



ANNEX 1 OF THE RESOLUTION L2

Pan-European Criteria and Indicators for Sustainable Forest Management

Criteria and Quantitative Indicators were adopted at expert level by the First Expert Level Follow-Up Meeting of the Helsinki Conference, held in Geneva in June 24, 1994.

The Descriptive Indicators were adopted at expert level for possible use by the Second Expert Level Follow-Up Meeting of the Helsinki Conference, held in Antalya in January 23, 1995.

CRITERION 1: Maintenance and Appropriate Enhancement of Forest Resources and their Contribution to Global Carbon Cycles

CONCEPT AREA: GENERAL CAPACITY

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - provides an overall policy framework for conservation and sustainable management of forests
2. Existence and capacity of an institutional framework to:
 - provide guidelines for national plans or programmes
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - permits the flow of capital in and out of the forest sector in response to market signals and public policy decisions

4. Existence of informational means to implement the policy framework, and the capacity to:
 - recognise the full range of forest values and potentials with periodic forest-related planning and assessment of national forest resources

CONCEPT AREA: LAND USE AND FOREST AREA

Quantitative indicator:

- 1.1. Area of forest and other wooded land and changes in area (classified, if appropriate, according to forest and vegetation type, ownership structure, age structure, origin of forest)

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - maintains forest resources and prevents forest degradation;
 - clarifies property rights and provides for appropriate land tenure arrangements
2. Existence and capacity of an institutional framework to:
 - carry out integration between land-use planning and forest management
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - supports mechanisms promoting integration between land-use planning and forest management planning
4. Existence of informational means to implement the policy framework, and the capacity to:
 - conduct and apply management guidelines for land-use planning in relation to forest resources
 - enhance conversion of agricultural and other treeless land to forest land by afforestation

CONCEPT AREA: GROWING STOCK

Quantitative indicator:

- 1.2. Changes in:
 - a. total volume of the growing stock
 - b. mean volume of the growing stock on forest land (classified, if appropriate, according to different vegetation zones or site classes)
 - c. age structure or appropriate diameter distribution classes

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - supports sustainable management while increasing the growing stock of both merchantable and non-merchantable tree species on forest land available for timber production
2. Existence and capacity of an institutional framework to:
 - undertake and develop regular assessment of forest resources
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - provides appropriate incentives to support forest policy aiming at bigger growing stock
4. Existence of informational means to implement the policy framework, and the capacity to:
 - improve execution of forest resources assessment by acknowledged research institution or other similar organisations

CONCEPT AREA: CARBON BALANCE

Quantitative indicator:

- 1.3. Total carbon storage and, changes in the storage in forest stands

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - clarifies policies for enhancing the use of forest products for energy
2. Existence and capacity of an institutional framework to:
 - develop programmes for enhancing the use of forest products for energy
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - provides subventions for the use of wood for energy
4. Existence of informational means to implement the policy framework, and the capacity to:
 - enhance studies on the length of the life cycle of wood products
 - enhance effectively organised collection of waste paper

CRITERION 2: Maintenance of Forest Ecosystem Health and Vitality

Quantitative indicators:

- 2.1. Total amount of and, changes over the past 5 years in depositions of air pollutants (assessed in permanent plots)
- 2.2. Changes in serious defoliation of forests using the UN/ECE and EU defoliation classification (classes 2, 3, and 4) over the past 5 years
- 2.3. Serious damage caused by biotic or abiotic agents:
 - a. severe damage caused by insects and diseases with a measurement of seriousness of the damage as a function of (mortality or) loss of growth
 - b. annual area of burnt forest and other wooded land
 - c. annual area affected by storm damage and volume harvested from these areas
 - d. proportion of regeneration area seriously damaged by game and other animals or by grazing
- 2.4. Changes in nutrient balance and acidity over the past 10 years (pH and CEC); level of saturation of CEC on the plots of the European network or of an equivalent national network

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - enforces laws and policies related to maintaining forest health and vitality
2. Existence and capacity of an institutional framework to:
 - develop mechanisms for controlling the occurrence of serious damages / damage agents
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - creates appropriate incentives to prevent extreme disruption of ecological processes
4. Existence of informational means to implement the policy framework, and the capacity to:
 - strengthen regular field monitoring on forest health status and inventories of soil acidification
 - prevent serious damage caused by machinery and forestry operations: compaction of soil, injuries into standing trees, etc.

CRITERION 3: Maintenance and Encouragement of Productive Functions of Forests (wood and non-wood)

CONCEPT AREA: WOOD PRODUCTION

Quantitative indicators:

- 3.1. Balance between growth and removals of wood over the past 10 years
- 3.2. Percentage of forest area managed according to a management plan or management guidelines

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - encourages forest owners to practice environmentally sound forestry based on a forest management plan or equivalent guidelines
2. Existence and capacity of an institutional framework to:
 - develop institutions and mechanisms advocating economic, environmental and social factors as essential elements in wood production
 - develop and maintain efficient physical infrastructure to facilitate the delivery of forest products and services
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - supports investment and taxation policies which recognise the long-term nature of investments in forestry
 - supports non-discriminatory trade policies for forest products
4. Existence of informational means to implement the policy framework, and the capacity to:
 - improve technologies and plans based on proper forest inventories

CONCEPT AREA: NON-WOOD PRODUCTS

Quantitative indicator:

- 3.3. Total amount of and changes in the value and/or quantity of non-wood forest products (e.g., hunting and game, cork, berries, mushrooms, etc.)

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - provides legal instruments to regulate forest management practices for recreation and the harvesting of important non-wood forest products
2. Existence and capacity of an institutional framework to:
 - support appropriate organisations for extension services on non-wood benefits
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - enables the implementation of guidelines for management of non-wood benefits
4. Existence of informational means to implement the policy framework, and the capacity to:
 - develop management plans for non-wood benefits

CRITERION 4: Maintenance, Conservation and Appropriate Enhancement of Biological Diversity in Forest Ecosystems

CONCEPT AREA: GENERAL CONDITIONS

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - clarifies the concept of management, conservation and sustainable development of forest
 - provides for national adherence to international legal instruments
2. Existence and capacity of an institutional framework to:
 - maintain, conserve and appropriately enhance biological diversity at the ecosystem, species and genetic levels
 - identify economic value in forests whose management is adjusted in favour of maintaining biological diversity
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - creates new resources and incentives to enhance the mechanisms for predicting impacts of human interventions on forests
 - supports economic value in forests whose management is adjusted in favour of maintaining biological diversity

4. Existence of informational means to implement the policy framework, and the capacity to:
 - develop new inventories and ecological impact assessments on biological diversity
 - develop tools to assess the effects of forest management on biological diversity

CONCEPT AREA: REPRESENTATIVE, RARE AND VULNERABLE FOREST ECOSYSTEMS

Quantitative indicator:

4.1. Changes in the area of:

- a. natural and ancient seminatural forest types
- b. strictly protected forest reserves
- c. forests protected by special management regime

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - provides for legal instruments to protect representative, rare or vulnerable forest ecosystems
2. Existence and capacity of an institutional framework to:
 - develop and maintain institutional capacity and distribution of responsibilities related to protected areas
 - maintain degree of implementation of confirmed national forest conservation programmes
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - supports the representativeness of protected forests in relation to ecological and regional distribution
4. Existence of informational means to implement the policy framework, and the capacity to:
 - enhance measures to re-establish the endemic biological diversity in forests managed for production
 - apply measures for rehabilitation of degraded forest areas

CONCEPT AREA: THREATENED SPECIES

Quantitative indicator:

4.2. Changes in the number and percentage of threatened species in relation to total number of forest species (using reference lists e.g., IUCN, Council of Europe or the EU Habitat Directive)

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - provides for legal instruments to protect threatened species
2. Existence and capacity of an institutional framework to:
 - develop and maintain institutional instruments to protect threatened species
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - supports implementation of management guidelines to take into account threatened species
4. Existence of informational means to implement the policy framework, and the capacity to:
 - construct periodically reviewed lists of threatened forest species
 - enhance level of knowledge on threatened species / assessments, inventories or research on threatened species

CONCEPT AREA: BIOLOGICAL DIVERSITY IN PRODUCTION FORESTS

Quantitative indicators:

4.3. Changes in the proportions of stands managed for the conservation and utilisation of forest genetic resources (gene reserve forests, seed collection stands, etc.); differentiation between indigenous and introduced species

4.4. Changes in the proportions of mixed stands of 2-3 tree species

4.5. In relation to total area regenerated, proportions of annual area of natural regeneration

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - provides for legal instruments to ensure regeneration of managed forests

2. Existence and capacity of an institutional framework to:
 - develop and maintain institutional instruments to ensure regeneration of managed forests
 - conduct inventories on proportion of area covered by trees significantly older than the acceptable age of exploitation currently used
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - provides for economic incentives for taking account of environmental issues in management planning
 - conducts inventories / assessments on bioindicators
4. Existence of informational means to implement the policy framework, and the capacity to:
 - take measures to maintain or to re-establish biological diversity in old forests
 - monitor changes in the proportions of afforested or reforested areas covered by indigenous and introduced species, conifer and deciduous species

CRITERION 5: Maintenance and Appropriate Enhancement of Protective Functions in Forest Management (notably soil and water)

CONCEPT AREA: GENERAL PROTECTION

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - provides for legal instruments to regulate or limit forest management practices in forests protected for infrastructure / protection forests
2. Existence and capacity of an institutional framework to:
 - develop and maintain institutional instruments to regulate or limit forest management practices in forests protected for infrastructure / protection forests
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - supports the preparation of management guidelines for infrastructure and protection forests
4. Existence of informational means to implement the policy framework, and the capacity to:
 - conduct research on infrastructure and protection forests in relation to land use practices / forest management

CONCEPT AREA: SOIL EROSION

Quantitative indicator:

5.1. Proportion of forest area managed primarily for soil protection

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - provides for legal instruments to regulate or limit forest management practices in areas with vulnerable soils
2. Existence and capacity of an institutional framework to:
 - strengthen institutional instruments to regulate or limit forest management practices in areas with vulnerable soils
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - supports the preparation of management guidelines for areas with vulnerable soils
4. Existence of informational means to implement the policy framework, and the capacity to:
 - conduct inventories and research on soil erosion

CONCEPT AREA: WATER CONSERVATION IN FORESTS

Quantitative indicator:

5.2. Proportion of forest area managed primarily for water protection

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - provides for legal instruments to regulate or limit forest management practices in favour of water conservation or protection of water resources
2. Existence and capacity of an institutional framework to:
 - develop and maintain institutional instruments to regulate or limit forest management practices in favour of water conservation or protection of water resources

3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - supports the preparation of management guidelines for taking into consideration water conservation in forest management practices
4. Existence of informational means to implement the policy framework, and the capacity to:
 - conduct inventories and research on water quality and flow characteristics in relation to land use practices / forest management

CRITERION 6: Maintenance of other Socio-Economic Functions and Conditions

CONCEPT AREA: SIGNIFICANCE OF THE FOREST SECTOR

Quantitative indicator:

6.1. Share of the forest sector from the gross national product

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - provides for legal instruments to ensure development of the forest sector
2. Existence and capacity of an institutional framework to:
 - develop and maintain efficient physical infrastructure to facilitate the supply of forest products
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - ensures new investments in the forest sector to meet future demands
4. Existence of informational means to implement the policy framework, and the capacity to:
 - develop and put into practice new improved technology
 - conduct market analysis to better fulfil the needs of society

CONCEPT AREA: RECREATIONAL SERVICES

Quantitative indicator:

6.2. Provision of recreation: area of forest with access per inhabitant, % of total forest area

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - recognises customary and traditional rights of indigenous people, and provides means of resolving access disputes
2. Existence and capacity of an institutional framework to:
 - undertake planning and assessment in recreational services on forestry
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - supports forestry constituencies to conserve special environmental, cultural, social and scientific values in relation to recreational services
4. Existence of informational means to implement the policy framework, and the capacity to:
 - conduct assessment on recreation

CONCEPT AREA: PROVISION OF EMPLOYMENT

Quantitative indicator:

- 6.3. Changes in the rate of employment in forestry, notably in rural areas (persons employed in forestry, logging, forest industry)

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - provides for legal instruments for securing income levels in forest sector
2. Existence and capacity of an institutional framework to:
 - develop and maintain human resource skills in all relevant tasks
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - supports programmes to ensure employment in rural areas in relation to forestry
4. Existence of informational means to implement the policy framework, and the capacity to:
 - secure a fair share of income from non-wood products coming from rural sources of income

CONCEPT AREA: RESEARCH AND PROFESSIONAL EDUCATION

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - provides for national programmes for research and professional education
2. Existence and capacity of an institutional framework to:
 - develop and maintain institutional instruments to enhance forest related research and education
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - provides public and private funding for research, educational and extension programmes
4. Existence of informational means to implement the policy framework, and the capacity to:
 - guarantee a sufficient number of people educated at different levels of forestry and cross-cutting field of education

CONCEPT AREA: PUBLIC AWARENESS

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - provides opportunities for public access to information
2. Existence and capacity of an institutional framework to:
 - strengthen organisations to provide extension services for general public
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - guarantees that part of forest revenues are reinvested in informing the public about forests
4. Existence of informational means to implement the policy framework, and the capacity to:
 - support teaching and informing of environmental issues and other forestry related subjects

CONCEPT AREA: PUBLIC PARTICIPATION

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - provides opportunities for public participation in public policy and decision making on forests
2. Existence and capacity of an institutional framework to:
 - enforce institutional mechanisms for the involvement of local people and NGOs in decision-making
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - attracts public outreach and preparatory planning
4. Existence of informational means to implement the policy framework, and the capacity to:
 - enhance public participation in decision-making processes related to implementation of forest policy

CONCEPT AREA: CULTURAL VALUES

Descriptive indicators (examples):

1. Existence of a legal / regulatory framework, and the extent to which it:
 - provides for programmes and management guidelines which recognise cultural heritage in relation to forestry
2. Existence and capacity of an institutional framework to:
 - develop and maintain programmes to conserve culturally valuable sites and landscapes
3. Existence of economic policy framework and financial instruments, and the extent to which it:
 - provides for sufficient financial incentives for acknowledgement of cultural values in forest management planning
4. Existence of informational means to implement the policy framework, and the capacity to:
 - conduct studies on proportion of culturally valuable sites and sites with special visual value