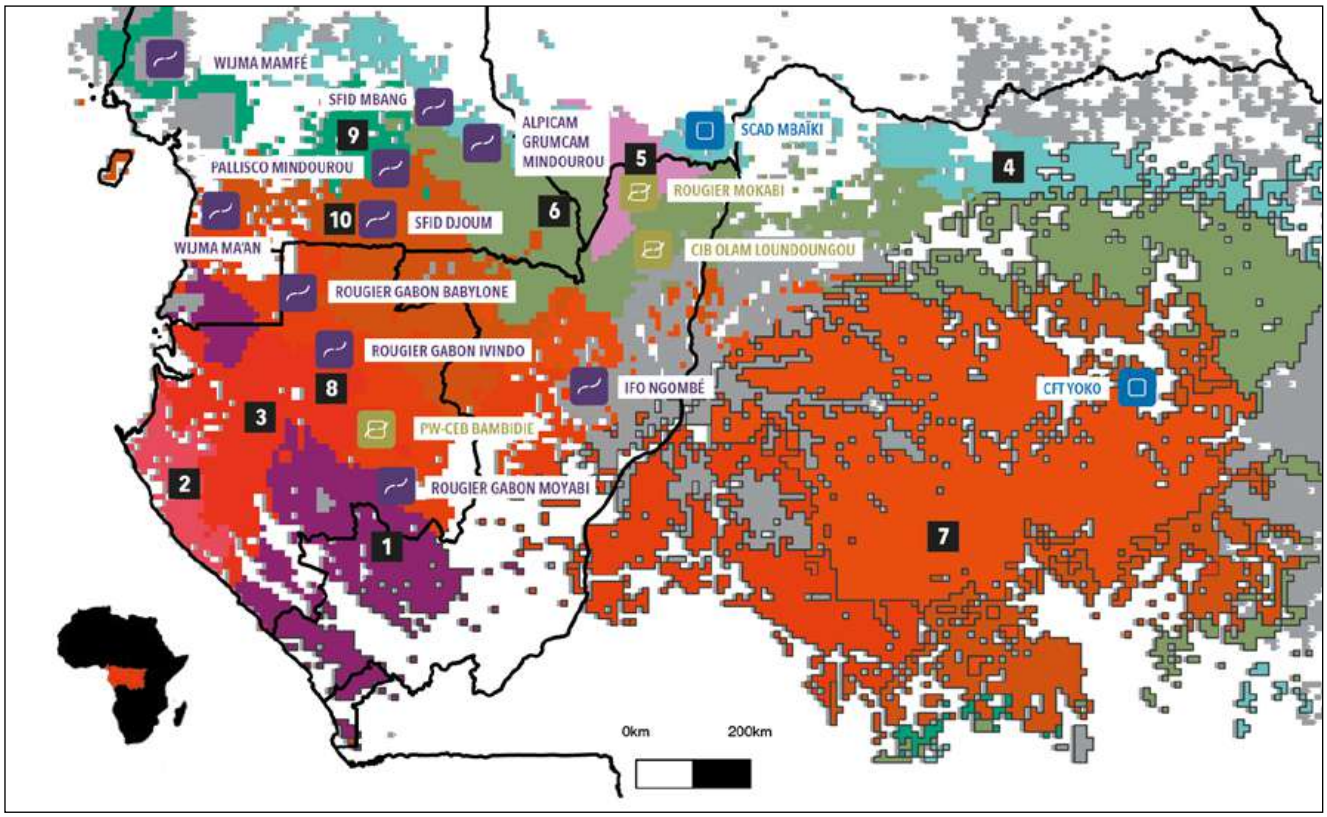
FMPs use scientific data to set parameters for forest logging. The aim is to ensure that forest stands recover sufficiently to sustain wood supply and to maintain the socio-environmental services they provide.

Until now, existing FMPs have used data from a single research mechanism based in the Central African Republic. Under the DynAfFor and P3FAC projects, additional research mechanisms were set up throughout the region. This means that more robust data are now available on stand dynamics, which can make future FMPs more sustainable.

01

Tailor forest management to the 10 major forest types

In 2021, a major scientific publication identified 10 major forest types in Central Africa. FMPs should take this variety in forest types into account and, where available, use scientific data specific to each forest type.



[1] *Réjou-Méchain et al. (Nature, 2021)*

Data collection mechanisms

- Routes
- Plots
- Plots and routes

Major forest types of Central Africa

1. High-altitude evergreen forests on the Atlantic coast
2. Evergreen forests on the Atlantic coast
3. Inland Atlantic evergreen forests
4. Semi-deciduous forests on the northern edge of the forest massif
5. Forests in transition from evergreen to semi-deciduous on sandstone
6. Semi-deciduous forests
7. Evergreen forests in the centre of the forest massif
8. Mixed evergreen forests
9. Degraded semi-deciduous forests
10. Forests in transition from semi-deciduous to evergreen

02

With a few exceptions, standardise a rotation time of 30 years

A forest logged for timber needs a period of rest – rotation time – to allow for partial replenishment of the trees harvested. In most cases, simulations show that a 30 year rotation provides the best compromise between recovery of harvested stock and the economic viability of the operation. However, in some particularly fast-growing forests (e.g. young Okoume forests), rotations of 20-25 years could work.

03

Set up data collection routes in all concessions larger than 50,000 hectares

The scientific data used to set the forest management parameters vary between forest types, but can also vary within the same forest type. To make FMPs more reliable, forest companies managing over 50,000 hectares should therefore set up basic monitoring mechanisms (routes) to refine the parameters used for management to suit their particular concessions.

Illustration of a route linking monitored trees of different species

According to *Tosso et al. (Presses Universitaires de Liège, 2020)*

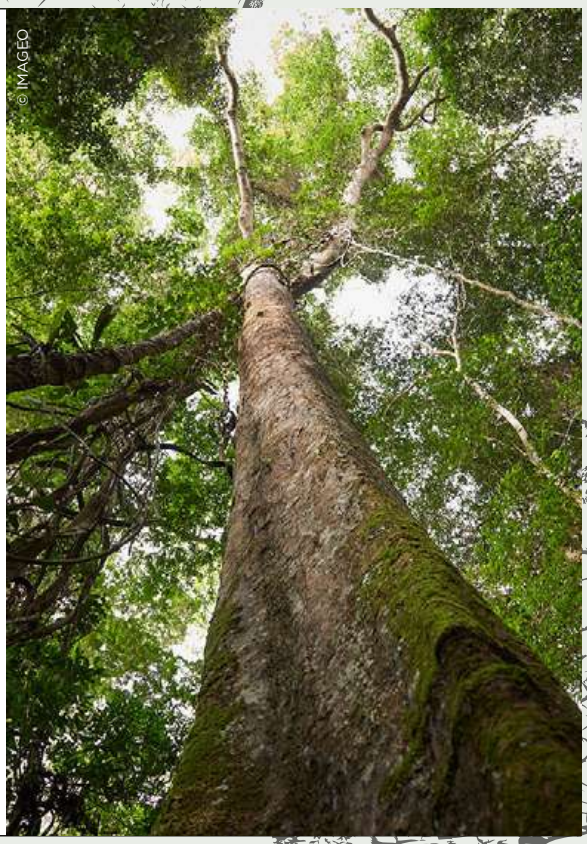
04

Promote forest regenerations

Even without logging, many timber species have sub-optimal tree population structure, resulting in poor natural regeneration. Human interventions can help to improve the long-term regeneration of these species.

Forest enrichment planting has been trialled in some concessions to assess feasibility and benefits. For P3FAC and other research projects, a handbook has been published (in French): *"Guide pratique des plantations d'arbres des forêts denses humides d'Afrique"* (Practical guide to planting trees in Africa's dense rainforests), Daïnou et al. (Presses Universitaires de Liège, 2021).

Depending on forest type, 70-90% of tree species require animals to support seed dispersal and, consequently, natural regeneration. It is therefore essential to protect large and medium-sized mammals (elephants, great apes, duikers) in forest concessions. A work has been published (in French), *"Elaboration et mise en œuvre d'un plan de gestion de la faune. Guide Technique à destination des gestionnaires des forêts de production d'Afrique Centrale"* (Developing and implementing a wildlife management plan. Technical guide for managers of commercial forests in Central Africa), Haurez et al. (Presses Universitaires de Liège, 2020).



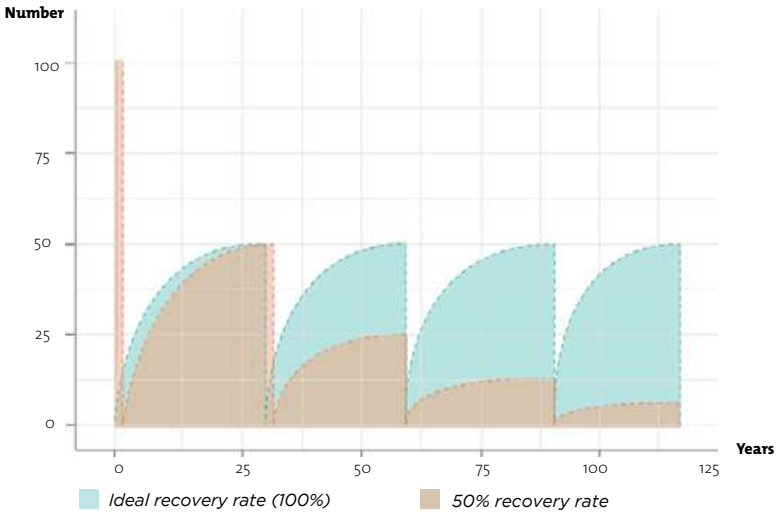
05

Improve recovery rates for species harvested for timber

The recovery rate is the proportion of trees logged during a rotation that have grown back by the following rotation. A 100% rate signifies that every tree felled has been replaced by another before the next logging operation. This is the ideal scenario, which should be the aim wherever possible.

A standard target of 100% should therefore be adopted for the species group harvested by each logging company, right from the first rotation, to ensure sustainability of logging for this species group.

Graph showing theoretical changes in forest stands over 4 rotations

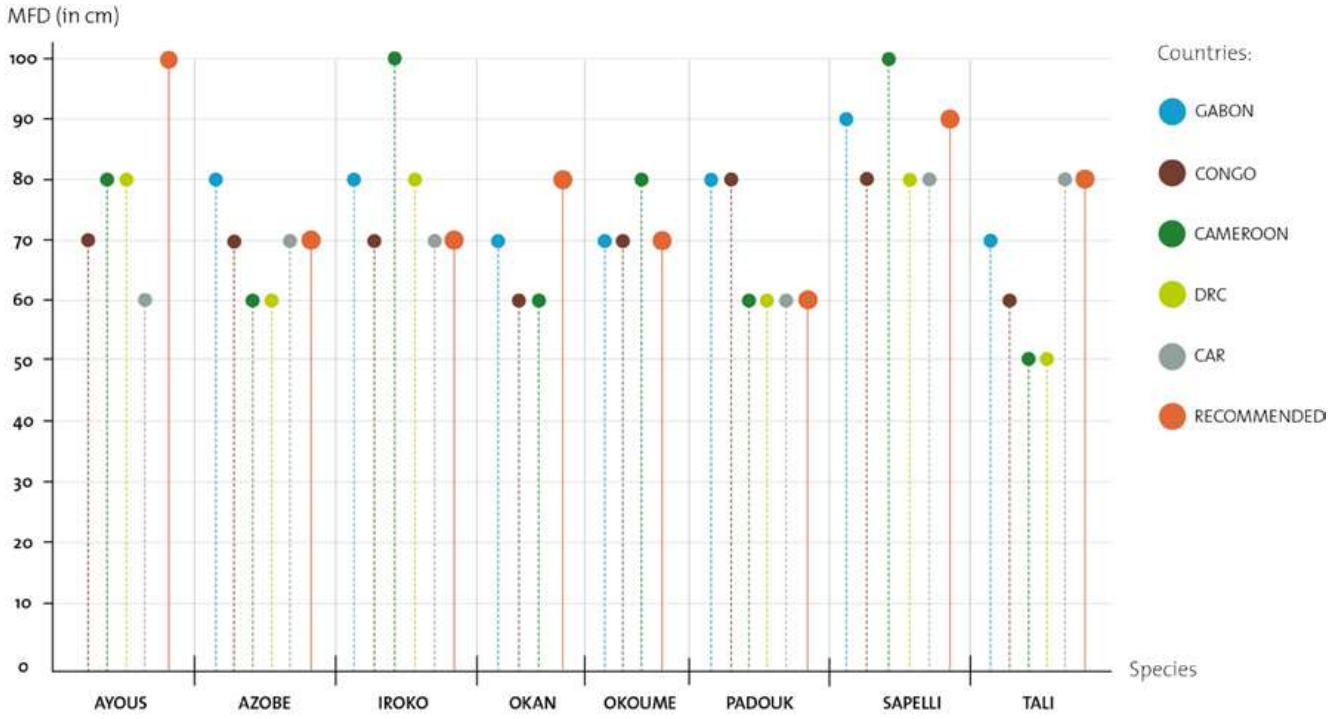


However, the 100% rate is difficult to achieve on the first rotation, as the harvested trees have been produced by the forest over several centuries. It should be applied from the second rotation. A 100% rate will be a challenge on the second rotation for certain tree species that have insufficient population structure for natural regeneration, even without logging. This particularly applies to some of the most widely-logged light-demanding species, for which it will be difficult to achieve 100% recovery on the second rotation, especially if the forest is being logged for the first time. Therefore, we propose that a minimum recovery rate of 50% is adopted per species logged, starting from the second rotation.

Review and standardise Minimum Felling Diameters (MFDs)

The variation between Central African countries in Minimum Felling Diameter (MFD) for the same species does not seem justifiable from an ecological perspective. The MFD should instead be based on the biological characteristics of the species. Among other things, it should ensure that a sufficient number of seed-bearing trees are retained to guarantee dispersal and natural species regeneration.
Phenological, genetic and ecological studies under the projects DynAfFor and P3FAC have served to identify the minimum diameter for each species above which at least 50% of trees in the population produce seeds capable of germinating. This has enabled proposals for MFDs that reflect the ecology of species and their capacity for natural regeneration, and these should be applied in all Central African countries.
From a commercial viewpoint, standardising MFDs at the regional level would reduce competition between countries.

MFD (in cm) of commercial species whose phenology and/or gene flow were studied under the DynAfFor mechanisms



And tomorrow?

The 6 key lessons learned through over 30 years of forest research, enhanced and galvanised by the DynAfFor and P3FAC projects, can now be applied in producing second-generation management plans that will be more sustainable when compared to the first-generation. For this to happen, the key takeaways need to be widely communicated, adopted by forest managers, and incorporated by decision-makers in Central African countries into their respective legislation.

Any reduction in economic profitability that may result from applying these lessons could be compensated through introducing differential tax systems to encourage companies' sustainability efforts, and through other sources of income such as payments for environmental services (PES).

Meanwhile, the reduction in volumes of flagship species should be offset by promoting greater appreciation of, and diversification into, species better understood thanks to the research mechanisms.

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