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Sustainable Forest Management - Criteria and Indicators

SUSTAINABLE FOREST MANAGEMENT CRITERIA AND INDICATORS

0 - INTRODUCTION

In 1995 in Santiago de Chile, the signing countries of the "Montreal Process" agreed on a frame of Criteria and Indicators that offer the countries members a common definition of what characterizes the sustainable management of temperate and boreal forests (Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests). In this frame, seven Criteria of the Montreal Process are identified, and are taken as the base for the definition of the specific indicators of the present Norm.

1 - OBJECTIVE AND SCOPE

The present Norm has the objective of establishing the requirements of the planification, criteria and specific indicators for the Sustainable Forest Management. This Norm is applicable to forest plantations in a unit of forest management, **both public and private**.

Forest plantations with genetically modified trees are expressly excluded from the scope of this standard.

2 - NORMATIVE REFERENCES

Norm UNIT 1151:2009. - Sustainable Forest Management. Glossary of terms.

3 - DEFINITIONS

For the purpose of this Norm the terms and definitions established in the Norm UNIT 1151 are applicable.

4 - REQUIREMENTS FOR THE PLANIFICATION

4.1 Planification

For the implementation and compliance of the criteria and indicators established, in the unit of forest management, a cohesive planification must take place with the concept of Sustainable Forest Management, seeking a balance between the conservation of the natural resources, historic-cultural and socio-economic aspects, productivity (technical, economic and financial) and the general society's well being.

The planification of the forest management, territory, inventory and mapping of forest resources should identify, protect and/or preserve environmentally important forest areas that contain significant concentrations of:

- protected ecosystems, rare, vulnerable or representative, such as riparian or wetland biotopes;
- areas containing endemic species and habitats of endangered species, as defined in recognized reference lists;
- threatened or protected *in situ* genetic resources;

and take into account significant areas of landscape to global, regional, and national levels with natural

distribution and abundance of natural existence;

Note: This not necessarily excludes management activities that do not harm the biodiversity values of these biotopes

The planification of the unit of management must be formulated, documented and reviewed periodically, in the short and long term for:

- the use of the land, with previous characterization of the natural, historic and socio-economic resources, to determine the areas of management
- the production of a diversity of goods (wood and non wood products) and services in a sustainable way;
- the execution of each one of the activities;
- the conservation and promotion of the biological diversity at the ecosystem, species and genetic level and where appropriate, the diversity at the landscape level;
- the prevention of labour and environmental risks;
- [the prevention of unauthorized activities by third parties, including , among others, intrusions, permanent or temporary illegal occupation, unregulated recreational use , unauthorized starting of a fire and unsupervised harvest of forest products.](#)
- the achievement of a sustainable economical development, in consideration of new markets and economical activities in relation to all the products and relevant services in the management unit.

In the planification of the different uses and functions of the management unit the role of the forest production in the rural development must be taken into consideration. The instruments of the established policies to support the production of goods and commercial and non commercial forest services must be used.

In the planification of the forest management, the socio-cultural context must be considered, having as reference the experience and traditional knowledge associated to the forest of the local communities and other interested parties.

4.2 General Plan of Management

The unit of forest management must have a General Plan of Management. This plan must include the directives of the management in the activities of the unit over which the person responsible has the control of. The General Plan of Management must be a document itself, subject to periodical reviews, appropriate for the size and uses of the forest area, or a series of documents that include, among others: plans of forest management, operative plans of management and forestry treatments, plans of production control (of wood and non wood products and services), plans for the conservation of endangered species, plans for the use and conservation of the soils, plans for fire protection of forests, [plans to prevent illegal activities by third parties](#), plans for monitoring and integrated control of pests and diseases, forestry plans of recuperation of forest areas affected by fire or climatic agents, plans for the construction and maintenance of infrastructure (among others, of roads, ways, areas of storage, bridges) necessary for the development of activities of the management unit.

The General Plan of Management must include the procedures through which the persons responsible of the unit of forest management seek to achieve the objectives defined for each indicator.

5 - CRITERIA

The Criteria for the Conservation of Temperate and Boreal Forests (Montreal Process) are the following:

CRITERION 1 - Conservation of biological .

CRITERION 2 - Maintenance of the productive capability of the forest ecosystems.

CRITERION 3 - Maintenance of the health and vitality of the forest ecosystems.

CRITERION 4 - Conservation and maintenance of the soil and water resources.

CRITERION 5 - Maintenance of the contribution of the forest to the global Carbon cycle.

CRITERION 6 - Maintenance and improvement of the multiple socio-economical benefits in the long term to cover the needs of the societies.

CRITERION 7 - Legal, institutional and economic frame for the conservation and sustainable management of the forests.

6 - CRITERIA AND INDICATORS

6.1 CRITERION 1. - Conservation of biological diversity

6.1.1 Indicator: area of natural ecosystems

6.1.1.1 Justification: It seeks to prevent the conversion of all types of forest to other land uses, except when: a) it is fully justified by national or regional planning of land use; b) it affects a small proportion of a forest type; c) it does not generate negative impacts on threatened forest ecosystems, areas of cultural or social significance, habitats or endangered species and other protected areas d) it contributes to conservation benefits, economic and social problems in the long term.

6.1.1.2 Objective: to identify the natural ecosystems in the management unit.

6.1.1.3 Parameters:

- location of the field in the biogeographical context
- total area of each natural ecosystem identified (ha)
- ratio of area of each natural ecosystem identified in relation to the total area of the management unit (%)

6.1.1.4 Procedures: to be defined by those responsible of the management unit.

6.1.1.5 Documents: General Plan of Management.

6.1.1.6 Registers: they must give evidence of the parameters. Cartography.

(NOTE: for orientation purposes it is recommended to use Geographical Information).

6.1.2 Indicator: state of the ecosystems, species and their genetic diversity

6.1.2.1 Justification: the natural ecosystems present in the management unit must be identified and

evaluated to determine the sites, species or communities of importance for the conservation of the biological diversity.

6.1.2.2 Objective: to describe, evaluate and plan the management of the natural ecosystems identified in the item 6.1.1 and the animal and plant species, native and exotic. To increase the genetic diversity inter and intraspecific and the structural diversity in order to improve the capability of the plantations in the stability, vitality and resistance to adverse environmental factors and to strengthen the natural mechanisms of regulation.

6.1.2.3 Parameters:

- list of plant and animal species, native and exotic, predominant in the management unit;
- list of native species endangered (critical risk, endangered or vulnerable) and of special importance for the conservation of the biological diversity.;
- (NOTE: for orientation purposes it is recommended to use the guidelines established by the government institutions).
- List of areas (ha) of the habitats of importance for the biological diversity to be conserved;
- List of the key biotopes (among others, sources of running waters, wetlands, rocky surfaces) to be conserved or recovered if appropriate;
- List of exotic plants and animals that might represent a threat or pest;
- State of conservation of the natural ecosystems of importance for the conservation of the biological diversity;
- The existence, when corresponds, of plans for
 - conservation of natural ecosystems;
 - conservation of native plant and animal species;
 - control of exotic animal and plant species that might represent a threat or pest;
 - forestation and/or re-population with a diversity of genotypes, species and/or clones in the management unit;
 - natural re-population for the maintenance of native forests and those populations of exotic species where the natural re-population is the only economical alternative possible;
 - construction and maintenance of infrastructure, considering the conservation of ecosystems, species and their habitats.

6.1.2.4 Procedures:

- monitoring of the habitats to be conserved in the management unit, including at least the abundance/richness indexes for the endangered species and those of singular importance for the conservation, as well as the exotic species that might represent a threat or pest;
- procedures to adequate the animal endowment to the load capacity, for exotic and native animals in the management unit;
- formulation and implementation of forestry norms and procedures that include measures for the conservation of the biological diversity (maintenance of dead trees, fallen or standing for fauna habitats, and maintenance of aging tree areas of rare or singular species.) considering the potential effects of these measures on the safety of people and the protection and stability of forests and surrounding ecosystems simultaneously.

6.1.2.5 Documents:

- General Plan of Management. Register of native forests (before the competent authorities).

Forestation plans with different species and/or clones in the forest management unit. Conservation plan of natural ecosystems. Conservation plan of native animal and plant species. Plan of control of exotic plant and animal species that might represent a threat or pest.

6.1.2.6 Registers: list and categorization of species. Reports of evaluation and follow up of plant and animal ecosystems.

6.1.3. Indicator: surface of biological corridors and buffer zones

6.1.3.1 Justification: the maintenance of biological corridors allows the connectivity of the ecosystems at a regional level and the movement of species between adjacent basins. It is necessary to establish buffer areas between habitats and/or ecosystems of interest and forest plantations, to avoid compromising the conservation.

6.1.3.2 Objective: to contribute to the conservation of the natural ecosystems and species of interest present in the management unit or adjacent areas.

6.1.3.3 Parameters:

- surface of buffer zones between habitats of interest and plantations (ha);
- surface of biological corridors (ha).

6.1.3.4 Procedures:

- territory planning of the management units including the biological corridors and buffer zones;

6.1.3.5 Documents: General Plan of Management; specific plan for the coordinated management of areas of conservation of biological diversity, biological corridors and buffer zones.

6.1.3.6 Registers: registers must give evidence of the parameters. Aerial photos. Cartography.
(NOTE: for orientation purposes it is recommended to use the Geographical Information Systems)

6.2. CRITERION 2: Maintenance and improvement of the productive capacity of the forest ecosystems.

6.2.1 Indicator: genotypes used in the forested area to obtain wood and non wood products and services, in relation to the total area of the management unit

6.2.1.1 Justification: it is necessary to plan the use of the land, previous characterization of the natural and socio-cultural resources in the management unit in order to define the different areas of management. For each site, the origins of the species or varieties introduced and appropriate genotypes must be determined as well as the impact on the ecosystems and genetic integrity of the native species and local origins; **the use of genetically modified organisms is prohibited**. The equipments and techniques to use in each activity must be defined, as well as establish and maintain the necessary infrastructure to accomplish a Sustainable Forest Management.

6.2.1.2 Objective: to determine the ratio of the total area available to the management unit with forest production aptitude and the effective area forested and destined to other productions or uses.

6.2.1.3 Parameters:

- effective forested area in the management unit (ha);

- forested area in relation to the area of forestry aptitude (%) and area destined to other productions or uses in relation to the total area (%);
- list of species, origins, varieties introduced or clones used;
- forested areas with each species, origins, introduced variety or clone;
- plans of construction and maintenance of infrastructure.

6.2.1.4 Procedures: to be defined by the persons responsible for the management unit.

6.2.1.5 Documents: General Plan of Management.

6.2.1.6 Registers: the registers must give evidence of the parameters. Aerial photos. Cartography.
(NOTE: for orientation purposes it is recommended to use the Geographical Information Systems)

6.2.2 Indicator: periodic balance of the forest plantation in terms of effective forested area, growing existences, increase, mortality and harvest yields for the management unit

6.2.2.1 Justification: the conservation of the productivity of the forest plantations in the management unit in the relationship between the increase in the growing existences and harvested volume, in periods of reference of the General Plan of Management.

6.2.2.2 Objective: to obtain predictable relations between the effective forested area, the growing existences and harvest yields of the forest plantations; [to assess potential losses from various causes, including natural mortality and uncontrolled harvest.](#)

6.2.2.3 Parameters:

- area planted periodically (ha);
- area harvested periodically (ha);
- annual average increase (m³/ha/year);
- annual harvest volume (m³/year);
- volume harvested periodically (m³);
- [differences between annual harvest volumes projected and actual \(m³ / year\).](#)

6.2.2.4 Procedures: to be defined by the persons responsible of the management unit.

6.2.2.5 Documents: General Plan of Management. Plans of control of wood productions. Forest inventory. Current aerial photo.

6.2.2.6 Registers: registers must give evidence of the parameter. Reports of periodical inventories, annual or periodical harvest reports.
(NOTE: for orientation purposes it is recommended to use the Geographical Information Systems)

6.2.3 Indicator: percentage of wood used *versus* wood produced.

6.2.3.1 Justification: there must be an adequate control of the production, identifying the volumes produced and the volumes used or commercialized, annually or periodically. The objective is to maximize the percentage of the volume used to obtain the maximum benefit from the resource.

6.2.3.2 Objective: to obtain the maximum commercial benefit from the forest. To seek to minimize the

tree residues, product of the management practices and harvest of wood products mainly [and to prevent uncontrolled harvest losses](#).

6.2.3.3 Parameters:

- volume of robust wood standing (m^3/year m^3/period);
- volume of commercialized wood (m^3/year ; m^3/period);
- ratio between commercialized and produced (%) annual or periodic;
- [differences between annual harvest volumes projected and actual \(\$m^3 / \text{year}\$ \)](#).

6.2.3.4 Procedures: to be defined by the persons responsible for the management unit.

6.2.3.5 Documents: General Plan of Management. Operative plans of silviculture treatments (cuts, thinning or other interventions) and harvest. Reports of forest inventory. Commercial reports.

6.2.3.6 Registers: reports and spreadsheets of production and commercialization.

6.2.4 Indicator: amount of non wood products and services of the forest

6.2.4.1 Justification: the resources and services that might produce non wood products must be quantified for the producer and the community.

6.2.4.2 Objective: to identify and quantify the non wood products in the management unit. [To prevent use without control or supervision by the responsible forest management unit](#)

6.2.4.3 Parameters:

- husbandry (Cattle units/ha/year);
- apiculture production (Number of beehives/ha/year o kg of product /ha/year);
- mushroom production or collection (kg/year);
- essential oils (liters/ha/year);
- harvest or commercialization of seeds (kg/ha/year);
- recreational hunting and fishing (Number of visitors per year);
- recreational activities (Number of visitors per year);
- other products that might be identified and evaluated by the persons responsible of the management unit .
- tree covered surface that might qualify as protection forest (ha) and its ratio (%) with the total surface of the management unit.

6.2.4.4 Procedures:

- identification and evaluation of utilities and potential services relevant in the management unit;
- regulation of the use of non wood products in management unit;
- [regulation of the use of services \(silvopasture, recreational activities, etc.\) in the management unit](#);
- others to be defined by the persons responsible for the management unit.

6.2.4.5 Documents: General Plan of Management. Plans of production of wood and non wood products and services.

6.2.4.6 Registers: registers must give evidence of the parameters. Registers of wood and non wood products obtained and commercialized by the management unit.

6.3 CRITERION 3 - Maintenance and improvement of the health and vitality of the forest ecosystems.

6.3.1 Indicator: estate of the system of protection against fires, climatic agents and mechanical damages.

6.3.1.1 Justification: in the management unit a system of prevention and combat of forest fires must be implemented, to ensure the survival and productivity of the forest plantations and the natural ecosystems present. There must be contingency plans for cases of damage caused by climatic agents. The planification of the silvicultural tasks must reduce to a minimum the mechanical damage to the forest populations.

6.3.1.2 Objective: to prevent the forest fires and in case of sinister, to apply the proper measures to reduce to a minimum the damages and losses. To recover the forest populations affected by climatic agents. To prevent mechanical damages caused by the silvicultural activities.

6.3.1.3 Parameters:

- surface affected by the fire in the management unit (ha/year);
- plans and silvicultural procedures to recover the forest ecosystems affected by the fire or climatic agents in the management unit;
- number of persons instructed for the protection against forest fires;
- adequation of the infrastructure destined to the protection against forest fires;
- adequation of the number and types of tools, machinery and equipment specific destined to the protection against forest fires;
- recovered area of the total area affected by climatic agents (%);
- quality control of the silvicultural tasks that might affect the forest populations.

6.3.1.4 Procedures:

- to plan, implement and review periodically the silvicultural preventive measures coordinating with the objectives of management unit;
- to schedule the realization of drills (see item 6.6.2);
- to avoid the use of fire in the forest fields. Some controlled fires might take place after technical evaluation;
- prevention of the mechanical damages during silvicultural tasks, harvest or transport.

6.3.1.5 Documents: General Plan of Management for forest fire protection. Plans and silvicultural procedures for recuperation of forest ecosystems affected by fire and climatic agents.

6.3.1.6 Registers: the registers must give evidence of the parameters. Inventories. Cartography.

(NOTE: for orientation purposes it is recommended to use the Geographical Information Systems)

6.3.2 Indicator: sanitary state of the forest ecosystems.

6.3.2.1 Justification: the task to develop and the real and potential sanitary risks must be considered. In the management unit documented preventive actions must take place to reduce the incidence of pests and diseases.

6.3.2.2 Objective: to identify the pests and forest diseases existent in management unit. To establish strategies to minimize the risks of introduction of harmful organisms and to prevent the increment of the incidence of those already existent. To control the pathogen agents under the guidelines of an integrated control system of pests and diseases. To determine the best alternative for the control of pests from an environmental and economical point of view.

Pesticides Type 1A and 1B of the WHO and other highly toxic pesticides will be prohibited, except when not provided any viable alternative.

Any exceptions to the prohibition of use of pesticides Type 1A and 1B WHO will be defined by a specific standard of forest management.

Pesticides, such as chlorinated hydrocarbons whose derivatives remain biologically active and accumulate in the food chain beyond their intended use and any pesticides banned by international agreements should also be banned.

NOTE: "pesticides banned by international agreements" are defined in the Stockholm Convention on Persistent Organic Pollutants 2001, as has been amended.

6.3.2.3 Parameters: Result of the existence and implementation of a system integrated control of pests and diseases that at least considers:

- quantification of the incidence of pests and/or diseases in the plantations (% affected in relation to the total forested area);
- quantity and frequency of the application of phytosanitary as complementary measures of biological control, silvicultural or mechanical;
- existence and application of documented measures of prospection, prevention and control

6.3.2.4 Procedures:

- follow up of pests and diseases in nurseries and plantations;
- selection of alternatives of pest and disease control, giving preference to measures of biological, silvicultural or mechanical control against the use of chemical products;
- follow up of biological control agents. Plans for their increase and/or installation;
- plans of immediate corrective actions in case of significant incidences.

6.3.2.5 Documents: General Plan of Management. Integrated plans of control of pests and diseases. Silvicultural plans and procedures for the recovery of forest ecosystems affected for pests and/or diseases. Procedures for the prevention of mechanical damages during silvicultural treatments, harvest or transport. [List of pesticides used and/or stored.](#)

6.3.2.6 Registers: registers must give evidence of the parameters. Reports of the follow ups and application of integrated control of pests and diseases.

6.4 CRITERION 4: Conservation and Maintenance of the soil and water resources.

6.4.1 Indicator: relation between the aptitude and use/current management of the soil in the management unit.

6.4.1.1 Justification: the management unit must have information to design practices that allow the use of the soil resource according to its aptitude and ensure the proper conservation and recuperation

of the soil.

6.4.1.2 Objective: to establish a diagnosis of the situation of the soil resource in reference to the previous and current use, that allows to elaborate and periodically review the management of soils in the management unit. To minimize the proportion of areas with use/management non consistent with their aptitude.

6.4.1.3 Parameters:

- surface of the different types of soils present in the management unit (ha);
- aptitude of the use of the different types of soils present in the management unit;
- main physical and chemical properties of the soils in the management unit;
- state of conservation of the soil resource;
- area of soils with a current use and management non consistent with their aptitude (ha).

6.4.1.4 Procedures:

- to map the aptitude of use and current use of the soils in the management unit;
- sampling and analysis of the soils;
- others to be defined by the persons responsible for the management unit.

6.4.1.5 Documents: General Plan of Management. Documents about the aptitude of the use of the soils.

(NOTE: for orientation purposes it is recommended to use the guidelines established by the government agencies)

6.4.1.6 Registers: registers must give evidence of the parameters. Cartography of soils. Soil analyses.

6.4.2 Indicator: state of erosion and degradation of affected soils.

6.4.2.1 Justification: the potential erosion and degradation risks must be considered in the planning and execution of the tasks. Documented corrective and preventive actions and must take place to diminish or attenuate the current erosion in the affected areas.

6.4.2.2 Objective: to quantify the affected areas and the potential risk. To adopt corrective and preventive measures to reduce, avoid and even revert the advance of the erosion process and degradation.

6.4.2.3 Parameters: periodical quantification of the surface (ha) of the affected areas in different levels of:

- laminar erosion;
- lines of water erosion;
- ridges;
- naked soil;
- compactation by machinery traffic;
- erosion associated to infrastructure;

and their relation in percentage (%) to the total surface of the management unit.

- to formulate, implement and periodically review plans and procedures to reduce to a minimum the areas affected by degradation processes and apply corrective action in degraded areas ;
- procedures to control the animal load in areas under husbandry and/or joint use.

6.4.2.4 Procedures:

- to apply techniques and tools appropriate to the soils of the management unit;
(NOTE: for orientation purposes it is recommended to use the model of expected erosion USLE - RUSLE validated at national level).
- to plan to reduce traffic in the direction of the maximum slope during harvest operations;
- to minimize impact of harvesting equipment, storage and/or cargo on soil of the management unit;
- to respect timeouts of the operating machinery in relation to the traffic conditions of the soil and roads;
- to minimize the times and areas of exposure of soil without vegetation cover;
- others to be defined by the persons responsible of the management unit.

6.4.2.5 Documents: General Plan of Management. Plans of corrective action for soil degradation processes. Silvicultural, husbandry and harvest norms to prevent, attenuate and correct process of degradation of the soil resource.

6.4.2.6 Registers: the registers must give evidence of the parameters. Soil cartography. Reports of evaluation of action plans and corrective action plans.

6.4.3 Indicator: state of the soil resource

6.4.3.1 Justification: the persons responsible for the unit of forest management must know the state of the soil resource and for that they must do follow up activities and evaluation of the soil resource. The follow up can include modification to the General Plan of Management, to the forest operation or to the application of preventive action to avoid the soil deterioration. The use of agro- chemicals, fuels and lubricants, as well as other activities of the management unit, must be oriented to prevent the soil contamination.

6.4.3.2 Objective: to evaluate the state of the soil resource, taking in consideration the initial situation of the parameters determined in the item 6.4.1 and the quality of soil.

6.4.3.3 Parameters: Result of the periodical evaluation through chemical analyses:

- pH;
- organic matter content;
- available phosphorus (estimated by the Bray Method N^{er} 1);
- interchangeable bases;
- interchangeable aluminum.

Result of evaluation of morphological parameter (at least of the A and B horizons):

- horizons successions;
- horizons thickness;
- texture and structure of horizons.

Other parameters to be evaluated:

- procedures for storage, manipulation, application and management of agrochemicals;
- procedures for the storage, manipulation and prevention of possible spillage of fuels and lubricants;
- procedures for the disposal of liquid and solid waste;
- silvicultural procedures for the prevention of mechanical damage to the soil during harvest, silvicultural treatments and transport;
- installation and maintenance of infrastructure to ensure a minimum negative impact of the operations over the soil resource;
- to establish procedures for operations related to the use of agrochemicals, fuels and lubricants and for the disposal of liquid and solid waste that might affect the quality of the soil resource;
- report of environmental accidents.

6.4.3.4 Procedures:

- to define the representative number of samples according to the types of soils and surface of the management unit;
(NOTE: for orientation purposes it is recommended the use of guidelines established by government organisms).
- to define the frequency of the determinations, with a minimum of one per rotation;
- other to be defined by the persons responsible for the management unit.

6.4.3.5 Documents: General Plan of Management. Plans and specific procedures for operations related to the use of agrochemicals, fuels and lubricants, for the disposal of liquid and solid waste and for the forest activities or the installation and maintenance of infrastructure that can affect the quality and use of the soil resource. Contingency plans in case of spillage of agrochemicals, fuels or lubricants.

6.4.3.6 Registers: the registers must give evidence of the parameters. Cartography and results of soil analyses.

6.4.4 Indicator: state of the quality of the water resource.

6.4.4.1 Justification: In the management of the natural resources of the unit of forest management it must be considered the water resource, with the objective of minimizing the potential damaging effects in its quality. The persons responsible for the unit of management must identify and limit the basins associate. Contamination of the water resources by the use of agrochemicals, fuels and lubricants or other activities of the management unit must be prevented.

6.4.4.2 Objective: To know the current state of the resource and follow it up in time. In the cases where the activities in the unit of forest management affect the quality of the superficial waters in the limiting basins, to establish corrective action.

6.4.4.3 Parameters:

- basin area (ha);
- physicochemical analyses of superficial waters, including at least total Nitrogen (mg/l N), total Phosphorus (PO₄, µg/l P), Total Suspended Solids (mg/l);
- procedures for storage, manipulation and prevention of possible spillages of fuels and

lubricants;

- procedures for storage, manipulation, application and management of agrochemicals ;
- contingency plans in case of spillage of agrochemicals, fuels or lubricants;
- procedures for the disposal of liquid and solid waste.

6.4.4.4 Procedures:

- to establish the points of water monitoring;
- to follow up semestrally the water quality associated to a recurrence lower than a year;
- to establish procedures for operations related to the use of agrochemicals, fuels and lubricants and for the disposal of liquid and solid waste that might affect the quality of the water resource;
- to establish procedures for forest activities that might affect the use of water (site preparation, plantation, silvicultural treatments, construction and maintenance of infrastructure, among others);
- others to be defined by the persons responsible for the unit of forest management.

6.4.4.5 Documents: General Plan of Management. Plans of follow up of the water quality. Plans and procedures specific for operations related with the use of agrochemicals, fuels and lubricants, for the disposal of liquid and solid waste and for the forest activities that might affect the use of the water resource.

(NOTE: for orientation purposes it is recommended the use of guidelines established by government organisms).

6.4.4.6 Registers: the registers must give evidence of the parameters. Cartography that identify the basin associated to the unit of forest management, water courses, protection areas and points and sites of monitoring. Results of the analyses of superficial waters.

6.5 CRITERION 5 - Maintenance of the contribution of the forest to the global Carbon cycle

6.5.1 Indicator: estate of the carbon capture.

6.5.1.1 Justification: the forest resources are characterized by their capacity to act as net fixers of carbon. The maintenance or increase of the forest resource in extension or standing existences will mean a positive value for this indicator. The quantification of the existences and the growth rate of the resource allow the person responsible for the unit forest management to evaluate the contribution of the unit to the carbon capture.

(NOTE: those responsible for the forest management may opt for determining the changes of the carbon pools taking in consideration the parameters of this indicator).

6.5.1.2 Objective: to maintain or increase the contribution to the net capture of carbon.

6.5.1.3 Parameters: see items 6.2.1.3 y 6.22.3

6.5.1.4 Procedures: to be defined by the persons responsible for management unit.

6.5.1.5 Documents: General Plan of Management.

6.5.1.6 Registers: the registers must give evidence of the parameters.

6.5.2 Indicator: state of the state of the carbon emissions (such as CO₂).

6.5.2.1 Justification: the implantation of forests contributes to the fixation of carbon dioxide, but

certain activities developed in unit of forest management might cause emissions of carbon (such as CO₂) to the atmosphere, resulting in a lower net capture. In the unit of forest management, with the adoption of certain practices, it is possible to contribute to minimize the emissions. Different or new alternatives to the management of the forest resource tending to minimize the carbon emissions can be generated.

6.5.2.2 Objective: to minimize the carbon emissions through the regulation of the activities in the management unit.

6.5.2.3 Parameters:

- surface of the management unit where the fields are burned or fire is used as a silvicultural tool, (ha) and percentage in relation to the total surface of the management unit (%) (see item 6.1.3.4);
- surface where conventional tillage takes place, moving and eventually mixing the horizons (ha) and percentage in relation to the total surface of the management unit (%).

6.5.2.4 Procedure: to be defined by the persons responsible for the management unit.

6.5.2.5 Documents: General Plan of Management.

6.5.2.6 Registers: the registers must give evidence of the parameters.

6.6 CRITERION 6 - Maintenance and improvement of the multiple socioeconomic benefits on the long term to cover the needs of the societies

6.6.1 Indicator: socio-laboral conditions of the workers in the management unit

6.6.1.1 Justification: the conditions socio laboral of the forest worker in the management unit must be valued, since they contribute to improve the quality of the forest management. A person responsible of enforcing a health policy and safety of the workers must be appointed

6.6.1.2 Objective: to respect and value the conditions and labor rights of the forest workers. To ensure the labor conditions of safety and capacitation, for company workers as well as personnel under contract.

6.6.1.3 Parameters:

- number of jobs generated, direct and indirect, for the unit of forest management;
- grade of compliance with collective agreements and others;
- levels of remuneration according to the implicit risk of the activity and with the level of responsibility of the worker ;
- rate of grave and mortal accidents (number of accidents/total hours worked annually);

6.6.1.4 Procedures: written documentation that contemplates the task to be done by the workers.

6.6.1.5 Documents: General Plan of Management. Documentation to support the compliance with the objectives. Work contracts and services by third parties and with workers.

6.6.1.6 Registers: the registers must reflect the parameters. Registers of authorizations, inscriptions and other certificates given by the proper control organisms. Registers of work inspections.

6.6.2 Indicator: level of capacitation of the workers of the management unit

6.6.2.1 Justification: the workers that work in the management unit must be qualified for the activities

they do.

6.6.2.2 Objective: to capacitate workers, in the management unit as well as hired companies, in all those activities related to their work, safety and hygiene.

6.6.2.3 Parameters:

- number of hours of training given to the workers;
- numbers of workers participating in training sessions in total thereof;
- degree of compliance with the training plan (%);
- evaluation of the results of the training.

6.6.2.4 Procedures: mechanisms to identify the need of capacitation according to the activities of the management unit.

6.6.2.5 Documents: General Plan of Management. Contracts with companies of forest services.

6.6.2.6 Registers: the registers must reflect the parameters. Register of the capacitation activities that took place.

6.6.3 Indicator: estate of relation with the local communities

6.6.3.1 Justification: the social and cultural aspects of the community must be incorporated for a Sustainable Forest Management, to generate benefits, for the management unit as well as the employees and communities and to favour the good understanding among them. The persons responsible of the unit of forest management must identify a person in charge of the relation with the local community.

6.6.3.2 Objective: to promote the communication and good understanding of the communities implied in the productive process of the unit forest management. To consider in the planning of the forest management the work opportunities and opportunities to promote the activities in areas of influence such as the contribution to the rural development.

6.6.3.3 Parameters:

- identification of the interested parts in the process of forest management;
- number and descriptive list of the activities of the community;
- number of persons who benefit from the programs of relationship with the community;
- annual registers of the wood and non wood products obtained and/or services with the participation of the community;
- procedures for several functions and activities (recreational, cultural, of consultation) to relate to the local communities.

6.6.3.4 Procedures: to establish opportunities to relate and interact with the communities including the reception and attention to suggestions, requests and complaints.

6.6.3.5 Documents: General Plan of Management. Plan to promote the use of wood and non good products and services. Public summary of the General Plan of Management. Plans of relationships with the local communities.

6.6.3.6 Registers: the registers must reflect the parameters.

6.6.4 Indicator: estate of the conservation of the landscape, historical, cultural and recreational

values

6.6.4.1 Justification: the valorisation of the landscape, historical, cultural and recreational sites is fundamental for the achievement of the socioeconomic functions and the multiple use of the forest resources.

6.6.4.2 Objective: To consider, in the planning of the forest management, the landscape and the recreational values, in their quality of pre-existing global resources in relation to the intervention and production activities, and their patrimonial value, in consideration to any future scenario, conserving all the historical, cultural and spiritual values.

6.6.4.3 Parameters:

- surface of the visual basins relevant to the management unit (ha);
- location of the sites with historical, cultural and/or recreational significant values for the region;
- outstanding aspects that characterize the visual basin values or attributes that give significance to the region;
- operative plans (among other, silvicultural treatments, harvest, installation and maintenance of infrastructure) that consider the conservation and proper improvement of the historical, cultural recreational and/or landscape values of the management unit.

6.6.4.4 Procedures:

- to plan the treatment and management of the landscape;
- to plan the identification. Follow up and conservation of the historical, cultural and recreational values

(NOTE: for orientation purposes it is recommended to use the guidelines established by government institutions).

6.6.4.5 Documents: General Plan of Management.

6.6.4.6 Registers: the registers must reflect the parameters.

6.7 CRITERION 7 - Legal, institutional and economic frame for the conservation and sustainable management of forests

6.7.1 Indicator: state of compliance with the current legal frame for the forest management

6.7.1.1 Justification: the persons responsible for the management unit, [be it public or private](#), must enforce the compliance with the current legal frame applicable to the unit and the activities associated with it.

NOTE: the compliance with the legal frame refers not only to forest management, but ALL the requirements applicable to a unit of forest management.

6.7.1.2 Objective: to identify and implement in the management unit the legal normative applicable.

6.7.1.3 Parameters:

- availability of the current legal normative applicable to the management unit and the activities associated with it;
- compliance with the current legal normative applicable to the management unit and the activities associated with it;
- permits or legal authorizations corresponding to the execution of those activities that require them;
- policies, procedures, manuals, codes of good practices internally defined, according to the current legal frame.

6.7.1.4 Procedures:

- actualization and follow up of the legal frame applicable;
- capacitation of personnel in the application of the reference normative.

6.7.1.5 Documents: General Plan of Management. Applicable Current Legislation Compendium.

6.7.1.6 Registers: the registers must give evidence of the parameters. Up to date register of the current Legislation. Regulations, permits, declarations and applicable resolutions to the activities that take place in the management unit.

ANNEXA
(NORMATIVE)

A.1 Introduction

This annex indicates the general aspects of the documentation of the unit of forest management and the established mechanisms for the control of documents and registers.

A.2. Generalities

The documentation of the unit of forest management must include:

- a) General Plan of Management;
- b) procedures and other necessary document to develop a Sustainable Forest Management;
- c) the required registers.

A.3. Documents and registers control

The persons responsible for the unit of forest management must establish a system that allows the actualization and approval of the documents when necessary. All the documentation necessary for the Forest management must be at the places of use.

The registers must be identified and kept by a determined period by the management unit, to provide evidence of the parameters, as well as the activities in general.

España, UNE 162002-1:2001. Gestión Forestal Sostenible. Criterios e Indicadores de la management unit. Parte 1: Criterios e indicadores genéricos.

Brasil, NBR 14789:2001 Manejo Forestal - Principios, Criterios e Indicadores para plantaciones Forestales.

<http://www.mpci.org> Proceso de Montreal.

URUGUAY. MINISTERIO DE GANADERÍA, AGRICULTURA Y PESCA. *Código Nacional de Buenas Prácticas Forestales*. Primera Edición. Montevideo. Cinterfor/ OIT. 2004. 77 p.

REPORT CORRESPONDING TO THE NORM UNIT 1152:2009 SUSTAINABLE FOREST

MANAGEMENT. CRITERIA AND INDICATORS

Since the United Nations Committee for the Environment and Development met in Río de Janeiro in the year 1992, the governments of the world are committed to promote the sustainable development in the national and international cooperative works. When the Declaration of Forestry Principles was adopted, the importance of the Sustainable Forest Management was emphasized for all forests and all kind of benefits to comply with the current and future generations.

Different organizations have worked to define the criteria of the Sustainable Forest Management, as well as the terminology for a management of the forest of the planet. In consideration to the development of the forestry sector in Uruguay and with the support of the Society of Forestry Producers, the Instituto Uruguayo de Normas Técnicas (UNIT, Uruguayan Institute of Technical Norms) constituted a Specialized Committee for the Normalization of Sustainable Forest Management within the project "Access to markets and integration through the technical Normalization" BID FOMIN UNIT.

In the present Norm, the applicable definitions for a Sustainable Forest Management of forest plantation in Uruguay are established; including the necessary terms for the application of the Norm UNIT 1152. Sustainable Forest Management. Criteria and indicators.

2 - COMMITTEE INTEGRATION

For the integration of the Specialized Committee of UNIT delegates from the following Institutions were summoned:

Ministerio de Ganadería Agricultura y Pesca (c. c. Dirección General Forestal; Dirección General de Recursos Naturales Renovables); Ministerio de Trabajo y Seguridad Social (c. c. Inspección General del Trabajo y Seguridad Social); Ministerio de Vivienda Ordenamiento Territorial y Medio Ambiente (c. c. Dirección Nacional de Medio Ambiente); Universidad de la República, Facultad de Agronomía (c.c. Departamento de Producción Forestal y Tecnología de la Madera; Departamento de Suelos y Aguas, Unidad de Sistemas Ambientales); Facultad de Ingeniería; Facultad de Ciencias; Instituto Nacional de Investigación Agropecuaria (INIA); Instituto Interamericano de cooperación para la Agricultura (IICA); Asociación Rural del Uruguay (ARU); Sociedad de Productores Forestales (SPF); Asociación de Empresas Contratistas Forestales del Uruguay (ASECFUR); Plenario Interdisciplinario de Trabajadores - Confederación Nacional de Trabajadores (PIT - CNT) ; Asociación Sindical Uruguay (ASU); Asociación Nacional de ONG (ANOG); Red ONGS ambientalistas, Asociación de Ingenieros Agrónomos (AIA), Banco de Seguros del Estado (BSE), Universidad del Trabajo del Uruguay (c. c. Oficina de Programa para el Agro), Administración Nacional de Usinas y Transmisiones Eléctricas (UTE).

For the review of UNIT 1152:2014 the following Institutions were summoned:

Ministerio de Ganadería Agricultura y Pesca (c.c. Dirección General forestal, Dirección General de Recursos Naturales Renovables); Ministerio de Trabajo y Seguridad Social (c.c. Inspección General del Trabajo y Seguridad Social); Ministerio de Vivienda Ordenamiento Territorial y Medio Ambiente (c.c. Dirección Nacional de Medio Ambiente); Universidad de la República, Facultad de Agronomía (c.c. Departamento de Producción Forestal y Tecnología de la Madera, Departamento de Suelos y Aguas, Unidad de Sistemas Ambientales), Instituto Nacional de Investigación Agropecuaria (INIA), Instituto Interamericano de Cooperación para la Agricultura (IICA); Asociación rural del Uruguay (ARU); Sociedad de Productores Forestales (SPF); Asociación de Empresas contratistas Forestales del Uruguay (ASECFUR); Plenario Interdisciplinario de Trabajadores-Conferencia Nacional de Trabajadores (PIT-CNT); Asociación Sindical Uruguay (ASU); Asociación Nacional de ONGs (ANOG); ONG Vida Silvestre; Asociación de Ingenieros Agrónomos (AIA); Banco de Seguros del Estado (BSE); ANEP- Consejo de Educación Técnico Profesional; Administración Nacional de Usinas y Trasmisiones Eléctricas (UTE) and related companies.

3 - ANTECEDENTS

For the elaboration of the present Norm, the Specialized Committee took into consideration the following antecedents:

3.1 - Instituto Uruguayo de Normas Técnicas (UNIT)

UNIT - ISO 14050: 2005. Environmental Management. Vocabulary. Guide UNIT 18101:2002. Systems of Security Management and Occupational Health. Vocabulary.

3.2 Associação Brasileira de Normas Técnicas (ABNT)

NBR 14789:2001 Forest Management. Principles, Criteria and Indicators for Forest plantations.

3.3 Asociación Española de Normalización (UNE)

UNE 162001. Sustainable Forest Management. Vocabulary, terminology and definitions.

UNE 162002-1:2001. Sustainable Forest Management Criteria and Indicators of the Management unit. Part 1: Criteria and generic indicators.

3.4 Criteria and indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests.

[http:// www.mpci.org](http://www.mpci.org). Montreal Process.

3.5 Ministerio de Ganadería Agricultura y Pesca. (Uruguay)

National Code of Good Forest Practices. First Edition. Montevideo. Cinterfor/ OIT. 2004.

3.6 Food and Agricultural Organization (FAO)

Terminology of Forest Practice. Serie IV. 1999

4 - CONSIDERATIONS

For the elaboration of the Norm UNIT 1152 the Specialized Committee analyzed different documents at the national and international level to establish a frame of definition of the Criteria and Indicators of the Sustainable Forest Management in Uruguay.

The Committee defined as document of reference the "Criteria and Indicators for the Conservation of temperate and boreal forests" (Process Montreal), government process ratified by Uruguay in 1995 and the National Code of Good Forestry Practices elaborated and approved by consensus among the other parties of the sector in 2004. The format established for the norm UNIT was similar to the Norm UNE 162002:2001.

Based on the 7 Criteria of the Montreal Process, specific indicators were defined, applicable to the Unit of Forest Management; for all forestry producers without exclusions of scales and for implanted forests; since the silviculture of plantations is the base of the forest development in Uruguay.

The indicator, with its justification, objective and parameters; for each Criterion, have been related among them and provide a frame of evaluation of environmental, social and economic productive conditions of the Unit of Forest Management.

The first version of the norm was approved on April 24th, 2006 by the Specialized Technical Committee and on May 10th, 2006 by the Norms General Committee.

At the end of 2006, this norm was reviewed with the objective of introducing some modification in the Criterion N^{ef} 4, "Conservation and maintenance of the soil and water resources", item 6.4.

The second edition to the norm UNIT 1152 was approved by the Specialized Committee of Sustainable Forest Management on December 18th, 2006 and on March 7th, 2007 by the Norms General Committee.

The norm UNIT 1152:2009

The UNIT norms about Sustainable Forest Management (UNIT 1151, UNIT 1152 and UNIT 1153) were conceived from the beginning to be presented as national initiatives in the implementation of the PEFC system (Programme for the Endorsement of Forest Certification schemes) in Uruguay.

The Society of Forestry Producers (Sociedad de Productores Forestales) formally requested Uruguay's admission in 2009 to the PEFC system, assuming the responsibilities inherent to the membership of the group.

As part of the requirements for the admission to the PEFC, the documents submitted as national initiatives, in this case UNIT 1151, UNIT 1152 and UNIT 1153, must pass through a process of public consultation for a period of 60 days.

In order to comply with this requirement, the public consultation took place from April 1st until May 23rd, 2009 about the norms UNIT 1151, UNIT 1152 y UNIT 1153.

The corresponding documents were made accessible through the UNIT website: www.unit.org.uy/gfs along with a on-line form for those interested to express their opinion.

As a result of the consultation the comments received were derived to the UNIT Specialized Committee for its consideration.

During the period October-December 2009, the Specialized Committee considered the modifications proposed and finally agree on the approval of the revision of this nor on December 10th, 2009. On December 14th, 2009 the norm UNIT 1152:2009 by the Norms General Committee.

The UNIT 1152:2014 Review

UNIT Specialized Committee revisited the norm during the period March to May 2014, for the purpose of achieving compliance with the requirements of PEFC certification schemes (PEFC ST 1003: 2010), November 2010.

The main changes relate to details of the nature (public or private) of the forest management units. New requirements were added to restrict the conversion of primary natural forests to other land uses and to protect forests from illegal activities. Pesticides Type 1A and 1B WHO and persistent organic pollutants are banned and genetically modified trees are prohibited.

Amending requirements were incorporated in indicators of Criterion 4: Conservation and maintenance of soil and water resources; related parameters were added to reduce the impact of forest harvesting activities erosion and degradation of the management unit. Finally, amendments to the parameters of the indicator 6.6 on the social and working conditions of workers in the management unit were added.

The Specialized Technical Committee agreed -on May 26, 2014- to send this project to Public Consultation. The project was in Public Survey from June 9, 2014 to August 9, 2014.

The comments received during the consultation were analyzed and resolved at the meeting of the Specialized Committee on 29 August 2014 when the project was finally approved by the Committee.

This standard was approved by the Directive Board on September 30,2014