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Towards Defining Forest Degradation: Comparative Analysis of Existing Definitions

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Outline of the Presentation

1. Objectives of the discussion paper
2. Some characteristics of forest degradation
3. Comparison of international definitions
4. National definitions
5. Conclusions
6. Options for future action

Objectives of the Paper

1. To review the existing international and national definitions for forest degradation and degraded forests (considering multilingual aspects),
2. To analyze their elements and parameters within a common framework, and
3. To identify their commonalities and differences as well as options for improvement of their comparability, consistency and coherence

The purpose is **not** to provide a comprehensive review of scientific literature on forest degradation but rather a review of the existing situation.

The approach is holistic but there is a certain focus on climate change aspects.

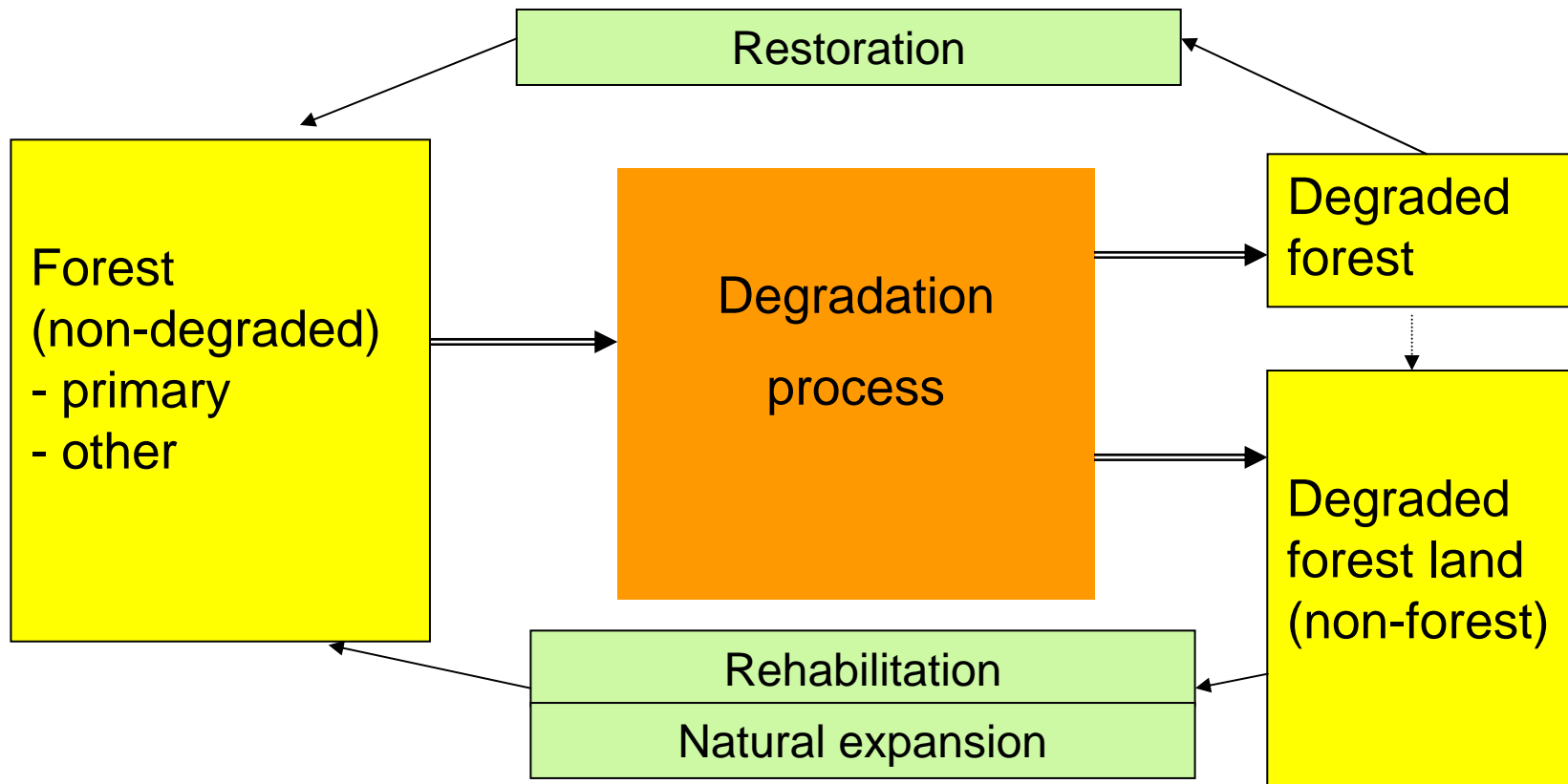
Purposes of Degradation Definitions: for What?

- **Monitoring of the status and change** in the degree of forest degradation (provision of associated goods and services)
- **Reporting to international conventions** and processes on the status and quality of forest resources
- Design and implementation of **policies, programmes and forest management measures** to take preventive and corrective action
- Design and implementation of **payment mechanisms or other incentives schemes** for forest environmental services such as carbon offsets or conservation easements.

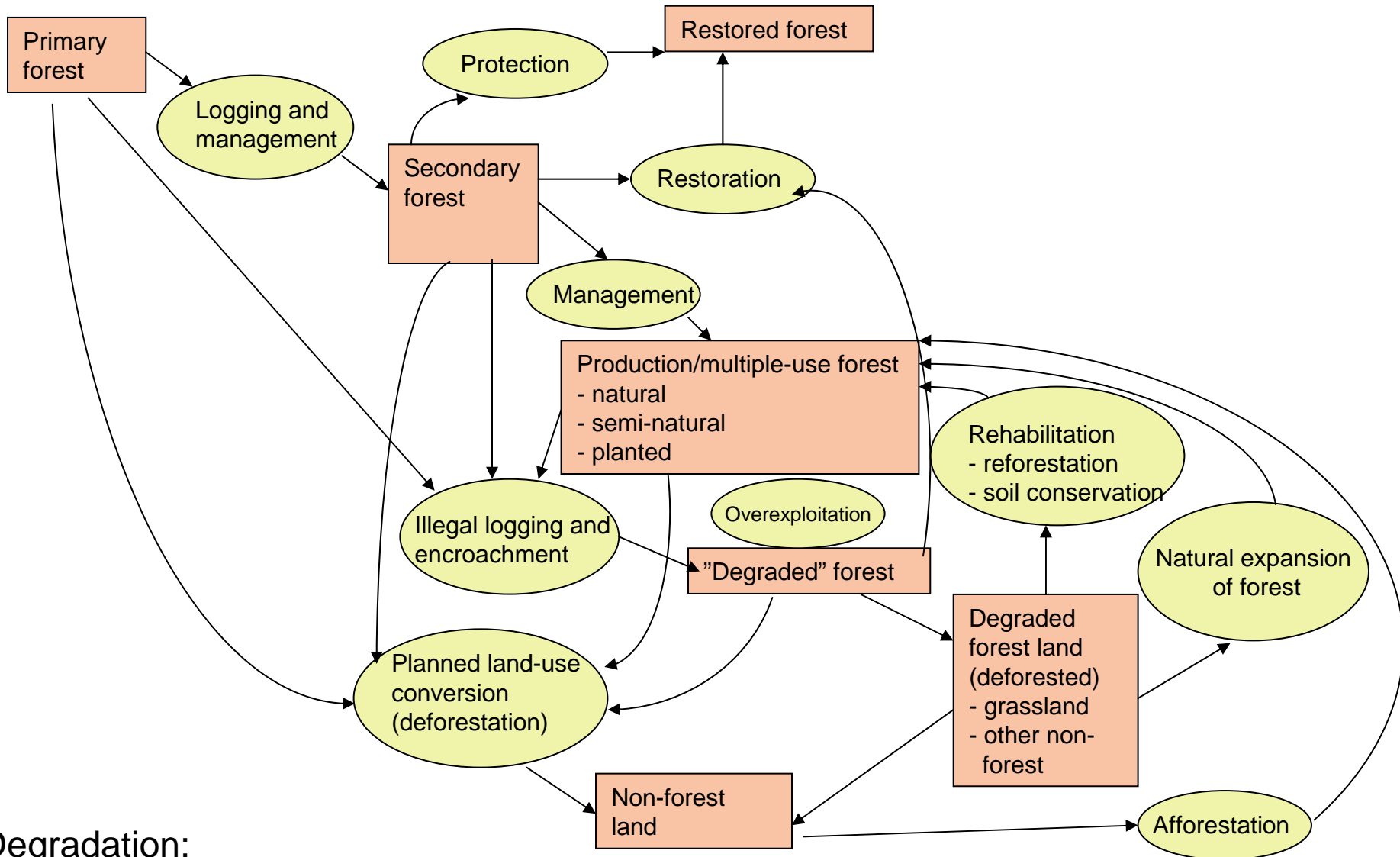
Specific Criteria for Degradation Definitions

- **Comprehensive** to allow consideration of all forest products and services
- Relate to **human-induced and natural** changes in forests, as appropriate
- Contain **clear terms** which are supported by **applicable variables** and indicators (or their proxies if necessary) that are measurable and detectable
- Consider different **time scales** (temporal and long-term variation)
- Availability of technically and economically feasible options for **measurement and assessment**
- Provision of **reference points** such as time frames, thresholds and levels of absolute or relative changes as appropriate
- Allowance for different levels of **resilience** among forest types.

Degradation and Related Processes



Simplified Illustration of Human-induced Forest Degradation

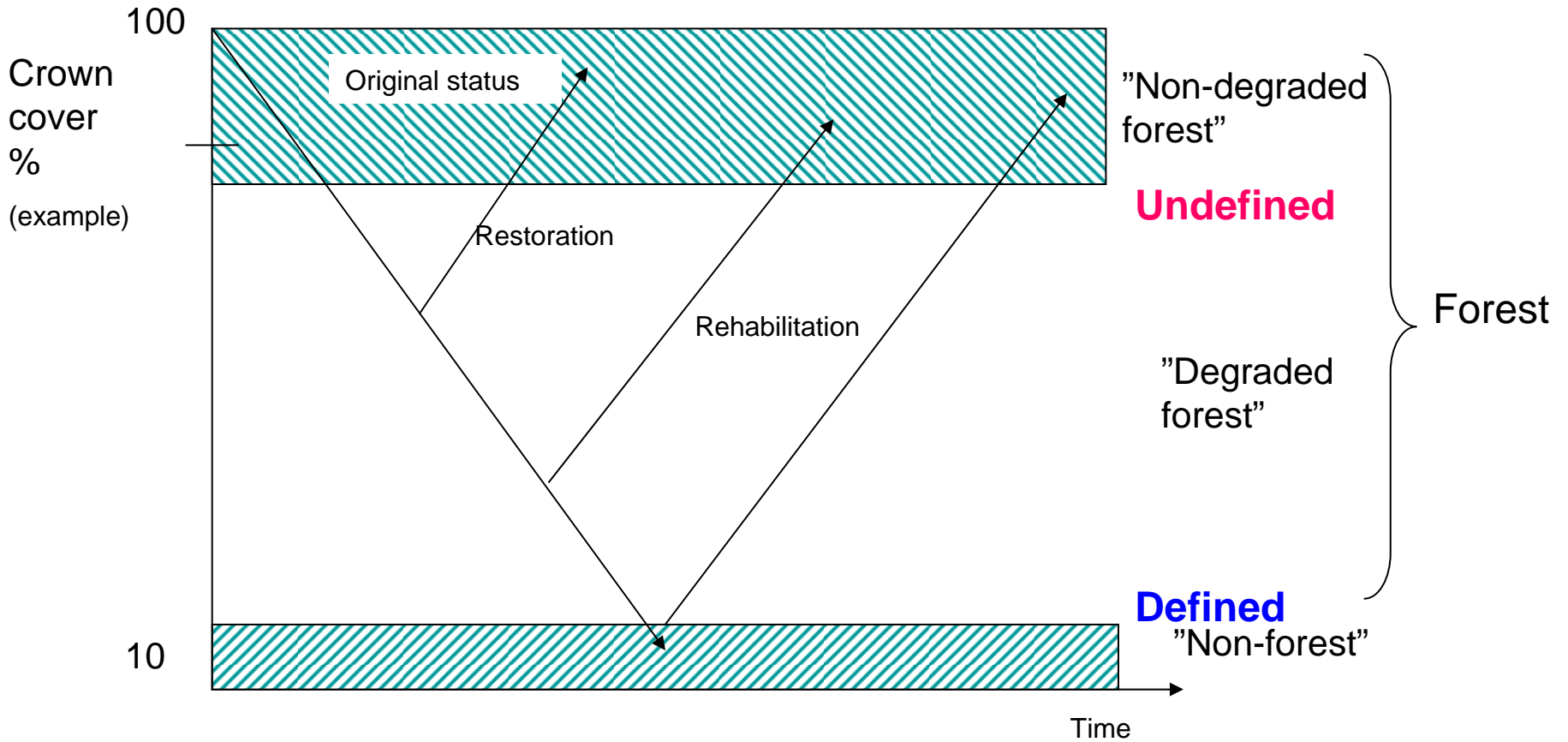


Degradation:

➔ complex, multifaceted highly location-specific phenomenon

➔ does not easily lend itself for generalizations

Degradation Thresholds



Do we have to define non-degraded forest?

Levels of Assessment

1. Global/regional/sub-regional (reporting, int. policy)
2. National (national policies, programmes)
3. Sub-national (programmes, projects)
4. Landscape/watershed (projects)
5. Forest management unit (operational decisions)
6. **Stand/site** (most definitions target at this level)

- ➔ **Implications** for (inter alia)
- Choice of indicators
 - Choice of assessment methodology

Generic Definition of Forest Degradation

The **reduction**

of the **capacity** of a forest

to provide **goods and services**

Source: Second Expert Meeting on Harmonization of Forest-related Definitions (2002)

Comparison of Definition Elements (1/3)

Parameter	FAO/FRA (2001)	ITTO (2002; 2003)	CBD (2001; 2005)	IPCC (2003a)	IUFRO	National definitions
Change within the forest						
• Canopy cover						
• Stocking level						
• Structure						
• Age structure						
• Species composition						
• Biomass density						
• Dynamics						
• Function						
• Sanitary condition						
Functions						
• Goods/products						
• Services						
• Carbon cycle						
• Biodiversity						
• Productivity						
• Capacity to supply						
• Ecosystem services						

Comparison of Definition Elements (2/3)

Element	FAO/FRA (2001)	ITTO (2002; 2003)	CBD (2001; 2005)	IPCC (2003a)	IUFRO	National definitions
Ecosystem resilience						
Degree of degradation						
Causes						
• Direct						
- Human induced						
- Natural						
• Indirect						
• Indeterminate (both)						
Reference state						
• Natural forest						
• Previous						
• Other						
Spatial scale						
• Stand/site						
• FMU						
• Landscape						

Comparison of Definition Elements (3/3)

Element	FAO/FRA (2001)	ITTO (2002; 2003)	CBD (2001; 2005)	IPCC (2003a)	IUFRO	National definitions
Temporal scale						
• Short term						
• Long term						
• Undefined						
• Duration years						
Exclusion						
• Deforestation (non-forest)						
• Activities under Art. 3.4 of the Kyoto Protocol						
• Planted forest						
• Degraded forest land (non-forest)						

Question: Are there elements which should be harmonized?

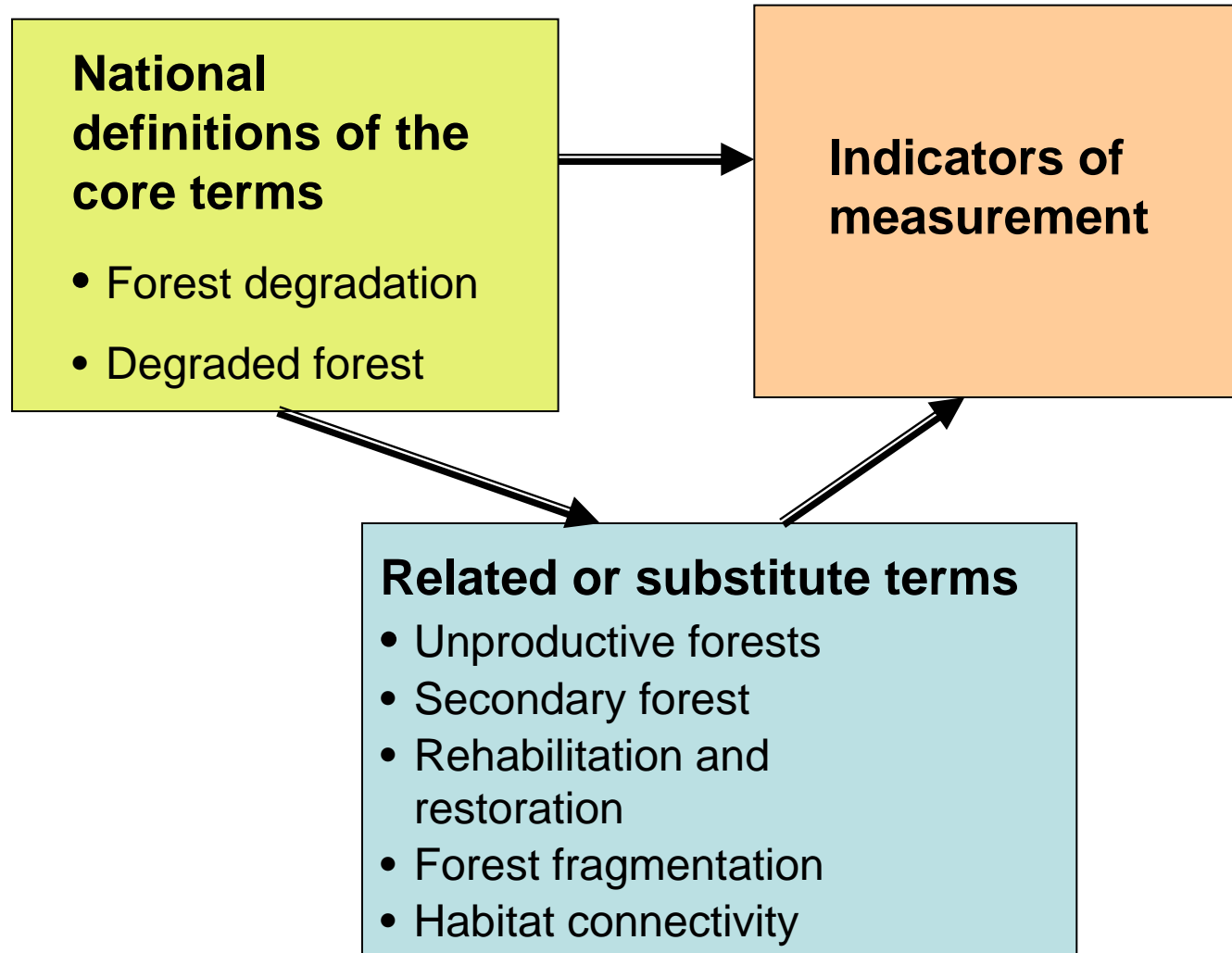
National Defintions

Typical indicators

- **Limitations of the sample**
- **Different strategies in definitions**
- **Relevance of the degradation concept**
in countries with no degraded forests
- **Reporting**
one third of countries had estimates

Definitions	Assessment
Stocking level (6 countries)	Stock density (8)
Productivity (7)	Forest/canopy cover (6)
Biomass density (3)	Diasappearance of bd/species (6)
Canopy cover (4)	Occupancy of invasive/introduced species (3)
Species composition (2)	Erosion (3)
Structure (1)	Wildlife habitats (2)
Number of trees per ha (1)	Timber/NTFP value (2)

Definitional Approaches to Forest Degradation by Countries



Degradation and SFM Elements: Summary of Country Suggestions

- A small number of **key commonly supported indicators** under each SFM criterion but also a wide range of individual suggestions.
- There is a **strong overlap** between Extent of Forest Resources, the Productive Functions and the Carbon Cycle (carbon stocks).
- **Two indicators** could be applied under three Criteria: (i) growing stock and (ii) species composition
- Many indicators proposed are **difficult to apply** in practice.
- With few exceptions, indicators under **Socio-economic Functions of Forests do not assess status** of degradation but rather its consequences.
- Many respondents lacked **clarity on how to classify** their proposals for indicators under the individual SFM Criteria

Potential Indicators Related to Degradation by SFM Element

SFM element	Potential indicators (examples)
Extent of forest resources	Forest cover, crown cover, growing stock, stand density, degree of fragmentation, trees outside forests (TOF)
Biological diversity	Ecosystem diversity, species composition/diversity, genetic diversity, degree of fragmentation, connectivity, naturalness, crown cover, forest structure.
Forest health and vitality	Area affected by pests, diseases, fire, storm damage, area subject to air pollution damage, area with diminished biological components,
Productive functions of forest resources	Stocking level, MAI, age structure, NTFP yield, wood quality
Protective functions of forest resources	Soil erosion, water quality and runoff, managed watershed area, flood protection areas, protective plantation area
Socio-economic functions of forests	Value of forest products, recreation and tourism; cultural and community values; employment; income; area available for recreation, area available to indigenous people/social services
Contribution to the carbon cycle/climate change by forests	Carbon stock in pools (above/below ground biomass, deadwood, litter, soil), stocking density, removals, TOF

Question: Can this be validated?

General Conclusions

- **Generic definitions** of degradation will be difficult to operationalize
- **Need to combine** the holistic approach and specific-purpose definitions
- **Thresholds between non-degraded/degraded/non-forest;** in the climate regime wall-to-wall approach to avoid major leakage, justification for inclusion of degradation in REDD
- **Temporal scale** is crucial for degradation definitions: need for a long-term approach
- **Purpose of definition is linked with the level of assessment;** limitations of stand-level definitions → carbon stock reduction

Conclusions: Elements of Operational Definitions

- identification of **forest goods and services**
- a **spatial context** of assessment (land area identification)
- a **reference point**;
- cover both **process and state** (degradation/degraded forest)
- relevant **threshold** values
- specification of **reasons** for degradation (human induced/natural) when required by the use of definition
- an agreed set of **variables**; and
- **indicators** (and their proxies if necessary) to measure the change of a forest (ecosystem)

→ As appropriate for specific purposes

Conclusions: Possible Core Elements by Three Proxies

- Reduction in **biomass** for the growing stock or the carbon stored which can be associated with the reduction of canopy cover and/or number of trees per unit area^[1]
- Reduction in loss of **biological diversity** which can be associated with the occurrence of species (dominant and non-dominant) and habitats
- Reduction in **soil** as indicated by soil cover, depth and fertility

^[1] Degradation does not necessarily lead to loss of biomass even if the growing stock may decrease.

Source: Lund (2009)

Question: Can this be validated?

Options for Action

- Maintain the **holistic generic definition** of forest degradation to provide a common framework for definitions developed for particular purposes.
- Maintain the understanding that forest degradation can be **further defined for various specific purposes** and that different indicators can be used for its assessment.
- For each purpose **identify what needs to be known, by whom, and for what** the data should be used in order to develop appropriate indicators.
- Recognize that for international purposes forest degradation needs to be geographically assessed at a **higher than stand or site level** without a *priori* specification of the temporal scale in the definition.
- Allow scope for **national interpretation** of international definitions of forest degradation to ensure relevance and cost-efficiency and to harness synergies.
- **Improve the existing definitions** in view of greater clarity, consistency and compatibility with each other.
- Expand efforts to **measure and assess** forest degradation

Thank You

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