# European Forest Institute

# What is sustainable forest management?
# How to measure it?
# Criteria and indicators, lessons learnt

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# 300 years of sustainable forestry…?



*300 years since a German administrator became the first person to define the concept of sustainability. **Hans von Carlowitz** is being honoured for his seminal work, **Sylvicultura oeconomica (1713),** which is generally accepted as the first publication to articulate the concept of forest sustainability and which later in the eighteenth century marked the conceptual starting point and framework for forest science*



*„Wird derhalben die größte Kunst/Wissenschaft/Fleiß und Einrichtung hiesiger Lande darinnen beruhen / wie eine sothane Conservation und Anbau des Holtzes anzustellen / daß es eine continuierliche beständige und nachhaltende Nutzung gebe / weiln es eine unentberliche Sache ist / ohne welche das Land in seinem Esse nicht bleiben mag."*
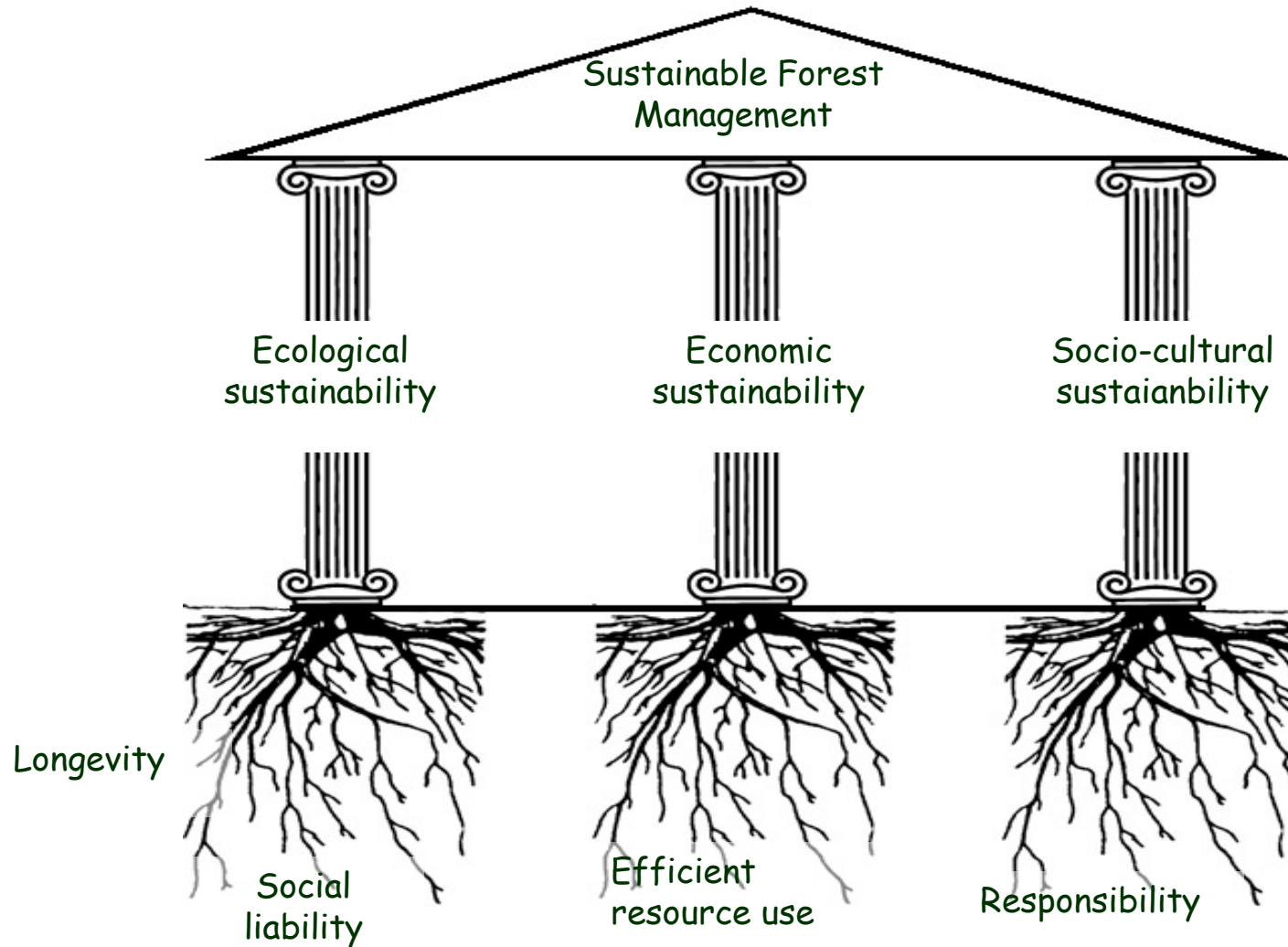
# Raw history



**1972** Stockholm Declaration

**1987** Our Common Future

**1992** Rio Earth Summit

**1997** Kyoto Climate Change Protocol

**2002** Johannesburg World Summit on Sustainable Developm

OUR COMMON FUTURE

THE WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT

Dr. Bernhard Wolfslehner

# Basics of basics: what is sustainable forest management (SFM)?

- The United Nations General Assembly defined SFM as a "*dynamic and evolving concept [that] aims to maintain and enhance the economic, social and environmental values of all types of forests, for the benefit of present and future generations*" (UN, 2008a).

- In order to make progress in SFM, there is a growing need for active **public involvement in forestry decision-making** as well as for streamlined, systematic and more results-oriented approaches to **measuring and reporting on progress** and results in SFM.

# Pillars of sustainability



Sustainable Forest Management

Ecological sustainability

Economic sustainability

Socio-cultural sustainbility

Longevity

Social liability

Efficient resource use

Responsibility

Wolfslehner, 2007

# Basics of basics: criteria and indicators

- "CRITERIA define the **essential elements** against which sustainability is assessed, with due consideration paid to the **productive, protective and social roles of forests** and forest ecosystems. Each criterion relates to a key element of sustainability and may be described by one or more indicators" *

- "INDICATORS are **parameters** which **can be measured** and correspond to a particular criterion. They measure and help monitor the status and changes of forests in quantitative, qualitative and descriptive terms that **reflect forest values** as seen by those who defined each criterion" *

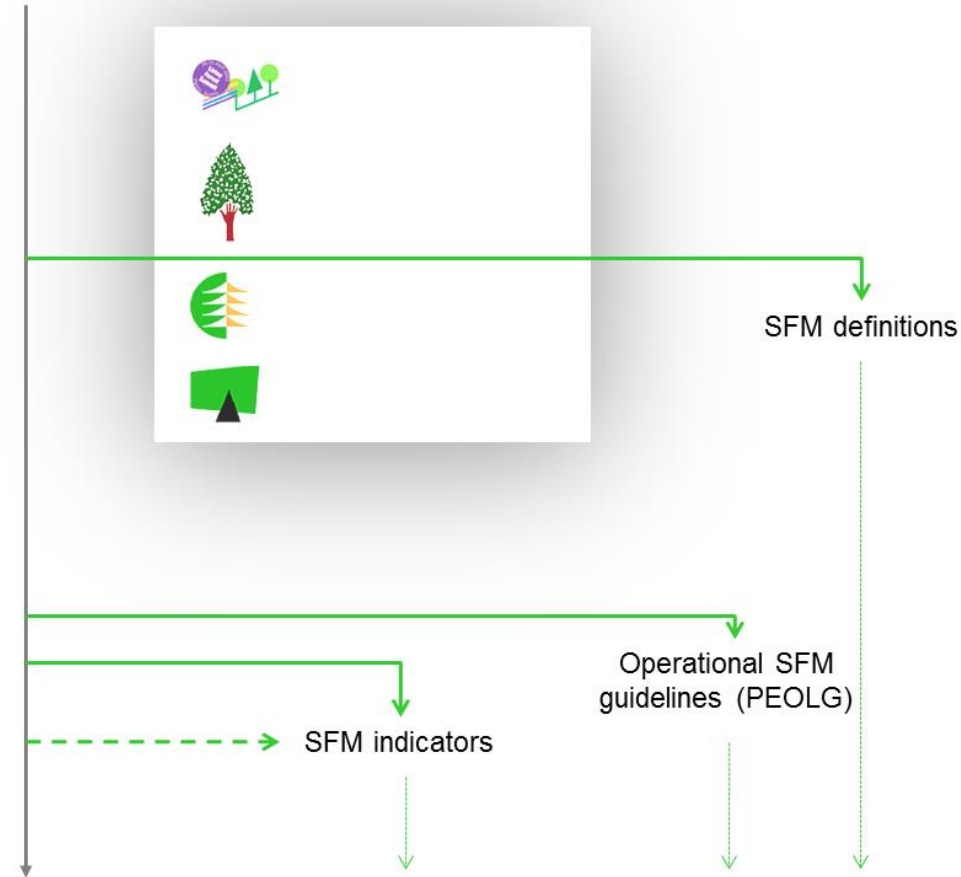*Criteria and Indicators for Sustainable Forest Management:
http://www.fao.org/forestry/ci/en/

# The concept of SFM – criteria ("essential elements")
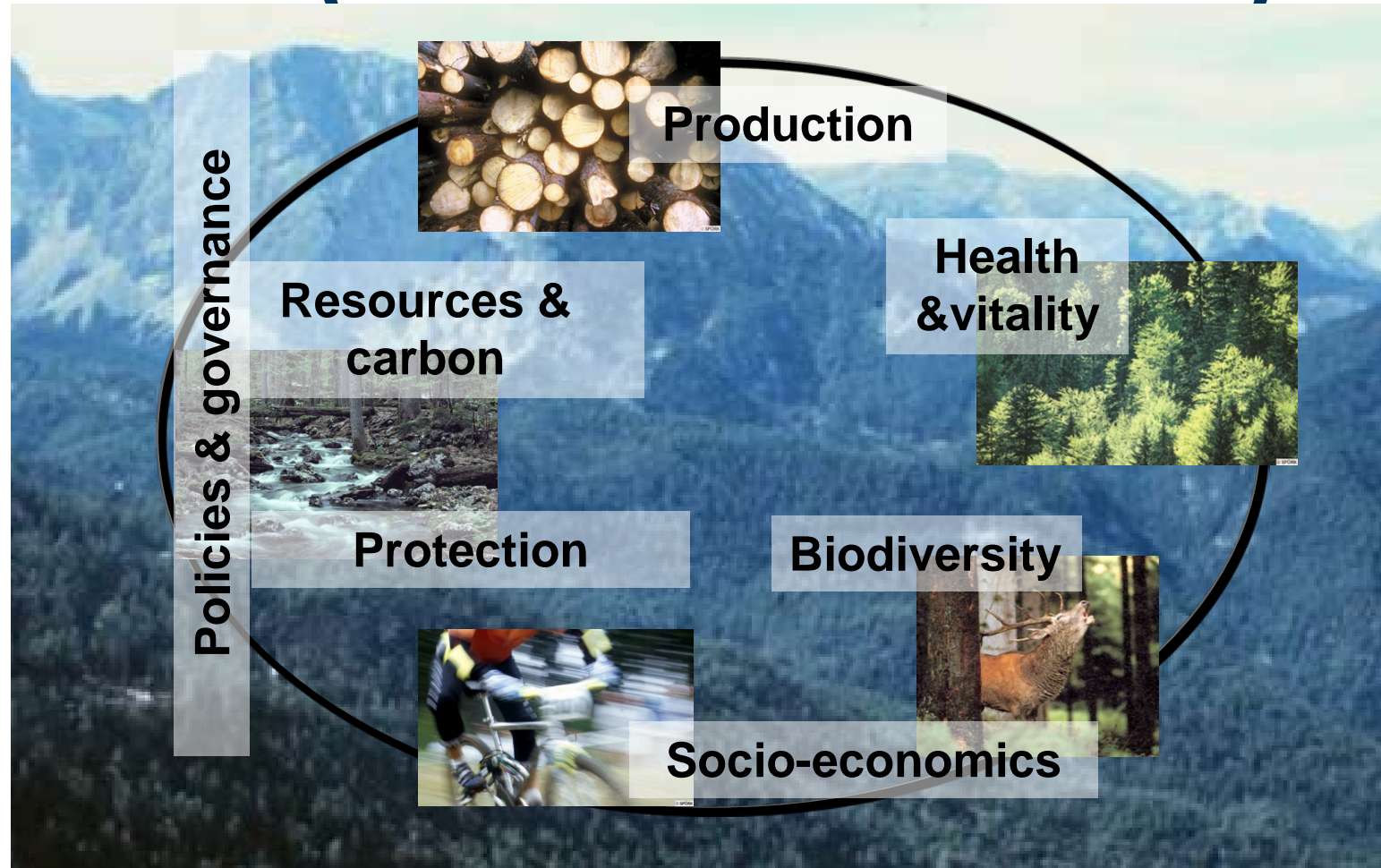
# SFM policy processes & outcomes in Europe (C&I)
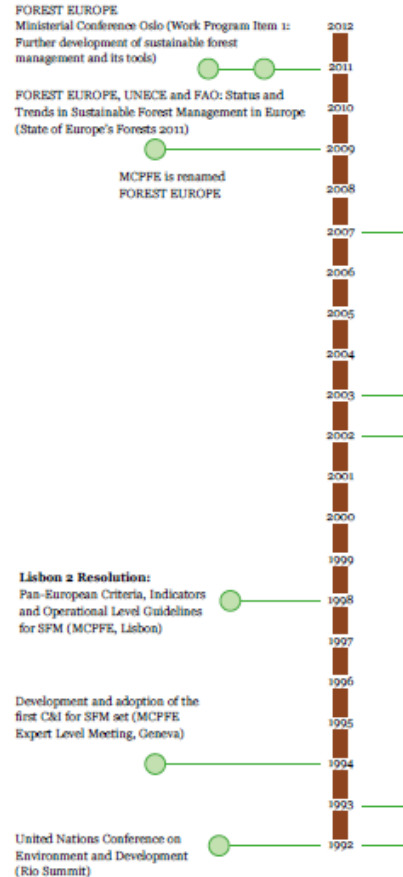
# Indicators for SFM ("parameters which can be measured")
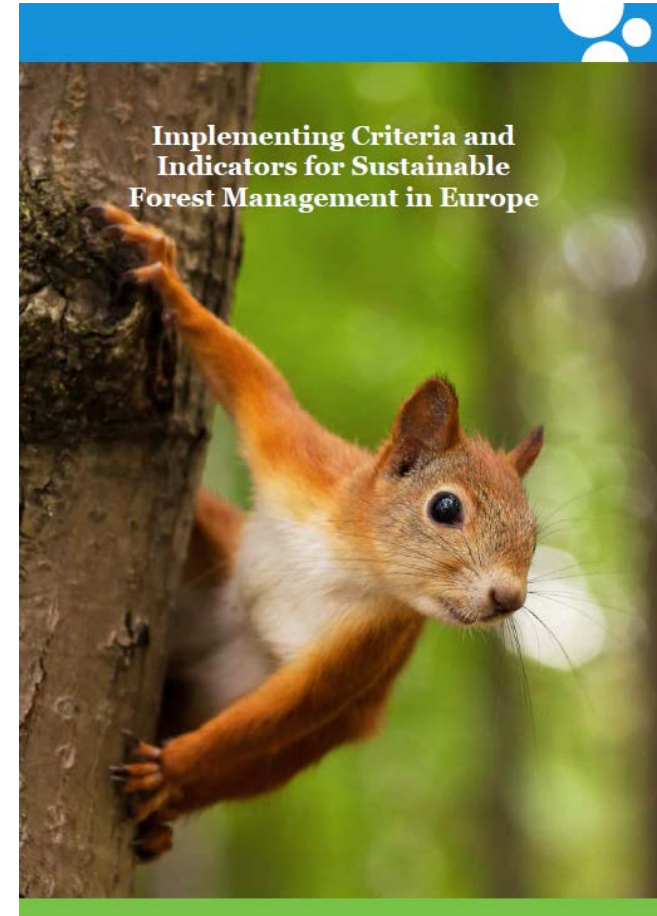
- Strong tools to collect and report information

- Different approaches
  - political
  - scientific
  - market-oriented

- Different purposes
  - description and diagnosis
  - communication
  - forecasting and future trends
  - collection of heterogeneous information and interests
  - means of political control
  - check of effectiveness of programmes

# Indicators for SFM
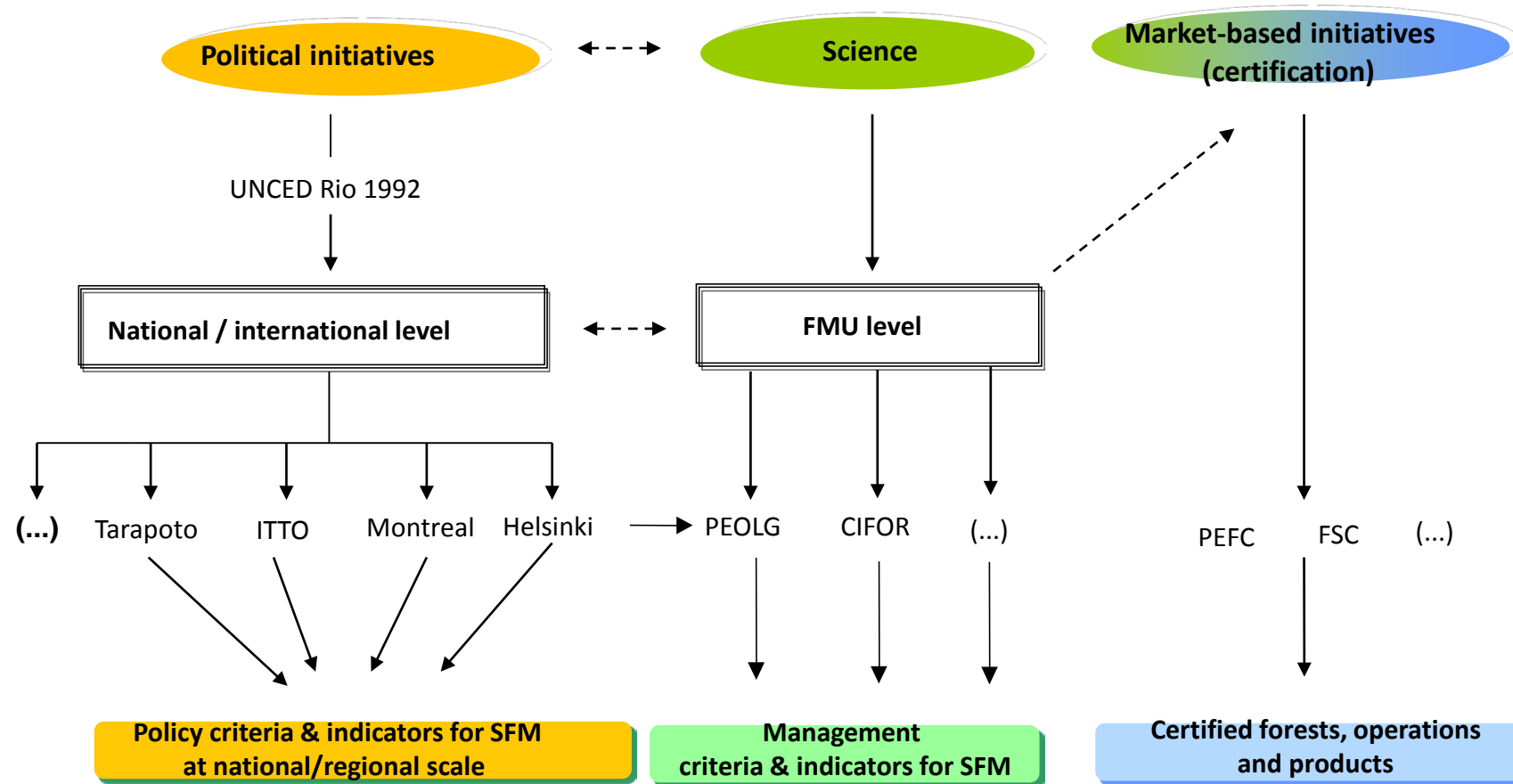
# How was the progress in implemeting C&I in Europe?

- EFI Project funded by German Federal Ministry of Food, Agriculture and Consumer Protection (BMELV), 2011-2013

- Examine implementation of Criteria & indicators (C&I) for Sustainable Forest Management (SFM) in in the 46 signatory states of the FOREST EUROPE process
  - 15 years after adoption in Lisbon (MCPFE, 1998)
  - 10 years after improved C&I set in Vienna (MCPFE, 2003)



Implementing Criteria and Indicators for Sustainable Forest Management in Europe

| | | | |
|---|---|---|---|
| **C1** | Maintenance and Appropriate Enhancement of Forest Resources and their Contribution to Global Carbon Cycles | **C4** | Maintenance, Conservation and Appropriate Enhancement of Biological Diversity in Forest Ecosystems |
| | 1.1 Forest area and OWL | | 4.1 Tree species composition |
| | 1.2 Growing stock | | 4.2 Regeneration |
| | 1.3 Age structure and/or diameter distribution | | 4.3 Naturalness |
| | 1.4 Carbon stock | | 4.4 Introduced tree species |
| | | | 4.5 Deadwood |
| | | | 4.6 Genetic resources |
| | | | 4.7 Landscape pattern |
| | | | 4.8 Threatened forest species |
| | | | 4.9 Protected forests |
| **C2** | Maintenance of Forest Ecosystem Health and Vitality | **C5** | Maintenance and Appropriate Enhancement of Protective Functions in Forest Management |
| | 2.1 Deposition of air pollutants | | 5.1 Protective forests – soil, water and other ecosystem functions |
| | 2.2 Soil condition | | |
| | 2.3 Defoliation | | 5.2 Protective forests – infrastructure and managed natural resources |
| | 2.4 Forest damage | | |
| **C3** | Maintenance and Encouragement of Productive Functions of Forests | **C6** | Maintenance of Other Socio-Economic Functions and Conditions |
| | 3.1 Increment and fellings | | 6.1 Forest holdings |
| | 3.2 Roundwood | | 6.2 Contribution of forest sector to GDP |
| | 3.3 Non-wood goods | | 6.3 Net revenue |
| | 3.4 Services | | 6.4 Expenditures for services |
| | 3.5 Forests under management plans | | 6.5 Forest sector workforce |
| | | | 6.6 Occupational safety and health |
| | | | 6.7 Wood consumption |
| | | | 6.8 Trade in wood |
| | | | 6.9 Energy from wood resources |
| | | | 6.10 Accessibility for recreation |
| | | | 6.11 Cultural and spiritual values |
| | A. Overall policies, institutions and instruments for sustainable forest management | | B. Policies, institutions and instruments by policy area |
| | A.1 National forest programmes or similar | | B1 Land use and forest area and OWL |
| | A.2 Institutional frameworks | | B2 Carbon balance |
| | A.3 Legal/regulatory frameworks and international commitments | | B3 Health and vitality |
| | | | B4 Production and use of wood |
| | A.4 Financial instruments/economic policy | | B5 Production and use of non-wood goods and services, provision of especially recreation |
| | A.5 Informational means | | B6 Biodiversity |
| | | | B7 Protective forests |
| | | | B8 Economic viability |
| | | | B9 Employment (incl. safety and health) |
| | | | B10 Public awareness and participation |
| | | | B11 Research, training and education |
| | | | B12 Cultural and spiritual values |

**Major requirements:**

- **Dialogue and communication**
- **Tool for monitoring and reporting**
- **Assess progress towards SFM**
- **Facilitate national/subnational policy programmes**
- **Provide information of**
- **Inter-sectoral relevance**

# Summary: the pan-European set of C&I...

- Has **served as a framework for dialogue and communication**
- Has **served as an adequate tool for monitoring and reporting** on sustainable forest management
- Has made **limited contribution to assessing progress** towards sustainable forest management
- Has **facilitated the development and adaptation of national policy** instruments
- Has only generated **limited information of inter-sectoral relevance**

# Recommendations of the C&I Forum

- Improve national implementation including resources, capacities, smart/multi-purpose use of C&I, and stronger links to management practice

- Revision of C&I set recommended **to adapt to current and emerging information needs**, implying:
  - Formulation of objectives for a (revised) C&I set
  - Development of harmonised methods to assess sustainability
  - Development of understanding on use of the qualitative indicators
  - Development of subsets of indicators or composite indicators to address specific policy questions
  - Building bridges to other sectors

# Current pan-European indicators for SFM



Ind. 1.1 Forest area
Ind. 2.1 Deposition of air pollutants
Ind. 2.2 Soil condition
Ind. 2.3 Defoliation
Ind. 2.4 Forest damage
Ind. 4.8 Threatened forest species
Ind. 4.9 Protected forests
Ind. 1.2 Growing Stock
Ind. 4.2 Regeneration
Ind. 4.6 Genetic resources
Ind. 4.7 Landscape pattern
Ind. 3.5 Forests under management plans
Ind. 3.3 Non-wood goods
Ind. 3.4 Services
Ind. 4.1 Tree species composition
Ind. 1.3 Age structure/ diameter distribution
Ind. 1.4 Carbon stock
Ind. 4.3 Naturalness
Ind. 4.4 Introduced tree species
Ind. 4.5 Deadwood
Ind. 6.10 Accessibility for recreation
Ind. 6.11 Cultural and spiritual values
Ind. 6.1 Forest holdings
Ind. 5.1+5.2 Protective forests
Ind. 6.4 Expenditure for services
Ind. 6.3 Net revenue of forest enterprises
Ind. 3.1 Increment and fellings
Ind. 6.6 Occupational safety and health
Ind. 6.2 Contribution of the forest sector to GDP
Ind. 6.5 Forest sector workforce
Ind. 3.2 Roundwood
Ind. 6.7 Wood consumption
Ind. 6.8 Trade in wood
Ind. 6.9 Energy from wood resources

# … and how to be broadened



Current pan-European indicators for SFM and new scope of indicators along the forest-based sector value chain
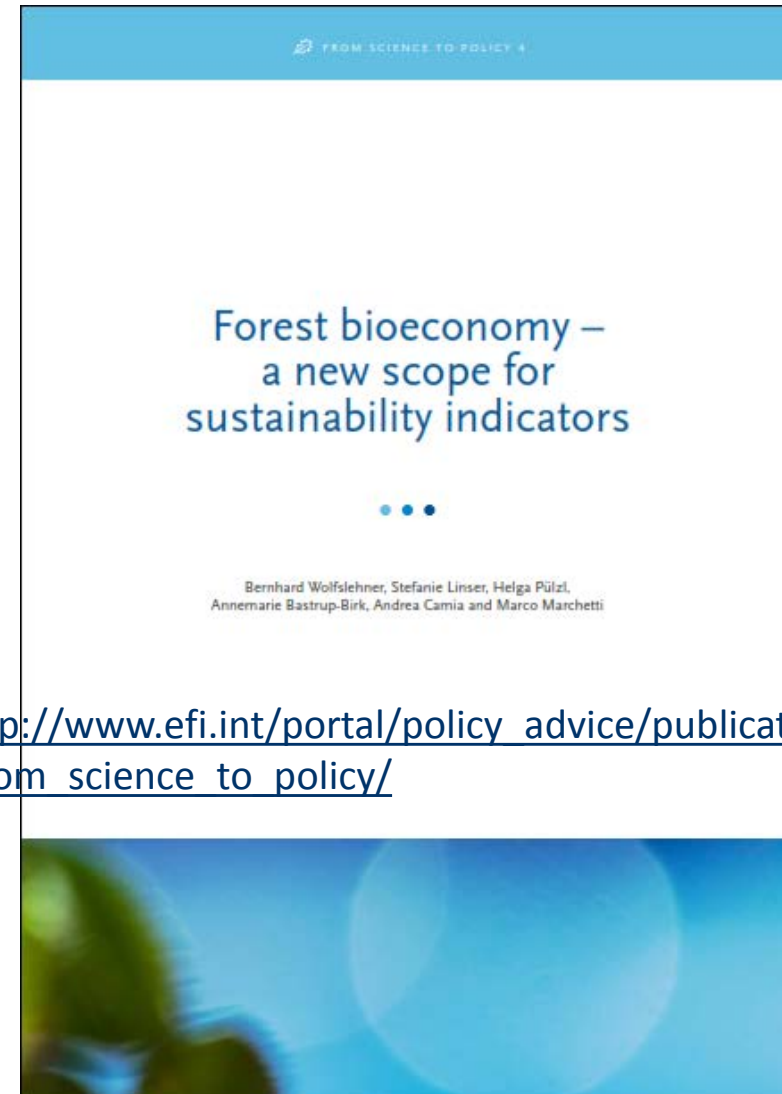
# C&I are back on the agenda

- Revision of Forest Europe indicators

- EU Commission addresses SFM C&I on EU level

- FAO Global C&I Project with a focus on social and governance indicators

- Indicators for UN Sustainable Development Goals to be designed (SDGs)

# Important issues to be considered

- Linkages to bio-economy needed
- Ecosystem service to be better covered
- Cross-sectoral approaches needed
- Better use for assessments
- Links to business implementation
  - Links to incentives - certification
  - …

# … next step is taken

- Current pan-European indicators (35) for SFM:
  - mostly covers the first part of the forest-based sector value chain
- The whole forest-based value chain is very much linked to a bioeconomy:
  - not only primary production
  - but use of wood and non-wood material, the provision of forest ecosystem services, energy production and material use during recycling
- A broadening of current forest indicator understanding is required

Forest bioeconomy – a new scope for sustainability indicators

Bernhard Wolfslehner, Stefanie Linser, Helga Pülzl, Annemarie Bastrup-Birk, Andrea Camia and Marco Marchetti

http://www.efi.int/portal/policy_advice/publications/from_science_to_policy/