ITTO International Tropical Timber Organization

Sustaining Tropical Forests

ITTO Voluntary Guidelines for the Sustainable Management of Natural Tropical Forests

PART II :

SFM Objectives 3

Maintaining the multiple functions of forests to deliver products and environmental services

including the Principles 3-4

Maintaining the multiple functions of forests to deliver products and environmental services

Principle 4: Multipurpose forest management

Principle 5: Silvicultural management

Ensuring forest ecosystem health and vitality

Principle 3:
Ecological resilience, forest health and climate-change adaptation (pages 38-41)

Résilience écologique, santé des écosysèmes et adaptation au changement climatique

Ecological resilience is a key tenet of SFM in natural tropical forests, and it must be maintained or enhanced to reduce the risks posed to sustainability by destructive agents, climate change and other stresses and disturbances .

Principle 3: Ecological resilience, forest health and climate-change adaptation

Rationale (pages 38-39)

- Managing intact natural tropical forests
- Restoring degraded forest ecosystems
- Addressing the effects of climate change on natural tropical forests.
- Management of pests and diseases

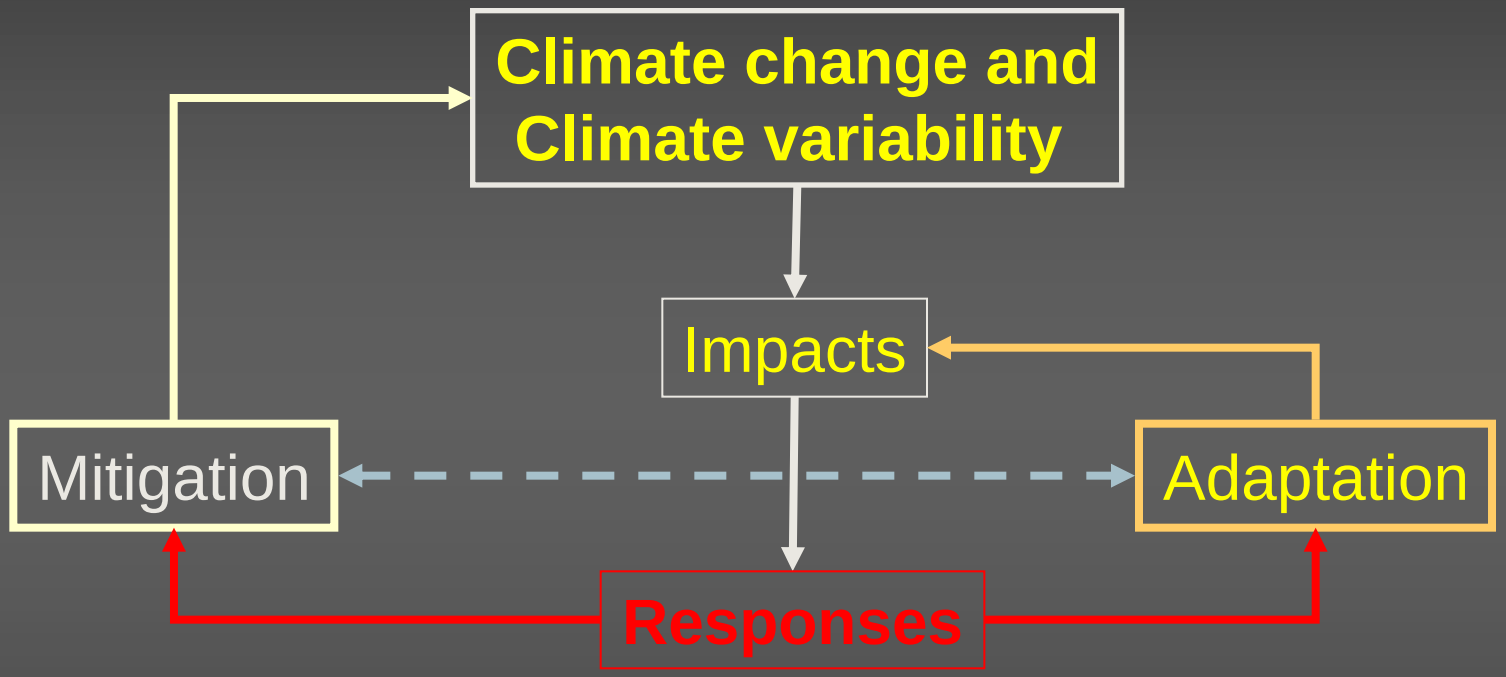
Broader rationale: Forest Management Guidelines and C&I at a landscape level

- Focus stability:
  Ability to retain (and/or restore) forest landscapes while adapting to changing environmental, social and economic conditions (including climate change)

- Focus functional flexibility (goods & services):
  Ability to respond to varying needs, demands and changing priorities and values of people (local and beyond)

- Focus ecosystem integrity:
  Ability to protect biodiversity and nature while using the resources sustainably

Forests and climate change: the basics



… maintaining and increasing ecosystem C pools and C sequestration – reducing emissions from biosphere

… maintaining and increasing ecosystem resilience – reducing vulnerability

Forests in Climate Change:
Forests can increase resilience, fix and maintain carbon

- If average C02 concentration continues to increase to 550 ppm or higher, forests will become highly vulnerable → high risk that GHG sinks become sources of GHG emissions
  - Forests are a mitigation option now and over the next 50 – 100 years or so, a transitional measure towards a low carbon economy
  - Need to increase resilience of forest trees and ecosystems at the same time as using forests as a mitigation option.
- Presently, the potential of forests as a mitigation option is huge : keeping and managing forests; planting forests; restoring forests
  - **REDD+**
- **Integrate such new risks and potentials into tropical forest management approaches**

The role of SFM in climate change

Adaptation

Maintaining and increasing ecosystem resilience – reducing vulnerability

- Forest ecosystems are affected by climate variability and climate change:

  What are the direct and indirect impacts
  - forest-dependent people?
  - on the forestry production chain?
  - at the landscape level?

- How can forests and trees contribute to reduce vulnerability for people and ecosystems)?

→ **A forest management agenda that includes a CC adaptation analysis and measures can increase the value of forests**

"Avoid the unmanageable and manage the unavoidable.." (Sigma Xi)

Principle 3: Ecological resilience, forest health and climate-change adaptation

Guidelines (1-8)

3.1 Identify causes and put in place preventative and remedial actions to reduce the vulnerability of forests to biotic and abiotic stresses

3.2 Conserve and use biodiversity in ways that maintain ecological resilience and enable adaptation to change

3.3 Manage forests in ways that maintain their regenerative capacities land ecological resilience

3.4 Restore degraded forest ecosystems to improve habitats for native species, forest structure, biodiversity, productivity & ecosystem functions

3.5 Assess the impacts of climate change and climate variability on natural tropical forests and evaluate the risks

3.6 Assess the economic and social effects of climate change as they relate to tropical forests

3.7 Manage natural tropical forests for adaptation to climate change

3.8 As appropriate, include carbon storage as a management option in natural tropical forests and monitor forest carbon and safeguards

Example: Principle 3, Guidelines 3.1 & 3.2 and suggested actions under the guidelines

Principle 3: Ecological resilience, ecosystem health and climate-change adaptation			
Guidelines		**Suggested actions**	**Indicative stakeholder group**
3.1	**Identify causes and put in place preventative and remedial actions to reduce the vulnerability of forests to biotic and abiotic stresses**	Develop policies and remedial actions, including capacity building, technologies and resources to reduce the vulnerability of forests to biotic and abiotic stresses	Government, forest managers, civil society, research and education institutions
		Strengthen the capacity of forest managers to address new and emerging issues affecting ecological resilience	
		Provide technical support to private and community forest owners to ensure that their activities increase the ecological resilience of forests	
3.2	**Conserve and use biodiversity in ways that maintain ecological resilience and enable adaptation to change**	Identify forests with high conservation value, provide them with legal status, and manage them to maintain and increase their ecological resilience	Government, civil society, research and education institutions
		Improve and apply ecological knowledge to ensure that forest processes such as pollination, seed dispersal and nutrient cycling are maintained	
		Identify and manage species of flora and fauna that are strongly interactive, play key ecological roles or have important influences on the ecological resilience of the forest	Government, forest managers, civil society, research and education institutions

Maintaining the multiple functions of forests to deliver products and environmental services

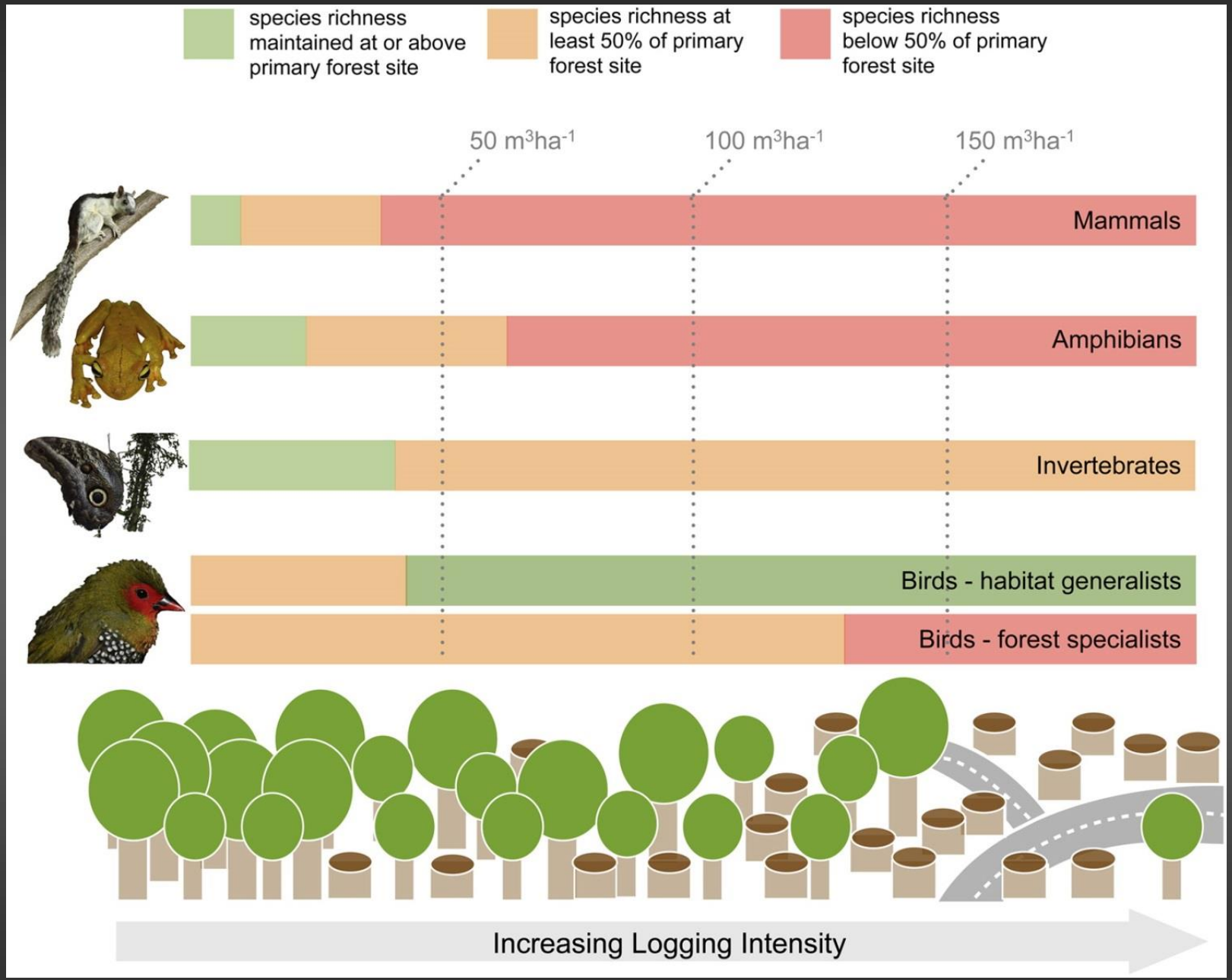
Principle 4:
Multipurpose forest management (pages 42-46)
Aménagement forestier à finalités multiples

The role of natural tropical forests as providers of multiple goods and services should be safeguarded by the application of sound planning and management practices that maintain ecosystem functions and the potential of forests to yield the full range of benefits to society.

Principle 4: Multi-purpose forest management

Rationale (pages 42-44)

- Management for multiple complementary objectives
- Biodiversity conservation at forest management unit level
- Managing forest carbon in natural tropical forests



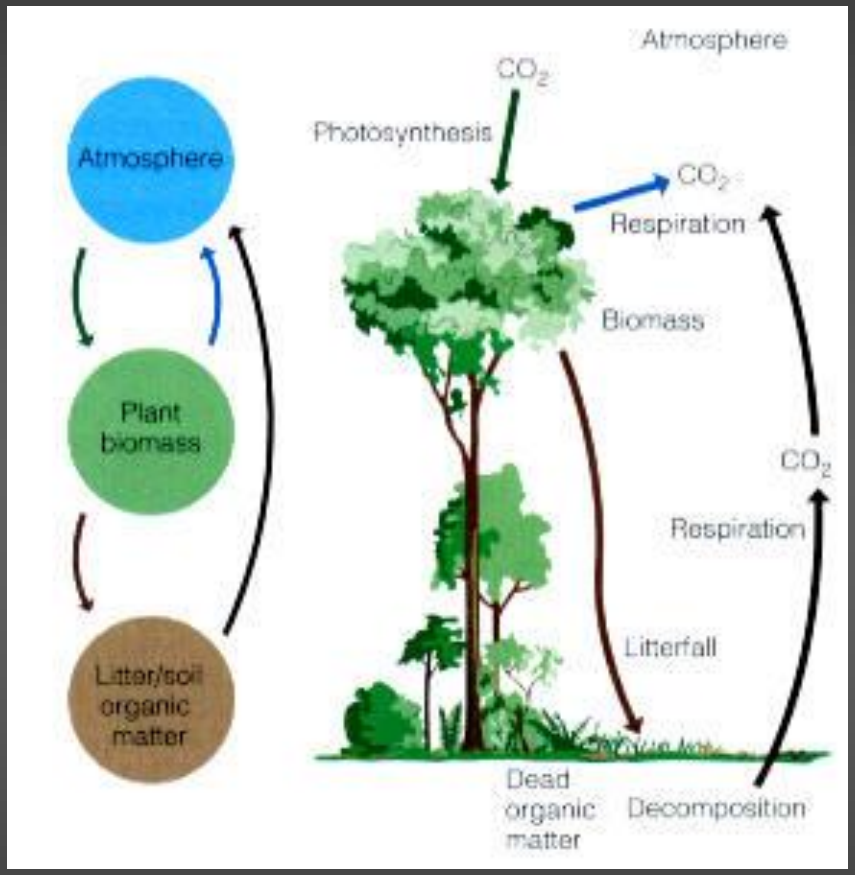
Current Biology 2014 24, 1893-1898DOI: (10.1016/j.cub.2014.06.065)

Mitigation: Carbon cycle and forest

Source
1.6 m Gt/y.

Emissions:

- Deforestation
- Degradation



Sink
12.1 m Gt/y.

Sequestration in 5 carbon pools:

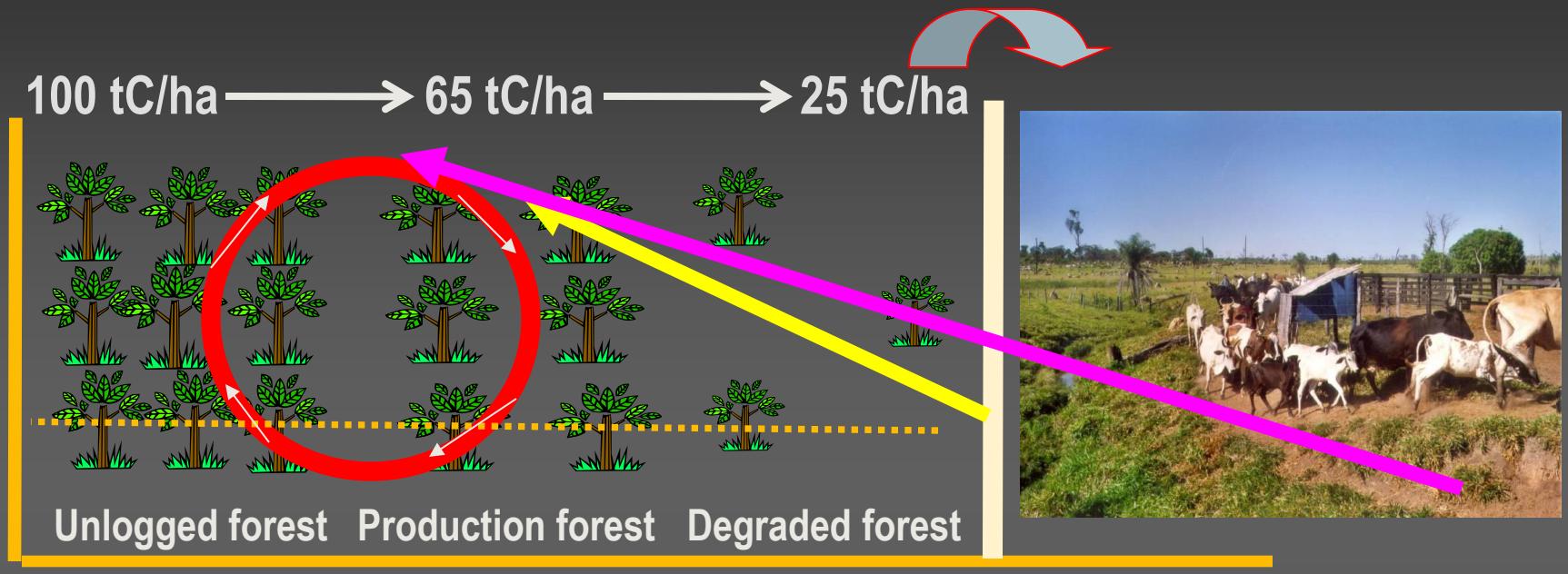
- Biomass (AGB + BGB)
- Litter
- Dead wood
- Organic soil

Substitution: 1650 m GtC

- Conserving existing carbon stocks
- Bioenergy, wood products subsistuting other materials

→ Natural Forest Degradation Process →

Deforestation
(land-use change)



— Reducing deforestation and forest degradation

- - - - - Conservation and sustainable use of existing forest

------ Forest Restoration: Carbon sequestration

------ Plantations & Agroforestry: Carbon sequestration

REDD+ options

Principle 4: Multi-purpose forest management

Guidelines (1-5)

4.1 Enable multipurpose forest management to manage forest products and environmental services , including carbon

4.2 Ensure effective soil and water management to maintain the productivity and health of forests and their hydrological regulation functions

4.3 Emphasize biodiversity in all aspects of the management of natural tropical production forests

4.4 Provide guidance and take measures to avoid unsustainable levels of NTFP extraction and hunting

4.5 Monitor biodiversity in FMUs to minimize negative impacts

Example: Principle 4, Guideline 4.1 and suggested actions under the guideline

Principle 4: Multipurpose forest management			
Guidelines		**Suggested actions**	**Indicative stakeholder group**
4.1	**Enable multipurpose forest management to manage forest products and environmental services**	Develop a comprehensive knowledge of forest resources with the aim of boosting the value of forest goods and services and uphold usufruct rights	Government, forest managers, civil society, private sector, research and education institutions
		Complement national, subnational and FMU-level forest resource assessments and inventories with qualitative assessments of timber, NTFPs and environmental and cultural services, using the ITTO C&I for SFM as a basis	
		As appropriate, integrate assessment methods recommended at the international or national level for forest carbon assessments into national forest inventories	Government, forest managers, research and education institutions

Example: Principle 4, Guideline 4.1 and suggested actions under the guideline

Principle 4: Multipurpose forest management			
Guidelines		**Suggested actions**	**Indicative stakeholder group**
4.1	**Enable multipurpose forest management to manage forest products and environmental services**	Develop a comprehensive knowledge of forest resources with the aim of boosting the value of forest goods and services and uphold usufruct rights	Government, forest managers, civil society, private sector, research and education institutions
		Complement national, subnational and FMU-level forest resource assessments and inventories with qualitative assessments of timber, NTFPs and environmental and cultural services, using the ITTO C&I for SFM as a basis	
		As appropriate, integrate assessment methods recommended at the international or national level for forest carbon assessments into national forest inventories	Government, forest managers, research and education institutions

4.4	**Provide guidance and take measures to avoid unsustainable levels of NTFP extraction and hunting**	As appropriate, accommodate the existing NTFP harvesting and trade patterns of local communities in the method and scale of timber harvesting	Government, forest managers, civil society, private sector
		In forest management plans, consider the potential for human–wildlife conflicts due to logging activities, and take appropriate measures to prevent them	
		Take measures that benefit wildlife species, such as retaining dead standing trees and large fruiting trees, maintaining wide riparian strips to provide wildlife with access to water, and providing migration pathways for large animals	Government, forest managers, private sector, civil society
		When planning the road network, take measures to minimize direct negative impacts on wildlife	Forest managers, private sector, research and education institutions
		Ensure that forest management plans have provisions for biodiversity monitoring and that managers understand and are responsive to the outcomes of such monitoring	Forest managers, private sector, civil society

Guidelines 4.4 – bushmeat/viande de brousse

Maintaining the multiple functions of forests to deliver products and environmental services

Principle 5:
Silvicultural management (pages 47-55)
Aménagement sylvicole

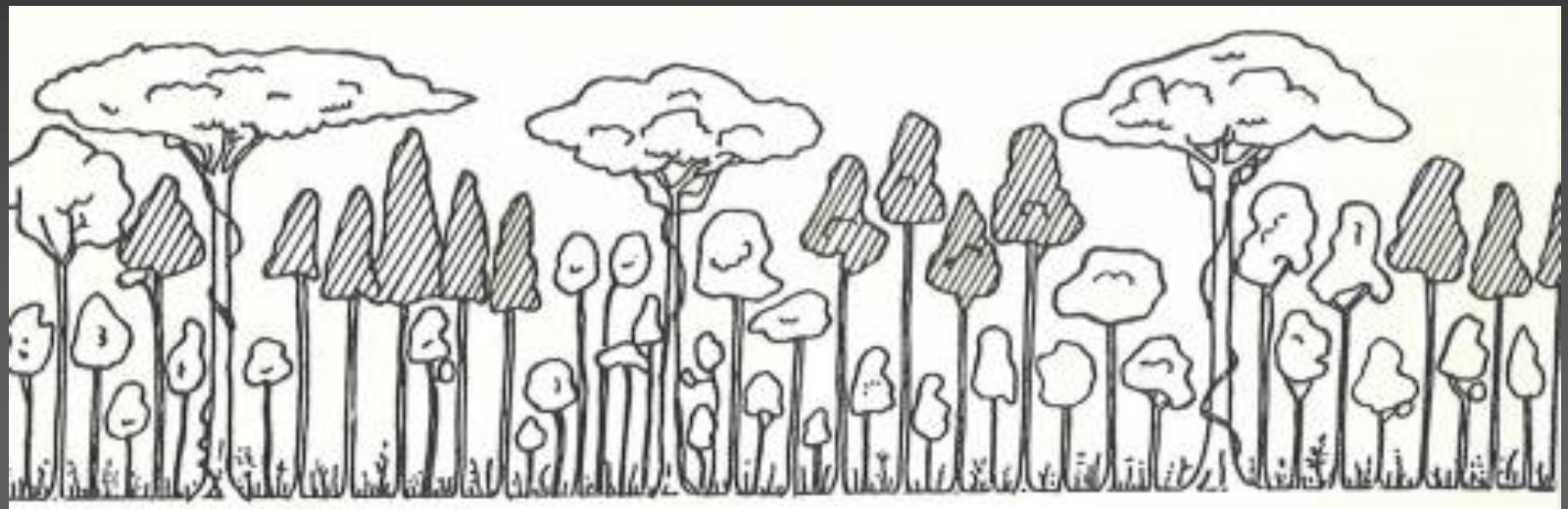
In timber production forests, each FMU should have an approved management plan, with clearly stated management objectives and measures—including silvicultural measures—for achieving them. Silvicultural measures should be revised periodically in the light of accumulated experience, new information and changing circumstances.

Principle 5: Silvicultural management

Rationale (pages 47-50)

- Multifunctional zoning and multiresource inventory
- Annual allowable cut
- Yield regulation
- Forest management plans
- Silvicultural systems
- Reduced impact harvesting
- Monitoring
- Post-harvesting actions
- Protection measures at the FMU level

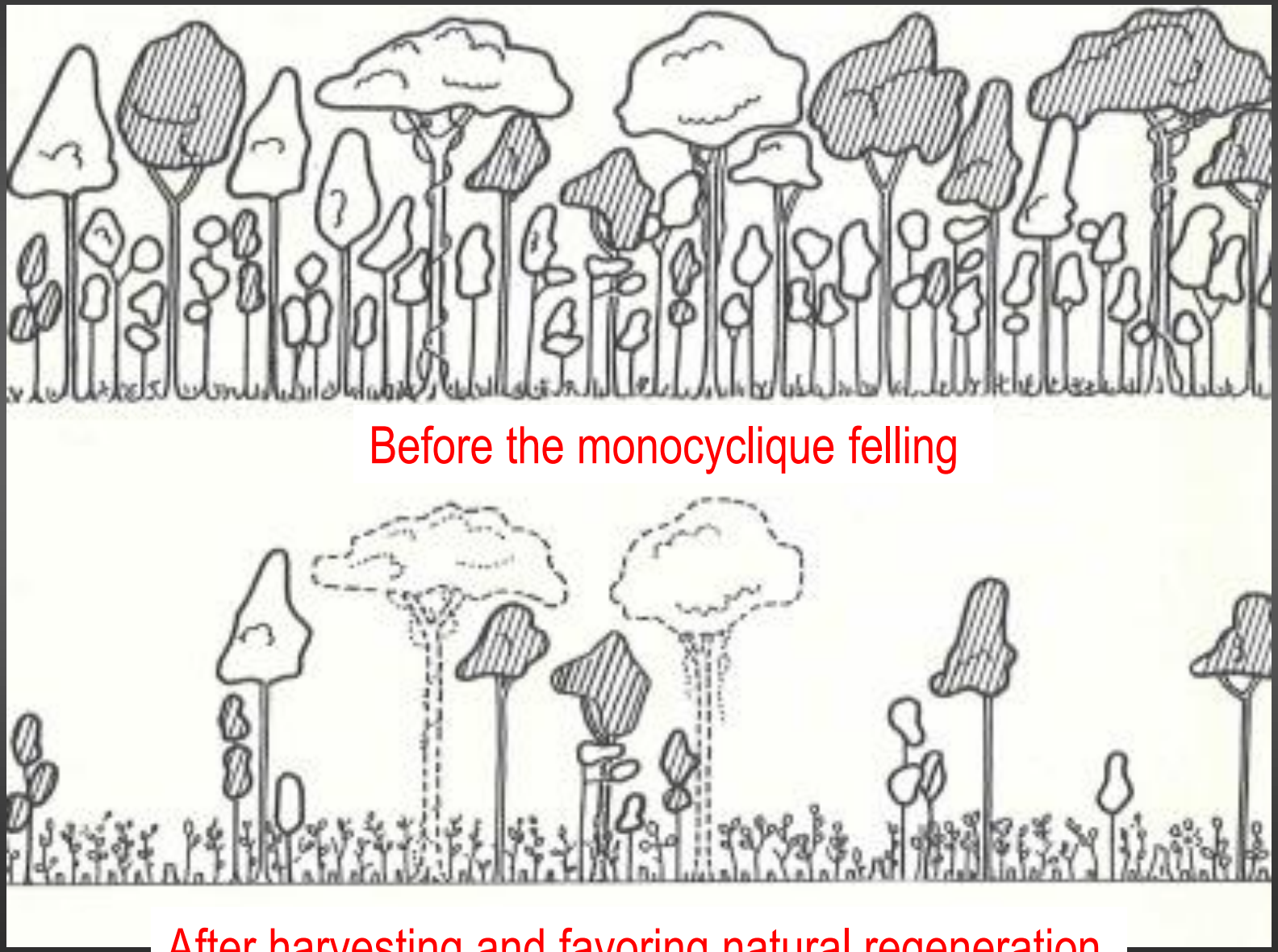
Silvicultural transformation, of low impact type



Before improvement felling

After improvement felling

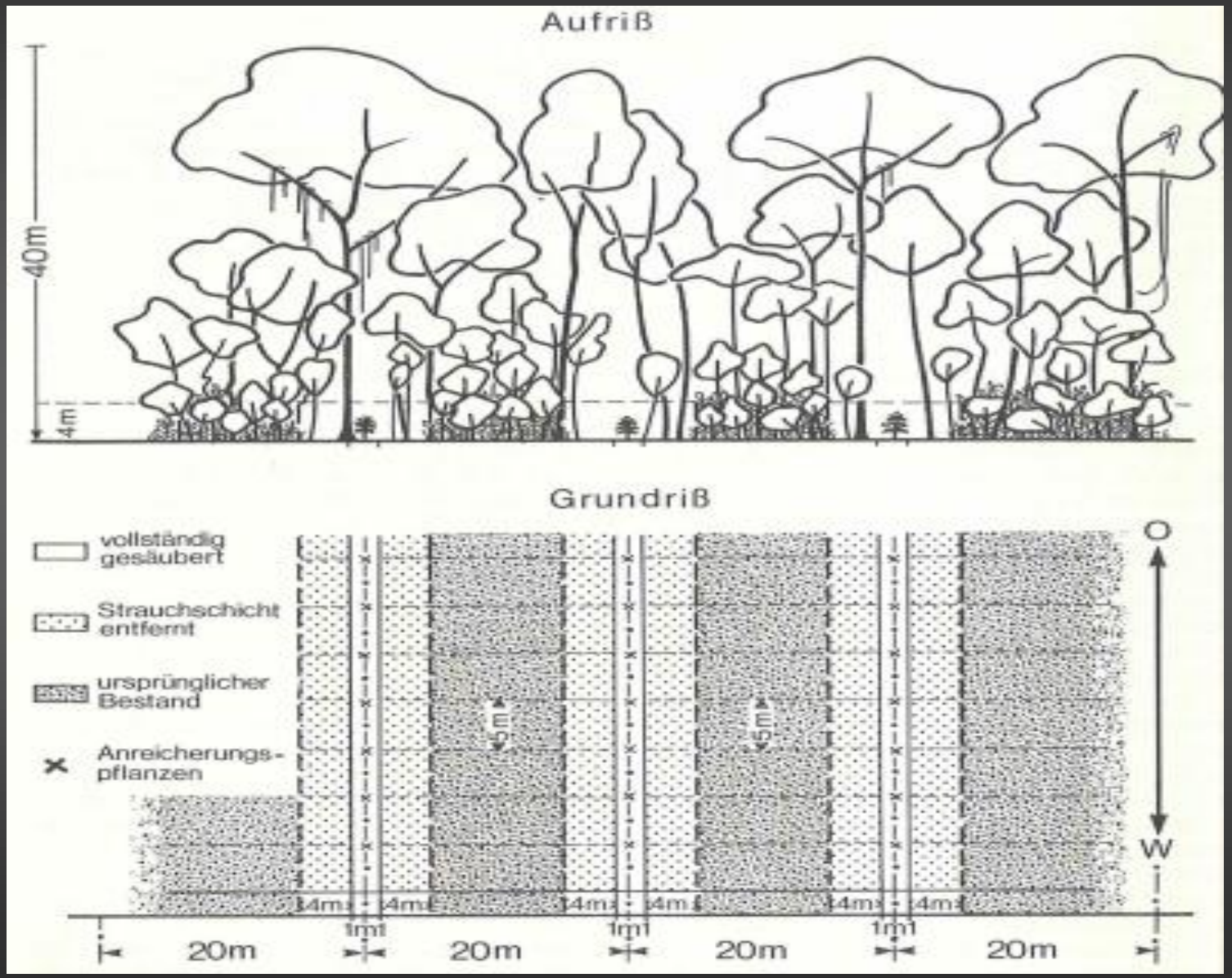
Silvicultural transformation, of high impact type



Before the monocyclique felling

After harvesting and favoring natural regeneration

Silvicultural transformation, of high impact type (2): enrichment planting



Principle 5: Silvicultural management

Guidelines (1-13)

5.1 Conduct preliminary studies and develop a multiresource inventory

5.2 Define management objectives for individual resources (e.g. timber, NTFPs, and carbon and other environmental services)

5.3 Use a reliable method for regulating and controlling yields of timber and NTFPs

5.4 Plan harvests to enable good technical control, minimize costs and reduce environmental impacts

5.5 Manage FMUs according to forest management plans and silvicultural systems

Principle 5: Silvicultural management

Guidelines (continues to 13)

5.6 Incorporate wildlife and biodiversity concerns into forest management plans

5.7 Enhance the potential for generating income from the environmental services provided by FMUs

5.8 Prepare detailed 10-year working plans and annual operational plans for harvesting and silvicultural management

5.9 Monitor the implementation of management plans and apply adaptive management

5.10 Protect FMUs from illegal and unsustainable activities

5.11 Formulate and implement fire management plans for FMUs and adjacent lands

5.12 Integrate the management of pests and diseases into forest management plans

5.13 Ensure that all waste and pollution derived from, and chemicals used in, forest management activities are stored and disposed of properly

Example: Principle 5, Guideline 5.1 and suggested actions under the guideline

Principle 5: Silvicultural management			
Guidelines		**Suggested actions**	**Indicative stakeholder group**
5.1	**Conduct preliminary studies and develop a multiresource inventory**	Conduct preliminary studies (socioeconomic, environmental, biodiversity) for the development of the management plan and establish a GIS database for creating forest zoning maps	Government, forest managers, private sector
		Conduct a multiresource forest inventory and collect data on timber, NTFPs, natural regeneration, fauna, flora, soil, hydrology, human activities, etc.	
		Integrate the multiresource inventory and forest zoning by forest function, taking into account customary rights where applicable	
		Create wildlife GIS overlays based on agreed priorities for wildlife conservation and designate wildlife conservation areas as appropriate	
		Analyze management scenarios in accordance with national laws, policies and strategies based on inventory data	
		Develop a clear understanding of the forest values to be maintained and the goals to be achieved, and establish clear medium-term and long-term management objectives, taking into account the tradeoffs needed	

First cut: Moabi in Cameroon

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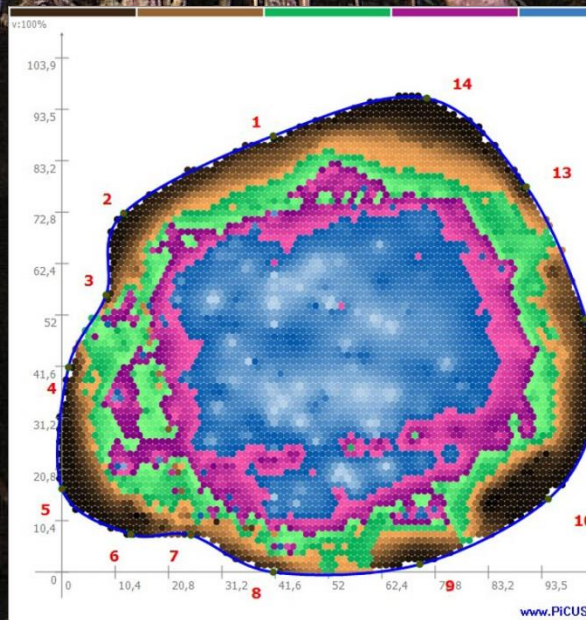
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Second cut: Ayous, 120 Jahre, d 95 cm